ANEJO Nº 6. ESTRUCTURAS

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   - Marco encauzamiento arroyo Valdagras

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1. Cuadro resumen

1. CUADRO RESUMEN

Este Subtramo consta de un solo Viaducto, con lo que no se ha realizado cuadro resumen.

2. Descripción: tipología, aparatos de apoyo, juntas, etc.

2. DESCRIPCIÓN: tipología, aparatos de apoyo, etc.

Este epígrafe está recogido en los Planos nº 5.1.4.

3. Definición geométrica

3. DEFINICIÓN GEOMÉTRICA

La definición geométrica del Viaducto está recogido en los Planos nº 5.1.3.

4. Cálculos

SE ADJUNTA COPIA DE LAS BASES DE CALCULO EN LAS QUE SE OBSERVA QUE SE HAN UTILIZADO TANTO LA NORMA PDS 1/1974 COMO LA NORMA NCS-98.

ASIMISMO, SE ADJUNTA UNA NOTA EXPLICATIVA DE LAS SECCIONES CONSIDERADAS PARA EL CALCULO A ESFUERZO CONSTANTE.

POR ULTIMO , SE ADJUNTA UNA NOTA EXPLICATIVA DE LOS PROGRAMAS DE CALCULO.

PROYECTO LÍNEA DE ALTA VELOCIDAD
MADRID-BARCELONA-FONTERA FRANCESA
TRAMO ZARAGOZA-LERIDA

PUENTE SOBRE EL RÍO CINCA

ANEJO DE CÁLCULO

PUENTE SOBRE EL RÍO CINCA EN LA LÍNEA DEL ALTA VELOCIDAD ZARAGOZA-LÉRIDA

Bases de cálculo

19 de Febrero 197

Se tomo en consecuencia como valor de frenado los siguientes valores:

- Tren U.I.C → 1161 t
- Tren IPF-75 → 726,75 t

Arranque (Tracción)

a) Según el Eurocódigo

- Q = 33 x L < 1000 Kn

En nuestro caso:

- Q = 1000 Kn = 102 t/vía

b) Según UIC

- Q = 1000 Kn 102 t/vía

c) Según IPF-75

- Q = 12 x 30 x 2 x 1/8 = 90 t

Efecto sísmico.

No se considerará acción sísmica vertical

- Acción Sísmica horizontal

a) Según PDS 1/1974

Coeficiente sísmico básico C = 0,08

Se considerará como acción sísmica horizontal H = S x Q.

Donde Q es la carga vertical actuando en la hipótesis considerada.

$S = \alpha\ \eta\ \beta\ \delta$
$\alpha = 0.080$
$\eta = 1.000$
$\beta = 1.000$
$\delta = 0.800$ factor de cimentación

- Para puente vacío

Q = (14,22 x 2,5 + 12,39) x 830 = 39790 t

- Peso de traviesas de apoyo:

P = 15 x 4,8 x 4,0 x 2 x 2,8 ~ 1440 t

En nuestro caso:

$F_L = F_T = 0,064 \times (39790 + 1440) = 2640$ t

- Para puente cargado

Se considera actuando el 30% de la sobrecarga y del frenado con un tren de 300 m de longitud.

con lo que:

F = 0,064 (41230 + 0,3 x 300 x 2 x 8) - 2130 t

Frenado compatible - 1161 x 0,3 = 348 t

b) Según NCSE-94

El puente se sitúa a unos 15 km al norte de Fraga.

Se trata de una zona donde la aceleración sísmica básica es inferior a 0,04.

La aceleración de cálculo es:

- $A_{SQ} = 0,04 \times 1,3 = 0,052 < 0,06$

Es decir, de acuerdo con este Instrucción no sería necesario el estudio sísmico en esta zona.

No obstante se ha efectuado un cálculo considerando el apoyo del tablero en el estribo como elástico con una rigidez correspondiente a un neopreno de 6 m^2 de área y unos 2 cm de espesor.

Con este criterio se obtienen coeficientes del 6 al 7% por lo que se dan por válidos los anteriores valores.

Rozamiento de teflones.

Se suponen apoyos de teflón con un rozamiento del 0,05 en caso de ser desfavorable y del 0,01 en caso de ser favorable.

- $F_L = 0,05$ (41230 - 18 x 48 - 100) = 2013 t
  ó
  $F_L = 0,01$ (41230 - 18 x 48 - 100) = 403 t

Interacción vía estructura

Se refiere este capítulo a los esfuerzos producidos por una dilatación diferencial entre carriles y estructura de hormigón.

Se siguen los criterios del apartado 3.4.9 del EC1/93.

En el caso de carril con junta en un extremo:

- F = 400 + 5 L < 112 t/vía → 225 t/total

Asientos diferencial

Se toma un asiento diferencial de 1/2 pulgada com evolución lenta.

CALCULO DEL TABLERO DE LOSA CONTINUA

Para el cálculo del tablero se hace uso de un programa propiedad de Intecsa específicamente creado para estructuras del tipo de losa continua.

Los datos necesarios paro el cálculo son los siguientes:

- Geometría (nº de vanos, longitud).
- Definición de cargas (carga permanente, sobrecargas, ...).
- Características de materiales.
- Coeficientes de ponderación del pretensado.
- Características mecánicas de la sección.
- Trazado del cable equivalente y toneladas en anclaje.

A partir de dichos datos de entrada se obtienen los siguientes resultados a décimos de la luz:

- Esfuerzos de peso propio.

- Esfuerzos debidos a carga permanente.

- Esfuerzos debidos a temperatura (calentamiento).

- Esfuerzos debidos a descanso de apoyos en estructura inicial. Para los valores en estructura final se multiplican los valores del apartado anterior por $e^{-\varnothing}$, siendo $\varnothing = 2,5$ el valor $e^{-2,5}$ es 0,0821.

- Envolvente de esfuerzos de sobrecarga repartida.

- Envolvente de esfuerzos de paseo del carro.

- Envolvente de esfuerzos por sobrecarga total, que Incluyen el descenso de apoyos, en estructura inicial o final. y la temperatura, calentamiento o

enfriamiento.

Se hace notar aquí que los momentos en apoyos están redondeados en el entorno comprendido a uno y otro lado del apoyo de 0,75 h siendo h el canto del tablero.

Una vez obtenidos todos los esfuerzos, se generan a partir de la geometría del cable y las toneladas en anclaje los siguientes resultados:

- Esfuerzos debidos al cable a décimas de la luz, considerando únicamente las pérdidas por rozamiento, para lo cual previamente se han introducido los valores del coeficiente de rozamiento μ y de desviación parásita K.

- Esfuerzos de pretensado en estado inicial, considerando tanto las pérdidas de rozamiento como las elásticas Instantáneas.

- Esfuerzos de pretensado en estado final, que considera el total de pérdidas, instantáneas más diferidas.

- Tensiones en construcción.

- Tensiones en servicio, tanto en estado inicial como en estado final.

- Comprobación a cortante.

- Comprobación a rasante.

- Reacciones y giros debidos a;

  - Peso propio
  - Cargas muertas
  - Temperatura
  - Descenso de apoyos
  - Sobrecarga repartida
  - Carro
  - Sobrecarga total (suma de los 4 anteriores)

- Comprobación a rotura.

- Desplazamiento y giros acumulado debidos a todas y cada una de las cargas, incluso pretensado.

En las hojas correspondientes a las tensiones en construcción y servicio se han usado las siguientes abreviaturas.

- Pti : Pretensado Inicial
- Ptf : Pretensado final
- Pi : Pesa propio Inicial
- Pf :Peso propio final
- M : Cargas permanentes (o muertas)
- Sp : Sobrecarga que produce el máximo momento positivo
- Sn : Sobrecarga que produce el máximo momento negativo

COMPROBACIÓN A CORTANTE

ANCHURAS DE ALMA CONSIDERADAS EN EL CÁLCULO

Según las dimensiones de la sección geométrica la anchura tipo de las almas es de 0,60 m en total 1,20 m.

En la sección de apoyo de los vanos de 70 metros (dovelas sobre pilas 1, 2, 3 y 4) las almas se regruesan hasta los 0,80 m, en total 1,60 m.

En el capítulo "Cálculo de las armaduras de cortante" aparecen para todas las secciones de comprobación dos valores de anchura de hormigón.

Ancho sección: Es la anchura total sin descontar vainas y solape toma en cuenta a efectos de calcular la armadura mínima necesaria en la sección.

En nuestro caso:

$b_{(Tipo)} = 2 \times 0,60 = 1,20$

$b_{(Apoyos\ vanos\ 70\ m)} = 2 \times 0,80 = 1,60$

Ancho eficaz: Es la anterior descontando las vainas.

Según EP-93 (apartado 48.1.3.1) "La sección resistente del hormigón se obtiene a partir de las dimensiones reales de la pieza deduciendo un medio de los huecos correspondientes a los conductos de pretensado que cruzan la sección.

En nuestro caso se trato de 2 vainas base 24 ∅ 6”

$b_{eficaz} = b_o - 2 \times 1/2 \times 0,11 = b_o - 0,11$

En nuestro caso:

$b_{EF\ (Tipo)} = 1,20 - 0,11 = 1,09$

En el cálculo $B_{EF} = 1,00$

$B_{EF\ (Apoyos\ vanos\ 70\ m)} = 1,60 - 0,11 = 1\ 49$ m

En el cálculo $B_{EF} = 1,40$ m

1.- DESCRIPCIÓN GENERAL DE LA ESTRUCTURA

intecsa

PROYECTO:

HOJA ... DE ...

FECHA

EJECUTANTE:

LAS CARACTERÍSTICAS FUNDAMENTALES DE LA UNIDAD, DISPOSICIÓN DE LUCES Y SECCIÓN TRANSVERSAL TIPO SE ENCUENTRAN REPRESENTADAS EN EL DIBUJO ADJUNTO.

EL SISTEMA CONSTRUCTIVO PREVISTO EN EL PROYECTO ES MEDIANTE EMPUJE, SITUANDO LA PLANTA DE FABRICACIÓN EN EL ESTRIBO 2

LA TRAZA EN PLANTA (R=11000 m) PERMITE ESTE SISTEMA DE MONTAJE, MIENTRAS QUE EL LONGITUDINAL REQUIERE UNA ADAPTACIÓN DE LA SECCIÓN TRANSVERSAL DEBIDO AL ACUERDO VERTICAL CUYO PUNTO DE TANGENCIA DE SALIDA SE SITÚA EN LAS PROXIMIDADES DE LA PILA 12

intecsa

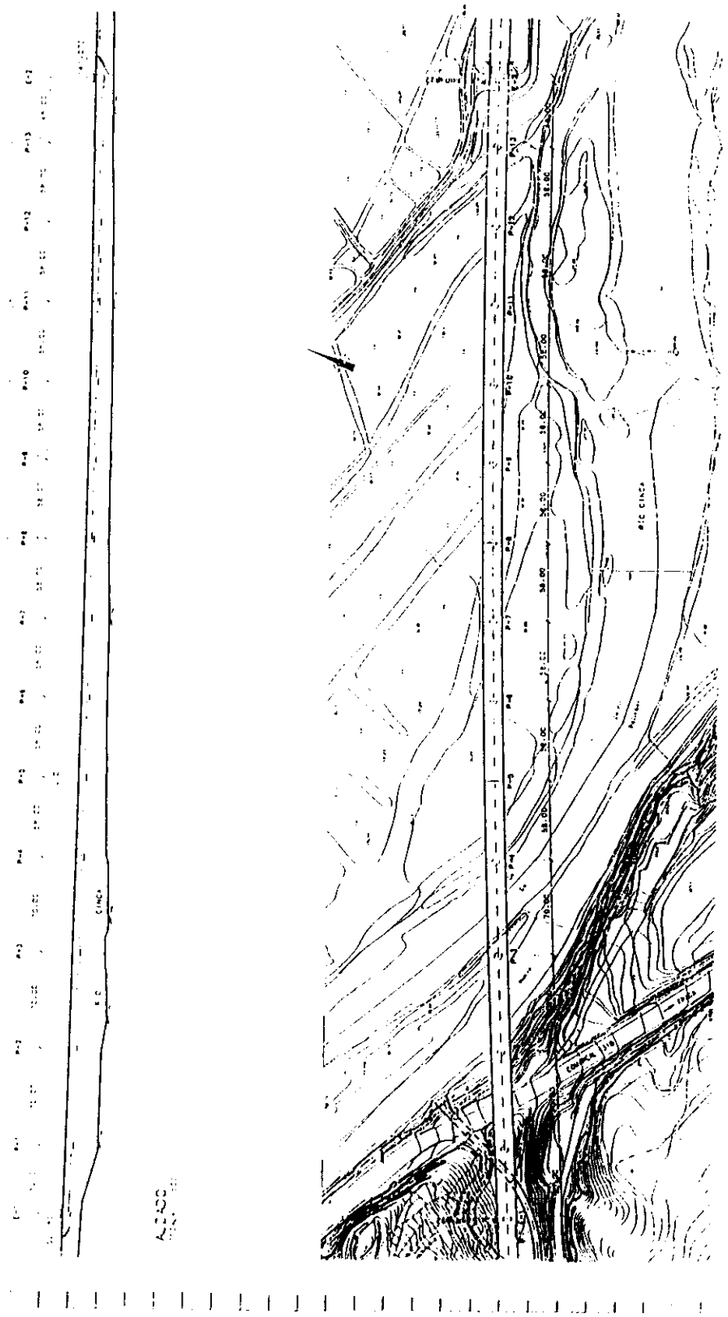
PROYECTO:

HOJA ... DE ...

FECHA

EJECUTANTE:

PLANTA Y ALZADOS GENERAL



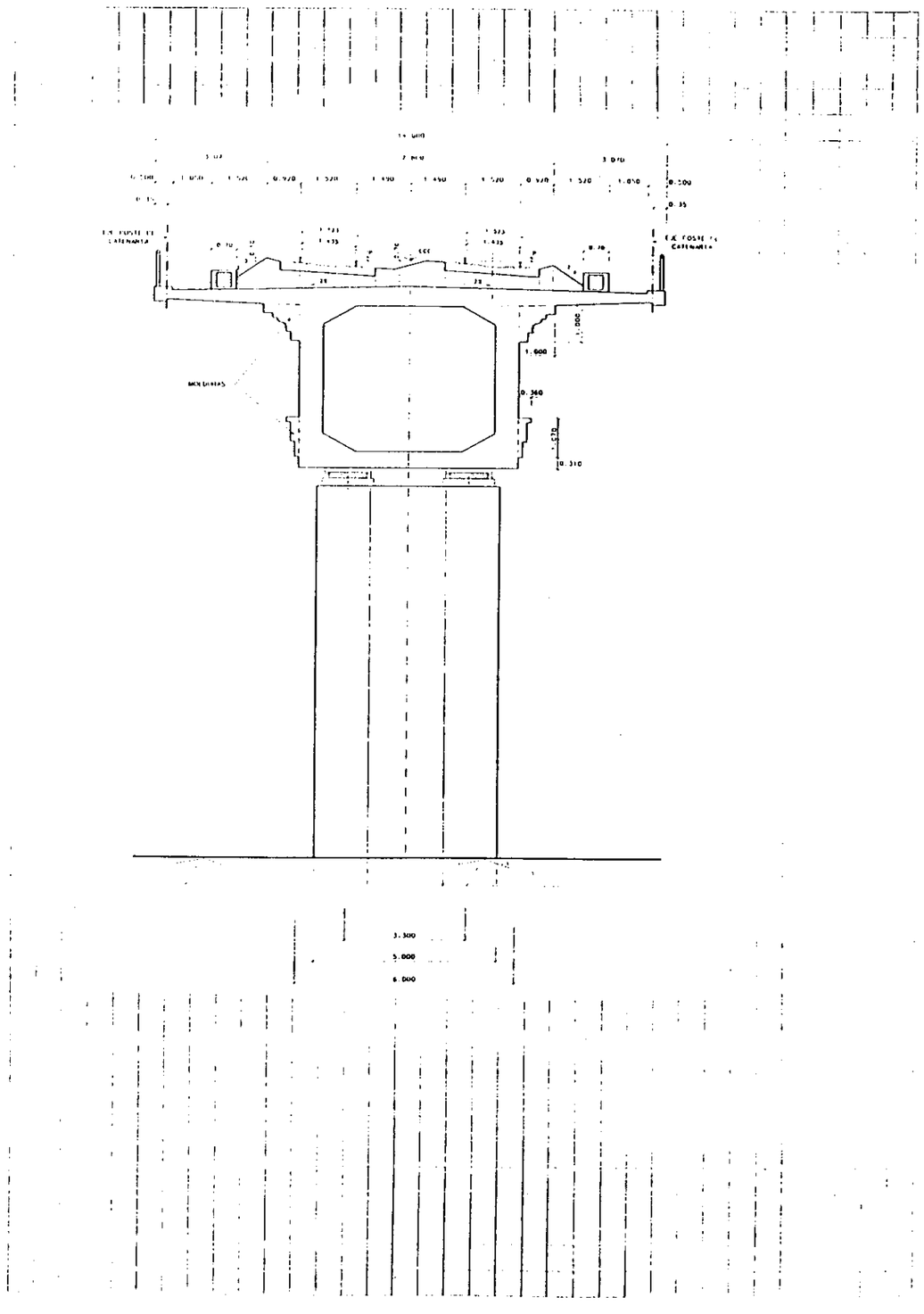
intecsa

PROYECTO:

HOJA DE

FECHA

EJECUTANTE:



1.2.- CARGAS VERTICALES ACTUANTES

ACCIONES A CONSIDERAR

Peso propio de la estructura.

Los que se deduzcan de aplicar a las secciones de proyecto los siguientes pesos específicos:

Hormigón en masa o armado	$\gamma = 2,5 \ t/m^3$
Acero estructural	$\gamma = 7,85 \ t/m^3$

Cargas permanentes.

Según "Bases de Cálculo para el Proyecto de Estructuras de Puentes de Ferrocarril en la LAV Zaragoza-Lleida".

Balasto + vías + traviesas:

4,74 t/m/circulación

En nuestro caso 4,74 x 2 = 9,42 t/m

Barreras y barandillas

2 x 0,05 t/m = 0,10 t/m

Postes y catenarias

Esf. horizontal	0,5 t
Esf. vertical	0,5 t
Momento en base	9,0 t
Bloque de anclaje	0,5 t

Estos postes irán anclados al tablero en la sección de apoyo sobre pilas disponiéndose además otros en los centros de los tres vanos de 70,0 metros.

Su efecto se estudiará a nivel local de anclaje.

intecsa
PROYECTO: HOJA DE
EJECUTANTE: FECHA

Como hipótesis de rotura de cable se supondrá con $\gamma = 1,0$ una fuerza de 2,0 t aplicada a una altura de 7,0 metros del anclaje sobre la estructura principal.

Impostas.

2 x 0,10 (0,35 + 0,35 + 0,35) x 2,5 = 0,52 t/m

Canaletas cables y paseos.

(4 x 0,50 x 0,10 + 4 x 0,60 x 0,10) x 2,5 = 1,10 t/m

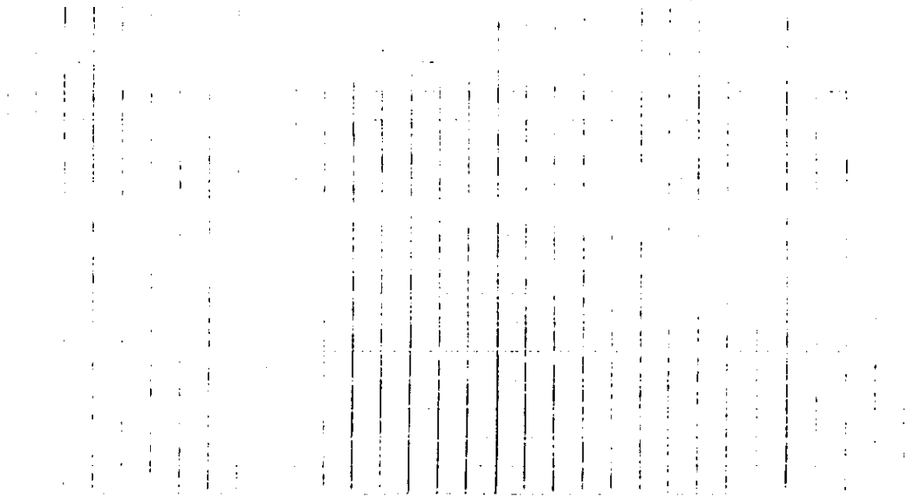
Molduras.

(2 x 1,50 x 0,10 + 2 x 0,10 x 1,00) x 2,5 = 1,25 t/m

$$TOTAL \ 11,57 \ t/m \rightarrow \frac{12,39}{13,70} = 0,90 \ t/m^2$$

Sobrecargas móviles verticales.

Se tomará la envolvente de esfuerzos debidos a los trenes de carga IPF75 y UIC.



2.- CÁCULO DEL TABLERO

2.1.- CARACTERÍSTICAS GEOMÉTRICAS Y MECÁNICAS DE LA SECCIÓN TRANSVERSAL

```
12
 4,  4.93
 .00,  13.700,  0.130,  0.000
   70,  13.700,  0.250,  0.130
 7.70,   0.000,  0.230,  0.380
 6.00,   6.000,  4.550,  0.380
 0
 8,  4.93
0.000,  13.700,  0.130,  0.000
13.70,  13.700,  0.250,  0.130
 7.70,   0.000,  0.230,  0.380
 4.80,   4.800,  0.050,  0.380
 2.00,   0.000,  0.300,  0.430
 1.20,   1.200,  4.550,  0.380
 0.00,   2.400,  0.300,  4.230
 4.80,   4.800,  0.400,  4.530
 0
 8,  4.93
0.000,  13.700,  0.130,  0.000
13.70,  13.700,  0.250,  0.130
 7.70,   0.000,  0.230,  0.380
 4.40,   4.400,  0.050,  0.380
    0,   0.000,  0.300,  0.430
 1.60,   1.600,  4.550,  0.380
 0.00,   0.400,  0.100,  4.230
 4.40,   4.400,  0.600,  4.330
 0
 8,  4.93
0.000,  13.700,  0.130,  0.000
13.70,  13.700,  0.250,  0.130
 7.70,   0.000,  0.230,  0.380
 4.40,   4.400,  0.050,  0.380
 1.60,   0.000,  0.300,  0.430
 1.60,   1.600,  4.550,  0.380
 0.00,   2.000,  0.300,  4.230
 4.40,   4.400,  0.400,  4.530
 0
10,   5.050
0.000,   10.900,  0.109,   0.000
10.90,   10.900,  0.113,   0.109
10.90,   13.700,  0.028,   0.222
    0,    7.700,  0.250,   0.250
7.700,    0.000,  0.230,   0.500
4.800,    4.800,  0.300,   0.250
2.000,    0.000,  0.300,   0.550
1.200,    1.200,  4.800,   0.250
0.000,    2.400,  0.300,   4.350
4.800,    4.800,  0.400,   4.650
0
10,   5.087
0.000,   10.900,  0.109,   0.000
10.90,   10.900,  0.150,   0.109
10.90,   13.700,  0.028,   0.259
7.700,    7.700,  0.250,   0.287
7.700,    0.000,  0.230,   0.537
4.800,    4.800,  0.263,   0.287
2.000,    0.000,  0.300,   0.550
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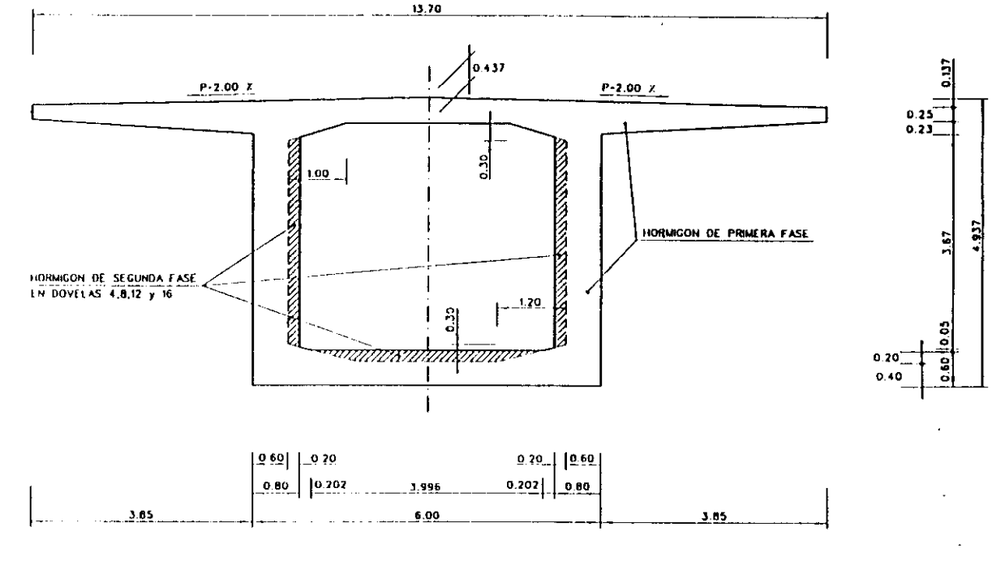
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7.700,    7.700,  0.250,   0.371
4.800,    4.800,  0.207,   0.343
   00,    0.000,  0.230,   0.621
2.000,    0.000,  0.300,   0.550
1.200,    1.200,  4.828,   0.343
0.000,    2.400,  0.300,   4.471
4.800,    4.800,  0.400,   4.771
0
10,   5.267
0.000,   10.900,  0.109,   0.000
10.90,   10.900,  0.330,   0.109
4.900,    7.700,  0.028,   0.439
4.800,    4.800,  0.083,   0.439
7.700,    7.700,  0.250,   0.467
7.700,    0.000,  0.230,   0.717
2.000,    0.000,  0.300,   0.550
1.200,    1.200,  4.828,   0.439
0.000,    2.400,  0.300,   4.567
4.800,    4.800,  0.400,   4.867
0
9.    5.376
   0,   10.900,  0.109,   0.000
10.90,   10.900,  0.439,   0.109
4.900,    7.700,  0.028,   0.548
7.700,    7.700,  0.250,   0.576
7.700,    0.000,  0.230,   0.826
2.000,    0.000,  0.300,   0.548
1.200,    1.200,  4.828,   0.548
0.000,    2.400,  0.300,   4.676
4.800,    4.800,  0.400,   4.976
0
10,   5.510
0.000,   10.900,  0.109,   0.000
10.90,   10.900,  0.441,   0.109
4.900,    4.900,  0.132,   0.550
4.900,    7.700,  0.028,   0.682
7.700,    7.700,  0.250,   0.710
7.700,    0.000,  0.230,   0.960
2.000,    0.000,  0.300,   0.550
1.200,    1.200,  4.960,   0.550
   0,    2.400,  0.300,   4.810
4.800,    4.800,  0.400,   5.110
0
13,   13.700
0.000,   0.130,  6.850,   0.000
0.130,   0.000,  6.850,   6.850
0.250,   0.250, 13.700,   0.000
0.000,   0.230,  3.850,   0.000
0.230,   0.000,  3.850,   9.850
4.550,   4.550,  0.600,   3.850
4.550,   4.550,  0.600,   9.250
0.350,   0.050,  1.000,   4.450
0.050,   0.350,  1.000,   9.250
0.300,   0.000,  1.200,   4.450
0.000,   0.300,  1.200,   8.050
0.050,   0.050,  2.800,   5.450
0.400,   0.400,  4.800,   4.450
0
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0.000,   -2.460,   1.230,   0.400
-2.46,   -2.460,   1.740,   1.630
-? 46,    0.000,   1.230,   3.370
   74,   -1.740,   4.200,   0.400
0
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intecsa

PROYECTO: HOJA DE

EJECUTANTE: FECHA



SECCION TIPO-1 (DOVELAS 1 a 39)
(ESCALA 1:50)

CALCULO DE CARACTERISTICAS MECANICAS

Seccion Tipo A
con altura de 0.60 y
Solera de 0.40 m.

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	13.700	.130	.000
13.700	13.700	.250	.130
7.700	.000	.230	.380
4.800	4.800	.050	.380
2.000	.000	.300	.430
1.200	1.200	4.550	.380
.000	2.400	.300	4.230
4.800	4.800	.400	4.530

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
13.481	45.3025	1.987	2.943	4.930	.044	.065	1.0

CALCULO DE CARACTERISTICAS MECANICAS

Seccion Tipo A
con altura de 0.60 m
y Solera de 0.40 m.

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	13.700	.130	.000
13.700	13.700	.250	.130
7.700	.000	.230	.380
4.400	4.400	.050	.380
1.600	.000	.300	.430
1.600	1.600	4.550	.380
.000	2.000	.300	4.230
4.400	4.400	.400	4.530

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
15.001	47.4753	2.037	2.893	4.930	.043	.061	1.0

T. 0.70

CALCULO DE CARACTERISTICAS MECANICAS

Seccion Tipo 1
con altura de 0.80 y
solera de 0.60

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	13.700	.130	.000
13.700	13.700	.250	.130
7.700	.000	.230	.380
4.400	4.400	.050	.380
1.600	.000	.300	.430
1.600	1.600	4.550	.380
.000	.400	.100	4.230
4.400	4.400	.600	4.330

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
15.601	50.7692	2.129	2.801	4.930	.042	.055	1.0

intecsa

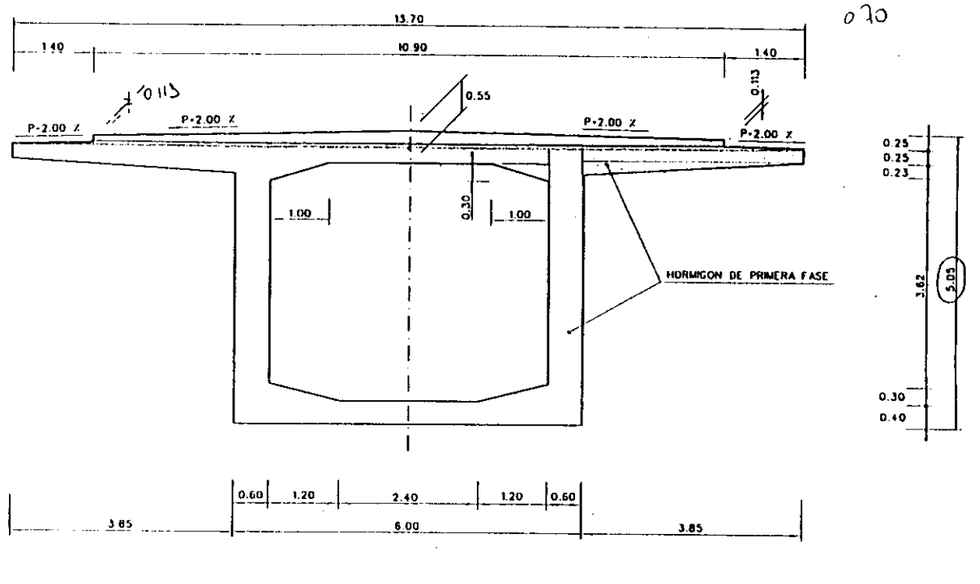
PROYECTO: HOJA ___ DE ___

FECHA

EJECUTANTE:

Secc 23-22-21-20-19-18

0.70



SECCION TIPO-2 (DOVELA 40 y ½ DOVELA 41)
ESCALA 1:50

10 TOTO

0.000	10.90	0.109	0
10.90	10.95	0.113	0.109
10.90	13.70	0.028	0.222
7.70	7.70	0.250	0.250
7.70	0.00	0.230	0.500
4.80	4.80	0.300	0.85
2.00	0.00	0.300	0.55
1.25	1.200	4.80	0.25
0.00	2.40	0.300	4.35
4.80	4.80	6.400	4.85

Seccion TIPO 2

CALCULO DE CARACTERISTICAS MECANICAS

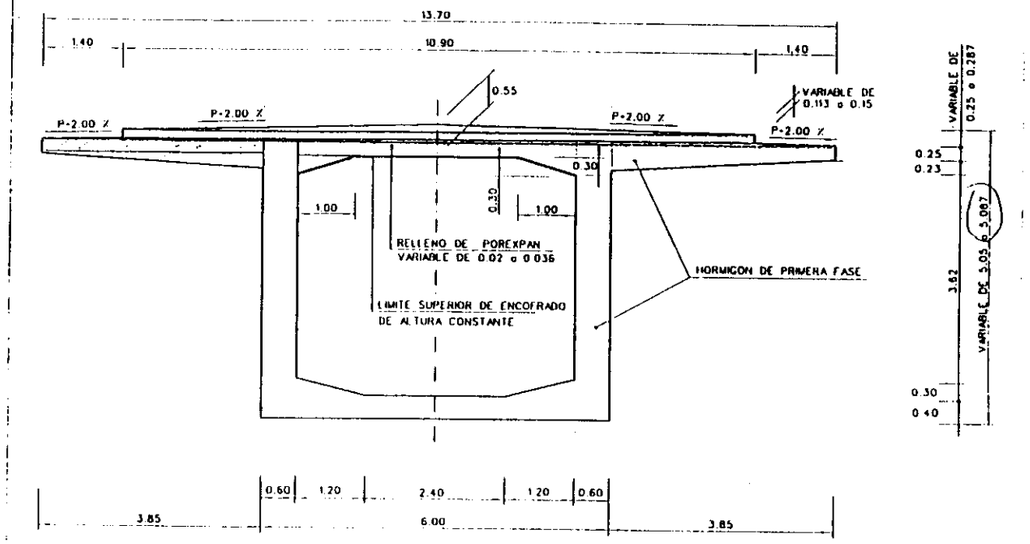
BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.113	.109
10.900	13.700	.028	.222
7.700	7.700	.250	.250
7.700	.000	.230	.500
4.800	4.800	.300	.250
2.000	.000	.300	.550
1.200	1.200	4.800	.250
.000	2.400	.300	4.350
4.800	4.800	.400	4.650

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
14.761	49.9516	1.934	3.116	5.050	.039	.062	1.0

PROYECTO: HOJA DE

EJECUTANTE: FECHA

Sec 16



SECCION TIPO-3 (1/2 DOVELA 41)
ESCALA 1:50

5.087

0.000	10.90	0.109	0
10.90	10.90	0.15	0.109
10.90	13.70	0.028	0.259
7.70	7.70	0.250	0.287
7.70	0.00	0.23	0.537
4.80	4.80	0.263	0.287
2.00	0.00	0.30	0.550
1.20	1.20	4.80	0.287
0.00	2.40	0.300	4.387
4.80	4.80	0.40	4.687
0			

Seccion TIPO 3

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.150	.109
10.900	13.700	.028	.259
7.700	7.700	.250	.287
7.700	.000	.230	.537
4.800	4.800	.263	.287
2.000	.000	.300	.550
1.200	1.200	4.800	.287
.000	2.400	.300	4.387
4.800	4.800	.400	4.687

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
14.986	51.0658	1.936	3.151	5.087	.038	.062	1.0

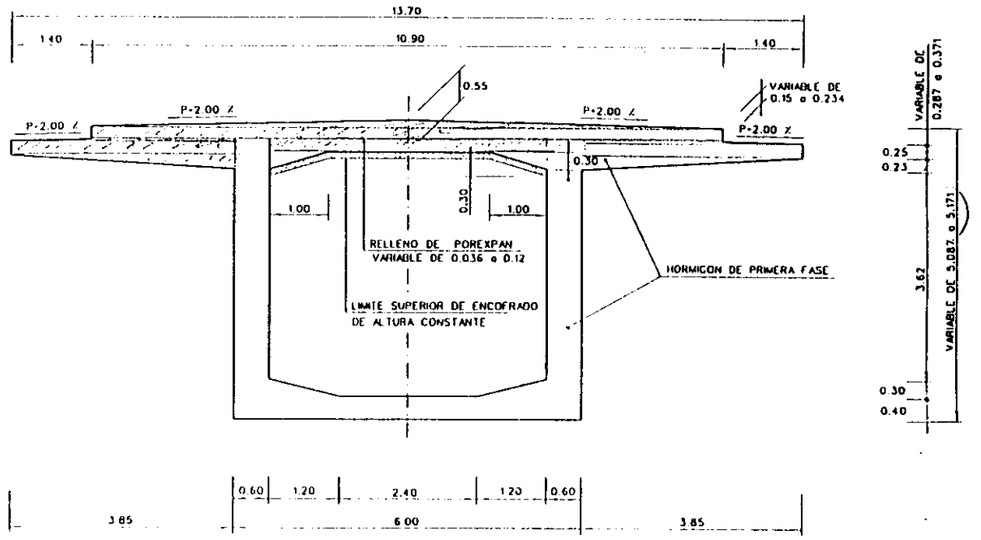
infecsa

PROYECTO: HOJA DE

FECHA

EJECUTANTE:

Sec 13



SECCION TIPO-4 (DOVELA 42)
ESCALA 1:50

10 5171

0.000	10.90	0.109	0.00
10.90	10.90	0.234	0.109
4.90	7.70	0.028	0.343
7.70	7.70	0.25	0.371
4.80	4.80	0.207	0.343
1.70	0.00	0.23	0.621
2.00	0.00	0.30	0.51
1.20	1.20	4.878	0.343
0	2.40	0.30	4.471
4.80	4.80	0.40	4.771
0			

Seccion TIPO 4

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.234	.109
4.900	7.700	.028	.343
7.700	7.700	.250	.371
4.800	4.800	.207	.343
7.700	.000	.230	.621
2.000	.000	.300	.550
1.200	1.200	4.828	.343
.000	2.400	.300	4.471
4.800	4.800	.400	4.771

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
15.499	53.6042	1.942	3.229	5.171	.036	.060	1.0

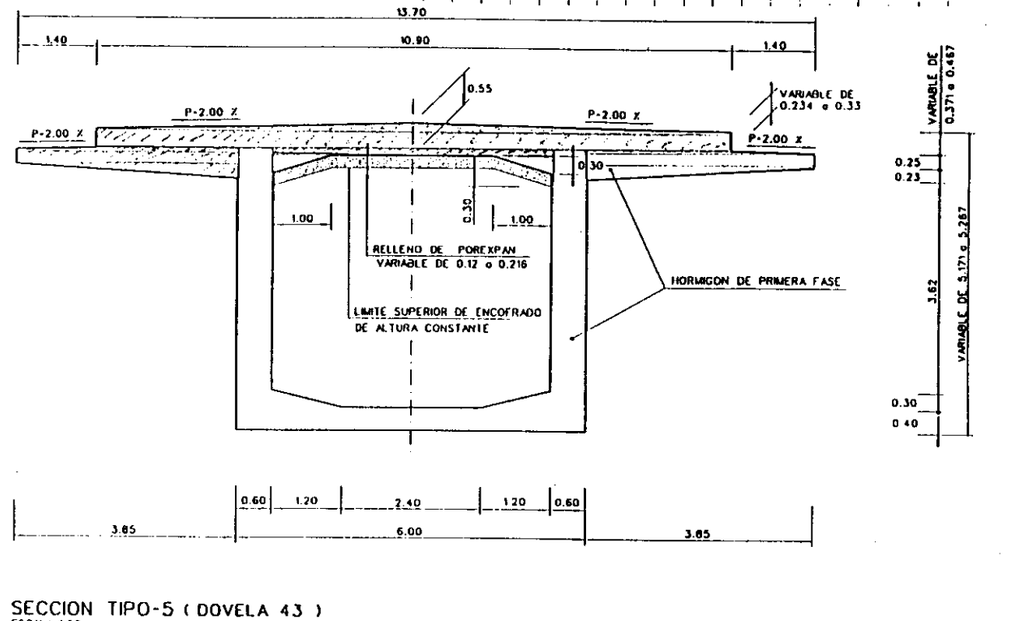
intecsa

PROYECTO: HOJA DE

FECHA

EJECUTA INTEC:

Sec 9



SECCION TIPO-5 (DOVELA 43)
ESCALA 1:50

0.00	10.90	0.109	0.00
10.90	10.90	0.330	0.109
4.90	7.70	0.028	0.439
4.80	4.80	0.083	0.439
7.70	7.70	0.21	0.467
7.70	0	0.23	0.717
2.00	0	0.30	0.55
1.20	1.20	4.827	0.439
0	2.40	0.30	4.567
4.80	4.80	0.40	4.867

SECCION TIPO 5

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.330	.109
4.900	7.700	.028	.439
4.800	4.800	.083	.439
7.700	7.700	.250	.467
7.700	.000	.230	.717
2.000	.000	.300	.550
1.200	1.200	4.828	.439
.000	2.400	.300	4.567
4.800	4.800	.400	4.867

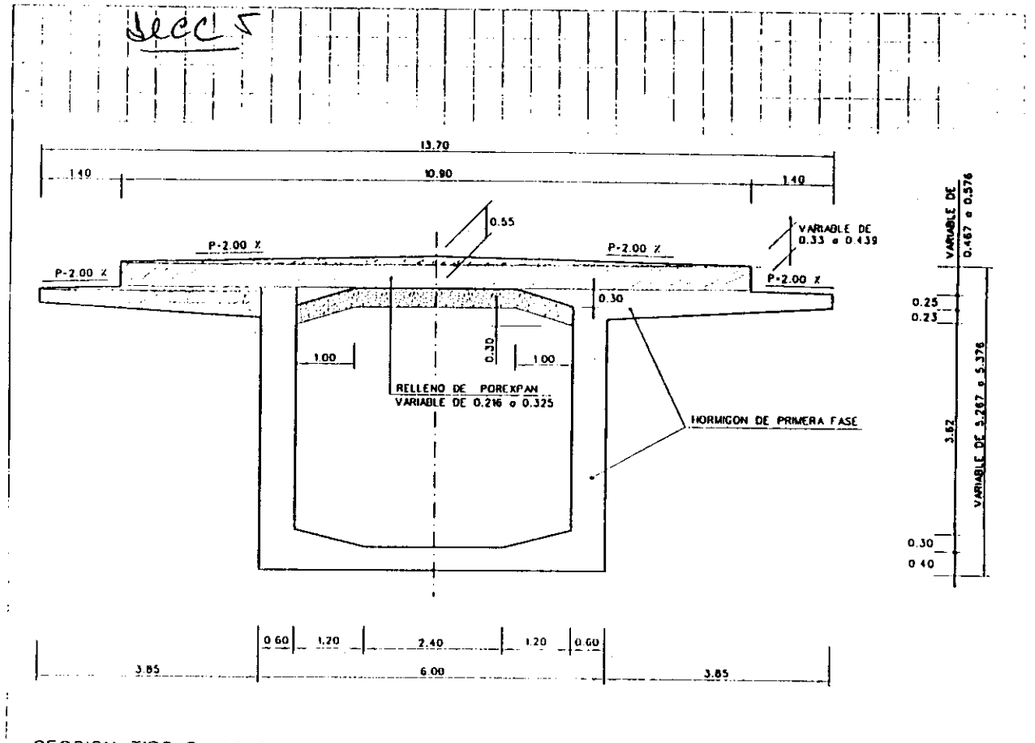
AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
15.950	56.2546	1.963	3.304	5.267	.035	.059	1.0

intecsa

PROYECTO: HOJA DE

FECHA

EJECUTANTE:



SECCION TIPO-6 (DOVELA 44)
ESCALA 1:50

5.376

0.00	10.90	0.109	0.00
10.90	10.90	0.439	0.109 ✓
4.90	7.70	0.028	0.547 ✓
7.70	7.90	0.25	0.576 ✓
7.70	0	0.23	0.826 ✓
2.00	0	0.30	0.548
1.20	1.20	4.828	0.548
0	2.40	0.30	4.676
4.80	4.80	0.40	4.976

Seccion tipo 6

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.439	.109
4.900	7.700	.028	.548
7.700	7.700	.250	.576
7.700	.000	.230	.826
2.000	.000	.300	.548
1.200	1.200	4.828	.548
.000	2.400	.300	4.676
4.800	4.800	.400	4.976

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
16.740	59.8627	1.966	3.410	5.376	.033	.057	1.0

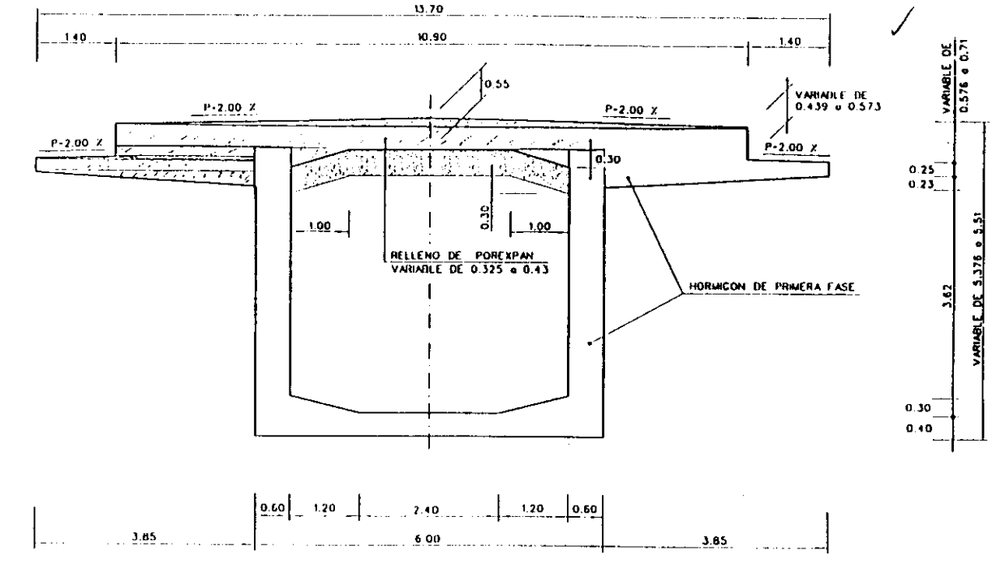
Inecsa

PROYECTO: ..... HOJA ..... DE .....

FECHA .....

EJECUTANTE: .....

Lcc 1



SECCION TIPO-7 (DOVELA 45)
ESCALA 1:50

10 5.51

0.00	10.90	0.109	0.00
10.90	10.90	0.441	0.109
4.90	4.90	0.132	0.550
4.90	7.70	0.028	0.682
7.70	7.70	0.25	0.71
7.70	0	0.23	0.96
2.00	0	0.30	0.55
1.20	1.20	4.96	0.55
0	2.40	0.30	4.81
4.80	4.80	0.40	5.11

SECCION TIPO 7

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	10.900	.109	.000
10.900	10.900	.441	.109
4.900	4.900	.132	.550
4.900	7.700	.028	.682
7.700	7.700	.250	.710
7.700	.000	.230	.960
2.000	.000	.300	.550
1.200	1.200	4.960	.550
.000	2.400	.300	4.810
4.800	4.800	.400	5.110

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
17.567	64.0722	1.987	3.523	5.510	.031	.055	1.0

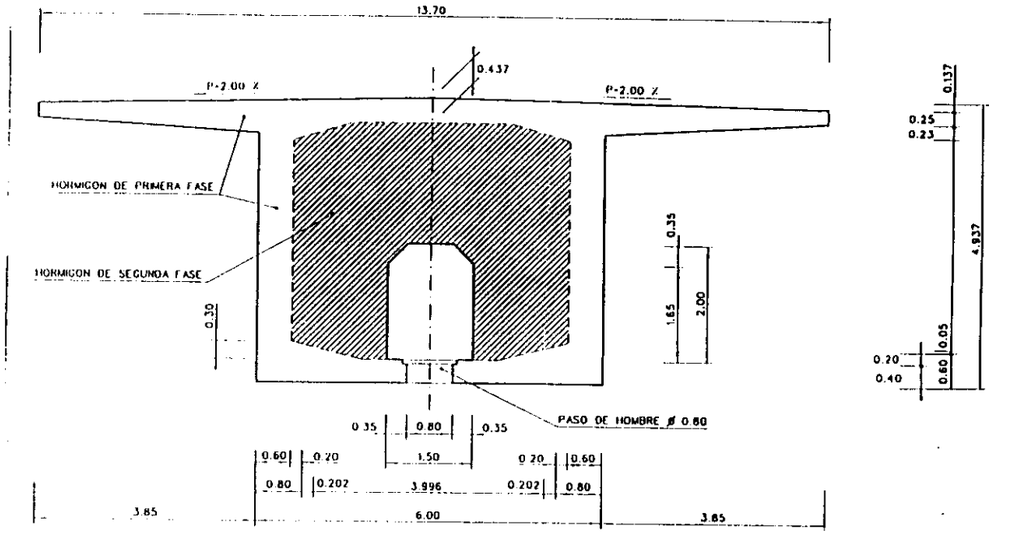
intecsa

PROYECTO:

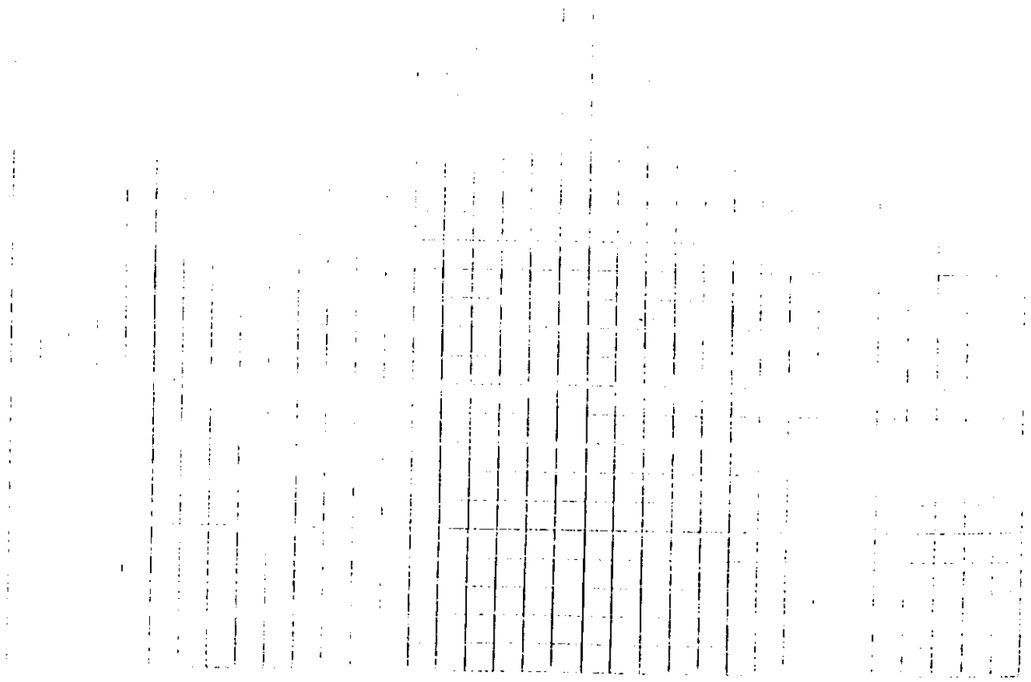
HOJA DE

FECHA

EJECUTANTE:



SECCION TIPO POR MAMPARO DE PILAS
ESCALA 1:50



Secar las placas

CALCULO DE CARACTERISTICAS MECANICAS

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	13.700	.130	.000
13.700	13.700	.250	.130
7.700	.000	.230	.380
6.000	6.000	4.550	.380

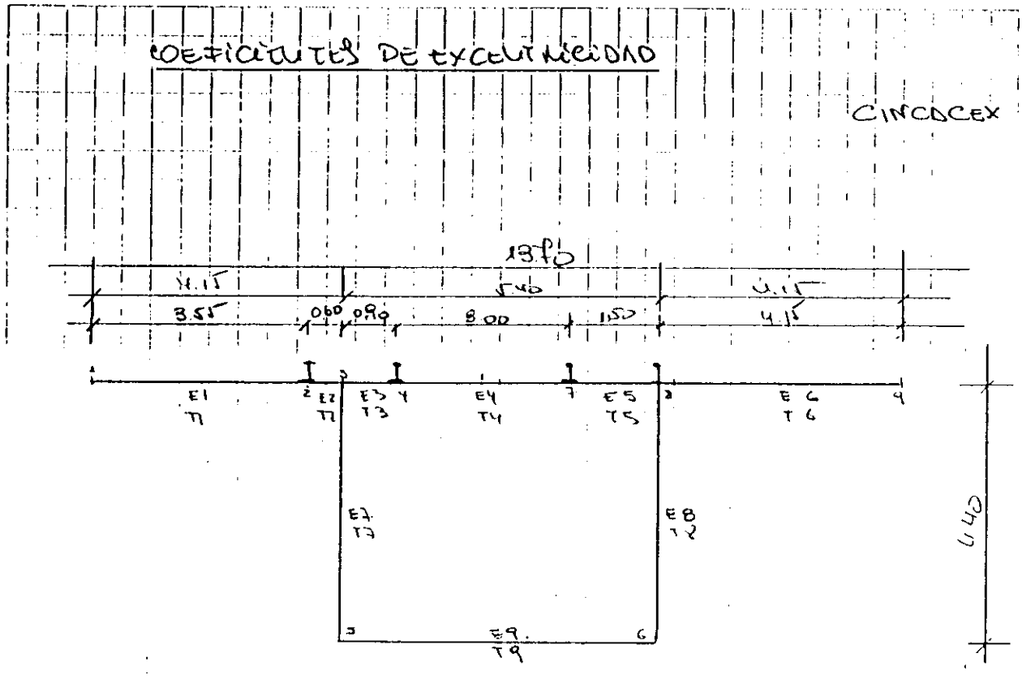
AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
32.501	72.2288	2.272	2.658	4.930	.031	.037	1.0

2.2.- CÁLCULO DE LOS COEFICIENTES DE EXCENTRICIDAD E IMPACTO

intecsa

PROYECTO: HOJA DE

EJECUTANTE: FECHA



SE CONSIDERA UN VANO CARGADO Y DOS VANOS DESCARGADOS

→ PARA CARGA DE VANO $L = 7 \times \frac{3}{5} = 4.2\,m$

→ PARA APOYOS $L = 2 \times \frac{1}{5} \times \frac{7}{2} = 1.4\,m$

VALOR DE CARGAS APLICADAS

- PARA CARGA DE VANO $6 \times 42 = 252\,t$
- PARA APOYOS $6 \times 28 = 168\,t$

La posición de carga produce los cortantes negativos a 0.30 m a la izquierda de la pila

```
PUENTE SOBRE EL CINCA. CAJON 70 M. CENTRO VANOS. UN TREN
42.00,  9,  9,  9,  3,  20,  1
0.00,  21.00,  42.00
       3.55,     0.000,    0.300,    3350000.,   0.20
2,     0.60,     0.000,    0.300,    3350000.,   0.20
3,     0.90,     0.000,    0.400,    3350000.,   0.20
4,     3.00,     0.000,    0.400,    3350000.,   0.20
5,     1.50,     0.000,    0.400,    3350000.,   0.20
6,     4.15,     0.000,    0.300,    3350000.,   0.20
7,     0.00,     4.400,    0.600,    3350000.,   0.20
8,     0.00,     4.400,    0.600,    3350000.,   0.20
9,     5.40,     0.000,    0.400,    3350000.,   0.20
1,   1,   2,   1,   1,   0.000,   0.000,   0.000
2,   2,   3,   2,   1,   0.000,   0.000,   0.000
3,   3,   4,   3,   1,   0.000,   0.000,   0.000
4,   4,   7,   4,   1,   0.000,   0.000,   0.000
5,   7,   8,   5,   1,   0.000,   0.000,   0.000
6,   8,   9,   6,   1,   0.000,   0.000,   0.000
7,   3,   5,   7,   1,   0.000,   0.000,   0.000
8,   5,   6,   8,   1,   0.000,   0.000,   0.000
9,   6,   7,   9,   1,   0.000,   0.000,   0.000
0
       0.,    0.,   0.,   0.,   0,   0,   0,   0
       0.,    0.,   0.,   0.,   0,   0,   0,   0
3,     0.,    0.,   0.,   0.,   0,   0,   0,   0
4,     0.,    0.,   0.,   0.,   0,   0,   0,   0
5,     0.,    0.,   0.,   0.,   0,   0,   0,   0
6,     0.,    0.,   0.,   0.,   0,   0,   0,   0
7,     0.,    0.,   0.,   0.,   0,   0,   0,   0
8,     0.,    0.,   0.,   0.,   0,   0,   0,   0
9,     0.,    0.,   0.,   0.,   0,   0,   0,   0
2
2,    0.,   252.,   0.,   0.,   21.,   42.
4,    0.,   252.,   0.,   0.,   21.,   42.
```

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL CINCA. CAJON 70 M. CENTRO VANOS. U

LUZ ..... = 42.000
NUMERO DE TIPOS DE PLACA ..... = 9
NUMERO DE ELEMENTOS ..... = 9
NUMERO DE JUNTAS ..... = 9
NUMERO DE SECCIONES TRANVERSALES DE CALCULO .... = 3
MAXIMO NUMERO DE ARMONICOS ..... = 20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA x IGUAL A :

SECCION 1 X = .000

SECCION 2 X = 21.000

SECCION 3 X = 42.000

I. PLACA	PROY./X	PROY./Y	ESPESOR	M.E.ASTICIDAD	POISSON
1	3.550	.000	.300	3350000.0	.20
2	.600	.000	.300	3350000.0	.20
3	.900	.000	.400	3350000.0	.20
4	3.000	.000	.400	3350000.0	.20
5	1.500	.000	.400	3350000.0	.20
6.	4.150	.000	.300	3350000.0	.20
7	.000	4.400	.600	3350000.0	.20
8	.000	4.400	.600	3350000.0	.20
9	5.400	.000	.400	3350000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	3	1	.000	.000	.000
4	4	7	4	1	.000	.000	.000
5	7	8	5	1	.000	.000	.000
6	8	9	6	1	.000	.000	.000
7	3	5	7	1	.000	.000	.000
8	5	6	8	1	.000	.000	.000
9	6	7	9	1	.000	.000	.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 2

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
2	.000	252.000	.000	.000	21.000	42.000
4	.000	252.000	.000	.000	21.000	42.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A .000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	.0017
2	.0000	.0000	.0000	.0102
3	.0000	.0000	.0000	.0119
4	.0000	.0000	.0000	.0102
5	.0000	.0000	.0000	-.0054
6	.0000	.0000	.0000	-.0224
7	.0000	.0000	.0000	.0058
8	.0000	.0000	.0000	.0082
9	.0000	.0000	.0000	.0156

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0289	.1271	.0001	.0000
2	.0286	.0898	.0001	.0000
3	.0285	.0865	.0000	.0000
4	.0285	.0963	-.0001	.0000
5	.0312	.0848	.0000	.0000
6	.0295	.0835	.0000	.0000
7	.0289	.1332	-.0001	.0000
8	.0287	.1513	-.0001	.0000
9	.0279	.2012	-.0001	.0000

SECCION A 42.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	-.0017
2	.0000	.0000	.0000	-.0102
3	.0000	.0000	.0000	-.0119
4	.0000	.0000	.0000	-.0102
5	.0000	.0000	.0000	.0054
6	.0000	.0000	.0000	.0224
7	.0000	.0000	.0000	-.0058
8	.0000	.0000	.0000	-.0082
9	.0000	.0000	.0000	-.0156

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.1159	.1019	.0000	.0000	.0000	.0000	.00	.00	.00
2	.0000	.0000	-.3635	.7523	.0000	.0000	.0000	2.1242	-.01	.00	.00

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0291	.0000	.0000	.0000	-.0002	.8769	.0000	.0000	.00	-.03	.00
2	.0149	-.0295	.0000	.0000	.0547	6.3954	-.0121	.0000	.00	-.03	.00

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.1159	-.1019	.0000	.0000	.0000	.0000	.00	.00	.00
2	.0000	.0000	.3635	-.7523	.0000	.0000	.0000	-2.1242	.01	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.3635	.7523	.0000	.0000	.0000	2.1242	-.01	.00	.00
2	.0000	.0000	.0366	-2.2383	.0000	.0000	.0000	3.1393	-.01	.00	.00

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0149	-.0295	.0000	.0000	5.8642	6.3954	-.0121	.0000	.00	-.03	.00
2	.0830	3.5590	.0000	.0000	5.8613	7.3249	-.0140	.0000	.00	-.03	.00

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.3635	-.7523	.0000	.0000	.0000	-2.1242	.01	.00	.00
2	.0000	.0000	-.0366	2.2383	.0000	.0000	.0000	-3.1393	.01	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.0867	-2.4325	.0000	.0000	.0000	-23.7436	-.01	.00	.000
2	.0000	.0000	.6082	1.4291	.0000	.0000	.0000	-21.8453	-.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-.8835	-4.7588	.0000	.0000	-5.7132	9.8152	.2248	.0000	.00	-.03	.001
2	.1361	.3984	.0000	.0000	-5.6977	9.0262	1.4321	.0000	.00	-.03	.001

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.0867	2.4325	.0000	.0000	.0000	23.7436	.01	.00	.000
2	.0000	.0000	-.6082	-1.4291	.0000	.0000	.0000	21.8453	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.6082	1.4291	.0000	.0000	.0000	-21.8453	-.01	.00	.000
2	.0000	.0000	.1647	-.1004	.0000	.0000	.0000	-18.9636	-.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.1361	.3984	.0000	.0000	.1118	9.0262	1.4321	.0000	.00	-.03	.001
2	.0550	-.1378	.0000	.0000	.1856	6.5804	5.3730	.0000	.00	-.03	.001

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.6082	-1.4291	.0000	.0000	.0000	21.8453	.01	.00	.000
2	.0000	.0000	-.1647	.1004	.0000	.0000	.0000	18.9636	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 7/ 8

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.1647	.1713	.0000	.0000	.0000	-3.7085	-.01	.00	.000
2	.0000	.0000	.1516	.1125	.0000	.0000	.0000	-2.8593	-.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0861	.0177	.0000	.0000	-.0009	5.3702	-.6779	.0000	.00	-.03	.001
2	.0915	.0116	.0000	.0000	.0015	7.8475	-.3883	.0000	.00	-.03	.002

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.1647	-.1713	.0000	.0000	.0000	3.7085	.01	.00	.000
2	.0000	.0000	-.1516	-.1125	.0000	.0000	.0000	2.8593	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 9

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.0639	.0610	.0000	.0000	.0000	-2.8593	-.01	.00	.000
2	.0000	.0000	.0677	.0277	.0000	.0000	.0000	.0000	-.02	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0599	.0116	.0000	.0000	-.0007	5.8662	-.3883	.0000	.00	-.03	.002
2	.0476	.0000	.0000	.0000	.0021	11.3982	.0000	.0000	.00	-.03	.002

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.0639	-.0610	.0000	.0000	.0000	2.8593	.01	.00	.000
2	.0000	.0000	-.0677	-.0277	.0000	.0000	.0000	.0000	.02	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 3/ 5

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.2925	.2539	.0000	.0000	.0000	26.8829	-.01	.00	.000
2	.0000	.0000	-.0873	.0287	.0000	.0000	.0000	29.3666	.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3329	1.1998	.0000	.0000	.2437	16.9705	11.5754	.0000	.00	.09	.000
2	.1291	.1598	.0000	.0000	.2325	-5.8100	5.5542	.0000	.00	.08	.000

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.2925	-.2539	.0000	.0000	.0000	-26.8829	.01	.00	.000
2	.0000	.0000	.0873	-.0287	.0000	.0000	.0000	-29.3666	-.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 5/ 6

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0873	.0287	.0000	.0000	.0000	29.3666	.01	.00	.000
2	.0000	.0000	.1553	-.1681	.0000	.0000	.0000	19.9421	.02	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1291	.1598	.0000	.0000	.2325	-5.8100	5.5542	.0000	.00	.08	.000
2	-.0772	-.8571	.0000	.0000	.2315	-29.7415	-.1912	.0000	.00	.08	.000

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0873	-.0287	.0000	.0000	.0000	-29.3666	-.01	.00	.000
2	.0000	.0000	-.1553	.1681	.0000	.0000	.0000	-19.9421	-.02	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 6/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0460	-.1672	.0000	.0000	.0000	19.9421	.02	.00	.000
2	.0000	.0000	.1647	.3840	.0000	.0000	.0000	15.2551	-.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0978	-.8571	.0000	.0000	-.1912	-19.8485	-.2315	.0000	.00	-.03	.001
2	.1137	.1555	.0000	.0000	-.1829	4.2956	-6.0508	.0000	.00	-.03	.001

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0460	.1672	.0000	.0000	.0000	-19.9421	-.02	.00	.000
2	.0000	.0000	-.1647	-.3840	.0000	.0000	.0000	-15.2551	.01	.00	.000

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PUENTE SOBRE EL CINCA. CAJON 70 M. CENTRO VANOS. DOS TRENES
42.00,  9,  9,  9,  3,  20,  1
0.00,  21.00,  42.00
      3.55,     0.000,    0.300,    3350000.,  0.20
      0.60,     0.000,    0.300,    3350000.,  0.20
      0.90,     0.000,    0.400,    3350000.,  0.20
      3.00,     0.000,    0.400,    3350000.,  0.20
      1.50,     0.000,    0.400,    3350000.,  0.20
      4.15,     0.000,    0.300,    3350000.,  0.20
      0.00,     4.400,    0.600,    3350000.,  0.20
      0.00,     4.400,    0.600,    3350000.,  0.20
      5.40,     0.000,    0.400,    3350000.,  0.20
1,    1,   2,   1,   1,    0.000,    0.000,    0.000
2,    2,   3,   2,   1,    0.000,    0.000,    0.000
3,    3,   4,   3,   1,    0.000,    0.000,    0.000
4,    4,   7,   4,   1,    0.000,    0.000,    0.000
5,    7,   8,   5,   1,    0.000,    0.000,    0.000
6,    8,   9,   6,   1,    0.000,    0.000,    0.000
7,    3,   5,   7,   1,    0.000,    0.000,    0.000
8,    5,   6,   8,   1,    0.000,    0.000,    0.000
9,    6,   7,   9,   1,    0.000,    0.000,    0.000
0
      0.,    0.,   0.,    0.,    0,    0,    0,   0
      0.,    0.,   0.,    0.,    0,    0,    0,   0
5,    0.,    0.,   0.,    0.,    0,    0,    0,   0
4,    0.,    0.,   0.,    0.,    0,    0,    0,   0
5,    0.,    0.,   0.,    0.,    0,    0,    0,   0
6,    0.,    0.,   0.,    0.,    0,    0,    0,   0
7,    0.,    0.,   0.,    0.,    0,    0,    0,   0
8,    0.,    0.,   0.,    0.,    0,    0,    0,   0
9,    0.,    0.,   0.,    0.,    0,    0,    0,   0
4
2,    0.,  252.,   0.,    0.,   21.,   42.
4,    0.,  252.,   0.,    0.,   21.,   42.
7,    0.,  252.,   0.,    0.,   21.,   42.
8,    0.,  252.,   0.,    0.,   21.,   42.
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PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL CINCA. CAJON 70 M. CENTRO VANOS. D

LUZ	= 42.000
NUMERO DE TIPOS DE PLACA	= 9
NUMERO DE ELEMENTOS	= 9
NUMERO DE JUNTAS	= 9
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	= 3
MAXIMO NUMERO DE ARMONICOS	= 20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = .000

SECCION 2 X = 21.000

SECCION 3 X = 42.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	3.550	.000	.300	3350000.0	.20
2	.600	.000	.300	3350000.0	.20
3	.900	.000	.400	3350000.0	.20
4	3.000	.000	.400	3350000.0	.20
5	1.500	.000	.400	3350000.0	.20
6	4.150	.000	.300	3350000.0	.20
7	.000	4.400	.600	3350000.0	.20
8	.000	4.400	.600	3350000.0	.20
9	5.400	.000	.400	3350000.0	.20

TTL	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	3	1	.000	.000	.000
4	4	7	4	1	.000	.000	.000
5	7	8	5	1	.000	.000	.000
6	8	9	6	1	.000	.000	.000
7	3	5	7	1	.000	.000	.000
8	5	6	8	1	.000	.000	.000
9	6	7	9	1	.000	.000	.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 4

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
2	.000	252.000	.000	.000	21.000	42.000
4	.000	252.000	.000	.000	21.000	42.000
7	.000	252.000	.000	.000	21.000	42.000
8	.000	252.000	.000	.000	21.000	42.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A .000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	.0050
2	.0000	.0000	.0000	.0209
3	.0000	.0000	.0000	.0240
4	.0000	.0000	.0000	.0204
5	.0000	.0000	.0000	-.0102
6	.0000	.0000	.0000	-.0447
7	.0000	.0000	.0000	.0115
8	.0000	.0000	.0000	.0162
9	.0000	.0000	.0000	.0305

SECCION A .21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0547	-.2817	-.0011	.0000
2	.0541	.1040	-.0011	.0000
3	.0539	.1735	-.0013	.0000
4	.0542	.3665	-.0029	.0000
5	.1786	.1706	.0003	.0000
6	.0602	.1682	-.0001	.0000
7	.0564	1.6559	-.0049	.0000
8	.0560	2.4206	-.0052	.0000
9	.0545	4.5541	-.0051	.0000

SECCION A .42.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	-.0050
2	.0000	.0000	.0000	-.0209
3	.0000	.0000	.0000	-.0240
4	.0000	.0000	.0000	-.0204
5	.0000	.0000	.0000	.0102
6	.0000	.0000	.0000	.0447
7	.0000	.0000	.0000	-.0115
8	.0000	.0000	.0000	-.0162
9	.0000	.0000	.0000	-.0305

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.6400	.0320	.0000	.0000	.0000	.0000	.00	.00	.000
2	.0000	.0000	.5462	.5737	.0000	.0000	.0000	4.3003	-.02	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0259	.0000	.0000	.0000	.0193	2.4599	.0000	.0000	.00	-.05	-.003
2	.0144	-.1427	.0000	.0000	.0616	13.2154	-.0057	.0000	.00	-.05	.001

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.6400	-.0320	.0000	.0000	.0000	.0000	.00	.00	.000
2	.0000	.0000	-.5462	-.5737	.0000	.0000	.0000	-4.3003	.02	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.5462	.5737	.0000	.0000	.0000	4.3003	-.02	.00	.000
2	.0000	.0000	1.0389	-2.4576	.0000	.0000	.0000	5.8946	-.02	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0144	-.1427	.0000	.0000	5.8711	13.2154	-.0057	.0000	.00	-.05	.001
2	.6761	-3.6834	.0000	.0000	5.8653	15.0503	-.0156	.0000	.00	-.05	.002

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.5462	-.5737	.0000	.0000	.0000	-4.3003	.02	.00	.000
2	.0000	.0000	-1.0389	2.4576	.0000	.0000	.0000	-5.8946	.02	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	.0000	.0000	2.4625	-8.4606	.0000	.0000	.0000	-45.8271	-.02	.00	.0
2	.0000	.0000	6.6267	-2.4362	.0000	.0000	.0000	-42.6356	-.02	.00	.0

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	8.1705	-41.5700	.0000	.0000	-16.0682	21.4201	6.7440	.0000	.00	-.05	.0
2	5.2529	-27.1437	.0000	.0000	-16.0220	19.6676	9.1974	.0000	.00	-.05	.0

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-2.4625	8.4606	.0000	.0000	.0000	45.8271	.02	.00	.00
2	.0000	.0000	-6.6267	2.4362	.0000	.0000	.0000	42.6356	.02	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	6.6267	-2.4362	.0000	.0000	.0000	-42.6356	-.02	.00	.00
2	.0000	.0000	10.2202	3.5667	.0000	.0000	.0000	-36.9481	-.01	.00	.00

SECCION A 1.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	5.2529	27.1437	.0000	.0000	-10.2126	19.6676	9.1974	.0000	.00	-.05	.00
2	1.0543	2.8785	.0000	.0000	-9.9861	14.4107	17.1336	.0000	.00	-.06	.01

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-6.6267	2.4362	.0000	.0000	.0000	42.6356	.02	.00	.00
2	.0000	.0000	-10.2202	-3.5667	.0000	.0000	.0000	36.9481	.01	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 7/ 8

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	10.2202	2.9255	.0000	.0000	.0000	-7.2017	-.01	.00	.000
2	.0000	.0000	9.6655	5.4810	.0000	.0000	.0000	-5.5528	-.02	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-1.1996	-8.3908	.0000	.0000	-6.0730	10.7097	-1.3713	.0000	.00	-.06	.017
2	.7580	.3892	.0000	.0000	-5.8448	15.5503	-.7861	.0000	.00	-.06	.024

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-10.2202	-2.9255	.0000	.0000	.0000	7.2017	.01	.00	.000
2	.0000	.0000	-9.6655	-5.4810	.0000	.0000	.0000	5.5528	.02	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 9

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	4.0776	3.6669	.0000	.0000	.0000	-5.5528	-.02	.00	.000
2	.0000	.0000	3.1574	1.0282	.0000	.0000	.0000	.0000	-.03	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3648	.3892	.0000	.0000	-.1089	11.6234	-.7861	.0000	.00	-.06	.024
2	.6790	.0000	.0000	.0000	.0794	22.4542	.0000	.0000	.00	-.05	.046

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-4.0776	-3.6669	.0000	.0000	.0000	5.5528	.02	.00	.000
2	.0000	.0000	-3.1574	-1.0282	.0000	.0000	.0000	.0000	.03	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 3/ 5

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	8.3110	6.0691	.0000	.0000	.0000	51.7216	-.02	.00	.000
2	.0000	.0000	-2.2324	.9821	.0000	.0000	.0000	57.4886	.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	7.7590	37.8865	.0000	.0000	6.8631	34.4971	21.9512	.0000	.00	.17	.001
2	1.9356	7.9028	.0000	.0000	6.7234	-11.6506	9.5820	.0000	.00	.17	.002

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-8.3110	-6.0691	.0000	.0000	.0000	-51.7216	.02	.00	.000
2	.0000	.0000	2.2324	-.9821	.0000	.0000	.0000	-57.4886	-.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 5/ 6

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-2.2324	.9821	.0000	.0000	.0000	57.4886	.01	.00	.000
2	.0000	.0000	1.6998	-3.3493	.0000	.0000	.0000	39.6252	.04	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.9356	7.9028	.0000	.0000	6.7234	-11.6506	9.5820	.0000	.00	.17	.002
2	4.1175	-21.5232	.0000	.0000	6.7441	-59.8702	-2.0363	.0000	.00	.17	.001

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	2.2324	-.9821	.0000	.0000	.0000	-57.4886	-.01	.00	.000
2	.0000	.0000	-1.6998	3.3493	.0000	.0000	.0000	-39.6252	-.04	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 6/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.5036	-3.3538	.0000	.0000	.0000	39.6252	.04	.00	.000
2	.0000	.0000	10.2202	1.5797	.0000	.0000	.0000	29.7464	-.01	.00	.000

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-4.1562	-21.5232	.0000	.0000	-2.0402	-40.9934	-6.7574	.0000	.00	-.06	.002
2	-1.7753	-11.2694	.0000	.0000	-1.8018	7.2830	-18.5049	.0000	.00	-.06	.017

SECCION A 42.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.5036	3.3538	.0000	.0000	.0000	-39.6252	-.04	.00	.000
2	.0000	.0000	-10.2202	-1.5797	.0000	.0000	.0000	-29.7464	.01	.00	.000

```
PUENTE SOBRE EL CINCA. CAJON 70 M. APOYOS. UN TREN
28.00,  9,  9,  9,  3,  20,  1
0.00,  14.00,  28.00
      3.55,    0.000,    0.300,    3350000.,  0.20
2,    0.60,    0.000,    0.300,    3350000.,  0.20
3,    0.90,    0.000,    0.400,    3350000.,  0.20
4,    3.00,    0.000,    0.400,    3350000.,  0.20
5,    1.50,    0.000,    0.400,    3350000.,  0.20
6,    4.15,    0.000,    0.300,    3350000.,  0.20
7,    0.00,    4.400,    0.600,    3350000.,  0.20
8,    0.00,    4.400,    0.600,    3350000.,  0.20
9,    5.40,    0.000,    0.400,    3350000.,  0.20
1,  1,  2,  1,  1,  0.000,  0.000,  0.000
2,  2,  5,  2,  1,  0.000,  0.000,  0.000
3,  3,  4,  3,  1,  0.000,  0.000,  0.000
4,  4,  7,  4,  1,  0.000,  0.000,  0.000
5,  7,  8,  5,  1,  0.000,  0.000,  0.000
6,  8,  9,  6,  1,  0.000,  0.000,  0.000
7,  3,  5,  7,  1,  0.000,  0.000,  0.000
8,  5,  6,  8,  1,  0.000,  0.000,  0.000
9,  6,  7,  9,  1,  0.000,  0.000,  0.000
0
      0.,   0.,   0.,   0.,   0,   0,   0,   0
2,    0.,   0.,   0.,   0.,   0,   0,   0,   0
3,    0.,   0.,   0.,   0.,   0,   0,   0,   0
4,    0.,   0.,   0.,   0.,   0,   0,   0,   0
5,    0.,   0.,   0.,   0.,   0,   0,   0,   0
6,    0.,   0.,   0.,   0.,   0,   0,   0,   0
7,    0.,   0.,   0.,   0.,   0,   0,   0,   0
8,    0.,   0.,   0.,   0.,   0,   0,   0,   0
9,    0.,   0.,   0.,   0.,   0,   0,   0,   0
2
2,    0.,  168.,   0.,   0.,   14.,   28.
4,    0.,  168.,   0.,   0.,   14.,   28.
```

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL CINCA. CAJON 70 M. APOYOS. UN TREN

LUZ	=	28.000
NUMERO DE TIPOS DE PLACA	=	9
NUMERO DE ELEMENTOS	=	9
NUMERO DE JUNTAS	=	9
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	3
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = .000

SECCION 2 X = 14.000

SECCION 3 X = 28.000

I. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	3.550	.000	.300	3350000.0	.20
2	.600	.000	.300	3350000.0	.20
3	.900	.000	.400	3350000.0	.20
4	3.000	.000	.400	3350000.0	.20
5	1.500	.000	.400	3350000.0	.20
6	4.150	.000	.300	3350000.0	.20
7	.000	4.400	.600	3350000.0	.20
8	.000	4.400	.600	3350000.0	.20
9	5.400	.000	.400	3350000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	3	1	.000	.000	.000
4	4	7	4	1	.000	.000	.000
5	7	8	5	1	.000	.000	.000
6	8	9	6	1	.000	.000	.000
7	3	5	7	1	.000	.000	.000
8	5	6	8	1	.000	.000	.000
9	6	7	9	1	.000	.000	.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 2

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
2	.000	168.000	.000	.000	14.000	28.000
4	.000	168.000	.000	.000	14.000	28.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A .000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	.0023
2	.0000	.0000	.0000	.0058
3	.0000	.0000	.0000	.0066
4	.0000	.0000	.0000	.0052
5	.0000	.0000	.0000	-.0022
6	.0000	.0000	.0000	-.0105
7	.0000	.0000	.0000	.0018
8	.0000	.0000	.0000	.0024
9	.0000	.0000	.0000	.0043

SECCION A 14.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0066	.0757	.0001	.0000
2	.0063	.0375	.0001	.0000
3	.0063	.0339	.0000	.0000
4	.0062	.0433	-.0001	.0000
5	.0085	.0323	.0000	.0000
6	.0071	.0312	.0000	.0000
7	.0065	.0768	-.0001	.0000
8	.0064	.0923	-.0001	.0000
9	.0060	.1326	-.0001	.0000

SECCION A 28.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	-.0023
2	.0000	.0000	.0000	-.0058
3	.0000	.0000	.0000	-.0066
4	.0000	.0000	.0000	-.0052
5	.0000	.0000	.0000	.0022
6	.0000	.0000	.0000	.0105
7	.0000	.0000	.0000	-.0018
8	.0000	.0000	.0000	-.0024
9	.0000	.0000	.0000	-.0043

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.1149	.1055	.0000	.0000	.0000	.0000	.00	.00	.00
2	.0000	.0000	-.4026	1.2807	.0000	.0000	.0000	2.3936	-.01	.00	.00

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0270	.0000	.0000	.0000	-.0010	2.4252	.0000	.0000	.00	-.01	.00
2	.0090	-.0251	.0000	.0000	.0775	5.6171	-.1830	.0000	.00	-.01	.00

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.1149	-.1055	.0000	.0000	.0000	.0000	.00	.00	.00
2	.0000	.0000	.4026	-1.2807	.0000	.0000	.0000	-2.3936	.01	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-.4026	1.2807	.0000	.0000	.0000	2.3936	-.01	.00	.00
2	.0000	.0000	.0337	-2.7120	.0000	.0000	.0000	3.5465	-.01	.00	.00

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0090	.0251	.0000	.0000	5.8870	5.6171	-.1830	.0000	.00	-.01	.00
2	.0913	5.5783	.0000	.0000	5.9002	6.2284	-.2530	.0000	.00	-.01	.00

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	.4026	-1.2807	.0000	.0000	.0000	-2.3936	.01	.00	.00
2	.0000	.0000	-.0337	2.7120	.0000	.0000	.0000	-3.5465	.01	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0799	-2.7669	.0000	.0000	.0000	-13.7396	-.01	.00	.000
2	.0000	.0000	.6299	2.1074	.0000	.0000	.0000	-11.6613	-.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.8834	-4.7053	.0000	.0000	-5.7604	8.3677	-.0211	.0000	.00	-.01	.000
2	.1469	.4788	.0000	.0000	-5.7098	7.0886	.9829	.0000	.00	-.01	.000

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0799	2.7669	.0000	.0000	.0000	13.7396	.01	.00	.000
2	.0000	.0000	-.6299	-2.1074	.0000	.0000	.0000	11.6613	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.6299	2.1074	.0000	.0000	.0000	-11.6613	-.01	.00	.000
2	.0000	.0000	.1602	-.1122	.0000	.0000	.0000	-9.1287	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1469	.4788	.0000	.0000	.0997	7.0886	.9829	.0000	.00	-.01	.000
2	.0855	-.1160	.0000	.0000	.1996	3.3977	4.0863	.0000	.00	-.01	.001

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.6299	-2.1074	.0000	.0000	.0000	11.6613	.01	.00	.000
2	.0000	.0000	-.1602	.1122	.0000	.0000	.0000	9.1287	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 7/ 8

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.1602	.1747	.0000	.0000	.0000	-2.2307	.00	.00	.000
2	.0000	.0000	.1480	.1138	.0000	.0000	.0000	-1.6991	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1244	.0787	.0000	.0000	.0029	2.4404	-.7004	.0000	.00	-.01	.001
2	.1446	.0474	.0000	.0000	.0092	3.3922	-.4046	.0000	.00	-.01	.001

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.1602	-.1747	.0000	.0000	.0000	2.2307	.00	.00	.000
2	.0000	.0000	-.1480	-.1138	.0000	.0000	.0000	1.6991	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 9

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0624	.0618	.0000	.0000	.0000	-1.6991	.00	.00	.000
2	.0000	.0000	.0655	.0282	.0000	.0000	.0000	.0000	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0474	.0000	.0000	.0003	2.5239	-.4046	.0000	.00	-.01	.001
2	.0954	.0000	.0000	.0000	.0072	4.8703	.0000	.0000	.00	-.01	.001

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0624	-.0618	.0000	.0000	.0000	1.6991	.00	.00	.000
2	.0000	.0000	-.0655	-.0282	.0000	.0000	.0000	.0000	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 3/ 5

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.2697	.1584	.0000	.0000	.0000	17.2861	-.01	.00	.000
2	.0000	.0000	-.0871	.0261	.0000	.0000	.0000	19.6842	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.2713	1.1270	.0000	.0000	.2494	14.8906	11.6636	.0000	.00	.03	.000
2	.0845	.1251	.0000	.0000	.2165	-2.7988	5.5604	.0000	.00	.03	.000

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.2697	-.1584	.0000	.0000	.0000	-17.2861	.01	.00	.000
2	.0000	.0000	.0871	-.0261	.0000	.0000	.0000	-19.6842	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 5/ 6

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0871	.0261	.0000	.0000	.0000	19.6842	.00	.00	.000
2	.0000	.0000	.1541	-.1699	.0000	.0000	.0000	11.3788	.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0845	.1251	.0000	.0000	.2165	-2.7988	5.5604	.0000	.00	.03	.000
2	-.1137	-.8177	.0000	.0000	.2186	-21.6846	-.2039	.0000	.00	.03	.000

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0871	-.0261	.0000	.0000	.0000	-19.6842	.00	.00	.000
2	.0000	.0000	-.1541	.1699	.0000	.0000	.0000	-11.3788	-.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 6/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.0456	-.1672	.0000	.0000	.0000	11.3788	.01	.00	.000
2	.0000	.0000	.1602	.4036	.0000	.0000	.0000	6.8980	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1002	-.8177	.0000	.0000	-.2035	-14.4727	-.2173	.0000	.00	-.01	.000
2	.1476	.1948	.0000	.0000	-.1831	1.6231	-4.7867	.0000	.00	-.01	.001

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.0456	.1672	.0000	.0000	.0000	-11.3788	-.01	.00	.000
2	.0000	.0000	-.1602	-.4036	.0000	.0000	.0000	-6.8980	.00	.00	.000

```
PUENTE SOBRE EL CINCA. CAJON 70 M. APOYOS. DOS TRENES
28.00,  9,  9,  9,  3,  20,  1
0.00,  14.00,  28.00
      3.55,    0.000,   0.300,   3350000.,  0.20
2,    0.60,    0.000,   0.300,   3350000.,  0.20
3,    0.90,    0.000,   0.400,   3350000.,  0.20
4,    3.00,    0.000,   0.400,   3350000.,  0.20
5,    1.50,    0.000,   0.400,   3350000.,  0.20
6,    4.15,    0.000,   0.300,   3350000.,  0.20
7,    0.00,    4.400,   0.600,   3350000.,  0.20
8,    0.00,    4.400,   0.600,   3350000.,  0.20
9,    5.40,    0.000,   0.400,   3350000.,  0.20
1,  1,  2,  1,  1,  0.000,  0.000,  0.000
2,  2,  3,  2,  1,  0.000,  0.000,  0.000
3,  3,  4,  3,  1,  0.000,  0.000,  0.000
4,  4,  7,  4,  1,  0.000,  0.000,  0.000
5,  7,  8,  5,  1,  0.000,  0.000,  0.000
6,  8,  9,  6,  1,  0.000,  0.000,  0.000
7,  3,  5,  7,  1,  0.000,  0.000,  0.000
8,  5,  6,  8,  1,  0.000,  0.000,  0.000
9,  6,  7,  9,  1,  0.000,  0.000,  0.000
0
     0.,   0.,   0.,   0.,   0,   0,   0,   0
2,   0.,   0.,   0.,   0.,   0,   0,   0,   0
3,   0.,   0.,   0.,   0.,   0,   0,   0,   0
4,   0.,   0.,   0.,   0.,   0,   0,   0,   0
5,   0.,   0.,   0.,   0.,   0,   0,   0,   0
6,   0.,   0.,   0.,   0.,   0,   0,   0,   0
7,   0.,   0.,   0.,   0.,   0,   0,   0,   0
8,   0.,   0.,   0.,   0.,   0,   0,   0,   0
9,   0.,   0.,   0.,   0.,   0,   0,   0,   0
2,   0.,  168.,   0.,   0.,  14.,   28.
3,   0.,  168.,   0.,   0.,  14.,   28.
7,   0.,  168.,   0.,   0.,  14.,   28.
8,   0.,  168.,   0.,   0.,  14.,   28.
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PROGRAMA DE CALCULO DE LAMINA PLEGADA
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PROYECTO : PUENTE SOBRE EL CINCA. CAJON 70 M. APOYOS. DOS TRE
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LUZ ..................................................... =   28.000
NUMERO DE TIPOS DE PLACA ................................ =       9
NUMERO DE ELEMENTOS ..................................... =       9
NUMERO DE JUNTAS ........................................ =       9
NUMERO DE SECCIONES TRANVERSALES DE CALCULO .... =       3
MAXIMO NUMERO DE ARMONICOS .............................. =      20


NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES


VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION  1   X =     .000

SECCION  2   X =  14.000

SECCION  3   X =  28.000

T. PLACA   PROY./X  PROY./Y  ESPESOR  M.ELASTICIDAD  POISSON
--------   ------  -------  -------  -------------  -------
    1        3.550     .000     .300     3350000.0     .20
    2         .600     .000     .300     3350000.0     .20
    3         .900     .000     .400     3350000.0     .20
    4        3.000     .000     .400     3350000.0     .20
    5        1.500     .000     .400     3350000.0     .20
    6        4.150     .000     .300     3350000.0     .20
    7         .000    4.400     .600     3350000.0     .20
    8         .000    4.400     .600     3350000.0     .20
    9        5.400     .000     .400     3350000.0     .20

LLL   I   J   PI   NSEC    LON     UNIF HL  UNIF VL
---   -   -   --   ----  -------  -------  -------
  1   1   2   1     1      .000     .000     .000
  2   2   3   2     1      .000     .000     .000
  3   3   4   3     1      .000     .000     .000
  4   4   7   4     1      .000     .000     .000
  5   7   8   5     1      .000     .000     .000
  6   8   9   6     1      .000     .000     .000
  7   3   5   7     1      .000     .000     .000
  8   5   6   8     1      .000     .000     .000
  9   6   7   9     1      .000     .000     .000
```

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 4

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
2	.000	168.000	.000	.000	14.000	28.000
4	.000	168.000	.000	.000	14.000	28.000
7	.000	168.000	.000	.000	14.000	28.000
8	.000	168.000	.000	.000	14.000	28.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A .000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	.0058
2	.0000	.0000	.0000	.0117
3	.0000	.0000	.0000	.0132
4	.0000	.0000	.0000	.0103
5	.0000	.0000	.0000	-.0041
6	.0000	.0000	.0000	-.0209
7	.0000	.0000	.0000	.0035
8	.0000	.0000	.0000	.0046
9	.0000	.0000	.0000	.0083

SECCION A 14.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0110	-.3024	-.0008	.0000
2	.0103	.0080	-.0009	.0000
3	.0102	.0679	-.0011	.0000
4	.0104	.2419	-.0026	.0000
5	.0150	.0649	.0003	.0000
6	.0157	.0632	-.0002	.0000
7	.0123	1.4013	-.0043	.0000
8	.0121	2.0744	-.0045	.0000
9	.0114	3.8510	-.0042	.0000

SECCION A 28.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0000	.0000	.0000	-.0058
2	.0000	.0000	.0000	-.0117
3	.0000	.0000	.0000	-.0132
4	.0000	.0000	.0000	-.0103
5	.0000	.0000	.0000	.0041
6	.0000	.0000	.0000	.0209
7	.0000	.0000	.0000	-.0035
8	.0000	.0000	.0000	-.0046
9	.0000	.0000	.0000	-.0083

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.6211	.0320	.0000	.0000	.0000	.0000	-.01	.00	.000
2	.0000	.0000	.4944	1.0959	.0000	.0000	.0000	4.8675	-.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.2448	.0000	.0000	.0000	.0618	5.9247	.0000	.0000	.00	-.01	-.003
2	-.0837	-.4354	.0000	.0000	.1204	11.7326	-.3825	.0000	.00	-.01	.000

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.6211	-.0320	.0000	.0000	.0000	.0000	.01	.00	.000
2	.0000	.0000	-.4944	-1.0959	.0000	.0000	.0000	-4.8675	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.4944	1.0959	.0000	.0000	.0000	4.8675	-.01	.00	.000
2	.0000	.0000	1.0261	-2.9378	.0000	.0000	.0000	6.6025	-.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0837	-.4354	.0000	.0000	5.9299	11.7326	-.3825	.0000	.00	-.01	.000
2	-.7564	-4.0450	.0000	.0000	5.9374	12.8991	-.5404	.0000	.00	-.01	.001

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.4944	-1.0959	.0000	.0000	.0000	-4.8675	.01	.00	.000
2	.0000	.0000	-1.0261	2.9378	.0000	.0000	.0000	-6.6025	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	2.4323	-8.7788	.0000	.0000	.0000	-25.5147	-.01	.00	.000
2	.0000	.0000	6.6120	-1.7323	.0000	.0000	.0000	-22.1701	-.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	7.6608	-38.9273	.0000	.0000	-16.1677	18.4914	5.7420	.0000	.00	-.01	.001
2	4.6036	-24.6184	.0000	.0000	-15.9571	15.6578	7.7858	.0000	.00	-.01	.002

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-2.4323	8.7788	.0000	.0000	.0000	25.5147	.01	.00	.000
2	.0000	.0000	-6.6120	1.7323	.0000	.0000	.0000	22.1701	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	6.6120	-1.7323	.0000	.0000	.0000	-22.1701	-.01	.00	.000
2	.0000	.0000	10.1910	4.0451	.0000	.0000	.0000	-17.1778	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	4.6036	24.6184	.0000	.0000	-10.1476	15.6578	7.7858	.0000	.00	-.01	.002
2	2.4968	3.7445	.0000	.0000	-9.6287	7.8990	13.9554	.0000	.00	-.01	.014

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-6.6120	1.7323	.0000	.0000	.0000	22.1701	.01	.00	.000
2	.0000	.0000	-10.1910	-4.0451	.0000	.0000	.0000	17.1778	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 7/ 8

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	10.1910	3.6055	.0000	.0000	.0000	-4.2406	.00	.00	.000
2	.0000	.0000	9.5957	6.4659	.0000	.0000	.0000	-3.2266	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.5305	-6.0872	.0000	.0000	-5.9507	4.8311	-1.3841	.0000	.00	-.01	.014
2	3.0299	1.7755	.0000	.0000	-5.5549	6.5937	-.7962	.0000	.00	-.01	.021

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-10.1910	-3.6055	.0000	.0000	.0000	4.2406	.00	.00	.000
2	.0000	.0000	-9.5957	-6.4659	.0000	.0000	.0000	3.2266	.00	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 9

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	4.0482	4.3331	.0000	.0000	.0000	-3.2266	.00	.00	.000
2	.0000	.0000	3.0832	1.0540	.0000	.0000	.0000	.0000	-.01	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.4835	1.7755	.0000	.0000	-.0625	4.9055	-.7962	.0000	.00	-.01	.021
2	2.5059	.0000	.0000	.0000	.2783	9.2981	.0000	.0000	.00	-.01	.039

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-4.0482	-4.3331	.0000	.0000	.0000	3.2266	.00	.00	.000
2	.0000	.0000	-3.0832	-1.0540	.0000	.0000	.0000	.0000	.01	.00	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 3/ 5

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	8.2092	5.9486	.0000	.0000	.0000	32.1172	-.01	.00	.00
2	.0000	.0000	-2.2152	.9665	.0000	.0000	.0000	38.1110	.00	.00	.00

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	2.0985	34.8823	.0000	.0000	6.7135	30.4503	22.1790	.0000	.00	.07	.00
2	1.9904	6.4997	.0000	.0000	6.0768	-5.7763	9.4327	.0000	.00	.06	.00

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-8.2092	-5.9486	.0000	.0000	.0000	-32.1172	.01	.00	.00
2	.0000	.0000	2.2152	-.9665	.0000	.0000	.0000	-38.1110	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 5/ 6

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	-2.2152	.9665	.0000	.0000	.0000	38.1110	.00	.00	.00
2	.0000	.0000	1.7166	-3.3368	.0000	.0000	.0000	22.4280	.02	.00	.00

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.2904	6.4997	.0000	.0000	6.0768	-5.7763	9.4327	.0000	.00	.06	.00
2	5.6463	-19.7559	.0000	.0000	6.2088	-43.9587	-2.4426	.0000	.00	.06	.00

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0000	.0000	2.2152	-.9665	.0000	.0000	.0000	-38.1110	.00	.00	.00
2	.0000	.0000	-1.7166	3.3368	.0000	.0000	.0000	-22.4280	-.02	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 6/ 7

SECCION A .000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	.5086	-3.3378	.0000	.0000	.0000	22.4280	.02	.00	.000
2	.0000	.0000	10.1910	2.0900	.0000	.0000	.0000	12.9372	.00	.00	.000

SECCION A 14.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-3.8226	-19.7559	.0000	.0000	-2.4431	-30.2222	-6.2106	.0000	.00	-.02	.001
2	-.2184	-9.8318	.0000	.0000	-1.6655	2.0401	-15.3395	.0000	.00	-.01	.014

SECCION A 28.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0000	.0000	-.5086	3.3378	.0000	.0000	.0000	-22.4280	-.02	.00	.000
2	.0000	.0000	-10.1910	-2.0900	.0000	.0000	.0000	-12.9372	.00	.00	.000

infecsa

PROYECTO: HOJA DE

FECHA

EJECUTANTE:

COEFICIENTES DE EXCENTRICIDAD

DADO QUE LA DOS AUMENTA DEL CASO TIENEN LOS MISMOS INERCIAS LA CONCENTRACIÓN DE LOS ESFUERZOS DE FLEXIÓN A TRAVÉS DE LAS MISMAS ESTRUCTURAS A LAS DE FORMAS

a) EJE CORTO DE VIGAS

$$C_{exc} = \frac{2 \times 0.0848}{0.0848 + 0.0235} = \frac{0.1696}{0.1083} = 1.004 \quad (1 \text{ tra})$$

$$C_{exc} = \frac{2 \times 0.1706}{0.1706 + 0.1632} = \frac{0.3412}{0.3338} = 1.02 \quad (2 \text{ tras})$$

b) en apoyos

$$C_{exc} = \frac{2 \times 0.0323}{0.0323 + 0.0312} = \frac{0.0646}{0.0635} = 1.02 \quad (1 \text{ tra})$$

$$C_{exc} = \frac{2 \times 0.0649}{0.0649 + 0.0632} = \frac{0.1298}{0.1281} = 1.01 \quad (2 \text{ tras})$$

COEFICIENTE DE IMPACTO

a) Para caso de carga móvil IPF75

- Ripado de vías 0,30 m

- Coeficiente de impacto:

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

$$\mu = \frac{VT}{2L}$$

V = 200 km/h

a-1) Vanos de 70 m

$$f = 1,57 \sqrt{\frac{EI}{m L^4}}$$

E = 335.000 t/m²

I = 45,12 m⁴

Peso de losa	P = 2,5 x 14,22	=	35,55 t/m
Peso RCP	P	=	12,39 t/m
	TOTAL	=	47,94 t/m

$$m = \frac{47,94}{9,8} = 4,89\ t/m$$

$$U = 200\ km/h = \frac{200000}{3600} = 55,55\ m/t$$

De donde:

$$f = 1,57 \sqrt{\frac{3,35 \times 10^6 \times 45,12}{4,89 \times 70^4}} = 1,78\ c/seg.$$

$$T = 1/1,78 = 0,56 \text{ seg.}$$

$$\mu = \frac{55,55 \times 0,56}{2 \times 70} = 0,22\ m/t$$

$$I = 65 \frac{0,22}{1 - 0,22 \times 0,22^2} = \frac{14,3}{0,83} = 17,2 \qquad \phi = 1,17$$

a-2) Vanos de 58 m

$$f = 1,57 \sqrt{\frac{3,35 \times 10^6 \times 45,12}{4,81 \times 58^4}} = 2,62\ c/seg.$$

$$T = 1/2,62 = 0,38$$

$$\mu = \frac{55,55 \times 0,38}{2 \times 58} = 0,18\ t/m$$

$$I = 65\,\frac{0,18}{1 - 0,18 + 0,18^2} = 13,87 \qquad \phi = 1,14$$

Se toma el valor 1,17

b) Para caso de carga móvil U.I.C. según Eurocódigo.

- Ripado de vías 0,30 m

Coeficiente de impacto:

Para Momentos Flectores: $\phi_2 = \frac{1,44}{\sqrt{L\phi} - 0,20} + 0,82 < 1,67$

Para vanos L = 70 m

$$\phi_2 = \frac{1,44}{\sqrt{70} - 0,20} + 0,82 = 1,00$$

Para vanos L = 58 m

$$\phi_2 = \frac{1,44}{\sqrt{58} - 0,20} + 0,82 = 1,00$$

Voladizo:

Según Eurocódigo 1 parte 3

Para e < 0,50 m

$L\Phi = 3 \times (6 - 6,0) = 16,20$ m

$$\phi_2 = \frac{1,44}{\sqrt{16,2} - 0,2} + 0,82 = 1,20$$

Forjado superior:

Según Eurocódigo 1 parte 3

$L\Phi = 3 \times 5,40 = 16,20$

$\Phi = 1,19$

2.3.- CÁLCULO DEL PRETENSADO LONGITUDINAL

Programa general de puentes continuos (V1-0)

Proyecto : LAV ZARAGOZA-LERIDA. PUENTE SOBRE EL CINCA

CINCACAR 769 04/04/97 1 pag. SGE- 1

Programa general de puentes continuos (V1-0)

Proyecto : LAV ZARAGOZA-LERIDA. PUENTE SOBRE EL CINCA

```
LAV ZARAGOZA-LERIDA. PUENTE SOBRE EL CINCA
EFECTOS DE CARGAS VERTICALES
8  21
   47.99  4 4 4.748 3 4.444 1  6.000 1 4.833
   47.99  5 2 4.833 1 6.000 4  6.667 1 6.000 1  4.833
3  69.99  7 2 4.375 1 6.000 1 11.500 2 8.750 1 11.500 1 6.00 1 4.375
1  49.99  3 2 4.375 6 5.833 2  3.121
1
1  81 0  0
17.567  64.0722  1.9870  3.5230  14.720
17.360  63.0198  1.9810  3.4950  14.720
17.153  61.9674  1.9760  3.4660  14.720
16.946  60.9150  1.9710  3.4380  14.720
16.740  59.8627  1.9660  3.4100  14.720
16.551  59.0328  1.9660  3.3860  14.720
16.377  58.2030  1.9650  3.3610  14.720
16.195  57.3731  1.9640  3.3370  14.720
15.950  56.2546  1.9630  3.3040  14.720
15.837  55.5845  1.9570  3.2850  14.720
15.725  54.9244  1.9520  3.2660  14.720
15.612  54.2643  1.9470  3.2480  14.720
15.499  53.6042  1.9420  3.2290  14.720
15 335  52.7919  1.9400  3.2040  14.720
   60   51.9288  1.9380  3.1770  14.720
14.986  51.0658  1.9360  3.1510  14.720
14.873  50.5087  1.9350  3.1310  14.720
14.761  49.9516  1.9340  3.1160  14.720
13.481  45.3025  1.9870  2.9430  13.700
15.601  50.7692  2.1290  2.8010  13.700
32.501  72.2288  2.2702  2.6580  13.700
1
1  1
1  2
1  3
1  4
1  5
1  6
1  7
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1  9
1  10
1  11
1  12
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1  19
   9
1  19
1  19
1
1  19
6  19
   20

2  20
5  19
3  20
1
2  20
6  19
2  19
400.0   2.55
1 2 0 2
0.96
+5.0  -5.0  0.000012
1.02  1.01
1.50  1.17  1.00  2
10  0.0125
1
1.10  0.90
0.00025  0.04  2.50
10000.00  190.00  75.00
    14  6
1  2
0.000   -0.290  0.00
481.92  -0.290  0.00
1  24
0.000   -5.080  0.00
4.778   -5.046  0.00
9.496   -4.992  0.00
14.244  -4.979  0.00
18.992  -4.946  0.00
23.436  -4.916  0.00
27.880  -4.896  0.00
32.324  -4.891  0.00
38.324  -4.837  0.00
43.159  -4.812  0.00
47.990  -4.788  0.00
52.823  -4.765  0.00
57.656  -4.741  0.00
63 656  -4.714  0.00
    23  -4.685  0.00
76.990  -4.657  0.00
83.657  -4.636  0.00
90.324  -4.620  0.00
96.324  -4.600  0.00
101.16  -4.580  0.00
105.99  -4.560  0.00
110.82  -4.540  0.00
115.66  -4.520  0.00
481.92  -4.500  0.00
1  24
0.000   -5.310  0.00
4.778   -5.276  0.00
9.496   -5.242  0.00
14.244  -5.209  0.00
18.992  -5.176  0.00
23.436  -5.152  0.00
27.880  -5.126  0.00
 324    -5.101  0.00
   24   -5.067  0.00
43.159  -5.042  0.00
47.990  -5.018  0.00
```

```
52.823  -4.995  0.00
57.656  -4.971  0.00
63.656  -4.944  0.00
 323    -4.915  0.00
 990    -4.887  0.00
83.657  -4.866  0.00
90.324  -4.850  0.00
96.324  -4.835  0.00
101.16  -4.820  0.00
105.99  -4.805  0.00
110.82  -4.790  0.00
115.66  -4.773  0.00
481.92  -4.773  0.00
1  2
0.000   -0.254  0.00
481.92  -0.254  0.00
1  24
0.000   -5.310  0.00
4.778   -5.276  0.00
9.496   -5.242  0.00
14.244  -5.209  0.00
18.992  -5.176  0.00
23 436  -5.152  0.00
   80   -5.126  0.00
32.324  -5.101  0.00
38.324  -5.067  0.00
43.159  -5.042  0.00
47.990  -5.018  0.00
52.823  -4.995  0.00
57.656  -4.971  0.00
63.656  -4.944  0.00
70.323  -4.915  0.00
76.990  -4.887  0.00
83.657  -4.866  0.00
90.324  -4.850  0.00
96.324  -4.835  0.00
101.16  -4.820  0.00
105.99  -4.805  0.00
110.82  -4.790  0.00
115.66  -4.773  0.00
481.92  -4.773  0.00
1  2
   0    -2.487  0.00
481.92  -2.487  0.00
1  2766.0  20592.00  0.21  0.000  1  1  81   1  81  1
1   538.0   4006.00  0.21  0.000  1  1  81  29  81  1
1   538.0   4006.00  0.21  0.000  1  1  81  26  81  1
1   538.0   4006.00  0.21  0.000  1  1  81  24  81  1
1   384.0   2860.00  0.21  0.000  1  1  81  59  81  1
1   384.0   2860.00  0.21  0.000  1  1  81  57  81  1
1   384.0   2860.00  0.21  0.000  1  1  81  55  81  1
3  1383.0  10296.00  0.21  0.000  1  1  81   1  81  1
2   269.0   2003.00  0.21  0.000  1  1  81  29  81  1
2   269.0   2003.00  0.21  0.000  1  1  81  26  81  1
2   269.0   4206.00  0.21  0.000  1  1  81  24  81  1
2   192.0   1430.00  0.21  0.000  1  1  81  43  81  1
2   192.0   1430.00  0.21  0.000  1  1  81  39  81  1
2   192.0   1430.00  0.21  0.000  1  1  81  36  81  1
4  1140.0   8151.00  0.21  0.006  1  1  81   9  13  1
4  1520.0  10867.00  0.21  0.006  1  1  81  19  23  1
 ' 520.0  10867.00  0.21  0.006  1  1  81  29  33  1
   660.0  19019.00  0.21  0.006  1  1  81  39  43  1
4  3420.0  24453.00  0.21  0.006  1  1  81  49  53  1
4  3420.0  24453.00  0.21  0.006  1  1  81  59  63  1
4  1140.0   8151.00  0.21  0.006  1  1  81  69  73  1
5  1140.0   8151.00  0.21  0.006  1  1  81   1   9  1
5  1900.0  13585.00  0.21  0.006  1  1  81  13  19  1
 ' 1900.0  13585.00  0.21  0.006  1  1  81  23  29  1
   140.0   8151.00  0.21  0.006  1  1  81  33  39  1
5  1900.0  13585.00  0.21  0.006  1  1  81  43  49  1
5  1900.0  13585.00  0.21  0.006  1  1  81  53  59  1
5  1900.0  13585.00  0.21  0.006  1  1  81  63  69  1
5  1900.0  13585.00  0.21  0.006  1  1  81  73  81  1
6  1844.0  13728.00  0.21  0.000  1  1  81   1  81  1
4  2280.0  16302.00  0.21  0.006  0  1  81   8  14
4  2280.0  16302.00  0.21  0.006  0  1  81  18  24
4  2280.0  16302.00  0.21  0.006  0  1  81  28  34
4  2280.0  16302.00  0.21  0.006  0  1  81  38  44
4  2280.0  16302.00  0.21  0.006  0  1  81  48  54
4  2280.0  16302.00  0.21  0.006  0  1  81  58  64
4  2280.0  16302.00  0.21  0.006  0  1  81  68  74
5  2280.0  16302.00  0.21  0.006  0  1  81   1   8
5  2280.0  16302.00  0.21  0.006  0  1  81  14  18
5  2280.0  16302.00  0.21  0.006  0  1  81  24  28
5  2280.0  16302.00  0.21  0.006  0  1  81  34  38
5  3040.0  21736.00  0.21  0.006  0  1  81  44  48
 ' 3040.0  21736.00  0.21  0.006  0  1  81  54  58
   040.0   21736.00  0.21  0.006  0  1  81  64  68
2.35  2.35
```

Definicion geometrica de vanos

	Longitud
Vano 1	47.9900 m
Vano 2	57.9900 m
Vano 3	57.9900 m
Vano 4	57.9900 m
Vano 5	69.9900 m
Vano 6	69.9900 m
Vano 7	69.9900 m
Vano 8	49.9900 m

Definicion de cargas

Cargas muertas ..... = 0.960 t/m2

Tren RENFE/U.I.C. :

Coef. de excent. en centro de vano	1.020
Coef. de excent. en apoyo	1.010
Ancho de aceras	1.500 m
Coef. de impacto para tren de RENFE	1.170
Coef. de impacto para tren de U.I.C.	1.000
Numero de vias	2

Temperatura :

Coef. de dilatacion termica de 1E-04
Gradiente lineal termico entre ..... 5.000 y -5.000 grad

Descensos de apoyos (Lentos) :

Hip. 1	Apoyo 1	descenso de	0.000 m.
Hip. 2	Apoyo 11	descenso de	0.000 m.
Hip. 3	Apoyo 21	descenso de	0.000 m.
Hip. 4	Apoyo 31	descenso de	0.000 m.
Hip. 5	Apoyo 41	descenso de	0.000 m.
Hip. 6	Apoyo 51	descenso de	0.000 m.
Hip. 7	Apoyo 61	descenso de	0.000 m.
Hip. 8	Apoyo 71	descenso de	0.000 m.
Hip. 9	Apoyo 81	descenso de	0.000 m.

Caracteristicas de los materiales

Resistencia caracteristica del hormigon ..... =	400.00	kg/cm2
Densidad del hormigon ..... =	2.55	t/m3
Modulo de elasticidad del acero de pretensar .. =	19000.00	kg/mm2
Tension de rotura de los cables ..... =	190.00	kg/mm2
Porcentaje a que se tesan los cables ..... =	75.	%
Retraccion del hormigon .... =	0.00025	
Coeficiente de relajacion del acero ..... =	0.04000	
Coeficiente de fluencia del hormigon ..... =	2.50000	
Coef. de ponderacion para pretensado inicial .. =	1.1000	
Coef. de ponderacion para pretensado final .. =	0.9000	

Definicion de secciones de la estructura final

Vano	Sec	X	Y(Vs)	Vi	Area	Inercia	Ancho
1	1	0.000	1.987	3.523	17.567	64.072197	14.720
	2	4.748	1.981	3.495	17.360	63.019798	14.720
	3	9.496	1.976	3.466	17.153	61.967400	14.720
	4	14.244	1.971	3.438	16.946	60.915001	14.720
	5	18.992	1.966	3.410	16.740	59.862701	14.720
	6	23.436	1.966	3.386	16.551	59.032799	14.720
	7	27.880	1.965	3.361	16.377	58.202999	14.720
	8	32.324	1.964	3.337	16.195	57.373100	14.720
	9	38.324	1.963	3.304	15.950	56.254601	14.720
	10	43.157	1.957	3.285	15.837	55.584499	14.720
	11	47.990	1.952	3.266	15.725	54.924400	14.720
2	11	47.990	1.952	3.266	15.725	54.924400	14.720
	12	52.823	1.947	3.248	15.612	54.264301	14.720
	13	57.656	1.942	3.229	15.499	53.604198	14.720
	14	63.656	1.940	3.204	15.335	52.791901	14.720
	15	70.323	1.938	3.177	15.160	51.928799	14.720
	16	76.990	1.936	3.151	14.986	51.065800	14.720
	17	83.657	1.935	3.131	14.873	50.508701	14.720
	18	90.324	1.934	3.116	14.761	49.951599	14.720
	19	96.324	1.934	3.116	14.761	49.951599	14.720
	20	101.157	1.934	3.116	14.761	49.951599	14.720
	21	105.980	1.934	3.116	14.761	49.951599	14.720
3	21	105.980	1.934	3.116	14.761	49.951599	14.720
	22	110.813	1.934	3.116	14.761	49.951599	14.720
	23	115.646	1.934	3.116	14.761	49.951599	14.720
	24	121.646	1.934	3.116	14.761	49.951599	14.720
	25	128.313	1.987	2.943	13.481	45.302502	13.700
	26	134.980	1.987	2.943	13.481	45.302502	13.700
	27	141.647	1.987	2.943	13.481	45.302502	13.700
	28	148.314	1.987	2.943	13.481	45.302502	13.700
	29	154.314	1.987	2.943	13.481	45.302502	13.700
	30	159.147	1.987	2.943	13.481	45.302502	13.700
	31	163.970	1.987	2.943	13.481	45.302502	13.700
4	31	163.970	1.987	2.943	13.481	45.302502	13.700
	32	168.803	1.987	2.943	13.481	45.302502	13.700
	33	173.636	1.987	2.943	13.481	45.302502	13.700
	34	179.636	1.987	2.943	13.481	45.302502	13.700
	35	186.303	1.987	2.943	13.481	45.302502	13.700
	36	192.970	1.987	2.943	13.481	45.302502	13.700
	37	199.637	1.987	2.943	13.481	45.302502	13.700
	38	206.304	1.987	2.943	13.481	45.302502	13.700
	39	212.304	2.129	2.801	15.601	50.769199	13.700
	40	217.137	2.129	2.801	15.601	50.769199	13.700
	41	221.960	2.129	2.801	15.601	50.769199	13.700
5	41	221.960	2.129	2.801	15.601	50.769199	13.700
	42	226.335	2.129	2.801	15.601	50.769199	13.700

Definicion de secciones de la estructura final

Vano	Sec	X	Y(Vs)	Vi	Area	Inercia	Ancho
	43	230.710	2.129	2.801	15.601	50.769199	13.700
	44	236.710	1.987	2.943	13.481	45.302502	13.700
	45	248.210	1.987	2.943	13.481	45.302502	13.700
	46	256.960	1.987	2.943	13.481	45.302502	13.700
	47	265.710	1.987	2.943	13.481	45.302502	13.700
	48	277.210	1.987	2.943	13.481	45.302502	13.700
	49	283.210	2.129	2.801	15.601	50.769199	13.700
	50	287.585	2.129	2.801	15.601	50.769199	13.700
	51	291.950	2.129	2.801	15.601	50.769199	13.700
6	51	291.950	2.129	2.801	15.601	50.769199	13.700
	52	296.325	2.129	2.801	15.601	50.769199	13.700
	53	300.700	2.129	2.801	15.601	50.769199	13.700
	54	306.700	1.987	2.943	13.481	45.302502	13.700
	55	318.200	1.987	2.943	13.481	45.302502	13.700
	56	326.950	1.987	2.943	13.481	45.302502	13.700
	57	335.700	1.987	2.943	13.481	45.302502	13.700
	58	347.200	1.987	2.943	13.481	45.302502	13.700
	59	353.200	2.129	2.801	15.601	50.769199	13.700
	60	357.575	2.129	2.801	15.601	50.769199	13.700
	61	361.940	2.129	2.801	15.601	50.769199	13.700
7	61	361.940	2.129	2.801	15.601	50.769199	13.700
	62	366.315	2.129	2.801	15.601	50.769199	13.700
	63	370.690	2.129	2.801	15.601	50.769199	13.700
	64	376.690	1.987	2.943	13.481	45.302502	13.700
	65	388.190	1.987	2.943	13.481	45.302502	13.700
	66	396.940	1.987	2.943	13.481	45.302502	13.700
	67	405.690	1.987	2.943	13.481	45.302502	13.700
	68	417.190	1.987	2.943	13.481	45.302502	13.700
	69	423.190	2.129	2.801	15.601	50.769199	13.700
	70	427.565	2.129	2.801	15.601	50.769199	13.700
	71	431.930	2.129	2.801	15.601	50.769199	13.700
8	71	431.930	2.129	2.801	15.601	50.769199	13.700
	72	436.305	2.129	2.801	15.601	50.769199	13.700
	73	440.680	2.129	2.801	15.601	50.769199	13.700
	74	446.513	1.987	2.943	13.481	45.302502	13.700
	75	452.346	1.987	2.943	13.481	45.302502	13.700
	76	458.179	1.987	2.943	13.481	45.302502	13.700
	77	464.012	1.987	2.943	13.481	45.302502	13.700
	78	469.845	1.987	2.943	13.481	45.302502	13.700
	79	475.678	1.987	2.943	13.481	45.302502	13.700
	80	478.799	1.987	2.943	13.481	45.302502	13.700
	81	481.920	1.987	2.943	13.481	45.302502	13.700

Definicion de estados de la estructura

	Numero de secciones	Numero de secciones activas
Estado 1	81	de 1 a 81

Cable Numero 1 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 2766.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 2 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 3 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 26 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 4 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 5 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 59 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 6 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 57 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 7 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 55 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.290	0.00000
2	481.920	-0.290	0.00000

Cable Numero 8 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1383.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0,00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 9 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 10 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 26 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 11 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 12 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 43 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 13 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 39 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 14 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 36 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.080	0.00000
2	4.778	-5.046	0.00000
3	9.496	-4.992	0.00000
4	14.244	-4.979	0.00000
5	18.992	-4.946	0.00000
6	23.436	-4.916	0.00000
7	27.880	-4.896	0.00000
8	32.324	-4.891	0.00000
9	38.324	-4.837	0.00000
10	43.159	-4.812	0.00000
11	47.990	-4.788	0.00000
12	52.823	-4.765	0.00000
13	57.656	-4.741	0.00000
14	63.656	-4.714	0.00000
15	70.323	-4.685	0.00000
16	76.990	-4.657	0.00000
17	83.657	-4.636	0.00000
18	90.324	-4.620	0.00000
19	96.324	-4.600	0.00000
20	101.160	-4.580	0.00000
21	105.990	-4.560	0.00000
22	110.820	-4.540	0.00000
23	115.660	-4.520	0.00000
24	481.920	-4.500	0.00000

Cable Numero 15 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 9 (Activa)
Seccion final ..... = 13 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 16 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 19 (Activa)
Seccion final ..... = 23 (Pasiva)

Fuerza de Pretensado ..... = 1520.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 17 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 33 (Pasiva)

Fuerza de Pretensado ..... = 1520.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 18 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 39 (Activa)
Seccion final ..... = 43 (Pasiva)

Fuerza de Pretensado ..... = 2660.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 19 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 49 (Activa)
Seccion final ..... = 53 (Pasiva)

Fuerza de Pretensado ..... = 3420.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 20 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 59 (Activa)
Seccion final ..... = 63 (Pasiva)

Fuerza de Pretensado ..... = 3420.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 21 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 69 (Activa)
Seccion final ..... = 73 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Numero 22 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 9 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 23 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 13 (Activa)
Seccion final ..... = 19 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 24 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 23 (Activa)
Seccion final ..... = 29 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 25 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 33 (Activa)
Seccion final ..... = 39 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 26 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 43 (Activa)
Seccion final ..... = 49 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 27 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 53 (Activa)
Seccion final ..... = 59 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 28 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 63 (Activa)
Seccion final ..... = 69 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 29 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 73 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Numero 30 (Pertenece a familia 1)

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1844.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-2.487	0.00000
2	481.920	-2.487	0.00000

Cable Fase Final Numero 1

Definicion general

Seccion inicial ..... = 8 (Activa)
Seccion final ..... = 14 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 2

Definicion general

Seccion inicial ..... = 18 (Activa)
Seccion final ..... = 24 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 3

Definicion general

Seccion inicial ..... = 28 (Activa)
Seccion final ..... = 34 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 4

Definicion general

Seccion inicial ..... = 38 (Activa)
Seccion final ..... = 44 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 5

Definicion general

Seccion inicial ..... = 48 (Activa)
Seccion final ..... = 54 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 6

Definicion general

Seccion inicial ..... = 58 (Activa)
Seccion final ..... = 64 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 7

Definicion general

Seccion inicial ..... = 68 (Activa)
Seccion final ..... = 74 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-0.254	0.00000
2	481.920	-0.254	0.00000

Cable Fase Final Numero 8

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 8 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 9

Definicion general

Seccion inicial ..... = 14 (Activa)
Seccion final ..... = 18 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 10

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 28 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 11

Definicion general

Seccion inicial ..... = 34 (Activa)
Seccion final ..... = 38 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 12

Definicion general

Seccion inicial ..... = 44 (Activa)
Seccion final ..... = 48 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 13

Definicion general

Seccion inicial ..... = 54 (Activa)
Seccion final ..... = 58 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Cable Fase Final Numero 14

Definicion general

Seccion inicial ..... = 64 (Activa)
Seccion final ..... = 68 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Puntos Singulares del trazado

Pto.	X	Y	Pend
1	0.000	-5.310	0.00000
2	4.778	-5.276	0.00000
3	9.496	-5.242	0.00000
4	14.244	-5.209	0.00000
5	18.992	-5.176	0.00000
6	23.436	-5.152	0.00000
7	27.880	-5.126	0.00000
8	32.324	-5.101	0.00000
9	38.324	-5.067	0.00000
10	43.159	-5.042	0.00000
11	47.990	-5.018	0.00000
12	52.823	-4.995	0.00000
13	57.656	-4.971	0.00000
14	63.656	-4.944	0.00000
15	70.323	-4.915	0.00000
16	76.990	-4.887	0.00000
17	83.657	-4.866	0.00000
18	90.324	-4.850	0.00000
19	96.324	-4.835	0.00000
20	101.160	-4.820	0.00000
21	105.990	-4.805	0.00000
22	110.820	-4.790	0.00000
23	115.660	-4.773	0.00000
24	481.920	-4.773	0.00000

Esfuerzos acumulados por peso propio

Estructura completa estado inicial

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	0.00	-794.88	-0.87
	1	2	3272.15	-583.44	-0.87
	2	3	5546.35	-374.51	-0.51
	3	4	6834.49	-168.09	-0.29
	4	5	7148.46	35.83	-0.07
	5	6	6570.07	224.47	0.00
	6	7	5157.97	411.04	0.07
	7	8	2921.23	595.60	0.11
	8	9	-1390.08	841.51	0.12
	9	10	-5930.41	1037.38	1.16
	10	11	-11414.05	1231.87	1.17
2	11	11	-11414.05	-1144.44	-1.09
	11	12	-6349.61	-951.34	-1.09
	12	13	-2215.07	-759.63	-0.89
	13	14	1635.06	-523.75	-0.22
	14	15	4262.77	-264.53	-0.12
	15	16	5172.15	-8.27	-0.04
	16	17	4381.22	245.54	0.02
	17	18	1904.49	497.44	0.06
	18	19	-1757.70	723.29	0.00
	19	20	-5692.94	905.20	0.00
	20	21	-10496.51	1086.74	0.00
3	21	21	-10496.51	-1075.61	0.00
	21	22	-5737.71	-893.69	0.00
	22	23	-1858.10	-711.77	0.00
	23	24	1735.01	-485.93	0.00
	24	25	4174.38	-245.84	2.91
	25	26	5049.54	-16.67	0.00
	26	27	4396.70	212.51	0.00
	27	28	2215.86	441.70	0.00
	28	29	-1053.14	647.96	0.00
	29	30	-4586.23	814.10	0.00
	30	31	-8912.48	979.90	0.00
4	31	31	-8912.48	-938.71	0.00
	31	32	-4777.17	-772.57	0.00
	32	33	-1444.81	-606.43	0.00
	33	34	1574.98	-400.17	0.00
	34	35	3478.90	-170.98	0.00
	35	36	3854.83	58.21	0.00
	36	37	2702.76	287.39	0.00
	37	38	22.70	516.58	0.00
	38	39	-3744.61	738.95	-14.85
	39	40	-7781.11	931.33	0.00
	40	41	-12735.61	1123.20	0.00
5	41	41	-12735.61	-1232.79	0.00
	41	42	-7722.87	-1058.74	0.00
	42	43	-3471.59	-884.70	0.00
	43	44	1169.53	-662.06	-18.30
	44	45	6511.89	-266.89	0.00
	45	46	7531.19	33.91	0.00

Esfuerzos acumulados por peso propio

Estructura completa estado inicial

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	46	47	5918.53	334.70	0.00
	47	48	-203.69	730.03	0.00
	48	49	-5251.69	952.34	-19.90
	49	50	-9799.65	1126.56	0.00
	50	51	-15096.07	1300.21	0.00
6	51	51	-15096.07	-1269.03	0.00
	51	52	-9924.78	-1094.98	0.00
	52	53	-5514.95	-920.94	0.00
	53	54	-656.39	-698.29	-19.16
	54	55	5102.73	-303.13	0.00
	55	56	6439.12	-2.33	0.00
	56	57	5143.55	298.46	0.00
	57	58	-561.91	693.79	0.00
	58	59	-5392.48	916.11	-19.05
	59	60	-9781.89	1090.32	0.00
	60	61	-14920.13	1263.97	0.00
7	61	61	-14920.13	-1290.49	0.00
	61	62	-9654.98	-1116.44	0.00
	62	63	-5151.31	-942.39	0.00
	63	64	-164.03	-719.74	-19.67
	64	65	5841.79	-324.58	0.00
	65	66	7365.88	-23.79	0.00
	66	67	6258.02	277.01	0.00
	67	68	799.26	672.34	0.00
	68	69	-3902.59	894.66	-18.54
	69	70	-8198.15	1068.87	0.00
	70	71	-13242.75	1242.52	0.00
8	71	71	-13242.75	-1179.39	0.00
	71	72	-8463.64	-1005.34	0.00
	72	73	-4445.99	-831.29	0.00
	73	74	-227.47	-614.86	-17.60
	74	75	2775.07	-414.49	0.00
	75	76	4607.99	-213.97	0.00
	76	77	5271.28	-13.45	0.00
	77	78	4764.95	187.06	0.00
	78	79	3088.99	387.58	0.00
	79	80	1711.92	494.87	0.00
	80	81	0.00	602.16	0.00

Esfuerzos acumulados por peso propio

Estructura completa estado final

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	0.00	-794.88	-0.87
	1	2	3272.15	-583.44	-0.87
	2	3	5546.35	-374.51	-0.51
	3	4	6834.49	-168.09	-0.29
	4	5	7148.46	35.83	-0.07
	5	6	6570.07	224.47	0.00
	6	7	5157.97	411.04	0.07
	7	8	2921.23	595.60	0.11
	8	9	-1390.08	841.51	0.12
	9	10	-5930.41	1037.38	1.16
	10	11	-11414.05	1231.87	1.17
2	11	11	-11414.05	-1144.44	-1.09
	11	12	-6349.61	-951.34	-1.09
	12	13	-2215.07	-759.63	-0.89
	13	14	1635.06	-523.75	-0.22
	14	15	4262.77	-264.53	-0.12
	15	16	5172.15	-8.27	-0.04
	16	17	4381.22	245.54	0.02
	17	18	1904.49	497.44	0.06
	18	19	-1757.70	723.29	0.00
	19	20	-5692.94	905.20	0.00
	20	21	-10496.51	1086.74	0.00
3	21	21	-10496.51	-1075.61	0.00
	21	22	-5737.71	-893.69	0.00
	22	23	-1858.10	-711.77	0.00
	23	24	1735.01	-485.93	0.00
	24	25	4174.38	-245.84	2.91
	25	26	5049.54	-16.67	0.00
	26	27	4396.70	212.51	0.00
	27	28	2215.86	441.70	0.00
	28	29	-1053.14	647.96	0.00
	29	30	-4586.23	814.10	0.00
	30	31	-8912.48	979.90	0.00
4	31	31	-8912.48	-938.71	0.00
	31	32	-4777.17	-772.57	0.00
	32	33	-1444.81	-606.43	0.00
	33	34	1574.98	-400.17	0.00
	34	35	3478.90	-170.98	0.00
	35	36	3854.83	58.21	0.00
	36	37	2702.76	287.39	0.00
	37	38	22.70	516.58	0.00
	38	39	-3744.61	738.95	-14.85
	39	40	-7781.11	931.33	0.00
	40	41	-12735.61	1123.20	0.00
5	41	41	-12735.61	-1232.79	0.00
	41	42	-7722.87	-1058.74	0.00
	42	43	-3471.59	-884.70	0.00
	43	44	1169.53	-662.06	-18.30
	44	45	6511.89	-266.89	0.00
	45	46	7531.19	33.91	0.00

Esfuerzos acumulados por peso propio

Estructura completa estado final

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	46	47	5918.53	334.70	0.00
	47	48	-203.69	730.03	0.00
	48	49	-5251.69	952.34	-19.90
	49	50	-9799.65	1126.56	0.00
	50	51	-15096.07	1300.21	0.00
6	51	51	-15096.07	-1269.03	0.00
	51	52	-9924.78	-1094.98	0.00
	52	53	-5514.95	-920.94	0.00
	53	54	-656.39	-698.29	-19.16
	54	55	5102.73	-303.13	0.00
	55	56	6439.12	-2.33	0.00
	56	57	5143.55	298.46	0.00
	57	58	-561.91	693.79	0.00
	58	59	-5392.48	916.11	-19.05
	59	60	-9781.89	1090.32	0.00
	60	61	-14920.13	1263.97	0.00
7	61	61	-14920.13	-1290.49	0.00
	61	62	-9654.98	-1116.44	0.00
	62	63	-5151.31	-942.39	0.00
	63	64	-164.03	-719.74	-19.67
	64	65	5841.79	-324.58	0.00
	65	66	7365.88	-23.79	0.00
	66	67	6258.02	277.01	0.00
	67	68	799.26	672.34	0.00
	68	69	-3902.59	894.66	-18.54
	69	70	-8198.15	1068.87	0.00
	70	71	-13242.75	1242.52	0.00
8	71	71	-13242.75	-1179.39	0.00
	71	72	-8463.64	-1005.34	0.00
	72	73	-4445.99	-831.29	0.00
	73	74	-227.47	-614.86	-17.60
	74	75	2775.07	-414.49	0.00
	75	76	4607.99	-213.97	0.00
	76	77	5271.28	-13.45	0.00
	77	78	4764.95	187.06	0.00
	78	79	3088.99	387.58	0.00
	79	80	1711.92	494.87	0.00
	80	81	0.00	602.16	0.00

Esfuerzos debidos a cargas muertas

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	0.00	-255.85	-0.28
	1	2	1055.49	-188.76	-0.28
	2	3	1792.41	-121.66	-0.16
	3	4	2210.77	-54.56	-0.09
	4	5	2310.56	12.53	-0.02
	5	6	2115.33	75.33	0.00
	6	7	1641.03	138.13	0.02
	7	8	887.65	200.93	0.04
	8	9	-572.28	285.71	0.04
	9	10	-2118.17	354.01	0.40
	10	11	-3994.15	422.31	0.40
2	11	11	-3994.15	-409.89	-0.39
	11	12	-2178.20	-341.59	-0.39
	12	13	-692.33	-273.29	-0.32
	13	14	693.07	-188.51	-0.08
	14	15	1635.78	-94.29	-0.04
	15	16	1950.38	-0.08	-0.01
	16	17	1636.86	94.13	0.01
	17	18	695.22	188.35	0.02
	18	19	-689.21	273.13	0.00
	19	20	-2174.30	341.43	0.00
	20	21	-3985.37	409.58	0.00
3	21	21	-3985.37	-406.96	0.00
	21	22	-2183.56	-338.66	0.00
	22	23	-711.83	-270.37	0.00
	23	24	656.03	-185.58	0.00
	24	25	1590.10	-94.63	1.11
	25	26	1928.73	-6.95	0.00
	26	27	1682.77	80.74	0.00
	27	28	852.21	168.42	0.00
	28	29	-395.03	247.33	0.00
	29	30	-1743.98	310.90	0.00
	30	31	-3396.40	374.33	0.00
4	31	31	-3396.40	-358.18	0.00
	31	32	-1818.93	-294.61	0.00
	32	33	-548.67	-231.05	0.00
	33	34	600.89	-152.14	0.00
	34	35	1322.89	-64.45	0.00
	35	36	1460.31	23.23	0.00
	36	37	1013.13	110.91	0.00
	37	38	-18.63	198.60	0.00
	38	39	-1447.10	277.47	-5.63
	39	40	-2941.91	341.08	0.00
	40	41	-4739.88	404.51	0.00
5	41	41	-4739.88	-447.37	0.00
	41	42	-2908.49	-389.83	0.00

Esfuerzos debidos a cargas muertas

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	42	43	-1328.85	-332.29	0.00
	43	44	428.31	-253.32	-6.93
	44	45	2472.50	-102.13	0.00
	45	46	2862.69	12.95	0.00
	46	47	2245.92	128.03	0.00
	47	48	-96.07	279.27	0.00
	48	49	-2008.59	358.12	-7.54
	49	50	-3701.53	415.73	0.00
	50	51	-5641.47	473.14	0.00
6	51	51	-5641.47	-461.25	0.00
	51	52	-3749.37	-403.71	0.00
	52	53	-2109.00	-346.17	0.00
	53	54	-268.58	-267.20	-7.26
	54	55	1935.22	-116.01	0.00
	55	56	2446.84	-0.93	0.00
	56	57	1951.51	114.15	0.00
	57	58	-230.88	265.40	0.00
	58	59	-2060.13	344.25	-7.21
	59	60	-3692.36	401.85	0.00
	60	61	-5571.72	459.26	0.00
7	61	61	-5571.72	-469.27	0.00
	61	62	-3644.55	-411.73	0.00
	62	63	-1969.11	-354.19	0.00
	63	64	-80.59	-275.21	-7.45
	64	65	2215.39	-124.03	0.00
	65	66	2797.15	-8.95	0.00
	66	67	2371.96	106.13	0.00
	67	68	281.75	257.38	0.00
	68	69	-1499.40	336.23	-7.02
	69	70	-3096.55	393.83	0.00
	70	71	-4940.93	451.24	0.00
8	71	71	-4940.93	-427.57	0.00
	71	72	-3196.18	-370.03	0.00
	72	73	-1703.16	-312.49	0.00
	73	74	-104.01	-235.72	-6.67
	74	75	1047.53	-159.06	0.00
	75	76	1751.58	-82.34	0.00
	76	77	2008.14	-5.63	0.00
	77	78	1817.22	71.09	0.00
	78	79	1178.82	147.80	0.00
	79	80	653.46	188.85	0.00
	80	81	0.00	229.90	0.00

Esfuerzos por temperatura (Gradiente termico de 5.00 gr.)

Para Gradiente termico de -5.00 * -1.00

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
1	1	1	0.00	-61.89	-0.08	0.00	0.00
	1	2	293.87	-61.89	-0.08	-0.92	1.63
	2	3	587.75	-61.89	-0.06	-1.87	3.29
	3	4	881.62	-61.89	-0.06	-2.85	4.98
	4	5	1175.49	-61.89	-0.06	-3.86	6.70
	5	6	1450.55	-61.89	0.00	-4.83	8.32
	6	7	1725.60	-61.89	-0.01	-5.83	9.96
	7	8	2000.66	-61.89	-0.01	-6.85	11.64
	8	9	2372.03	-61.89	-0.01	-8.28	13.93
	9	10	2671.16	-61.89	-0.08	-9.41	15.79
	10	11	2970.29	-61.89	-0.06	-10.56	17.66
2	11	11	2970.29	15.47	0.02	-10.56	17.66
	11	12	2895.54	15.47	0.02	-10.39	17.33
	12	13	2820.79	15.47	0.02	-10.22	16.99
	13	14	2727.99	15.47	0.00	-10.02	16.56
	14	15	2624.88	15.47	0.00	-9.80	16.06
	15	16	2521.76	15.47	0.00	-9.56	15.56
	16	17	2418.65	15.47	0.00	-9.27	14.99
	17	18	2315.53	15.47	0.00	-8.97	14.44
	18	19	2222.73	15.47	0.00	-8.61	13.87
	19	20	2147.98	15.47	0.00	-8.32	13.40
	20	21	2073.38	15.47	0.00	-8.03	12.93
3	21	21	2073.38	-0.26	0.00	-8.03	12.93
	21	22	2074.62	-0.26	0.00	-8.03	12.94
	22	23	2075.86	-0.26	0.00	-8.04	12.95
	23	24	2077.39	-0.26	0.00	-8.04	12.96
	24	25	2079.10	-0.26	0.00	-9.12	13.51
	25	26	2080.81	-0.26	0.00	-9.13	13.52
	26	27	2082.51	-0.26	0.00	-9.13	13.53
	27	28	2084.22	-0.26	0.00	-9.14	13.54
	28	29	2085.75	-0.26	0.00	-9.15	13.55
	29	30	2086.99	-0.26	0.00	-9.15	13.56
	30	31	2088.23	-0.26	0.00	-9.16	13.57
4	31	31	2088.23	-1.69	0.00	-9.16	13.57
	31	32	2096.37	-1.69	0.00	-9.19	13.62
	32	33	2104.52	-1.69	0.00	-9.23	13.67
	33	34	2114.63	-1.69	0.00	-9.27	13.74
	34	35	2125.87	-1.69	0.00	-9.32	13.81
	35	36	2137.11	-1.69	0.00	-9.37	13.88
	36	37	2148.35	-1.69	0.00	-9.42	13.96
	37	38	2159.59	-1.69	0.00	-9.47	14.03
	38	39	2169.70	-1.68	0.04	-9.10	11.97
	39	40	2177.85	-1.69	0.00	-9.13	12.02
	40	41	2185.98	-1.69	0.00	-9.17	12.06

Esfuerzos por temperatura (Gradiente termico de 5.00 gr.)

Para Gradiente termico de -5.00 * -1.00

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
5	41	41	2185.98	-0.21	0.00	-9.17	12.06
	41	42	2186.91	-0.21	0.00	-9.17	12.07
	42	43	2187.85	-0.21	0.00	-9.17	12.07
	43	44	2189.14	-0.21	0.00	-9.60	14.22
	44	45	2191.59	-0.21	0.00	-9.61	14.24
	45	46	2193.47	-0.21	0.00	-9.62	14.25
	46	47	2195.34	-0.21	0.00	-9.63	14.26
	47	48	2197.80	-0.21	0.00	-9.64	14.28
	48	49	2199.09	-0.21	0.00	-9.22	12.13
	49	50	2200.02	-0.21	0.00	-9.23	12.14
	50	51	2200.96	-0.21	0.00	-9.23	12.14
6	51	51	2200.96	2.50	0.00	-9.23	12.14
	51	52	2190.01	2.50	0.00	-9.18	12.08
	52	53	2179.07	2.50	0.00	-9.14	12.02
	53	54	2164.07	2.50	0.06	-9.49	14.06
	54	55	2135.31	2.50	0.00	-9.37	13.87
	55	56	2113.42	2.50	0.00	-9.27	13.73
	56	57	2091.54	2.50	0.00	-9.17	13.59
	57	58	2062.78	2.50	0.00	-9.05	13.40
	58	59	2047.78	2.50	-0.06	-8.59	11.30
	59	60	2036.83	2.50	0.00	-8.54	11.24
	60	61	2025.91	2.50	0.00	-8.50	11.18
7	61	61	2025.91	-9.50	0.00	-8.50	11.18
	61	62	2067.46	-9.50	0.00	-8.67	11.41
	62	63	2109.00	-9.50	0.00	-8.84	11.64
	63	64	2165.98	-9.49	-0.22	-9.50	14.07
	64	65	2275.17	-9.50	0.00	-9.98	14.78
	65	66	2358.26	-9.50	0.00	-10.34	15.32
	66	67	2441.35	-9.50	0.00	-10.71	15.86
	67	68	2550.55	-9.50	0.00	-11.19	16.57
	68	69	2607.52	-9.49	0.22	-10.93	14.39
	69	70	2649.06	-9.50	0.00	-11.11	14.62
	70	71	2690.51	-9.50	0.00	-11.28	14.84
8	71	71	2690.51	53.82	0.00	-11.28	14.84
	71	72	2455.05	53.82	0.00	-10.30	13.54
	72	73	2219.58	53.82	0.00	-9.31	12.25
	73	74	1905.64	53.81	1.31	-8.35	12.39
	74	75	1591.70	53.82	0.00	-6.98	10.34
	75	76	1277.76	53.82	0.00	-5.60	8.30
	76	77	963.83	53.82	0.00	-4.23	6.26
	77	78	649.89	53.82	0.00	-2.85	4.22
	78	79	335.95	53.82	0.00	-1.47	2.18
	79	80	167.97	53.82	0.00	-0.74	1.09
	80	81	0.00	53.82	0.00	0.00	0.00

Envolvente de cortantes por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
1	1	1 MAX	0.00	0.00	0.00	0.00	0.00
		1 MIN	0.00	0.00	0.00	0.00	0.00
	1	2 MAX	0.00	0.00	0.00	0.00	0.00
		2 MIN	0.00	0.00	0.00	0.00	0.00
	2	3 MAX	0.00	0.00	0.00	0.00	0.00
		3 MIN	0.00	0.00	0.00	0.00	0.00
	3	4 MAX	0.00	0.00	0.00	0.00	0.00
		4 MIN	0.00	0.00	0.00	0.00	0.00
	4	5 MAX	0.00	0.00	0.00	0.00	0.00
		5 MIN	0.00	0.00	0.00	0.00	0.00
	5	6 MAX	0.00	0.00	0.00	0.00	0.00
		6 MIN	0.00	0.00	0.00	0.00	0.00
	6	7 MAX	0.00	0.00	0.00	0.00	0.00
		7 MIN	0.00	0.00	0.00	0.00	0.00
	7	8 MAX	0.00	0.00	0.00	0.00	0.00
		8 MIN	0.00	0.00	0.00	0.00	0.00
	8	9 MAX	0.00	0.00	0.00	0.00	0.00
		9 MIN	0.00	0.00	0.00	0.00	0.00
	9	10 MAX	0.00	0.00	0.00	0.00	0.00
		10 MIN	0.00	0.00	0.00	0.00	0.00
	10	11 MAX	0.00	0.00	0.00	0.00	0.00
		11 MIN	0.00	0.00	0.00	0.00	0.00
2	11	11 MAX	0.00	0.00	0.00	0.00	0.00
		11 MIN	0.00	0.00	0.00	0.00	0.00
	11	12 MAX	0.00	0.00	0.00	0.00	0.00
		12 MIN	0.00	0.00	0.00	0.00	0.00
	12	13 MAX	0.00	0.00	0.00	0.00	0.00
		13 MIN	0.00	0.00	0.00	0.00	0.00
	13	14 MAX	0.00	0.00	0.00	0.00	0.00
		14 MIN	0.00	0.00	0.00	0.00	0.00
	14	15 MAX	0.00	0.00	0.00	0.00	0.00
		15 MIN	0.00	0.00	0.00	0.00	0.00
	15	16 MAX	0.00	0.00	0.00	0.00	0.00
		16 MIN	0.00	0.00	0.00	0.00	0.00
	16	17 MAX	0.00	0.00	0.00	0.00	0.00
		17 MIN	0.00	0.00	0.00	0.00	0.00
	17	18 MAX	0.00	0.00	0.00	0.00	0.00
		18 MIN	0.00	0.00	0.00	0.00	0.00
	18	19 MAX	0.00	0.00	0.00	0.00	0.00
		19 MIN	0.00	0.00	0.00	0.00	0.00
	19	20 MAX	0.00	0.00	0.00	0.00	0.00
		20 MIN	0.00	0.00	0.00	0.00	0.00
	20	21 MAX	0.00	0.00	0.00	0.00	0.00
		21 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de cortantes por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
3	21	21 MAX	0.00	0.00	0.00	0.00	0.00
		21 MIN	0.00	0.00	0.00	0.00	0.00
	21	22 MAX	0.00	0.00	0.00	0.00	0.00
		22 MIN	0.00	0.00	0.00	0.00	0.00
	22	23 MAX	0.00	0.00	0.00	0.00	0.00
		23 MIN	0.00	0.00	0.00	0.00	0.00
	23	24 MAX	0.00	0.00	0.00	0.00	0.00
		24 MIN	0.00	0.00	0.00	0.00	0.00
	24	25 MAX	0.00	0.00	0.00	0.00	0.00
		25 MIN	0.00	0.00	0.00	0.00	0.00
	25	26 MAX	0.00	0.00	0.00	0.00	0.00
		26 MIN	0.00	0.00	0.00	0.00	0.00
	26	27 MAX	0.00	0.00	0.00	0.00	0.00
		27 MIN	0.00	0.00	0.00	0.00	0.00
	27	28 MAX	0.00	0.00	0.00	0.00	0.00
		28 MIN	0.00	0.00	0.00	0.00	0.00
	28	29 MAX	0.00	0.00	0.00	0.00	0.00
		29 MIN	0.00	0.00	0.00	0.00	0.00
	29	30 MAX	0.00	0.00	0.00	0.00	0.00
		30 MIN	0.00	0.00	0.00	0.00	0.00
	30	31 MAX	0.00	0.00	0.00	0.00	0.00
		31 MIN	0.00	0.00	0.00	0.00	0.00
4	31	31 MAX	0.00	0.00	0.00	0.00	0.00
		31 MIN	0.00	0.00	0.00	0.00	0.00
	31	32 MAX	0.00	0.00	0.00	0.00	0.00
		32 MIN	0.00	0.00	0.00	0.00	0.00
	32	33 MAX	0.00	0.00	0.00	0.00	0.00
		33 MIN	0.00	0.00	0.00	0.00	0.00
	33	34 MAX	0.00	0.00	0.00	0.00	0.00
		34 MIN	0.00	0.00	0.00	0.00	0.00
	34	35 MAX	0.00	0.00	0.00	0.00	0.00
		35 MIN	0.00	0.00	0.00	0.00	0.00
	35	36 MAX	0.00	0.00	0.00	0.00	0.00
		36 MIN	0.00	0.00	0.00	0.00	0.00
	36	37 MAX	0.00	0.00	0.00	0.00	0.00
		37 MIN	0.00	0.00	0.00	0.00	0.00
	37	38 MAX	0.00	0.00	0.00	0.00	0.00
		38 MIN	0.00	0.00	0.00	0.00	0.00
	38	39 MAX	0.00	0.00	0.00	0.00	0.00
		39 MIN	0.00	0.00	0.00	0.00	0.00
	39	40 MAX	0.00	0.00	0.00	0.00	0.00
		40 MIN	0.00	0.00	0.00	0.00	0.00
	40	41 MAX	0.00	0.00	0.00	0.00	0.00
		41 MIN	0.00	0.00	0.00	0.00	0.00
5	41	41 MAX	0.00	0.00	0.00	0.00	0.00
		41 MIN	0.00	0.00	0.00	0.00	0.00
	41	42 MAX	0.00	0.00	0.00	0.00	0.00
		42 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de cortantes por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
	42	43 MAX	0.00	0.00	0.00	0.00	0.00
		43 MIN	0.00	0.00	0.00	0.00	0.00
	43	44 MAX	0.00	0.00	0.00	0.00	0.00
		44 MIN	0.00	0.00	0.00	0.00	0.00
	44	45 MAX	0.00	0.00	0.00	0.00	0.00
		45 MIN	0.00	0.00	0.00	0.00	0.00
	45	46 MAX	0.00	0.00	0.00	0.00	0.00
		46 MIN	0.00	0.00	0.00	0.00	0.00
	46	47 MAX	0.00	0.00	0.00	0.00	0.00
		47 MIN	0.00	0.00	0.00	0.00	0.00
	47	48 MAX	0.00	0.00	0.00	0.00	0.00
		48 MIN	0.00	0.00	0.00	0.00	0.00
	48	49 MAX	0.00	0.00	0.00	0.00	0.00
		49 MIN	0.00	0.00	0.00	0.00	0.00
	49	50 MAX	0.00	0.00	0.00	0.00	0.00
		50 MIN	0.00	0.00	0.00	0.00	0.00
	50	51 MAX	0.00	0.00	0.00	0.00	0.00
		51 MIN	0.00	0.00	0.00	0.00	0.00
	51	51 MAX	0.00	0.00	0.00	0.00	0.00
		51 MIN	0.00	0.00	0.00	0.00	0.00
	51	52 MAX	0.00	0.00	0.00	0.00	0.00
		52 MIN	0.00	0.00	0.00	0.00	0.00
	52	53 MAX	0.00	0.00	0.00	0.00	0.00
		53 MIN	0.00	0.00	0.00	0.00	0.00
	53	54 MAX	0.00	0.00	0.00	0.00	0.00
		54 MIN	0.00	0.00	0.00	0.00	0.00
	54	55 MAX	0.00	0.00	0.00	0.00	0.00
		55 MIN	0.00	0.00	0.00	0.00	0.00
	55	56 MAX	0.00	0.00	0.00	0.00	0.00
		56 MIN	0.00	0.00	0.00	0.00	0.00
	56	57 MAX	0.00	0.00	0.00	0.00	0.00
		57 MIN	0.00	0.00	0.00	0.00	0.00
	57	58 MAX	0.00	0.00	0.00	0.00	0.00
		58 MIN	0.00	0.00	0.00	0.00	0.00
	58	59 MAX	0.00	0.00	0.00	0.00	0.00
		59 MIN	0.00	0.00	0.00	0.00	0.00
	59	60 MAX	0.00	0.00	0.00	0.00	0.00
		60 MIN	0.00	0.00	0.00	0.00	0.00
	60	61 MAX	0.00	0.00	0.00	0.00	0.00
		61 MIN	0.00	0.00	0.00	0.00	0.00
	61	61 MAX	0.00	0.00	0.00	0.00	0.00
		61 MIN	0.00	0.00	0.00	0.00	0.00
	61	62 MAX	0.00	0.00	0.00	0.00	0.00
		62 MIN	0.00	0.00	0.00	0.00	0.00
	62	63 MAX	0.00	0.00	0.00	0.00	0.00
		63 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de cortantes por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
	63	64 MAX	0.00	0.00	0.00	0.00	0.00
		64 MIN	0.00	0.00	0.00	0.00	0.00
	64	65 MAX	0.00	0.00	0.00	0.00	0.00
		65 MIN	0.00	0.00	0.00	0.00	0.00
	65	66 MAX	0.00	0.00	0.00	0.00	0.00
		66 MIN	0.00	0.00	0.00	0.00	0.00
	66	67 MAX	0.00	0.00	0.00	0.00	0.00
		67 MIN	0.00	0.00	0.00	0.00	0.00
	67	68 MAX	0.00	0.00	0.00	0.00	0.00
		68 MIN	0.00	0.00	0.00	0.00	0.00
	68	69 MAX	0.00	0.00	0.00	0.00	0.00
		69 MIN	0.00	0.00	0.00	0.00	0.00
	69	70 MAX	0.00	0.00	0.00	0.00	0.00
		70 MIN	0.00	0.00	0.00	0.00	0.00
	70	71 MAX	0.00	0.00	0.00	0.00	0.00
		71 MIN	0.00	0.00	0.00	0.00	0.00
8	71	71 MAX	0.00	0.00	0.00	0.00	0.00
		71 MIN	0.00	0.00	0.00	0.00	0.00
	71	72 MAX	0.00	0.00	0.00	0.00	0.00
		72 MIN	0.00	0.00	0.00	0.00	0.00
	72	73 MAX	0.00	0.00	0.00	0.00	0.00
		73 MIN	0.00	0.00	0.00	0.00	0.00
	73	74 MAX	0.00	0.00	0.00	0.00	0.00
		74 MIN	0.00	0.00	0.00	0.00	0.00
	74	75 MAX	0.00	0.00	0.00	0.00	0.00
		75 MIN	0.00	0.00	0.00	0.00	0.00
	75	76 MAX	0.00	0.00	0.00	0.00	0.00
		76 MIN	0.00	0.00	0.00	0.00	0.00
	76	77 MAX	0.00	0.00	0.00	0.00	0.00
		77 MIN	0.00	0.00	0.00	0.00	0.00
	77	78 MAX	0.00	0.00	0.00	0.00	0.00
		78 MIN	0.00	0.00	0.00	0.00	0.00
	78	79 MAX	0.00	0.00	0.00	0.00	0.00
		79 MIN	0.00	0.00	0.00	0.00	0.00
	79	80 MAX	0.00	0.00	0.00	0.00	0.00
		80 MIN	0.00	0.00	0.00	0.00	0.00
	80	81 MAX	0.00	0.00	0.00	0.00	0.00
		81 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de momentos por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
1	1	1 MAX	0.00	0.00	0.00	0.00	0.00
		1 MIN	0.00	0.00	0.00	0.00	0.00
	1	2 MAX	0.00	0.00	0.00	0.00	0.00
		2 MIN	0.00	0.00	0.00	0.00	0.00
	2	3 MAX	0.00	0.00	0.00	0.00	0.00
		3 MIN	0.00	0.00	0.00	0.00	0.00
	3	4 MAX	0.00	0.00	0.00	0.00	0.00
		4 MIN	0.00	0.00	0.00	0.00	0.00
	4	5 MAX	0.00	0.00	0.00	0.00	0.00
		5 MIN	0.00	0.00	0.00	0.00	0.00
	5	6 MAX	0.00	0.00	0.00	0.00	0.00
		6 MIN	0.00	0.00	0.00	0.00	0.00
	6	7 MAX	0.00	0.00	0.00	0.00	0.00
		7 MIN	0.00	0.00	0.00	0.00	0.00
	7	8 MAX	0.00	0.00	0.00	0.00	0.00
		8 MIN	0.00	0.00	0.00	0.00	0.00
	8	9 MAX	0.00	0.00	0.00	0.00	0.00
		9 MIN	0.00	0.00	0.00	0.00	0.00
	9	10 MAX	0.00	0.00	0.00	0.00	0.00
		10 MIN	0.00	0.00	0.00	0.00	0.00
	10	11 MAX	0.00	0.00	0.00	0.00	0.00
		11 MIN	0.00	0.00	0.00	0.00	0.00
2	11	11 MAX	0.00	0.00	0.00	0.00	0.00
		11 MIN	0.00	0.00	0.00	0.00	0.00
	11	12 MAX	0.00	0.00	0.00	0.00	0.00
		12 MIN	0.00	0.00	0.00	0.00	0.00
	12	13 MAX	0.00	0.00	0.00	0.00	0.00
		13 MIN	0.00	0.00	0.00	0.00	0.00
	13	14 MAX	0.00	0.00	0.00	0.00	0.00
		14 MIN	0.00	0.00	0.00	0.00	0.00
	14	15 MAX	0.00	0.00	0.00	0.00	0.00
		15 MIN	0.00	0.00	0.00	0.00	0.00
	15	16 MAX	0.00	0.00	0.00	0.00	0.00
		16 MIN	0.00	0.00	0.00	0.00	0.00
	16	17 MAX	0.00	0.00	0.00	0.00	0.00
		17 MIN	0.00	0.00	0.00	0.00	0.00
	17	18 MAX	0.00	0.00	0.00	0.00	0.00
		18 MIN	0.00	0.00	0.00	0.00	0.00
	18	19 MAX	0.00	0.00	0.00	0.00	0.00
		19 MIN	0.00	0.00	0.00	0.00	0.00
	19	20 MAX	0.00	0.00	0.00	0.00	0.00
		20 MIN	0.00	0.00	0.00	0.00	0.00
	20	21 MAX	0.00	0.00	0.00	0.00	0.00
		21 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de momentos por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
3	21	21 MAX	0.00	0.00	0.00	0.00	0.00
		21 MIN	0.00	0.00	0.00	0.00	0.00
	21	22 MAX	0.00	0.00	0.00	0.00	0.00
		22 MIN	0.00	0.00	0.00	0.00	0.00
	22	23 MAX	0.00	0.00	0.00	0.00	0.00
		23 MIN	0.00	0.00	0.00	0.00	0.00
	23	24 MAX	0.00	0.00	0.00	0.00	0.00
		24 MIN	0.00	0.00	0.00	0.00	0.00
	24	25 MAX	0.00	0.00	0.00	0.00	0.00
		25 MIN	0.00	0.00	0.00	0.00	0.00
	25	26 MAX	0.00	0.00	0.00	0.00	0.00
		26 MIN	0.00	0.00	0.00	0.00	0.00
	26	27 MAX	0.00	0.00	0.00	0.00	0.00
		27 MIN	0.00	0.00	0.00	0.00	0.00
	27	28 MAX	0.00	0.00	0.00	0.00	0.00
		28 MIN	0.00	0.00	0.00	0.00	0.00
	28	29 MAX	0.00	0.00	0.00	0.00	0.00
		29 MIN	0.00	0.00	0.00	0.00	0.00
	29	30 MAX	0.00	0.00	0.00	0.00	0.00
		30 MIN	0.00	0.00	0.00	0.00	0.00
	30	31 MAX	0.00	0.00	0.00	0.00	0.00
		31 MIN	0.00	0.00	0.00	0.00	0.00
4	31	31 MAX	0.00	0.00	0.00	0.00	0.00
		31 MIN	0.00	0.00	0.00	0.00	0.00
	31	32 MAX	0.00	0.00	0.00	0.00	0.00
		32 MIN	0.00	0.00	0.00	0.00	0.00
	32	33 MAX	0.00	0.00	0.00	0.00	0.00
		33 MIN	0.00	0.00	0.00	0.00	0.00
	33	34 MAX	0.00	0.00	0.00	0.00	0.00
		34 MIN	0.00	0.00	0.00	0.00	0.00
	34	35 MAX	0.00	0.00	0.00	0.00	0.00
		35 MIN	0.00	0.00	0.00	0.00	0.00
	35	36 MAX	0.00	0.00	0.00	0.00	0.00
		36 MIN	0.00	0.00	0.00	0.00	0.00
	36	37 MAX	0.00	0.00	0.00	0.00	0.00
		37 MIN	0.00	0.00	0.00	0.00	0.00
	37	38 MAX	0.00	0.00	0.00	0.00	0.00
		38 MIN	0.00	0.00	0.00	0.00	0.00
	38	39 MAX	0.00	0.00	0.00	0.00	0.00
		39 MIN	0.00	0.00	0.00	0.00	0.00
	39	40 MAX	0.00	0.00	0.00	0.00	0.00
		40 MIN	0.00	0.00	0.00	0.00	0.00
	40	41 MAX	0.00	0.00	0.00	0.00	0.00
		41 MIN	0.00	0.00	0.00	0.00	0.00
5	41	41 MAX	0.00	0.00	0.00	0.00	0.00
		41 MIN	0.00	0.00	0.00	0.00	0.00
	41	42 MAX	0.00	0.00	0.00	0.00	0.00
		42 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de momentos por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
	42	43 MAX	0.00	0.00	0.00	0.00	0.00
		43 MIN	0.00	0.00	0.00	0.00	0.00
	43	44 MAX	0.00	0.00	0.00	0.00	0.00
		44 MIN	0.00	0.00	0.00	0.00	0.00
	44	45 MAX	0.00	0.00	0.00	0.00	0.00
		45 MIN	0.00	0.00	0.00	0.00	0.00
	45	46 MAX	0.00	0.00	0.00	0.00	0.00
		46 MIN	0.00	0.00	0.00	0.00	0.00
	46	47 MAX	0.00	0.00	0.00	0.00	0.00
		47 MIN	0.00	0.00	0.00	0.00	0.00
	47	48 MAX	0.00	0.00	0.00	0.00	0.00
		48 MIN	0.00	0.00	0.00	0.00	0.00
	48	49 MAX	0.00	0.00	0.00	0.00	0.00
		49 MIN	0.00	0.00	0.00	0.00	0.00
	49	50 MAX	0.00	0.00	0.00	0.00	0.00
		50 MIN	0.00	0.00	0.00	0.00	0.00
	50	51 MAX	0.00	0.00	0.00	0.00	0.00
		51 MIN	0.00	0.00	0.00	0.00	0.00
6	51	51 MAX	0.00	0.00	0.00	0.00	0.00
		51 MIN	0.00	0.00	0.00	0.00	0.00
	51	52 MAX	0.00	0.00	0.00	0.00	0.00
		52 MIN	0.00	0.00	0.00	0.00	0.00
	52	53 MAX	0.00	0.00	0.00	0.00	0.00
		53 MIN	0.00	0.00	0.00	0.00	0.00
	53	54 MAX	0.00	0.00	0.00	0.00	0.00
		54 MIN	0.00	0.00	0.00	0.00	0.00
	54	55 MAX	0.00	0.00	0.00	0.00	0.00
		55 MIN	0.00	0.00	0.00	0.00	0.00
	55	56 MAX	0.00	0.00	0.00	0.00	0.00
		56 MIN	0.00	0.00	0.00	0.00	0.00
	56	57 MAX	0.00	0.00	0.00	0.00	0.00
		57 MIN	0.00	0.00	0.00	0.00	0.00
	57	58 MAX	0.00	0.00	0.00	0.00	0.00
		58 MIN	0.00	0.00	0.00	0.00	0.00
	58	59 MAX	0.00	0.00	0.00	0.00	0.00
		59 MIN	0.00	0.00	0.00	0.00	0.00
	59	60 MAX	0.00	0.00	0.00	0.00	0.00
		60 MIN	0.00	0.00	0.00	0.00	0.00
	60	61 MAX	0.00	0.00	0.00	0.00	0.00
		61 MIN	0.00	0.00	0.00	0.00	0.00
7	61	61 MAX	0.00	0.00	0.00	0.00	0.00
		61 MIN	0.00	0.00	0.00	0.00	0.00
	61	62 MAX	0.00	0.00	0.00	0.00	0.00
		62 MIN	0.00	0.00	0.00	0.00	0.00
	62	63 MAX	0.00	0.00	0.00	0.00	0.00
		63 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de momentos por descenso lento de apoyos

Para estado final (nulos para estado inicial)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)	Ten.Sup. (kg/cm2)	Ten.Inf. (kg/cm2)
	63	64 MAX	0.00	0.00	0.00	0.00	0.00
		64 MIN	0.00	0.00	0.00	0.00	0.00
	64	65 MAX	0.00	0.00	0.00	0.00	0.00
		65 MIN	0.00	0.00	0.00	0.00	0.00
	65	66 MAX	0.00	0.00	0.00	0.00	0.00
		66 MIN	0.00	0.00	0.00	0.00	0.00
	66	67 MAX	0.00	0.00	0.00	0.00	0.00
		67 MIN	0.00	0.00	0.00	0.00	0.00
	67	68 MAX	0.00	0.00	0.00	0.00	0.00
		68 MIN	0.00	0.00	0.00	0.00	0.00
	68	69 MAX	0.00	0.00	0.00	0.00	0.00
		69 MIN	0.00	0.00	0.00	0.00	0.00
	69	70 MAX	0.00	0.00	0.00	0.00	0.00
		70 MIN	0.00	0.00	0.00	0.00	0.00
	70	71 MAX	0.00	0.00	0.00	0.00	0.00
		71 MIN	0.00	0.00	0.00	0.00	0.00
8	71	71 MAX	0.00	0.00	0.00	0.00	0.00
		71 MIN	0.00	0.00	0.00	0.00	0.00
	71	72 MAX	0.00	0.00	0.00	0.00	0.00
		72 MIN	0.00	0.00	0.00	0.00	0.00
	72	73 MAX	0.00	0.00	0.00	0.00	0.00
		73 MIN	0.00	0.00	0.00	0.00	0.00
	73	74 MAX	0.00	0.00	0.00	0.00	0.00
		74 MIN	0.00	0.00	0.00	0.00	0.00
	74	75 MAX	0.00	0.00	0.00	0.00	0.00
		75 MIN	0.00	0.00	0.00	0.00	0.00
	75	76 MAX	0.00	0.00	0.00	0.00	0.00
		76 MIN	0.00	0.00	0.00	0.00	0.00
	76	77 MAX	0.00	0.00	0.00	0.00	0.00
		77 MIN	0.00	0.00	0.00	0.00	0.00
	77	78 MAX	0.00	0.00	0.00	0.00	0.00
		78 MIN	0.00	0.00	0.00	0.00	0.00
	78	79 MAX	0.00	0.00	0.00	0.00	0.00
		79 MIN	0.00	0.00	0.00	0.00	0.00
	79	80 MAX	0.00	0.00	0.00	0.00	0.00
		80 MIN	0.00	0.00	0.00	0.00	0.00
	80	81 MAX	0.00	0.00	0.00	0.00	0.00
		81 MIN	0.00	0.00	0.00	0.00	0.00

Envolvente de cortantes por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	115.26	0.14
		1	MIN	0.00	-627.27	-0.70
	1	2	MAX	-548.32	115.49	0.14
		2	MIN	2655.80	-490.20	-0.70
	2	3	MAX	-1098.79	115.71	0.12
		3	MIN	3846.55	-391.14	-0.42
	3	4	MAX	-1651.41	115.94	0.12
		4	MIN	5385.24	-253.07	-0.34
	4	5	MAX	-2206.16	116.16	0.12
		5	MIN	6269.42	-114.46	-0.19
	5	6	MAX	3845.07	179.87	0.00
		6	MIN	797.88	-34.04	0.00
	6	7	MAX	2752.16	309.88	0.08
		7	MIN	947.88	-34.00	-0.01
	7	8	MAX	1081.43	428.28	0.08
		8	MIN	1096.97	-33.94	-0.01
	8	9	MAX	-1780.19	574.82	0.08
		9	MIN	1297.40	-33.85	-0.01
	9	10	MAX	-4852.49	694.74	0.78
		10	MIN	1458.10	-33.79	-0.04
	10	11	MAX	-8478.15	811.01	0.77
		11	MIN	1618.17	-33.72	-0.04
2	11	11	MAX	1618.17	123.81	0.13
		11	MIN	-5531.30	-845.44	-0.79
	11	12	MAX	1021.46	124.02	0.13
		12	MIN	-4441.43	-707.77	-0.78
	12	13	MAX	422.78	124.22	0.13
		13	MIN	-1307.69	-590.90	-0.66
	13	14	MAX	-323.21	124.48	0.04
		14	MIN	3118.28	-452.95	-0.16
	14	15	MAX	-1155.71	124.76	0.04
		15	MIN	3973.66	-278.71	-0.11
	15	16	MAX	4708.78	130.69	0.01
		16	MIN	5285.40	-110.62	-0.06
	16	17	MAX	3245.46	298.69	0.03
		17	MIN	-841.86	-80.74	-0.01
	17	18	MAX	707.36	461.18	0.06
		18	MIN	-302.85	-80.56	-0.01
	18	19	MAX	-2321.18	612.44	0.00
		19	MIN	180.16	-80.40	0.00
	19	20	MAX	-5557.19	729.28	0.00
		20	MIN	567.79	-80.26	0.00
	20	21	MAX	-9342.71	845.48	0.00
		21	MIN	953.34	-80.13	0.00
3	21	21	MAX	1515.92	117.60	0.00
		21	MIN	-5561.78	-854.96	0.00
	21	22	MAX	949.12	117.79	0.00
		22	MIN	-5681.72	-726.40	0.00

Envolvente de cortantes por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	380.45	117.99	0.00
		23	MIN	-2459.85	-609.56	0.00
	23	24	MAX	-328.15	118.23	0.00
		24	MIN	759.42	-463.96	0.00
	24	25	MAX	-1118.92	118.50	0.00
		25	MIN	3316.23	-301.48	0.00
	25	26	MAX	4801.99	129.21	0.00
		26	MIN	4791.82	-138.26	0.00
	26	27	MAX	3348.32	297.21	0.00
		27	MIN	-1049.06	-101.68	0.00
	27	28	MAX	819.83	459.70	0.00
		28	MIN	-370.36	-101.45	0.00
	28	29	MAX	-2198.17	610.29	0.00
		29	MIN	237.83	-101.24	0.00
	29	30	MAX	-5423.99	727.13	0.00
		30	MIN	725.92	-101.07	0.00
	30	31	MAX	-9199.37	843.34	0.00
		31	MIN	1211.40	-100.91	0.00
4	31	31	MAX	2156.86	177.17	0.00
		31	MIN	-5303.72	-849.59	0.00
	31	32	MAX	1302.74	177.46	0.00
		32	MIN	-5165.13	-727.32	0.00
	32	33	MAX	445.79	177.76	0.00
		33	MIN	-1937.94	-610.48	0.00
	33	34	MAX	-622.02	178.12	0.00
		34	MIN	1073.00	-461.74	0.00
	34	35	MAX	-1813.64	178.52	0.00
		35	MIN	3615.68	-299.25	0.00
	35	36	MAX	3939.96	185.98	0.00
		36	MIN	4829.80	-134.87	0.00
	36	37	MAX	2110.57	353.86	0.00
		37	MIN	-1115.90	-106.02	0.00
	37	38	MAX	-791.92	516.22	0.00
		38	MIN	-408.15	-105.78	0.00
	38	39	MAX	-4140.21	666.33	0.00
		39	MIN	226.07	-105.56	0.00
	39	40	MAX	-7633.23	783.07	0.00
		40	MIN	735.05	-105.39	0.00
	40	41	MAX	-11674.37	899.19	0.00
		41	MIN	1241.31	-105.22	0.00
5	41	41	MAX	2186.95	134.74	0.00
		41	MIN	-8117.33	-1000.91	0.00
	41	42	MAX	1599.46	134.90	0.00
		42	MIN	-4021.52	-874.81	0.00
	42	43	MAX	1010.51	135.07	0.00
		43	MIN	-4188.00	-757.52	0.00
	43	44	MAX	200.43	135.30	0.00
		44	MIN	-82.41	-612.09	0.00
	44	45	MAX	-1359.88	135.74	0.00
		45	MIN	6800.91	-346.64	0.00

Envolvente de cortantes por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	6481.54	137.80	0.00
		46	MIN	7342.19	-117.76	0.00
	46	47	MAX	4324.06	352.05	0.00
		47	MIN	-955.45	-86.58	0.00
	47	48	MAX	-1341.74	632.02	0.00
		48	MIN	40.14	-86.31	0.00
	48	49	MAX	-5564.57	777.41	0.00
		49	MIN	557.03	-86.16	0.00
	49	50	MAX	-9187.93	883.09	0.00
		50	MIN	932.83	-86.05	0.00
	50	51	MAX	-13258.42	988.25	0.00
		51	MIN	1306.83	-85.95	0.00
6	51	51	MAX	1932.62	126.48	0.00
		51	MIN	-13386.51	-998.56	0.00
	51	52	MAX	1380.98	126.64	0.00
		52	MIN	-9262.23	-893.16	0.00
	52	53	MAX	827.98	126.79	0.00
		53	MIN	-5594.81	-787.50	0.00
	53	54	MAX	67.34	127.01	0.00
		54	MIN	-1311.39	-642.13	0.00
	54	55	MAX	-1397.74	127.42	0.00
		55	MIN	4471.12	-362.18	0.00
	55	56	MAX	6767.33	140.68	0.00
		56	MIN	6717.88	-147.96	0.00
	56	57	MAX	4584.00	354.92	0.00
		57	MIN	-1435.59	-131.00	0.00
	57	58	MAX	-1115.57	634.88	0.00
		58	MIN	70.65	-130.57	0.00
	58	59	MAX	-5355.92	780.27	0.00
		59	MIN	852.65	-130.35	0.00
	59	60	MAX	-8992.04	885.94	0.00
		60	MIN	1421.18	-130.19	0.00
	60	61	MAX	-13075.21	991.10	0.00
		61	MIN	1987.02	-130.03	0.00
7	61	61	MAX	1120.64	73.70	0.00
		61	MIN	-13324.59	-991.19	0.00
	61	62	MAX	799.18	73.79	0.00
		62	MIN	-9232.52	-885.78	0.00
	62	63	MAX	476.93	73.88	0.00
		63	MIN	-5597.39	-780.11	0.00
	63	64	MAX	33.68	74.01	0.00
		64	MIN	-1358.38	-634.73	0.00
	64	65	MAX	-820.07	74.25	0.00
		65	MIN	4338.58	-354.76	0.00
	65	66	MAX	7256.05	106.96	0.00
		66	MIN	6519.89	-140.52	0.00
	66	67	MAX	6762.17	345.14	0.00
		67	MIN	-1366.10	-136.63	0.00
	67	68	MAX	49.43	601.35	0.00
		68	MIN	204.49	-136.19	0.00

Envolvente de cortantes por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	-510.45	748.29	0.00
		69	MIN	1019.91	-135.96	0.00
	69	70	MAX	-4058.09	874.70	0.00
		70	MIN	1612.74	-135.79	0.00
	70	71	MAX	-8143.39	1000.51	0.00
		71	MIN	2202.75	-135.62	0.00
8	71	71	MAX	2202.75	44.06	0.00
		71	MIN	-11271.11	-880.26	0.00
	71	72	MAX	2013.45	44.14	0.00
		72	MIN	-7666.22	-775.10	0.00
	72	73	MAX	1823.49	44.22	0.00
		73	MIN	-4516.34	-669.57	0.00
	73	74	MAX	1569.18	44.32	0.00
		74	MIN	-1191.27	-527.58	0.00
	74	75	MAX	1313.68	44.42	0.00
		75	MIN	1470.23	-383.62	0.00
	75	76	MAX	1055.96	44.48	0.00
		76	MIN	3213.54	-212.96	0.00
	76	77	MAX	6468.06	182.17	0.00
		77	MIN	-2937.91	-164.06	0.00
	77	78	MAX	4896.17	352.13	0.00
		78	MIN	-1976.43	-163.68	0.00
	78	79	MAX	3530.51	474.65	0.00
		79	MIN	-1019.34	-163.30	0.00
	79	80	MAX	1904.83	564.91	0.00
		80	MIN	-509.04	-163.10	0.00
	80	81	MAX	0.00	654.94	0.00
		81	MIN	0.00	-162.90	0.00

Envolvente de momentos por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	-627.27	-0.70
		1	MIN	0.00	115.26	0.14
	1	2	MAX	2655.80	-490.20	-0.70
		2	MIN	-548.32	115.49	0.14
	2	3	MAX	4664.07	-352.60	-0.44
		3	MIN	-1098.79	115.71	0.12
	3	4	MAX	6020.98	-214.45	-0.29
		4	MIN	-1651.41	115.94	0.12
	4	5	MAX	6722.67	-75.76	-0.15
		5	MIN	-2206.16	116.16	0.12
	5	6	MAX	6782.37	54.53	0.00
		6	MIN	-2727.34	116.37	0.00
	6	7	MAX	6241.69	184.72	0.03
		7	MIN	-3240.10	116.22	0.03
	7	8	MAX	5184.61	275.76	0.05
		8	MIN	-3749.73	116.00	0.03
	8	9	MAX	2996.03	450.20	0.06
		9	MIN	-4434.82	115.72	0.02
	9	10	MAX	1458.10	-33.79	-0.04
		10	MIN	-4984.17	115.49	0.14
	10	11	MAX	1618.17	-33.72	-0.04
		11	MIN	-8579.09	806.89	0.77
2	11	11	MAX	1618.17	123.81	0.13
		11	MIN	-8579.09	-814.53	-0.77
	11	12	MAX	1021.46	124.02	0.13
		12	MIN	-4934.88	-698.03	-0.77
	12	13	MAX	1737.12	-434.05	-0.51
		13	MIN	-2928.68	-80.40	-0.08
	13	14	MAX	4168.40	-392.12	-0.16
		14	MIN	-2451.29	-80.56	-0.03
	14	15	MAX	6147.05	-197.73	-0.09
		15	MIN	-2410.67	16.24	0.00
	15	16	MAX	6829.67	-2.44	-0.03
		16	MIN	-2577.63	32.19	0.01
	16	17	MAX	6346.45	131.88	0.00
		17	MIN	-2838.83	47.99	0.01
	17	18	MAX	4805.34	326.43	0.03
		18	MIN	-3642.72	124.48	0.02
	18	19	MAX	2363.55	363.26	0.00
		19	MIN	-4380.63	124.22	0.00
	19	20	MAX	1355.39	-33.80	0.00
		20	MIN	-5703.52	723.62	0.00
	20	21	MAX	1515.92	-33.75	0.00
		21	MIN	-9461.56	839.84	0.00
3	21	21	MAX	1515.92	117.60	0.00
		21	MIN	-9461.56	-842.85	0.00
	21	22	MAX	949.12	117.79	0.00
		22	MIN	-5681.72	-726.40	0.00

Envolvente de momentos por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	1869.23	-362.19	0.00
		23	MIN	-3676.89	-101.24	0.00
	23	24	MAX	4287.64	-401.69	0.00
		24	MIN	-3075.72	-101.45	0.00
	24	25	MAX	6330.46	-207.30	2.38
		25	MIN	-2800.51	-7.72	0.12
	25	26	MAX	7077.52	-12.05	0.00
		26	MIN	-2808.30	8.18	0.00
	26	27	MAX	6650.89	121.61	0.00
		27	MIN	-2909.29	24.04	0.00
	27	28	MAX	5177.38	316.18	0.00
		28	MIN	-3481.08	118.23	0.00
	28	29	MAX	2851.28	334.85	0.00
		29	MIN	-4181.92	117.99	0.00
	29	30	MAX	1929.38	-47.90	0.00
		30	MIN	-5575.53	722.15	0.00
	30	31	MAX	2156.86	-47.83	0.00
		31	MIN	-9326.70	838.37	0.00
4	31	31	MAX	2156.86	177.17	0.00
		31	MIN	-9326.70	-839.50	0.00
	31	32	MAX	1302.74	177.46	0.00
		32	MIN	-5562.88	-723.04	0.00
	32	33	MAX	2261.09	-299.98	0.00
		33	MIN	-3855.91	-105.57	0.00
	33	34	MAX	4571.84	-348.46	0.00
		34	MIN	-3235.48	31.42	0.00
	34	35	MAX	6469.57	-201.90	0.00
		35	MIN	-3505.68	47.37	0.00
	35	36	MAX	7180.79	-6.63	0.00
		36	MIN	-3883.14	63.39	0.00
	36	37	MAX	6718.09	126.66	0.00
		37	MIN	-4348.96	79.12	0.00
	37	38	MAX	5210.88	321.22	0.00
		38	MIN	-5372.09	178.12	0.00
	38	39	MAX	2823.91	338.18	-6.19
		39	MIN	-6427.68	177.71	-4.15
	39	40	MAX	1959.96	-47.81	0.00
		40	MIN	-7791.68	778.50	0.00
	40	41	MAX	2186.95	-47.73	0.00
		41	MIN	-11810.53	894.63	0.00
5	41	41	MAX	2186.95	134.74	0.00
		41	MIN	-11810.54	-963.70	0.00
	41	42	MAX	1599.46	134.90	0.00
		42	MIN	-7836.99	-858.26	0.00
	42	43	MAX	1085.12	-510.42	0.00
		43	MIN	-4320.69	-752.56	0.00
	43	44	MAX	3833.72	-507.43	-13.55
		44	MIN	-3455.23	-86.28	-2.01
	44	45	MAX	8200.87	-239.54	0.00
		45	MIN	-2838.04	21.45	0.00

Envolvente de momentos por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	9201.55	-7.12	0.00
		46	MIN	-3159.44	50.53	0.00
	46	47	MAX	8382.78	165.85	0.00
		47	MIN	-3735.26	135.74	0.00
	47	48	MAX	4490.28	476.07	0.00
		48	MIN	-5279.12	135.30	0.00
	48	49	MAX	1622.42	-36.03	0.84
		49	MIN	-6080.61	135.03	-3.16
	49	50	MAX	1777.89	-35.99	0.00
		50	MIN	-9344.89	876.51	0.00
	50	51	MAX	1932.62	-35.95	0.00
		51	MIN	-13386.51	981.68	0.00
6	51	51	MAX	1932.62	126.48	0.00
		51	MIN	-13386.51	-998.56	0.00
	51	52	MAX	1380.98	126.64	0.00
		52	MIN	-9262.23	-893.16	0.00
	52	53	MAX	1280.19	-508.25	0.00
		53	MIN	-5990.91	-130.35	0.00
	53	54	MAX	4135.92	-499.18	-13.36
		54	MIN	-5217.61	-130.54	-3.05
	54	55	MAX	8391.93	-213.28	0.00
		55	MIN	-4022.75	-17.94	0.00
	55	56	MAX	9286.56	-17.63	0.00
		56	MIN	-3966.65	2.90	0.00
	56	57	MAX	8377.92	214.90	0.00
		57	MIN	-4073.41	23.73	0.00
	57	58	MAX	4027.37	420.17	-11.85
		58	MIN	-5076.39	127.01	0.00
	58	59	MAX	1118.00	512.02	-10.26
		59	MIN	-5828.56	126.76	-2.96
	59	60	MAX	1421.18	-130.19	0.00
		60	MIN	-9273.42	878.68	0.00
	60	61	MAX	1987.02	-130.03	0.00
		61	MIN	-13324.59	983.85	0.00
7	61	61	MAX	1987.02	36.97	0.00
		61	MIN	-13324.59	-991.19	0.00
	61	62	MAX	1827.54	37.01	0.00
		62	MIN	-9232.52	-885.78	0.00
	62	63	MAX	1667.66	37.06	0.00
		63	MIN	-6117.99	-135.96	0.00
	63	64	MAX	4626.16	-477.47	-12.85
		64	MIN	-5311.21	-136.15	-3.18
	64	65	MAX	8384.29	-207.63	0.00
		65	MIN	-3757.16	-136.63	0.00
	65	66	MAX	9285.03	6.97	0.00
		66	MIN	-2988.83	-51.09	0.00
	66	67	MAX	8161.67	239.44	0.00
		67	MIN	-2626.72	-30.13	0.00
	67	68	MAX	3680.63	427.57	-12.02
		68	MIN	-2963.68	74.01	0.00

Envolvente de momentos por paso de ferrocarril (RENFE)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	1019.91	-135.92	3.18
		69	MIN	-3992.04	746.60	-15.74
	69	70	MAX	1612.74	-135.79	0.00
		70	MIN	-7483.56	852.51	0.00
	70	71	MAX	2202.75	-135.62	0.00
		71	MIN	-11422.83	957.71	0.00
8	71	71	MAX	2202.75	44.06	0.00
		71	MIN	-11422.83	-879.58	0.00
	71	72	MAX	2013.45	44.14	0.00
		72	MIN	-7821.15	-774.42	0.00
	72	73	MAX	2757.39	-493.19	0.00
		73	MIN	-6741.30	-163.46	0.00
	73	74	MAX	5166.65	-329.58	-9.88
		74	MIN	-5801.13	-163.79	-3.92
	74	75	MAX	6710.38	-206.43	0.00
		75	MIN	-4856.58	-164.22	0.00
	75	76	MAX	7425.65	-35.54	0.00
		76	MIN	-3903.79	-164.43	0.00
	76	77	MAX	7117.45	135.31	0.00
		77	MIN	-2937.91	-164.06	0.00
	77	78	MAX	5816.78	305.37	0.00
		78	MIN	-1976.43	-163.68	0.00
	78	79	MAX	3530.51	474.65	0.00
		79	MIN	-1019.34	-163.30	0.00
	79	80	MAX	1904.83	564.91	0.00
		80	MIN	-509.04	-163.10	0.00
	80	81	MAX	0.00	654.94	0.00
		81	MIN	0.00	-162.90	0.00

Envolvente de cortantes por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	75.11	0.09
		1	MIN	0.00	-383.91	-0.43
	1	2	MAX	-357.30	75.25	0.09
		2	MIN	1643.89	-307.79	-0.43
	2	3	MAX	-716.01	75.40	0.08
		3	MIN	2928.48	-231.36	-0.20
	3	4	MAX	-1076.11	75.55	0.08
		4	MIN	3851.62	-154.64	-0.20
	4	5	MAX	-1437.61	75.69	0.08
		5	MIN	4411.19	-77.61	-0.12
	5	6	MAX	3019.36	119.14	0.00
		6	MIN	503.21	-21.47	0.00
	6	7	MAX	2249.98	231.98	0.04
		7	MIN	597.82	-21.44	0.00
	7	8	MAX	1056.24	303.84	0.06
		8	MIN	691.85	-21.40	0.00
	8	9	MAX	-1056.95	400.44	0.06
		9	MIN	818.26	-21.35	0.00
	9	10	MAX	-3175.43	477.90	0.54
		10	MIN	919.62	-21.31	-0.03
	10	11	MAX	-5662.93	555.05	0.53
		11	MIN	1020.57	-21.27	-0.02
2	11	11	MAX	1020.57	78.09	0.08
		11	MIN	-5748.48	-571.84	-0.55
	11	12	MAX	644.23	78.22	0.08
		12	MIN	-3178.73	-494.56	-0.55
	12	13	MAX	266.64	78.35	0.08
		13	MIN	-979.18	-417.01	-0.47
	13	14	MAX	-203.85	78.51	0.03
		14	MIN	1233.59	-320.39	-0.12
	14	15	MAX	-728.90	78.68	0.02
		15	MIN	3015.35	-212.55	-0.04
	15	16	MAX	-1256.31	78.86	0.02
		16	MIN	2949.45	-62.27	-0.03
	16	17	MAX	2692.94	218.70	0.02
		17	MIN	-581.16	-55.74	-0.01
	17	18	MAX	871.03	326.52	0.04
		18	MIN	-209.07	-55.61	-0.01
	18	19	MAX	-1377.68	423.13	0.00
		19	MIN	124.37	-55.50	0.00
	19	20	MAX	-3606.09	500.66	0.00
		20	MIN	391.96	-55.41	0.00
	20	21	MAX	-6198.84	577.78	0.00
		21	MIN	658.12	-55.32	0.00
3	21	21	MAX	969.30	75.20	0.00
		21	MIN	-6248.38	-581.97	0.00
	21	22	MAX	606.88	75.32	0.00
		22	MIN	-3630.43	-504.70	0.00

Envolvente de cortantes por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	243.26	75.44	0.00
		23	MIN	-1382.54	-427.17	0.00
	23	24	MAX	-209.83	75.60	0.00
		24	MIN	890.48	-330.57	0.00
	24	25	MAX	-715.46	75.77	0.00
		25	MIN	2739.47	-222.75	0.00
	25	26	MAX	-1223.36	75.94	0.00
		26	MIN	2732.12	-73.44	0.00
	26	27	MAX	2727.56	219.23	0.00
		27	MIN	-716.82	-69.47	0.00
	27	28	MAX	902.02	327.05	0.00
		28	MIN	-253.06	-69.32	0.00
	28	29	MAX	-1349.95	423.66	0.00
		29	MIN	162.51	-69.18	0.00
	29	30	MAX	-3580.97	501.20	0.00
		30	MIN	496.02	-69.06	0.00
	30	31	MAX	-6176.32	578.31	0.00
		31	MIN	827.74	-68.95	0.00
4	31	31	MAX	1415.95	116.31	0.00
		31	MIN	-6196.18	-583.37	0.00
	31	32	MAX	855.23	116.50	0.00
		32	MIN	-3571.36	-506.10	0.00
	32	33	MAX	292.65	116.69	0.00
		33	MIN	-1316.57	-428.58	0.00
	33	34	MAX	-408.35	116.93	0.00
		34	MIN	965.03	-331.98	0.00
	34	35	MAX	-1190.63	117.20	0.00
		35	MIN	2823.61	-224.17	0.00
	35	36	MAX	-1976.44	117.46	0.00
		36	MIN	2803.33	-75.11	0.00
	36	37	MAX	1911.84	257.10	0.00
		37	MIN	-745.17	-70.80	0.00
	37	38	MAX	-163.73	364.83	0.00
		38	MIN	-272.55	-70.64	0.00
	38	39	MAX	-2639.83	461.39	0.00
		39	MIN	150.96	-70.49	0.00
	39	40	MAX	-5050.77	538.86	0.00
		40	MIN	490.85	-70.38	0.00
	40	41	MAX	-7825.08	615.92	0.00
		41	MIN	828.91	-70.26	0.00
5	41	41	MAX	1475.38	90.90	0.00
		41	MIN	-8016.76	-672.41	0.00
	41	42	MAX	1079.04	91.01	0.00
		42	MIN	-5236.12	-602.45	0.00
	42	43	MAX	681.72	91.12	0.00
		43	MIN	-2758.65	-532.32	0.00
	43	44	MAX	135.22	91.28	0.00
		44	MIN	143.84	-435.83	0.00
	44	45	MAX	-917.41	91.57	0.00
		45	MIN	4096.09	-250.02	0.00

Envolvente de cortantes por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	-1722.88	91.80	0.00
		46	MIN	4365.48	-64.91	0.00
	46	47	MAX	3426.44	264.58	0.00
		47	MIN	-631.72	-57.25	0.00
	47	48	MAX	-690.50	450.34	0.00
		48	MIN	26.54	-57.06	0.00
	48	49	MAX	-3678.48	546.80	0.00
		49	MIN	368.30	-56.97	0.00
	49	50	MAX	-6218.10	616.92	0.00
		50	MIN	616.76	-56.90	0.00
	50	51	MAX	-9053.91	686.69	0.00
		51	MIN	864.04	-56.83	0.00
6	51	51	MAX	1321.56	86.49	0.00
		51	MIN	-9071.65	-691.32	0.00
	51	52	MAX	944.34	86.60	0.00
		52	MIN	-6209.44	-621.39	0.00
	52	53	MAX	566.19	86.70	0.00
		53	MIN	-3650.20	-551.28	0.00
	53	54	MAX	46.05	86.85	0.00
		54	MIN	-635.24	-454.83	0.00
	54	55	MAX	-955.80	87.13	0.00
		55	MIN	3533.65	-269.08	0.00
	55	56	MAX	3907.32	87.43	0.00
		56	MIN	-1722.04	-87.37	0.00
	56	57	MAX	3531.46	269.24	0.00
		57	MIN	-955.17	-87.16	0.00
	57	58	MAX	-639.19	454.98	0.00
		58	MIN	47.01	-86.88	0.00
	58	59	MAX	-3655.06	551.44	0.00
		59	MIN	567.31	-86.73	0.00
	59	60	MAX	-6214.96	621.54	0.00
		60	MIN	945.59	-86.62	0.00
	60	61	MAX	-9070.94	691.32	0.00
		61	MIN	1322.07	-86.52	0.00
7	61	61	MAX	773.97	50.90	0.00
		61	MIN	-9052.96	-686.63	0.00
	61	62	MAX	551.96	50.97	0.00
		62	MIN	-6211.29	-616.69	0.00
	62	63	MAX	329.39	51.03	0.00
		63	MIN	-3672.66	-546.58	0.00
	63	64	MAX	23.26	51.11	0.00
		64	MIN	-686.03	-450.11	0.00
	64	65	MAX	-566.38	51.28	0.00
		65	MIN	3428.30	-264.35	0.00
	65	66	MAX	4481.73	59.17	0.00
		66	MIN	-1721.57	-91.82	0.00
	66	67	MAX	4264.69	244.19	0.00
		67	MIN	-915.85	-91.60	0.00
	67	68	MAX	378.71	430.02	0.00
		68	MIN	137.10	-91.30	0.00

Envolvente de cortantes por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	-2489.37	526.52	0.00
		69	MIN	683.76	-91.15	0.00
	69	70	MAX	-4941.82	596.66	0.00
		70	MIN	1081.20	-91.04	0.00
	70	71	MAX	-7690.87	666.46	0.00
		71	MIN	1476.76	-90.92	0.00
8	71	71	MAX	1476.76	29.54	0.00
		71	MIN	-7504.87	-603.36	0.00
	71	72	MAX	1349.85	29.59	0.00
		72	MIN	-5028.54	-533.58	0.00
	72	73	MAX	1222.49	29.64	0.00
		73	MIN	-2853.99	-463.56	0.00
	73	74	MAX	1052.00	29.71	0.00
		74	MIN	-426.99	-369.79	0.00
	74	75	MAX	880.71	29.78	0.00
		75	MIN	1456.83	-275.62	0.00
	75	76	MAX	707.93	29.82	0.00
		76	MIN	1395.93	-134.83	0.00
	76	77	MAX	4558.04	108.80	0.00
		77	MIN	-1924.29	-107.45	0.00
	77	78	MAX	3638.16	203.26	0.00
		78	MIN	-1294.53	-107.21	0.00
	78	79	MAX	2171.29	297.29	0.00
		79	MIN	-667.65	-106.96	0.00
	79	80	MAX	1163.11	347.42	0.00
		80	MIN	-333.41	-106.83	0.00
	80	81	MAX	0.00	397.43	0.00
		81	MIN	0.00	-106.70	0.00

Envolvente de momentos por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	-383.91	-0.43
		1	MIN	0.00	75.11	0.09
	1	2	MAX	1643.89	-307.79	-0.43
		2	MIN	-357.30	75.25	0.09
	2	3	MAX	2928.48	-231.36	-0.28
		3	MIN	-716.01	75.40	0.08
	3	4	MAX	3851.62	-154.64	-0.20
		4	MIN	-1076.11	75.55	0.08
	4	5	MAX	4411.19	-77.61	-0.12
		5	MIN	-1437.61	75.69	0.08
	5	6	MAX	4554.35	53.65	0.00
		6	MIN	-1777.22	75.83	0.00
	6	7	MAX	4073.56	166.57	0.02
		7	MIN	-2111.35	75.73	0.02
	7	8	MAX	3166.64	238.55	0.05
		8	MIN	-2443.45	75.59	0.02
	8	9	MAX	1439.04	335.31	0.05
		9	MIN	-2889.87	75.41	0.01
	9	10	MAX	919.62	-21.31	-0.03
		10	MIN	-3491.20	430.30	0.48
	10	11	MAX	1020.57	-21.27	-0.02
		11	MIN	-5748.48	507.54	0.48
2	11	11	MAX	1020.57	78.09	0.08
		11	MIN	-5748.48	-571.84	-0.55
	11	12	MAX	644.23	78.22	0.08
		12	MIN	-3294.14	-452.95	-0.50
	12	13	MAX	992.19	-241.49	-0.29
		13	MIN	-2021.77	-55.50	-0.06
	13	14	MAX	2656.53	-273.62	-0.11
		14	MIN	-1692.21	-55.62	-0.02
	14	15	MAX	4129.03	-165.68	-0.06
		15	MIN	-1324.41	-55.74	-0.02
	15	16	MAX	4802.84	-7.55	-0.03
		16	MIN	-1256.31	78.86	0.02
	16	17	MAX	4227.94	150.77	0.03
		17	MIN	-1778.06	78.68	0.01
	17	18	MAX	2854.43	258.74	0.03
		18	MIN	-2297.44	78.51	0.01
	18	19	MAX	1112.06	308.82	0.00
		19	MIN	-2762.83	78.35	0.00
	19	20	MAX	866.66	-21.61	0.00
		20	MIN	-3837.14	463.05	0.00
	20	21	MAX	969.30	-21.58	0.00
		21	MIN	-6248.38	540.22	0.00
3	21	21	MAX	969.30	75.20	0.00
		21	MIN	-6248.38	-581.97	0.00
	21	22	MAX	606.88	75.32	0.00
		22	MIN	-3777.40	-464.02	0.00

Envolvente de momentos por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	1029.00	-241.81	0.00
		23	MIN	-2512.38	-69.18	0.00
	23	24	MAX	2707.08	-270.65	0.00
		24	MIN	-2101.61	-69.32	0.00
	24	25	MAX	4159.82	-162.69	1.70
		25	MIN	-1643.18	-69.47	0.54
	25	26	MAX	4813.77	-4.57	0.00
		26	MIN	-1223.36	75.94	0.00
	26	27	MAX	4218.97	153.75	0.00
		27	MIN	-1725.75	75.77	0.00
	27	28	MAX	2825.64	261.72	0.00
		28	MIN	-2225.86	75.60	0.00
	28	29	MAX	1116.46	-31.50	0.00
		29	MIN	-2673.99	75.44	0.00
	29	30	MAX	1266.61	-31.45	0.00
		30	MIN	-3786.40	462.73	0.00
	30	31	MAX	1415.95	-31.40	0.00
		31	MIN	-6196.18	539.90	0.00
4	31	31	MAX	1415.95	116.31	0.00
		31	MIN	-6196.18	-583.37	0.00
	31	32	MAX	855.23	116.50	0.00
		32	MIN	-3746.83	-465.68	0.00
	32	33	MAX	1179.50	-200.90	0.00
		33	MIN	-2574.86	-70.49	0.00
	33	34	MAX	2828.56	-270.93	0.00
		34	MIN	-2156.30	-70.64	0.00
	34	35	MAX	4283.45	-162.98	0.00
		35	MIN	-1689.18	-70.80	0.00
	35	36	MAX	4939.57	-4.85	0.00
		36	MIN	-1976.44	117.46	0.00
	36	37	MAX	4346.37	153.47	0.00
		37	MIN	-2753.34	117.20	0.00
	37	38	MAX	2954.63	261.43	0.00
		38	MIN	-3526.71	116.93	0.00
	38	39	MAX	1221.73	297.22	-5.80
		39	MIN	-4219.68	116.66	-2.72
	39	40	MAX	1322.24	-32.26	0.00
		40	MIN	-5412.89	503.59	0.00
	40	41	MAX	1475.38	-32.20	0.00
		41	MIN	-8016.76	580.70	0.00
5	41	41	MAX	1475.38	90.90	0.00
		41	MIN	-8016.76	-672.41	0.00
	41	42	MAX	1079.04	91.01	0.00
		42	MIN	-5236.12	-602.45	0.00
	42	43	MAX	698.24	15.17	0.00
		43	MIN	-2939.37	-489.71	0.00
	43	44	MAX	2235.78	-305.76	-8.27
		44	MIN	-2284.51	-57.05	-1.33
	44	45	MAX	5506.46	-200.60	0.00
		45	MIN	-1633.56	-57.25	0.00

Envolvente de momentos por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	6574.87	-8.60	0.00
		46	MIN	-1722.88	91.80	0.00
	46	47	MAX	5654.57	183.61	0.00
		47	MIN	-2519.91	91.57	0.00
	47	48	MAX	2481.48	320.37	0.00
		48	MIN	-3561.43	91.28	0.00
	48	49	MAX	1109.44	-24.64	0.58
		49	MIN	-4102.14	91.10	-2.13
	49	50	MAX	1215.76	-24.61	0.00
		50	MIN	-6400.97	579.09	0.00
	50	51	MAX	1321.56	-24.58	0.00
		51	MIN	-9071.65	648.92	0.00
6	51	51	MAX	1321.56	86.49	0.00
		51	MIN	-9071.65	-691.32	0.00
	51	52	MAX	944.34	86.60	0.00
		52	MIN	-6363.69	-582.08	0.00
	52	53	MAX	727.65	15.83	0.00
		53	MIN	-3986.07	-86.73	0.00
	53	54	MAX	2475.06	-301.12	-8.16
		54	MIN	-3471.55	-86.85	-2.03
	54	55	MAX	5726.91	-192.01	0.00
		55	MIN	-2480.47	-87.16	0.00
	55	56	MAX	6720.58	0.01	0.00
		56	MIN	-1722.42	87.35	0.00
	56	57	MAX	5724.82	192.19	0.00
		57	MIN	-2480.59	87.13	0.00
	57	58	MAX	2471.77	301.37	0.00
		58	MIN	-3471.34	86.85	0.00
	58	59	MAX	651.93	-14.18	0.33
		59	MIN	-3985.69	86.68	-2.03
	59	60	MAX	945.59	-86.62	0.00
		60	MIN	-6368.60	582.22	0.00
	60	61	MAX	1322.07	-86.52	0.00
		61	MIN	-9070.94	691.32	0.00
7	61	61	MAX	1322.07	24.60	0.00
		61	MIN	-9070.94	-648.86	0.00
	61	62	MAX	1215.96	24.63	0.00
		62	MIN	-6394.72	-578.88	0.00
	62	63	MAX	1109.58	24.66	0.00
		63	MIN	-4101.60	-91.15	0.00
	63	64	MAX	2482.06	-326.07	-8.74
		64	MIN	-3560.72	-91.28	-2.13
	64	65	MAX	5655.50	-183.36	0.00
		65	MIN	-2518.86	-91.60	0.00
	65	66	MAX	6573.06	8.69	0.00
		66	MIN	-1721.57	-91.82	0.00
	66	67	MAX	5501.92	200.85	0.00
		67	MIN	-1463.78	51.28	0.00
	67	68	MAX	2230.01	306.08	0.00
		68	MIN	-2046.86	51.11	0.00

Envolvente de momentos por paso de ferrocarril (UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	683.76	-91.12	2.13
		69	MIN	-2674.46	483.89	-10.17
	69	70	MAX	1081.20	-91.04	0.00
		70	MIN	-4941.82	596.66	0.00
	70	71	MAX	1476.76	-90.92	0.00
		71	MIN	-7690.87	666.46	0.00
8	71	71	MAX	1476.76	29.54	0.00
		71	MIN	-7690.87	-557.79	0.00
	71	72	MAX	1349.85	29.59	0.00
		72	MIN	-5414.56	-487.93	0.00
	72	73	MAX	1222.49	29.64	0.00
		73	MIN	-4415.45	-107.07	0.00
	73	74	MAX	2932.71	-274.90	0.00
		74	MIN	-3799.66	-107.28	-2.57
	74	75	MAX	4269.50	-180.51	0.00
		75	MIN	-3180.99	-107.56	0.00
	75	76	MAX	4899.56	-5.33	0.00
		76	MIN	-2556.92	-107.70	0.00
	76	77	MAX	4558.04	108.80	0.00
		77	MIN	-1924.29	-107.45	0.00
	77	78	MAX	3638.16	203.26	0.00
		78	MIN	-1294.53	-107.21	0.00
	78	79	MAX	2171.29	297.29	0.00
		79	MIN	-667.65	-106.96	0.00
	79	80	MAX	1163.11	347.42	0.00
		80	MIN	-333.41	-106.83	0.00
80		81	MAX	0.00	397.43	0.00
		81	MIN	0.00	-106.70	0.00

Envolvente de cortantes por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	115.26	0.14
		1	MIN	0.00	-627.27	-0.70
	1	2	MAX	-548.32	115.49	0.14
		2	MIN	2655.80	-490.20	-0.70
	2	3	MAX	-1098.79	115.71	0.12
		3	MIN	3846.55	-391.14	-0.42
	3	4	MAX	-1651.41	115.94	0.12
		4	MIN	5385.24	-253.07	-0.34
	4	5	MAX	-2206.16	116.16	0.12
		5	MIN	6269.42	-114.46	-0.19
	5	6	MAX	3845.07	179.87	0.00
		6	MIN	797.88	-34.04	0.00
	6	7	MAX	2752.16	309.88	0.08
		7	MIN	947.88	-34.00	-0.01
	7	8	MAX	1081.43	428.28	0.08
		8	MIN	1096.97	-33.94	-0.01
	8	9	MAX	-1780.19	574.82	0.08
		9	MIN	1297.40	-33.85	-0.01
	9	10	MAX	-4852.49	694.74	0.78
		10	MIN	1458.10	-33.79	-0.04
	10	11	MAX	-2816.82	811.01	0.77
		11	MIN	-1768.34	-33.72	-0.04
2	11	11	MAX	-2816.82	123.81	0.13
		11	MIN	-1768.34	-845.44	-0.79
	11	12	MAX	1021.46	124.02	0.13
		12	MIN	-4441.43	-707.77	-0.78
	12	13	MAX	422.78	124.22	0.13
		13	MIN	-1307.69	-590.90	-0.66
	13	14	MAX	-323.21	124.48	0.04
		14	MIN	3118.28	-452.95	-0.16
	14	15	MAX	-1155.71	124.76	0.04
		15	MIN	3973.66	-278.71	-0.11
	15	16	MAX	4708.78	130.69	0.01
		16	MIN	5285.40	-110.62	-0.06
	16	17	MAX	3245.46	298.69	0.03
		17	MIN	-841.86	-80.74	-0.01
	17	18	MAX	707.36	461.18	0.06
		18	MIN	-302.85	-80.56	-0.01
	18	19	MAX	-2321.18	612.44	0.00
		19	MIN	180.16	-80.40	0.00
	19	20	MAX	-5557.19	729.28	0.00
		20	MIN	567.79	-80.26	0.00
	20	21	MAX	-3281.25	845.48	0.00
		21	MIN	-2403.41	-80.13	0.00
3	21	21	MAX	-3281.25	117.60	0.00
		21	MIN	-2403.41	-854.96	0.00
	21	22	MAX	949.12	117.79	0.00
		22	MIN	-5681.72	-726.40	0.00

Envolvente de cortantes por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	380.45	117.99	0.00
		23	MIN	-2459.85	-609.56	0.00
	23	24	MAX	-328.15	118.23	0.00
		24	MIN	759.42	-463.96	0.00
	24	25	MAX	-1118.92	118.50	0.00
		25	MIN	3316.23	-301.48	0.00
	25	26	MAX	4801.99	129.21	0.00
		26	MIN	4791.82	-138.26	0.00
	26	27	MAX	3348.32	297.21	0.00
		27	MIN	-1049.06	-101.68	0.00
	27	28	MAX	819.83	459.70	0.00
		28	MIN	-370.36	-101.45	0.00
	28	29	MAX	-2198.17	610.29	0.00
		29	MIN	237.83	-101.24	0.00
	29	30	MAX	-5423.99	727.13	0.00
		30	MIN	725.92	-101.07	0.00
	30	31	MAX	-2961.03	843.34	0.00
		31	MIN	-2112.70	-100.91	0.00
4	31	31	MAX	-2961.03	177.17	0.00
		31	MIN	-2112.70	-849.59	0.00
	31	32	MAX	1302.74	177.46	0.00
		32	MIN	-5165.13	-727.32	0.00
	32	33	MAX	445.79	177.76	0.00
		33	MIN	-1937.94	-610.48	0.00
	33	34	MAX	-622.02	178.12	0.00
		34	MIN	1073.00	-461.74	0.00
	34	35	MAX	-1813.64	178.52	0.00
		35	MIN	3615.68	-299.25	0.00
	35	36	MAX	3939.96	185.98	0.00
		36	MIN	4829.80	-134.87	0.00
	36	37	MAX	2110.57	353.86	0.00
		37	MIN	-1115.90	-106.02	0.00
	37	38	MAX	-791.92	516.22	0.00
		38	MIN	-408.15	-105.78	0.00
	38	39	MAX	-4140.21	666.33	0.00
		39	MIN	226.07	-105.56	0.00
	39	40	MAX	-7633.23	783.07	0.00
		40	MIN	735.05	-105.39	0.00
	40	41	MAX	-4093.32	899.19	0.00
		41	MIN	-2669.65	-105.22	0.00
5	41	41	MAX	-4093.32	134.74	0.00
		41	MIN	-2669.65	-1000.91	0.00
	41	42	MAX	1599.46	134.90	0.00
		42	MIN	-4021.52	-874.81	0.00
	42	43	MAX	1010.51	135.07	0.00
		43	MIN	-4188.00	-757.52	0.00
	43	44	MAX	200.43	135.30	0.00
		44	MIN	-82.41	-612.09	0.00
	44	45	MAX	-1359.88	135.74	0.00
		45	MIN	6800.91	-346.64	0.00

Envolvente de cortantes por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	6481.54	137.80	0.00
		46	MIN	7342.19	-117.76	0.00
	46	47	MAX	4324.06	352.05	0.00
		47	MIN	-955.45	-86.58	0.00
	47	48	MAX	-1341.74	632.02	0.00
		48	MIN	40.14	-86.31	0.00
	48	49	MAX	-5564.57	777.41	0.00
		49	MIN	557.03	-86.16	0.00
	49	50	MAX	-9187.93	883.09	0.00
		50	MIN	932.83	-86.05	0.00
	50	51	MAX	-4917.45	988.25	0.00
		51	MIN	-5247.64	-85.95	0.00
6	51	51	MAX	-4917.45	126.48	0.00
		51	MIN	-5247.64	-998.56	0.00
	51	52	MAX	1380.98	126.64	0.00
		52	MIN	-9262.23	-893.16	0.00
	52	53	MAX	827.98	126.79	0.00
		53	MIN	-5594.81	-787.50	0.00
	53	54	MAX	67.34	127.01	0.00
		54	MIN	-1311.39	-642.13	0.00
	54	55	MAX	-1397.74	127.42	0.00
		55	MIN	4471.12	-362.18	0.00
	55	56	MAX	6767.33	140.68	0.00
		56	MIN	6717.88	-147.96	0.00
	56	57	MAX	4584.00	354.92	0.00
		57	MIN	-1435.59	-131.00	0.00
	57	58	MAX	-1115.57	634.88	0.00
		58	MIN	70.65	-130.57	0.00
	58	59	MAX	-5355.92	780.27	0.00
		59	MIN	852.65	-130.35	0.00
	59	60	MAX	-8992.04	885.94	0.00
		60	MIN	1421.18	-130.19	0.00
	60	61	MAX	-5180.51	991.10	0.00
		61	MIN	-4924.02	-130.03	0.00
7	61	61	MAX	-5180.51	73.70	0.00
		61	MIN	-4924.02	-991.19	0.00
	61	62	MAX	799.18	73.79	0.00
		62	MIN	-9232.52	-885.78	0.00
	62	63	MAX	476.93	73.88	0.00
		63	MIN	-5597.39	-780.11	0.00
	63	64	MAX	33.68	74.01	0.00
		64	MIN	-1358.38	-634.73	0.00
	64	65	MAX	-820.07	74.25	0.00
		65	MIN	4338.58	-354.76	0.00
	65	66	MAX	7256.05	106.96	0.00
		66	MIN	6519.89	-140.52	0.00
	66	67	MAX	6762.17	345.14	0.00
		67	MIN	-1366.10	-136.63	0.00
	67	68	MAX	49.43	601.35	0.00
		68	MIN	204.49	-136.19	0.00

Envolvente de cortantes por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	-510.45	748.29	0.00
		69	MIN	1019.91	-135.96	0.00
	69	70	MAX	-4058.09	874.70	0.00
		70	MIN	1612.74	-135.79	0.00
	70	71	MAX	-2145.17	1000.51	0.00
		71	MIN	-3897.47	-135.62	0.00
8	71	71	MAX	-2145.17	44.06	0.00
		71	MIN	-3897.47	-880.26	0.00
	71	72	MAX	2013.45	44.14	0.00
		72	MIN	-7666.22	-775.10	0.00
	72	73	MAX	1823.49	44.22	0.00
		73	MIN	-4516.34	-669.57	0.00
	73	74	MAX	1569.18	44.32	0.00
		74	MIN	-1191.27	-527.58	0.00
	74	75	MAX	1313.68	44.42	0.00
		75	MIN	1470.23	-383.62	0.00
	75	76	MAX	1055.96	44.48	0.00
		76	MIN	3213.54	-212.96	0.00
	76	77	MAX	6468.06	182.17	0.00
		77	MIN	-2937.91	-164.06	0.00
	77	78	MAX	4896.17	352.13	0.00
		78	MIN	-1976.43	-163.68	0.00
	78	79	MAX	3530.51	474.65	0.00
		79	MIN	-1019.34	-163.30	0.00
	79	80	MAX	1904.83	564.91	0.00
		80	MIN	-509.04	-163.10	0.00
	80	81	MAX	0.00	654.94	0.00
		81	MIN	0.00	-162.90	0.00

Envolvente de momentos por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	-383.91	-0.43
		1	MIN	0.00	75.11	0.09
	1	2	MAX	2655.80	-490.20	-0.70
		2	MIN	-548.32	115.49	0.14
	2	3	MAX	4664.07	-352.60	-0.44
		3	MIN	-1098.79	115.71	0.12
	3	4	MAX	6020.98	-214.45	-0.29
		4	MIN	-1651.41	115.94	0.12
	4	5	MAX	6722.67	-75.76	-0.15
		5	MIN	-2206.16	116.16	0.12
	5	6	MAX	6782.37	54.53	0.00
		6	MIN	-2727.34	116.37	0.00
	6	7	MAX	6241.69	184.72	0.03
		7	MIN	-3240.10	116.22	0.03
	7	8	MAX	5184.61	275.76	0.05
		8	MIN	-3749.73	116.00	0.03
	8	9	MAX	2996.03	450.20	0.06
		9	MIN	-4434.82	115.72	0.02
	9	10	MAX	1458.10	-33.79	-0.04
		10	MIN	-4984.17	115.49	0.14
	10	11	MAX	1464.97	-33.72	-0.04
		11	MIN	-7113.63	806.89	0.77
2	11	11	MAX	1464.97	123.81	0.13
		11	MIN	-7113.63	-814.53	-0.77
	11	12	MAX	1021.46	124.02	0.13
		12	MIN	-4934.88	-698.03	-0.77
	12	13	MAX	1737.12	-434.05	-0.51
		13	MIN	-2928.68	-80.40	-0.08
	13	14	MAX	4168.40	-392.12	-0.16
		14	MIN	-2451.29	-80.56	-0.03
	14	15	MAX	6147.05	-197.73	-0.09
		15	MIN	-2410.67	16.24	0.00
	15	16	MAX	6829.67	-2.44	-0.03
		16	MIN	-2577.63	32.19	0.01
	16	17	MAX	6346.45	131.88	0.00
		17	MIN	-2838.83	47.99	0.01
	17	18	MAX	4805.34	326.43	0.03
		18	MIN	-3642.72	124.48	0.02
	18	19	MAX	2363.55	363.26	0.00
		19	MIN	-4380.63	124.22	0.00
	19	20	MAX	1355.39	-33.80	0.00
		20	MIN	-5703.52	723.62	0.00
	20	21	MAX	1373.35	-33.75	0.00
		21	MIN	-7983.22	839.84	0.00
3	21	21	MAX	1373.35	117.60	0.00
		21	MIN	-7983.22	-842.85	0.00
	21	22	MAX	949.12	117.79	0.00
		22	MIN	-5681.72	-726.40	0.00

Envolvente de momentos por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	1869.23	-362.19	0.00
		23	MIN	-3676.89	-101.24	0.00
	23	24	MAX	4287.64	-401.69	0.00
		24	MIN	-3075.72	-101.45	0.00
	24	25	MAX	6330.46	-207.30	2.38
		25	MIN	-2800.51	-7.72	0.12
	25	26	MAX	7077.52	-12.05	0.00
		26	MIN	-2808.30	8.18	0.00
	26	27	MAX	6650.89	121.61	0.00
		27	MIN	-2909.29	24.04	0.00
	27	28	MAX	5177.38	316.18	0.00
		28	MIN	-3481.08	118.23	0.00
	28	29	MAX	2851.28	334.85	0.00
		29	MIN	-4181.92	117.99	0.00
	29	30	MAX	1929.38	-47.90	0.00
		30	MIN	-5575.53	722.15	0.00
	30	31	MAX	1949.90	-47.83	0.00
		31	MIN	-7887.87	838.37	0.00
4	31	31	MAX	1949.90	177.17	0.00
		31	MIN	-7887.87	-839.50	0.00
	31	32	MAX	1302.74	177.46	0.00
		32	MIN	-5562.88	-723.04	0.00
	32	33	MAX	2261.09	-299.98	0.00
		33	MIN	-3855.91	-105.57	0.00
	33	34	MAX	4571.84	-348.46	0.00
		34	MIN	-3235.48	31.42	0.00
	34	35	MAX	6469.57	-201.90	0.00
		35	MIN	-3505.68	47.37	0.00
	35	36	MAX	7180.79	-6.63	0.00
		36	MIN	-3883.14	63.39	0.00
	36	37	MAX	6718.09	126.66	0.00
		37	MIN	-4348.96	79.12	0.00
	37	38	MAX	5210.88	321.22	0.00
		38	MIN	-5372.09	178.12	0.00
	38	39	MAX	2823.91	338.18	-6.19
		39	MIN	-6427.68	177.71	-4.15
	39	40	MAX	1959.96	-47.81	0.00
		40	MIN	-7791.68	778.50	0.00
	40	41	MAX	2019.32	-47.73	0.00
		41	MIN	-10200.73	894.63	0.00
5	41	41	MAX	2019.32	134.74	0.00
		41	MIN	-10200.73	-963.70	0.00
	41	42	MAX	1599.46	134.90	0.00
		42	MIN	-7836.99	-858.26	0.00
	42	43	MAX	1085.12	-510.42	0.00
		43	MIN	-4320.69	-752.56	0.00
	43	44	MAX	3833.72	-507.43	-13.55
		44	MIN	-3455.23	-86.28	-2.01
	44	45	MAX	8200.87	-239.54	0.00
		45	MIN	-2838.04	21.45	0.00

Envolvente de momentos por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	9201.55	-7.12	0.00
		46	MIN	-3159.44	50.53	0.00
	46	47	MAX	8382.78	165.85	0.00
		47	MIN	-3735.26	135.74	0.00
	47	48	MAX	4490.28	476.07	0.00
		48	MIN	-5279.12	135.30	0.00
	48	49	MAX	1622.42	-36.03	0.84
		49	MIN	-6080.61	135.03	-3.16
	49	50	MAX	1777.89	-35.99	0.00
		50	MIN	-9344.89	876.51	0.00
	50	51	MAX	1783.30	-35.95	0.00
		51	MIN	-11659.22	981.68	0.00
6	51	51	MAX	1783.30	126.48	0.00
		51	MIN	-11659.22	-998.56	0.00
	51	52	MAX	1380.98	126.64	0.00
		52	MIN	-9262.23	-893.16	0.00
	52	53	MAX	1280.19	-508.25	0.00
		53	MIN	-5990.91	-130.35	0.00
	53	54	MAX	4135.92	-499.18	-13.36
		54	MIN	-5217.61	-130.54	-3.05
	54	55	MAX	8391.93	-213.28	0.00
		55	MIN	-4022.75	-17.94	0.00
	55	56	MAX	9286.56	-17.63	0.00
		56	MIN	-3966.65	2.90	0.00
	56	57	MAX	8377.92	214.90	0.00
		57	MIN	-4073.41	23.73	0.00
	57	58	MAX	4027.37	420.17	-11.85
		58	MIN	-5076.39	127.01	0.00
	58	59	MAX	1118.00	512.02	-10.26
		59	MIN	-5828.56	126.76	-2.96
	59	60	MAX	1421.18	-130.19	0.00
		60	MIN	-9273.42	878.68	0.00
	60	61	MAX	1833.49	-130.03	0.00
		61	MIN	-11602.08	983.85	0.00
7	61	61	MAX	1833.49	36.97	0.00
		61	MIN	-11602.08	-991.19	0.00
	61	62	MAX	1827.54	37.01	0.00
		62	MIN	-9232.52	-885.78	0.00
	62	63	MAX	1667.66	37.06	0.00
		63	MIN	-6117.99	-135.96	0.00
	63	64	MAX	4626.16	-477.47	-12.85
		64	MIN	-5311.21	-136.15	-3.18
	64	65	MAX	8384.29	-207.63	0.00
		65	MIN	-3757.16	-136.63	0.00
	65	66	MAX	9285.03	6.97	0.00
		66	MIN	-2988.83	-51.09	0.00
	66	67	MAX	8161.67	239.44	0.00
		67	MIN	-2626.72	-30.13	0.00
	67	68	MAX	3680.63	427.57	-12.02
		68	MIN	-2963.68	74.01	0.00

Envolvente de momentos por ferrocarril (RENFE/UIC)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	1019.91	-135.92	3.18
		69	MIN	-3992.04	746.60	-15.74
	69	70	MAX	1612.74	-135.79	0.00
		70	MIN	-7483.56	852.51	0.00
	70	71	MAX	2037.81	-135.62	0.00
		71	MIN	-9827.63	957.71	0.00
8	71	71	MAX	2037.81	44.06	0.00
		71	MIN	-9827.63	-879.58	0.00
	71	72	MAX	2013.45	44.14	0.00
		72	MIN	-7821.15	-774.42	0.00
	72	73	MAX	2757.39	-493.19	0.00
		73	MIN	-6741.30	-163.46	0.00
	73	74	MAX	5166.65	-329.58	-9.88
		74	MIN	-5801.13	-163.79	-3.92
	74	75	MAX	6710.38	-206.43	0.00
		75	MIN	-4856.58	-164.22	0.00
	75	76	MAX	7425.65	-35.54	0.00
		76	MIN	-3903.79	-164.43	0.00
	76	77	MAX	7117.45	135.31	0.00
		77	MIN	-2937.91	-164.06	0.00
	77	78	MAX	5816.78	305.37	0.00
		78	MIN	-1976.43	-163.68	0.00
	78	79	MAX	3530.51	474.65	0.00
		79	MIN	-1019.34	-163.30	0.00
	79	80	MAX	1904.83	564.91	0.00
		80	MIN	-509.04	-163.10	0.00
	80	81	MAX	0.00	397.43	0.00
		81	MIN	0.00	-106.70	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	177.15	0.22
		1	MIN	0.00	-689.16	-0.78
	1	2	MAX	-842.20	177.38	0.22
		2	MIN	2949.67	-552.10	-0.78
	2	3	MAX	-1686.54	177.60	0.19
		3	MIN	4434.30	-453.04	-0.49
	3	4	MAX	-2533.02	177.83	0.19
		4	MIN	6266.86	-314.97	-0.40
	4	5	MAX	-3381.65	178.06	0.19
		5	MIN	7444.91	-176.35	-0.26
	5	6	MAX	2394.52	241.76	0.00
		6	MIN	2248.42	-95.94	0.00
	6	7	MAX	1026.56	371.78	0.10
		7	MIN	2673.49	-95.89	-0.02
	7	8	MAX	-919.23	490.18	0.10
		8	MIN	3097.64	-95.83	-0.02
	8	9	MAX	-4152.22	636.72	0.09
		9	MIN	3669.42	-95.75	-0.02
	9	10	MAX	-7523.65	756.64	0.86
		10	MIN	4129.26	-95.68	-0.12
	10	11	MAX	-2771.40	872.90	0.84
		11	MIN	-1813.76	-95.61	-0.10
2	11	11	MAX	-2771.40	139.28	0.14
		11	MIN	-1813.76	-860.91	-0.81
	11	12	MAX	3917.00	139.49	0.14
		12	MIN	-7336.98	-723.24	-0.80
	12	13	MAX	3243.57	139.69	0.14
		13	MIN	-4128.48	-606.37	-0.68
	13	14	MAX	2404.78	139.94	0.05
		14	MIN	390.29	-468.42	-0.17
	14	15	MAX	1469.17	140.23	0.04
		15	MIN	1348.78	-294.18	-0.11
	15	16	MAX	7230.54	146.16	0.01
		16	MIN	2763.64	-126.08	-0.06
	16	17	MAX	5664.10	314.16	0.03
		17	MIN	-3260.50	-96.21	-0.01
	17	18	MAX	3022.89	476.64	0.06
		18	MIN	-2618.38	-96.03	-0.01
	18	19	MAX	-98.45	627.91	0.00
		19	MIN	-2042.57	-95.87	0.00
	19	20	MAX	-3409.21	744.74	0.00
		20	MIN	-1580.19	-95.73	0.00
	20	21	MAX	-3266.85	860.95	0.00
		21	MIN	-2417.81	-95.60	0.00
3	21	21	MAX	-3266.85	117.86	0.00
		21	MIN	-2417.81	-855.22	0.00
	21	22	MAX	-1125.50	118.05	0.00
		22	MIN	-3607.10	-726.65	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	-1695.41	118.24	0.00
		23	MIN	-383.99	-609.81	0.00
	23	24	MAX	-2405.55	118.49	0.00
		24	MIN	2836.81	-464.22	0.00
	24	25	MAX	-3198.02	118.75	0.00
		25	MIN	5395.33	-301.73	0.00
	25	26	MAX	2721.18	129.46	0.00
		26	MIN	6872.62	-138.51	0.00
	26	27	MAX	1265.81	297.47	0.00
		27	MIN	1033.45	-101.93	0.00
	27	28	MAX	-1264.39	459.96	0.00
		28	MIN	1713.86	-101.70	0.00
	28	29	MAX	-4283.92	610.54	0.00
		29	MIN	2323.58	-101.49	0.00
	29	30	MAX	-7510.98	727.38	0.00
		30	MIN	2812.91	-101.33	0.00
	30	31	MAX	-5050.57	843.59	0.00
		31	MIN	-23.15	-101.16	0.00
4	31	31	MAX	-5050.57	178.86	0.00
		31	MIN	-23.15	-851.27	0.00
	31	32	MAX	-793.63	179.15	0.00
		32	MIN	-3068.76	-729.01	0.00
	32	33	MAX	-1658.73	179.44	0.00
		33	MIN	166.58	-612.17	0.00
	33	34	MAX	-2736.65	179.81	0.00
		34	MIN	3187.63	-463.43	0.00
	34	35	MAX	-3939.51	180.21	0.00
		35	MIN	5741.55	-300.94	0.00
	35	36	MAX	1802.85	187.67	0.00
		36	MIN	6966.91	-136.56	0.00
	36	37	MAX	-37.77	355.54	0.00
		37	MIN	1032.44	-107.70	0.00
	37	38	MAX	-2951.51	517.90	0.00
		38	MIN	1751.44	-107.47	0.00
	38	39	MAX	-6309.92	668.01	-0.04
		39	MIN	2395.77	-107.25	0.04
	39	40	MAX	-9811.08	784.76	0.00
		40	MIN	2912.90	-107.08	0.00
	40	41	MAX	-6277.93	900.88	0.00
		41	MIN	-485.04	-106.90	0.00
5	41	41	MAX	-6277.93	134.95	0.00
		41	MIN	-485.04	-1001.13	0.00
	41	42	MAX	-587.45	135.12	0.00
		42	MIN	-1834.61	-875.03	0.00
	42	43	MAX	-1177.34	135.28	0.00
		43	MIN	-2000.15	-757.73	0.00
	43	44	MAX	-1988.70	135.51	0.00
		44	MIN	2106.73	-612.31	0.00
	44	45	MAX	-3551.48	135.95	0.00
		45	MIN	8992.51	-346.86	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	4288.08	138.01	0.00
		46	MIN	9535.65	-117.97	0.00
	46	47	MAX	2128.72	352.26	0.00
		47	MIN	1239.89	-86.80	0.00
	47	48	MAX	-3539.55	632.23	0.00
		48	MIN	2237.95	-86.52	0.00
	48	49	MAX	-7763.66	777.63	0.00
		49	MIN	2756.12	-86.37	0.00
	49	50	MAX	-11387.95	883.30	0.00
		50	MIN	3132.85	-86.27	0.00
	50	51	MAX	-4919.56	988.47	0.00
		51	MIN	-5245.53	-86.16	0.00
6	51	51	MAX	-4919.56	128.98	0.00
		51	MIN	-5245.53	-1001.06	0.00
	51	52	MAX	3571.00	129.14	0.00
		52	MIN	-11452.25	-895.66	0.00
	52	53	MAX	3007.05	129.29	0.00
		53	MIN	-7773.88	-790.00	0.00
	53	54	MAX	2231.41	129.51	0.06
		54	MIN	-3475.46	-644.63	-0.06
	54	55	MAX	737.56	129.92	0.00
		55	MIN	2335.81	-364.68	0.00
	55	56	MAX	8880.75	143.18	0.00
		56	MIN	4604.46	-150.46	0.00
	56	57	MAX	6675.54	357.42	0.00
		57	MIN	-3527.13	-133.50	0.00
	57	58	MAX	947.21	637.38	0.00
		58	MIN	-1992.13	-133.08	0.00
	58	59	MAX	-3308.15	782.77	-0.06
		59	MIN	-1195.13	-132.85	0.06
	59	60	MAX	-6955.21	888.44	0.00
		60	MIN	-615.65	-132.69	0.00
	60	61	MAX	-5186.98	993.60	0.00
		61	MIN	-4917.55	-132.53	0.00
7	61	61	MAX	-5186.98	83.20	0.00
		61	MIN	-4917.55	-1000.69	0.00
	61	62	MAX	-1268.28	83.29	0.00
		62	MIN	-7165.06	-895.28	0.00
	62	63	MAX	-1632.07	83.38	0.00
		63	MIN	-3488.39	-789.61	0.00
	63	64	MAX	-2132.30	83.50	0.22
		64	MIN	807.60	-644.22	-0.22
	64	65	MAX	-3095.25	83.75	0.00
		65	MIN	6613.76	-364.26	0.00
	65	66	MAX	4897.79	116.45	0.00
		66	MIN	8878.15	-150.02	0.00
	66	67	MAX	4320.82	354.63	0.00
		67	MIN	1075.25	-146.13	0.00
	67	68	MAX	-2501.12	610.85	0.00
		68	MIN	2755.04	-145.68	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	-3117.98	757.78	-0.22
		69	MIN	3627.43	-145.45	0.22
	69	70	MAX	-6707.16	884.20	0.00
		70	MIN	4261.80	-145.29	0.00
	70	71	MAX	-2186.15	1010.01	0.00
		71	MIN	-3856.49	-145.12	0.00
8	71	71	MAX	-2186.15	97.88	0.00
		71	MIN	-3856.49	-934.08	0.00
	71	72	MAX	4468.50	97.96	0.00
		72	MIN	-10121.26	-828.92	0.00
	72	73	MAX	4043.07	98.04	0.00
		73	MIN	-6735.92	-723.39	0.00
	73	74	MAX	3474.82	98.12	1.31
		74	MIN	-3096.92	-581.38	-1.31
	74	75	MAX	2905.38	98.24	0.00
		75	MIN	-121.47	-437.44	0.00
	75	76	MAX	2333.72	98.30	0.00
		76	MIN	1935.77	-266.78	0.00
	76	77	MAX	7431.88	235.99	0.00
		77	MIN	-3901.74	-217.88	0.00
	77	78	MAX	5546.06	405.95	0.00
		78	MIN	-2626.32	-217.50	0.00
	78	79	MAX	3866.46	528.47	0.00
		79	MIN	-1355.29	-217.13	0.00
	79	80	MAX	2072.81	618.73	0.00
		80	MIN	-677.02	-216.92	0.00
	80	81	MAX	0.00	708.76	0.00
		81	MIN	0.00	-216.72	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	-445.81	-0.51
		1	MIN	0.00	137.00	0.17
	1	2	MAX	2949.67	-552.10	-0.78
		2	MIN	-842.20	177.38	0.22
	2	3	MAX	5251.82	-414.49	-0.50
		3	MIN	-1686.54	177.60	0.19
	3	4	MAX	6902.60	-276.35	-0.36
		4	MIN	-2533.02	177.83	0.19
	4	5	MAX	7898.16	-137.66	-0.22
		5	MIN	-3381.65	178.06	0.19
	5	6	MAX	8232.91	-7.36	0.00
		6	MIN	-4177.89	178.27	0.00
	6	7	MAX	7967.29	122.82	0.01
		7	MIN	-4965.70	178.11	0.04
	7	8	MAX	7185.27	213.87	0.03
		8	MIN	-5750.39	177.90	0.04
	8	9	MAX	5368.05	388.30	0.05
		9	MIN	-6806.85	177.61	0.03
	9	10	MAX	4129.26	-95.68	-0.12
		10	MIN	-7655.33	177.38	0.22
	10	11	MAX	4359.58	-95.61	-0.10
		11	MIN	-10008.24	868.78	0.83
2	11	11	MAX	4359.58	139.28	0.14
		11	MIN	-10008.24	-830.00	-0.79
	11	12	MAX	3917.00	139.49	0.14
		12	MIN	-7830.43	-713.50	-0.79
	12	13	MAX	4557.92	-418.59	-0.50
		13	MIN	-5749.47	-95.87	-0.10
	13	14	MAX	6896.39	-376.66	-0.15
		14	MIN	-5179.28	-96.03	-0.03
	14	15	MAX	8771.93	-182.26	-0.08
		15	MIN	-5035.54	0.77	0.00
	15	16	MAX	9351.43	13.02	-0.02
		16	MIN	-5099.39	16.72	0.00
	16	17	MAX	8765.09	147.35	0.01
		17	MIN	-5257.48	32.52	0.00
	17	18	MAX	7120.87	341.89	0.04
		18	MIN	-5958.25	109.01	0.02
	18	19	MAX	4586.29	378.72	0.00
		19	MIN	-6603.36	108.75	0.00
	19	20	MAX	3503.37	-18.34	0.00
		20	MIN	-7851.50	708.16	0.00
	20	21	MAX	3461.63	-18.28	0.00
		21	MIN	-10071.49	824.37	0.00
3	21	21	MAX	3461.63	117.34	0.00
		21	MIN	-10071.49	-842.60	0.00
	21	22	MAX	3023.74	117.54	0.00
		22	MIN	-7756.34	-726.14	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	3945.08	-362.45	0.00
		23	MIN	-5752.74	-100.98	0.00
	23	24	MAX	6365.03	-401.95	0.00
		24	MIN	-5153.11	-101.19	0.00
	24	25	MAX	8409.56	-207.55	2.38
		25	MIN	-4879.61	-7.46	0.12
	25	26	MAX	9158.32	-12.30	0.00
		26	MIN	-4889.10	8.43	0.00
	26	27	MAX	8733.41	121.36	0.00
		27	MIN	-4991.80	24.29	0.00
	27	28	MAX	7261.59	315.93	0.00
		28	MIN	-5565.30	118.48	0.00
	28	29	MAX	4937.04	334.59	0.00
		29	MIN	-6267.67	118.24	0.00
	29	30	MAX	4016.37	-48.16	0.00
		30	MIN	-7662.52	722.41	0.00
	30	31	MAX	4039.45	-48.08	0.00
		31	MIN	-9977.41	838.63	0.00
4	31	31	MAX	4039.45	175.49	0.00
		31	MIN	-9977.41	-837.81	0.00
	31	32	MAX	3399.11	175.78	0.00
		32	MIN	-7659.25	-721.35	0.00
	32	33	MAX	4365.60	-301.66	0.00
		33	MIN	-5960.43	-103.88	0.00
	33	34	MAX	6686.47	-350.15	0.00
		34	MIN	-5350.11	33.11	0.00
	34	35	MAX	8595.44	-203.58	0.00
		35	MIN	-5631.55	49.05	0.00
	35	36	MAX	9317.90	-8.31	0.00
		36	MIN	-6020.25	65.07	0.00
	36	37	MAX	8866.44	124.97	0.00
		37	MIN	-6497.31	80.81	0.00
	37	38	MAX	7370.46	319.53	0.00
		38	MIN	-7531.68	179.81	0.00
	38	39	MAX	4993.61	336.49	-6.15
		39	MIN	-8597.38	179.39	-4.19
	39	40	MAX	4137.80	-49.50	0.00
		40	MIN	-9969.52	780.19	0.00
	40	41	MAX	4203.93	-49.42	0.00
		41	MIN	-12385.35	896.31	0.00
5	41	41	MAX	4203.93	134.52	0.00
		41	MIN	-12385.35	-963.49	0.00
	41	42	MAX	3786.37	134.69	0.00
		42	MIN	-10023.91	-858.05	0.00
	42	43	MAX	3272.97	-510.64	0.00
		43	MIN	-6508.54	-752.35	0.00
	43	44	MAX	6022.85	-507.64	-13.56
		44	MIN	-5644.37	-86.07	-2.01
	44	45	MAX	10392.47	-239.76	0.00
		45	MIN	-5029.64	21.66	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	11395.02	-7.34	0.00
		46	MIN	-5352.91	50.75	0.00
	46	47	MAX	10578.12	165.64	0.00
		47	MIN	-5930.60	135.95	0.00
	47	48	MAX	6688.08	475.86	0.00
		48	MIN	-7476.92	135.51	0.00
	48	49	MAX	3821.51	-36.24	0.85
		49	MIN	-8279.70	135.25	-3.16
	49	50	MAX	3977.91	-36.21	0.00
		50	MIN	-11544.91	876.72	0.00
	50	51	MAX	3981.75	-36.16	0.00
		51	MIN	-13857.67	981.90	0.00
6	51	51	MAX	3981.75	128.98	0.00
		51	MIN	-13857.67	-1001.06	0.00
	51	52	MAX	3571.00	129.14	0.00
		52	MIN	-11452.25	-895.66	0.00
	52	53	MAX	3459.26	-505.75	0.00
		53	MIN	-8169.98	-132.86	0.00
	53	54	MAX	6299.99	-496.68	-13.30
		54	MIN	-7381.68	-133.04	-3.11
	54	55	MAX	10527.24	-210.77	0.00
		55	MIN	-6158.06	-20.44	0.00
	55	56	MAX	11399.99	-15.13	0.00
		56	MIN	-6080.08	0.40	0.00
	56	57	MAX	10469.46	217.40	0.00
		57	MIN	-6164.95	21.23	0.00
	57	58	MAX	6090.15	422.67	-11.85
		58	MIN	-7139.17	124.50	0.00
	58	59	MAX	3165.77	514.52	-10.31
		59	MIN	-7876.33	124.26	-2.90
	59	60	MAX	3458.01	-127.69	0.00
		60	MIN	-11310.25	876.18	0.00
	60	61	MAX	3870.50	-127.53	0.00
		61	MIN	-13639.08	981.35	0.00
7	61	61	MAX	3870.50	27.47	0.00
		61	MIN	-13639.08	-981.69	0.00
	61	62	MAX	3895.00	27.52	0.00
		62	MIN	-11299.98	-876.29	0.00
	62	63	MAX	3776.66	27.56	0.00
		63	MIN	-8226.99	-126.46	0.00
	63	64	MAX	6792.14	-486.96	-13.08
		64	MIN	-7477.19	-126.66	-2.95
	64	65	MAX	10659.47	-217.13	0.00
		65	MIN	-6032.33	-127.13	0.00
	65	66	MAX	11643.29	-2.53	0.00
		66	MIN	-5347.09	-41.59	0.00
	66	67	MAX	10603.02	229.94	0.00
		67	MIN	-5068.06	-20.63	0.00
	67	68	MAX	6231.18	418.07	-12.02
		68	MIN	-5514.23	83.51	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	3627.43	-145.41	3.40
		69	MIN	-6599.56	756.10	-15.97
	69	70	MAX	4261.80	-145.29	0.00
		70	MIN	-10132.62	862.00	0.00
	70	71	MAX	4669.79	-145.12	0.00
		71	MIN	-12459.61	967.21	0.00
8	71	71	MAX	4669.79	97.88	0.00
		71	MIN	-12459.61	-933.40	0.00
	71	72	MAX	4468.50	97.96	0.00
		72	MIN	-10276.20	-828.24	0.00
	72	73	MAX	4976.97	-439.37	0.00
		73	MIN	-8960.88	-217.29	0.00
	73	74	MAX	7072.29	-275.78	-8.57
		74	MIN	-7706.78	-217.60	-5.23
	74	75	MAX	8302.09	-152.61	0.00
		75	MIN	-6448.28	-218.04	0.00
	75	76	MAX	8703.41	18.28	0.00
		76	MIN	-5181.55	-218.25	0.00
	76	77	MAX	8081.27	189.13	0.00
		77	MIN	-3901.74	-217.88	0.00
	77	78	MAX	6466.67	359.19	0.00
		78	MIN	-2626.32	-217.50	0.00
	78	79	MAX	3866.46	528.47	0.00
		79	MIN	-1355.29	-217.13	0.00
	79	80	MAX	2072.81	618.73	0.00
		80	MIN	-677.02	-216.92	0.00
	80	81	MAX	0.00	451.25	0.00
		81	MIN	0.00	-160.52	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	177.15	0.22
		1	MIN	0.00	-689.16	-0.78
	1	2	MAX	-842.20	177.38	0.22
		2	MIN	2949.67	-552.10	-0.78
	2	3	MAX	-1686.54	177.60	0.19
		3	MIN	4434.30	-453.04	-0.49
	3	4	MAX	-2533.02	177.83	0.19
		4	MIN	6266.86	-314.97	-0.40
	4	5	MAX	-3381.65	178.06	0.19
		5	MIN	7444.91	-176.35	-0.26
	5	6	MAX	2394.52	241.76	0.00
		6	MIN	2248.42	-95.94	0.00
	6	7	MAX	1026.56	371.78	0.10
		7	MIN	2673.49	-95.89	-0.02
	7	8	MAX	-919.23	490.18	0.10
		8	MIN	3097.64	-95.83	-0.02
	8	9	MAX	-4152.22	636.72	0.09
		9	MIN	3669.42	-95.75	-0.02
	9	10	MAX	-7523.65	756.64	0.86
		10	MIN	4129.26	-95.68	-0.12
	10	11	MAX	-2771.40	872.90	0.84
		11	MIN	-1813.76	-95.61	-0.10
2	11	11	MAX	-2771.40	139.28	0.14
		11	MIN	-1813.76	-860.91	-0.81
	11	12	MAX	3917.00	139.49	0.14
		12	MIN	-7336.98	-723.24	-0.80
	12	13	MAX	3243.57	139.69	0.14
		13	MIN	-4128.48	-606.37	-0.68
	13	14	MAX	2404.78	139.94	0.05
		14	MIN	390.29	-468.42	-0.17
	14	15	MAX	1469.17	140.23	0.04
		15	MIN	1348.78	-294.18	-0.11
	15	16	MAX	7230.54	146.16	0.01
		16	MIN	2763.64	-126.08	-0.06
	16	17	MAX	5664.10	314.16	0.03
		17	MIN	-3260.50	-96.21	-0.01
	17	18	MAX	3022.89	476.64	0.06
		18	MIN	-2618.38	-96.03	-0.01
	18	19	MAX	-98.45	627.91	0.00
		19	MIN	-2042.57	-95.87	0.00
	19	20	MAX	-3409.21	744.74	0.00
		20	MIN	-1580.19	-95.73	0.00
	20	21	MAX	-3266.85	860.95	0.00
		21	MIN	-2417.81	-95.60	0.00
3	21	21	MAX	-3266.85	117.86	0.00
		21	MIN	-2417.81	-855.22	0.00
	21	22	MAX	-1125.50	118.05	0.00
		22	MIN	-3607.10	-726.65	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	-1695.41	118.24	0.00
		23	MIN	-383.99	-609.81	0.00
	23	24	MAX	-2405.55	118.49	0.00
		24	MIN	2836.81	-464.22	0.00
	24	25	MAX	-3198.02	118.75	0.00
		25	MIN	5395.33	-301.73	0.00
	25	26	MAX	2721.18	129.46	0.00
		26	MIN	6872.62	-138.51	0.00
	26	27	MAX	1265.81	297.47	0.00
		27	MIN	1033.45	-101.93	0.00
	27	28	MAX	-1264.39	459.96	0.00
		28	MIN	1713.86	-101.70	0.00
	28	29	MAX	-4283.92	610.54	0.00
		29	MIN	2323.58	-101.49	0.00
	29	30	MAX	-7510.98	727.38	0.00
		30	MIN	2812.91	-101.33	0.00
	30	31	MAX	-5050.57	843.59	0.00
		31	MIN	-23.15	-101.16	0.00
4	31	31	MAX	-5050.57	178.86	0.00
		31	MIN	-23.15	-851.27	0.00
	31	32	MAX	-793.63	179.15	0.00
		32	MIN	-3068.76	-729.01	0.00
	32	33	MAX	-1658.73	179.44	0.00
		33	MIN	166.58	-612.17	0.00
	33	34	MAX	-2736.65	179.81	0.00
		34	MIN	3187.63	-463.43	0.00
	34	35	MAX	-3939.51	180.21	0.00
		35	MIN	5741.55	-300.94	0.00
	35	36	MAX	1802.85	187.67	0.00
		36	MIN	6966.91	-136.56	0.00
	36	37	MAX	-37.77	355.54	0.00
		37	MIN	1032.44	-107.70	0.00
	37	38	MAX	-2951.51	517.90	0.00
		38	MIN	1751.44	-107.47	0.00
	38	39	MAX	-6309.92	668.01	-0.04
		39	MIN	2395.77	-107.25	0.04
	39	40	MAX	-9811.08	784.76	0.00
		40	MIN	2912.90	-107.08	0.00
	40	41	MAX	-6277.93	900.88	0.00
		41	MIN	-485.04	-106.90	0.00
5	41	41	MAX	-6277.93	134.95	0.00
		41	MIN	-485.04	-1001.13	0.00
	41	42	MAX	-587.45	135.12	0.00
		42	MIN	-1834.61	-875.03	0.00
	42	43	MAX	-1177.34	135.28	0.00
		43	MIN	-2000.15	-757.73	0.00
	43	44	MAX	-1988.70	135.51	0.00
		44	MIN	2106.73	-612.31	0.00
	44	45	MAX	-3551.48	135.95	0.00
		45	MIN	8992.51	-346.86	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	4288.08	138.01	0.00
		46	MIN	9535.65	-117.97	0.00
	46	47	MAX	2128.72	352.26	0.00
		47	MIN	1239.89	-86.80	0.00
	47	48	MAX	-3539.55	632.23	0.00
		48	MIN	2237.95	-86.52	0.00
	48	49	MAX	-7763.66	777.63	0.00
		49	MIN	2756.12	-86.37	0.00
	49	50	MAX	-11387.95	883.30	0.00
		50	MIN	3132.85	-86.27	0.00
	50	51	MAX	-4919.56	988.47	0.00
		51	MIN	-5245.53	-86.16	0.00
6	51	51	MAX	-4919.56	128.98	0.00
		51	MIN	-5245.53	-1001.06	0.00
	51	52	MAX	3571.00	129.14	0.00
		52	MIN	-11452.25	-895.66	0.00
	52	53	MAX	3007.05	129.29	0.00
		53	MIN	-7773.88	-790.00	0.00
	53	54	MAX	2231.41	129.51	0.06
		54	MIN	-3475.46	-644.63	-0.06
	54	55	MAX	737.56	129.92	0.00
		55	MIN	2335.81	-364.68	0.00
	55	56	MAX	8880.75	143.18	0.00
		56	MIN	4604.46	-150.46	0.00
	56	57	MAX	6675.54	357.42	0.00
		57	MIN	-3527.13	-133.50	0.00
	57	58	MAX	947.21	637.38	0.00
		58	MIN	-1992.13	-133.08	0.00
	58	59	MAX	-3308.15	782.77	-0.06
		59	MIN	-1195.13	-132.85	0.06
	59	60	MAX	-6955.21	888.44	0.00
		60	MIN	-615.65	-132.69	0.00
	60	61	MAX	-5186.98	993.60	0.00
		61	MIN	-4917.55	-132.53	0.00
7	61	61	MAX	-5186.98	83.20	0.00
		61	MIN	-4917.55	-1000.69	0.00
	61	62	MAX	-1268.28	83.29	0.00
		62	MIN	-7165.06	-895.28	0.00
	62	63	MAX	-1632.07	83.38	0.00
		63	MIN	-3488.39	-789.61	0.00
	63	64	MAX	-2132.30	83.50	0.22
		64	MIN	807.60	-644.22	-0.22
	64	65	MAX	-3095.25	83.75	0.00
		65	MIN	6613.76	-364.26	0.00
	65	66	MAX	4897.79	116.45	0.00
		66	MIN	8878.15	-150.02	0.00
	66	67	MAX	4320.82	354.63	0.00
		67	MIN	1075.25	-146.13	0.00
	67	68	MAX	-2501.12	610.85	0.00
		68	MIN	2755.04	-145.68	0.00

Envolvente de cortantes por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	-3117.98	757.78	-0.22
		69	MIN	3627.43	-145.45	0.22
	69	70	MAX	-6707.16	884.20	0.00
		70	MIN	4261.80	-145.29	0.00
	70	71	MAX	-2186.15	1010.01	0.00
		71	MIN	-3856.49	-145.12	0.00
8	71	71	MAX	-2186.15	97.88	0.00
		71	MIN	-3856.49	-934.08	0.00
	71	72	MAX	4468.50	97.96	0.00
		72	MIN	-10121.26	-828.92	0.00
	72	73	MAX	4043.07	98.04	0.00
		73	MIN	-6735.92	-723.39	0.00
	73	74	MAX	3474.82	98.12	1.31
		74	MIN	-3096.92	-581.38	-1.31
	74	75	MAX	2905.38	98.24	0.00
		75	MIN	-121.47	-437.44	0.00
	75	76	MAX	2333.72	98.30	0.00
		76	MIN	1935.77	-266.78	0.00
	76	77	MAX	7431.88	235.99	0.00
		77	MIN	-3901.74	-217.88	0.00
	77	78	MAX	5546.06	405.95	0.00
		78	MIN	-2626.32	-217.50	0.00
	78	79	MAX	3866.46	528.47	0.00
		79	MIN	-1355.29	-217.13	0.00
	79	80	MAX	2072.81	618.73	0.00
		80	MIN	-677.02	-216.92	0.00
	80	81	MAX	0.00	708.76	0.00
		81	MIN	0.00	-216.72	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	MAX	0.00	-445.81	-0.51
		1	MIN	0.00	137.00	0.17
	1	2	MAX	2949.67	-552.10	-0.78
		2	MIN	-842.20	177.38	0.22
	2	3	MAX	5251.82	-414.49	-0.50
		3	MIN	-1686.54	177.60	0.19
	3	4	MAX	6902.60	-276.35	-0.36
		4	MIN	-2533.02	177.83	0.19
	4	5	MAX	7898.16	-137.66	-0.22
		5	MIN	-3381.65	178.06	0.19
	5	6	MAX	8232.91	-7.36	0.00
		6	MIN	-4177.89	178.27	0.00
	6	7	MAX	7967.29	122.82	0.01
		7	MIN	-4965.70	178.11	0.04
	7	8	MAX	7185.27	213.87	0.03
		8	MIN	-5750.39	177.90	0.04
	8	9	MAX	5368.05	388.30	0.05
		9	MIN	-6806.85	177.61	0.03
	9	10	MAX	4129.26	-95.68	-0.12
		10	MIN	-7655.33	177.38	0.22
	10	11	MAX	4359.58	-95.61	-0.10
		11	MIN	-10008.24	868.78	0.83
2	11	11	MAX	4359.58	139.28	0.14
		11	MIN	-10008.24	-830.00	-0.79
	11	12	MAX	3917.00	139.49	0.14
		12	MIN	-7830.43	-713.50	-0.79
	12	13	MAX	4557.92	-418.59	-0.50
		13	MIN	-5749.47	-95.87	-0.10
	13	14	MAX	6896.39	-376.66	-0.15
		14	MIN	-5179.28	-96.03	-0.03
	14	15	MAX	8771.93	-182.26	-0.08
		15	MIN	-5035.54	0.77	0.00
	15	16	MAX	9351.43	13.02	-0.02
		16	MIN	-5099.39	16.72	0.00
	16	17	MAX	8765.09	147.35	0.01
		17	MIN	-5257.48	32.52	0.00
	17	18	MAX	7120.87	341.89	0.04
		18	MIN	-5958.25	109.01	0.02
	18	19	MAX	4586.29	378.72	0.00
		19	MIN	-6603.36	108.75	0.00
	19	20	MAX	3503.37	-18.34	0.00
		20	MIN	-7851.50	708.16	0.00
	20	21	MAX	3461.63	-18.28	0.00
		21	MIN	-10071.49	824.37	0.00
3	21	21	MAX	3461.63	117.34	0.00
		21	MIN	-10071.49	-842.60	0.00
	21	22	MAX	3023.74	117.54	0.00
		22	MIN	-7756.34	-726.14	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	22	23	MAX	3945.08	-362.45	0.00
		23	MIN	-5752.74	-100.98	0.00
	23	24	MAX	6365.03	-401.95	0.00
		24	MIN	-5153.11	-101.19	0.00
	24	25	MAX	8409.56	-207.55	2.38
		25	MIN	-4879.61	-7.46	0.12
	25	26	MAX	9158.32	-12.30	0.00
		26	MIN	-4889.10	8.43	0.00
	26	27	MAX	8733.41	121.36	0.00
		27	MIN	-4991.80	24.29	0.00
	27	28	MAX	7261.59	315.93	0.00
		28	MIN	-5565.30	118.48	0.00
	28	29	MAX	4937.04	334.59	0.00
		29	MIN	-6267.67	118.24	0.00
	29	30	MAX	4016.37	-48.16	0.00
		30	MIN	-7662.52	722.41	0.00
	30	31	MAX	4039.45	-48.08	0.00
		31	MIN	-9977.41	838.63	0.00
4	31	31	MAX	4039.45	175.49	0.00
		31	MIN	-9977.41	-837.81	0.00
	31	32	MAX	3399.11	175.78	0.00
		32	MIN	-7659.25	-721.35	0.00
	32	33	MAX	4365.60	-301.66	0.00
		33	MIN	-5960.43	-103.88	0.00
	33	34	MAX	6686.47	-350.15	0.00
		34	MIN	-5350.11	33.11	0.00
	34	35	MAX	8595.44	-203.58	0.00
		35	MIN	-5631.55	49.05	0.00
	35	36	MAX	9317.90	-8.31	0.00
		36	MIN	-6020.25	65.07	0.00
	36	37	MAX	8866.44	124.97	0.00
		37	MIN	-6497.31	80.81	0.00
	37	38	MAX	7370.46	319.53	0.00
		38	MIN	-7531.68	179.81	0.00
	38	39	MAX	4993.61	336.49	-6.15
		39	MIN	-8597.38	179.39	-4.19
	39	40	MAX	4137.80	-49.50	0.00
		40	MIN	-9969.52	780.19	0.00
	40	41	MAX	4203.93	-49.42	0.00
		41	MIN	-12385.35	896.31	0.00
5	41	41	MAX	4203.93	134.52	0.00
		41	MIN	-12385.35	-963.49	0.00
	41	42	MAX	3786.37	134.69	0.00
		42	MIN	-10023.91	-858.05	0.00
	42	43	MAX	3272.97	-510.64	0.00
		43	MIN	-6508.54	-752.35	0.00
	43	44	MAX	6022.85	-507.64	-13.56
		44	MIN	-5644.37	-86.07	-2.01
	44	45	MAX	10392.47	-239.76	0.00
		45	MIN	-5029.64	21.66	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	45	46	MAX	11395.02	-7.34	0.00
		46	MIN	-5352.91	50.75	0.00
	46	47	MAX	10578.12	165.64	0.00
		47	MIN	-5930.60	135.95	0.00
	47	48	MAX	6688.08	475.86	0.00
		48	MIN	-7476.92	135.51	0.00
	48	49	MAX	3821.51	-36.24	0.85
		49	MIN	-8279.70	135.25	-3.16
	49	50	MAX	3977.91	-36.21	0.00
		50	MIN	-11544.91	876.72	0.00
	50	51	MAX	3981.75	-36.16	0.00
		51	MIN	-13857.67	981.90	0.00
	51	51	MAX	3981.75	128.98	0.00
		51	MIN	-13857.67	-1001.06	0.00
	51	52	MAX	3571.00	129.14	0.00
		52	MIN	-11452.25	-895.66	0.00
	52	53	MAX	3459.26	-505.75	0.00
		53	MIN	-8169.98	-132.86	0.00
	53	54	MAX	6299.99	-496.68	-13.30
		54	MIN	-7381.68	-133.04	-3.11
	54	55	MAX	10527.24	-210.77	0.00
		55	MIN	-6158.06	-20.44	0.00
	55	56	MAX	11399.99	-15.13	0.00
		56	MIN	-6080.08	0.40	0.00
	56	57	MAX	10469.46	217.40	0.00
		57	MIN	-6164.95	21.23	0.00
	57	58	MAX	6090.15	422.67	-11.85
		58	MIN	-7139.17	124.50	0.00
	58	59	MAX	3165.77	514.52	-10.31
		59	MIN	-7876.33	124.26	-2.90
	59	60	MAX	3458.01	-127.69	0.00
		60	MIN	-11310.25	876.18	0.00
	60	61	MAX	3870.50	-127.53	0.00
		61	MIN	-13639.08	981.35	0.00
	61	61	MAX	3870.50	27.47	0.00
		61	MIN	-13639.08	-981.69	0.00
	61	62	MAX	3895.00	27.52	0.00
		62	MIN	-11299.98	-876.29	0.00
	62	63	MAX	3776.66	27.56	0.00
		63	MIN	-8226.99	-126.46	0.00
	63	64	MAX	6792.14	-486.96	-13.08
		64	MIN	-7477.19	-126.66	-2.95
	64	65	MAX	10659.47	-217.13	0.00
		65	MIN	-6032.33	-127.13	0.00
	65	66	MAX	11643.29	-2.53	0.00
		66	MIN	-5347.09	-41.59	0.00
	66	67	MAX	10603.02	229.94	0.00
		67	MIN	-5068.06	-20.63	0.00
	67	68	MAX	6231.18	418.07	-12.02
		68	MIN	-5514.23	83.51	0.00

Envolvente de momentos por sobrecarga total

(+descensos lentos estructura final+temperatura)

V.	Barra	Nudo		Momento (m x t)	Cortante (t)	Axil (t)
	68	69	MAX	3627.43	-145.41	3.40
		69	MIN	-6599.56	756.10	-15.97
	69	70	MAX	4261.80	-145.29	0.00
		70	MIN	-10132.62	862.00	0.00
	70	71	MAX	4669.79	-145.12	0.00
		71	MIN	-12459.61	967.21	0.00
8	71	71	MAX	4669.79	97.88	0.00
		71	MIN	-12459.61	-933.40	0.00
	71	72	MAX	4468.50	97.96	0.00
		72	MIN	-10276.20	-828.24	0.00
	72	73	MAX	4976.97	-439.37	0.00
		73	MIN	-8960.88	-217.29	0.00
	73	74	MAX	7072.29	-275.78	-8.57
		74	MIN	-7706.78	-217.60	-5.23
	74	75	MAX	8302.09	-152.61	0.00
		75	MIN	-6448.28	-218.04	0.00
	75	76	MAX	8703.41	18.28	0.00
		76	MIN	-5181.55	-218.25	0.00
	76	77	MAX	8081.27	189.13	0.00
		77	MIN	-3901.74	-217.88	0.00
	77	78	MAX	6466.67	359.19	0.00
		78	MIN	-2626.32	-217.50	0.00
	78	79	MAX	3866.46	528.47	0.00
		79	MIN	-1355.29	-217.13	0.00
	79	80	MAX	2072.81	618.73	0.00
		80	MIN	-677.02	-216.92	0.00
	80	81	MAX	0.00	451.25	0.00
		81	MIN	0.00	-160.52	0.00

Cable Numero 1

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 2766.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 1

Se.	X	Y (s)	Y (i)	Pend.
1	0.000	0.290	5.220	0.0000
2	4.748	0.290	5.186	0.0000
3	9.496	0.290	5.152	0.0000
4	14.244	0.290	5.119	0.0000
5	18.992	0.290	5.086	0.0000
6	23.436	0.290	5.062	0.0000
7	27.880	0.290	5.036	0.0000
8	32.324	0.290	5.011	0.0000
9	38.324	0.290	4.977	0.0000
10	43.157	0.290	4.952	0.0000
11	47.990	0.290	4.928	0.0000
12	52.823	0.290	4.905	0.0000
13	57.656	0.290	4.881	0.0000
14	63.656	0.290	4.854	0.0000
15	70.323	0.290	4.825	0.0000
16	76.990	0.290	4.797	0.0000
17	83.657	0.290	4.776	0.0000
18	90.324	0.290	4.760	0.0000
19	96.324	0.290	4.760	0.0000
20	101.157	0.290	4.760	0.0000
21	105.980	0.290	4.760	0.0000
22	110.813	0.290	4.760	0.0000
23	115.646	0.290	4.760	0.0000
24	121.646	0.290	4.760	0.0000
25	128.313	0.290	4.640	0.0000
26	134.980	0.290	4.640	0.0000
27	141.647	0.290	4.640	0.0000
28	148.314	0.290	4.640	0.0000
29	154.314	0.290	4.640	0.0000
30	159.147	0.290	4.640	0.0000
31	163.970	0.290	4.640	0.0000
32	168.803	0.290	4.640	0.0000
33	173.636	0.290	4.640	0.0000
34	179.636	0.290	4.640	0.0000
35	186.303	0.290	4.640	0.0000
36	192.970	0.290	4.640	0.0000
37	199.637	0.290	4.640	0.0000
38	206.304	0.290	4.640	0.0000
39	212.304	0.290	4.640	0.0000
40	217.137	0.290	4.640	0.0000
41	221.960	0.290	4.640	0.0000

Se.	X	Y (s)	Y (i)	Pend.
42	226.335	0.290	4.640	0.0000
43	230.710	0.290	4.640	0.0000
44	236.710	0.290	4.640	0.0000
45	248.210	0.290	4.640	0.0000
46	256.960	0.290	4.640	0.0000
47	265.710	0.290	4.640	0.0000
48	277.210	0.290	4.640	0.0000
49	283.210	0.290	4.640	0.0000
50	287.585	0.290	4.640	0.0000
51	291.950	0.290	4.640	0.0000
52	296.325	0.290	4.640	0.0000
53	300.700	0.290	4.640	0.0000
54	306.700	0.290	4.640	0.0000
55	318.200	0.290	4.640	0.0000
56	326.950	0.290	4.640	0.0000
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 2

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 2

Se.	X	Y (s)	Y (i)	Pend.
29	154.314	0.290	4.640	0.0000
30	159.147	0.290	4.640	0.0000
31	163.970	0.290	4.640	0.0000
32	168.803	0.290	4.640	0.0000
33	173.636	0.290	4.640	0.0000
34	179.636	0.290	4.640	0.0000
35	186.303	0.290	4.640	0.0000
36	192.970	0.290	4.640	0.0000
37	199.637	0.290	4.640	0.0000
38	206.304	0.290	4.640	0.0000
39	212.304	0.290	4.640	0.0000
40	217.137	0.290	4.640	0.0000
41	221.960	0.290	4.640	0.0000
42	226.335	0.290	4.640	0.0000
43	230.710	0.290	4.640	0.0000
44	236.710	0.290	4.640	0.0000
45	248.210	0.290	4.640	0.0000
46	256.960	0.290	4.640	0.0000
47	265.710	0.290	4.640	0.0000
48	277.210	0.290	4.640	0.0000
49	283.210	0.290	4.640	0.0000
50	287.585	0.290	4.640	0.0000
51	291.950	0.290	4.640	0.0000
52	296.325	0.290	4.640	0.0000
53	300.700	0.290	4.640	0.0000
54	306.700	0.290	4.640	0.0000
55	318.200	0.290	4.640	0.0000
56	326.950	0.290	4.640	0.0000
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000

Se.	X	Y (s)	Y (i)	Pend.
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 3

Definicion general

Seccion inicial ..... = 26 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 3

Se.	X	Y (s)	Y (i)	Pend.
26	134.980	0.290	4.640	0.0000
27	141.647	0.290	4.640	0.0000
28	148.314	0.290	4.640	0.0000
29	154.314	0.290	4.640	0.0000
30	159.147	0.290	4.640	0.0000
31	163.970	0.290	4.640	0.0000
32	168.803	0.290	4.640	0.0000
33	173.636	0.290	4.640	0.0000
34	179.636	0.290	4.640	0.0000
35	186.303	0.290	4.640	0.0000
36	192.970	0.290	4.640	0.0000
37	199.637	0.290	4.640	0.0000
38	206.304	0.290	4.640	0.0000
39	212.304	0.290	4.640	0.0000
40	217.137	0.290	4.640	0.0000
41	221.960	0.290	4.640	0.0000
42	226.335	0.290	4.640	0.0000
43	230.710	0.290	4.640	0.0000
44	236.710	0.290	4.640	0.0000
45	248.210	0.290	4.640	0.0000
46	255.960	0.290	4.640	0.0000
47	265.710	0.290	4.640	0.0000
48	277.210	0.290	4.640	0.0000
49	283.210	0.290	4.640	0.0000
50	287.585	0.290	4.640	0.0000
51	291.950	0.290	4.640	0.0000
52	296.325	0.290	4.640	0.0000
53	300.700	0.290	4.640	0.0000
54	306.700	0.290	4.640	0.0000
55	318.200	0.290	4.640	0.0000
56	326.950	0.290	4.640	0.0000
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000

Se.	X	Y (s)	Y (i)	Pend.
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 4

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 538.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 4

Se.	X	Y (s)	Y (i)	Pend.
24	121.646	0.290	4.760	0.0000
25	128.313	0.290	4.640	0.0000
26	134.980	0.290	4.640	0.0000
27	141.647	0.290	4.640	0.0000
28	148.314	0.290	4.640	0.0000
29	154.314	0.290	4.640	0.0000
30	159.147	0.290	4.640	0.0000
31	163.970	0.290	4.640	0.0000
32	168.803	0.290	4.640	0.0000
33	173.636	0.290	4.640	0.0000
34	179.636	0.290	4.640	0.0000
35	186.303	0.290	4.640	0.0000
36	192.970	0.290	4.640	0.0000
37	199.637	0.290	4.640	0.0000
38	206.304	0.290	4.640	0.0000
39	212.304	0.290	4.640	0.0000
40	217.137	0.290	4.640	0.0000
41	221.960	0.290	4.640	0.0000
42	226.335	0.290	4.640	0.0000
43	230.710	0.290	4.640	0.0000
44	236.710	0.290	4.640	0.0000
45	248.210	0.290	4.640	0.0000
46	256.960	0.290	4.640	0.0000
47	265.710	0.290	4.640	0.0000
48	277.210	0.290	4.640	0.0000
49	283.210	0.290	4.640	0.0000
50	287.585	0.290	4.640	0.0000
51	291.950	0.290	4.640	0.0000
52	296.325	0.290	4.640	0.0000
53	300.700	0.290	4.640	0.0000
54	306.700	0.290	4.640	0.0000
55	318.200	0.290	4.640	0.0000
56	326.950	0.290	4.640	0.0000
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000

Se.	X	Y (s)	Y (i)	Pend.
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 5

Definicion general

Seccion inicial ..... = 59 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 5

Se.	X	Y (s)	Y (i)	Pend.
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 6

Definicion general

Seccion inicial ..... = 57 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 6

Se.	X	Y (s)	Y (i)	Pend.
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 7

Definicion general

Seccion inicial ..... = 55 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 384.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 7

Se.	X	Y (s)	Y (i)	Pend.
55	318.200	0.290	4.640	0.0000
56	326.950	0.290	4.640	0.0000
57	335.700	0.290	4.640	0.0000
58	347.200	0.290	4.640	0.0000
59	353.200	0.290	4.640	0.0000
60	357.575	0.290	4.640	0.0000
61	361.940	0.290	4.640	0.0000
62	366.315	0.290	4.640	0.0000
63	370.690	0.290	4.640	0.0000
64	376.690	0.290	4.640	0.0000
65	388.190	0.290	4.640	0.0000
66	396.940	0.290	4.640	0.0000
67	405.690	0.290	4.640	0.0000
68	417.190	0.290	4.640	0.0000
69	423.190	0.290	4.640	0.0000
70	427.565	0.290	4.640	0.0000
71	431.930	0.290	4.640	0.0000
72	436.305	0.290	4.640	0.0000
73	440.680	0.290	4.640	0.0000
74	446.513	0.290	4.640	0.0000
75	452.346	0.290	4.640	0.0000
76	458.179	0.290	4.640	0.0000
77	464.012	0.290	4.640	0.0000
78	469.845	0.290	4.640	0.0000
79	475.678	0.290	4.640	0.0000
80	478.799	0.290	4.640	0.0000
81	481.920	0.290	4.640	0.0000

Cable Numero 8

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1383.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 8

Se.	X	Y (s)	Y (i)	Pend.
1	0.000	5.310	0.200	0.0000
2	4.748	5.276	0.200	0.0003
3	9.496	5.242	0.200	0.0000
4	14.244	5.209	0.200	0.0000
5	18.992	5.176	0.200	0.0000
6	23.436	5.152	0.200	0.0000
7	27.880	5.126	0.200	0.0000
8	32.324	5.101	0.200	0.0000
9	38.324	5.067	0.200	0.0000
10	43.157	5.042	0.200	0.0000
11	47.990	5.018	0.200	0.0000
12	52.823	4.995	0.200	0.0000
13	57.656	4.971	0.200	0.0000
14	63.656	4.944	0.200	0.0000
15	70.323	4.915	0.200	0.0000
16	76.990	4.887	0.200	0.0000
17	83.657	4.866	0.200	0.0000
18	90.324	4.850	0.200	0.0000
19	96.324	4.835	0.215	0.0000
20	101.157	4.820	0.230	0.0000
21	105.980	4.805	0.245	0.0000
22	110.813	4.790	0.260	0.0000
23	115.646	4.773	0.277	0.0001
24	121.646	4.773	0.277	0.0000
25	128.313	4.773	0.157	0.0000
26	134.980	4.773	0.157	0.0000
27	141.647	4.773	0.157	0.0000
28	148.314	4.773	0.157	0.0000
29	154.314	4.773	0.157	0.0000
30	159.147	4.773	0.157	0.0000
31	163.970	4.773	0.157	0.0000
32	168.803	4.773	0.157	0.0000
33	173.636	4.773	0.157	0.0000
34	179.636	4.773	0.157	0.0000
35	186.303	4.773	0.157	0.0000
36	192.970	4.773	0.157	0.0000
37	199.637	4.773	0.157	0.0000
38	206.304	4.773	0.157	0.0000
39	212.304	4.773	0.157	0.0000
40	217.137	4.773	0.157	0.0000
41	221.960	4.773	0.157	0.0000

Se.	X	Y (s)	Y (i)	Pend.
42	226.335	4.773	0.157	0.0000
43	230.710	4.773	0.157	0.0000
44	236.710	4.773	0.157	0.0000
45	248.210	4.773	0.157	0.0000
46	256.960	4.773	0.157	0.0000
47	265.710	4.773	0.157	0.0000
48	277.210	4.773	0.157	0.0000
49	283.210	4.773	0.157	0.0000
50	287.585	4.773	0.157	0.0000
51	291.950	4.773	0.157	0.0000
52	296.325	4.773	0.157	0.0000
53	300.700	4.773	0.157	0.0000
54	306.700	4.773	0.157	0.0000
55	318.200	4.773	0.157	0.0000
56	326.950	4.773	0.157	0.0000
57	335.700	4.773	0.157	0.0000
58	347.200	4.773	0.157	0.0000
59	353.200	4.773	0.157	0.0000
60	357.575	4.773	0.157	0.0000
61	361.940	4.773	0.157	0.0000
62	366.315	4.773	0.157	0.0000
63	370.690	4.773	0.157	0.0000
64	376.690	4.773	0.157	0.0000
65	388.190	4.773	0.157	0.0000
66	396.940	4.773	0.157	0.0000
67	405.690	4.773	0.157	0.0000
68	417.190	4.773	0.157	0.0000
69	423.190	4.773	0.157	0.0000
70	427.565	4.773	0.157	0.0000
71	431.930	4.773	0.157	0.0000
72	436.305	4.773	0.157	0.0000
73	440.680	4.773	0.157	0.0000
74	446.513	4.773	0.157	0.0000
75	452.346	4.773	0.157	0.0000
76	458.179	4.773	0.157	0.0000
77	464.012	4.773	0.157	0.0000
78	469.845	4.773	0.157	0.0000
79	475.678	4.773	0.157	0.0000
80	478.799	4.773	0.157	0.0000
81	481.920	4.773	0.157	0.0000

Cable Numero 9

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 9

Se.	X	Y (s)	Y (i)	Pend.
29	154.314	4.519	0.411	0.0000
30	159.147	4.519	0.411	0.0000
31	163.970	4.519	0.411	0.0000
32	168.803	4.519	0.411	0.0000
33	173.636	4.519	0.411	0.0000
34	179.636	4.518	0.412	0.0000
35	186.303	4.518	0.412	0.0001
36	192.970	4.518	0.412	0.0001
37	199.637	4.517	0.413	0.0001
38	206.304	4.517	0.413	0.0001
39	212.304	4.517	0.413	0.0001
40	217.137	4.516	0.414	0.0001
41	221.960	4.516	0.414	0.0001
42	226.335	4.516	0.414	0.0001
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000

Se.	X	Y (s)	Y (i)	Pend.
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 10

Definicion general

Seccion inicial ..... = 26 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 10

Se.	X	Y (s)	Y (i)	Pend.
26	134.980	4.520	0.410	0.0000
27	141.647	4.520	0.410	0.0000
28	148.314	4.520	0.410	0.0000
29	154.314	4.519	0.411	0.0000
30	159.147	4.519	0.411	0.0000
31	163.970	4.519	0.411	0.0000
32	168.803	4.519	0.411	0.0000
33	173.636	4.519	0.411	0.0000
34	179.636	4.518	0.412	0.0000
35	186.303	4.518	0.412	0.0001
36	192.970	4.518	0.412	0.0001
37	199.637	4.517	0.413	0.0001
38	206.304	4.517	0.413	0.0001
39	212.304	4.517	0.413	0.0001
40	217.137	4.516	0.414	0.0001
41	221.960	4.516	0.414	0.0001
42	226.335	4.516	0.414	0.0001
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001

Se.	X	Y (s)	Y (i)	Pend.
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 11

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 269.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 11

Se.	X	Y (s)	Y (i)	Pend.
24	121.646	4.520	0.530	0.0000
25	128.313	4.520	0.410	0.0000
26	134.980	4.520	0.410	0.0000
27	141.647	4.520	0.410	0.0000
28	148.314	4.520	0.410	0.0000
29	154.314	4.519	0.411	0.0000
30	159.147	4.519	0.411	0.0000
31	163.970	4.519	0.411	0.0000
32	168.803	4.519	0.411	0.0000
33	173.636	4.519	0.411	0.0000
34	179.636	4.518	0.412	0.0000
35	186.303	4.518	0.412	0.0001
36	192.970	4.518	0.412	0.0001
37	199.637	4.517	0.413	0.0001
38	206.304	4.517	0.413	0.0001
39	212.304	4.517	0.413	0.0001
40	217.137	4.516	0.414	0.0001
41	221.960	4.516	0.414	0.0001
42	226.335	4.516	0.414	0.0001
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001

Se.	X	Y (s)	Y (i)	Pend.
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 12

Definicion general

Seccion inicial ..... = 43 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 12

Se.	X	Y (s)	Y (i)	Pend.
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 13

Definicion general

Seccion inicial ..... = 39 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 13

Se.	X	Y (s)	Y (i)	Pend.
39	212.304	4.517	0.413	0.0001
40	217.137	4.516	0.414	0.0001
41	221.960	4.516	0.414	0.0001
42	226.335	4.516	0.414	0.0001
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000

Se.	X	Y (s)	Y (i)	Pend.
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 14

Definicion general

Seccion inicial ..... = 36 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 192.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 14

Se.	X	Y (s)	Y (i)	Pend.
36	192.970	4.518	0.412	0.0001
37	199.637	4.517	0.413	0.0001
38	206.304	4.517	0.413	0.0001
39	212.304	4.517	0.413	0.0001
40	217.137	4.516	0.414	0.0001
41	221.960	4.516	0.414	0.0001
42	226.335	4.516	0.414	0.0001
43	230.710	4.515	0.415	0.0001
44	236.710	4.515	0.415	0.0001
45	248.210	4.514	0.416	0.0001
46	256.960	4.513	0.417	0.0001
47	265.710	4.513	0.417	0.0001
48	277.210	4.512	0.418	0.0001
49	283.210	4.511	0.419	0.0001
50	287.585	4.511	0.419	0.0001
51	291.950	4.511	0.419	0.0001
52	296.325	4.510	0.420	0.0001
53	300.700	4.510	0.420	0.0001
54	306.700	4.509	0.421	0.0001
55	318.200	4.508	0.422	0.0001
56	326.950	4.508	0.422	0.0001
57	335.700	4.507	0.423	0.0001
58	347.200	4.506	0.424	0.0001
59	353.200	4.506	0.424	0.0001
60	357.575	4.505	0.425	0.0001
61	361.940	4.505	0.425	0.0001
62	366.315	4.505	0.425	0.0001
63	370.690	4.504	0.426	0.0001
64	376.690	4.504	0.426	0.0001
65	388.190	4.503	0.427	0.0001
66	396.940	4.503	0.427	0.0001
67	405.690	4.502	0.428	0.0001
68	417.190	4.502	0.428	0.0000
69	423.190	4.501	0.429	0.0000
70	427.565	4.501	0.429	0.0000
71	431.930	4.501	0.429	0.0000
72	436.305	4.501	0.429	0.0000
73	440.680	4.501	0.429	0.0000
74	446.513	4.501	0.429	0.0000
75	452.346	4.500	0.430	0.0000
76	458.179	4.500	0.430	0.0000

Se.	X	Y (s)	Y (i)	Pend.
77	464.012	4.500	0.430	0.0000
78	469.845	4.500	0.430	0.0000
79	475.678	4.500	0.430	0.0000
80	478.799	4.500	0.430	0.0000
81	481.920	4.500	0.430	0.0000

Cable Numero 15

Definicion general

Seccion inicial ..... = 9 (Activa)
Seccion final ..... = 13 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 15

Se.	X	Y (s)	Y (i)	Pend.
9	38.324	0.254	5.013	0.0000
10	43.157	0.254	4.988	0.0000
11	47.990	0.254	4.964	0.0000
12	52.823	0.254	4.941	0.0000
13	57.656	0.254	4.917	0.0000

Cable Numero 16

Definicion general

Seccion inicial ..... = 19 (Activa)
Seccion final ..... = 23 (Pasiva)

Fuerza de Pretensado ..... = 1520.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 16

Se.	X	Y (s)	Y (i)	Pend.
19	96.324	0.254	4.796	0.0000
20	101.157	0.254	4.796	0.0000
21	105.980	0.254	4.796	0.0000
22	110.813	0.254	4.796	0.0000
23	115.646	0.254	4.796	0.0000

Cable Numero 17

Definicion general

Seccion inicial ..... = 29 (Activa)
Seccion final ..... = 33 (Pasiva)

Fuerza de Pretensado ..... = 1520.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 17

Se.	X	Y (s)	Y (i)	Pend.
29	154.314	0.254	4.676	0.0000
30	159.147	0.254	4.676	0.0000
31	163.970	0.254	4.676	0.0000
32	168.803	0.254	4.676	0.0000
33	173.636	0.254	4.676	0.0000

Cable Numero 18

Definicion general

Seccion inicial ..... = 39 (Activa)
Seccion final ..... = 43 (Pasiva)

Fuerza de Pretensado ..... = 2660.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 18

Se.	X	Y (s)	Y (i)	Pend.
39	212.304	0.254	4.676	0.0000
40	217.137	0.254	4.676	0.0000
41	221.960	0.254	4.676	0.0000
42	226.335	0.254	4.676	0.0000
43	230.710	0.254	4.676	0.0000

Cable Numero 19

Definicion general

Seccion inicial ..... = 49 (Activa)
Seccion final ..... = 53 (Pasiva)

Fuerza de Pretensado ..... = 3420.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 19

Se.	X	Y (s)	Y (i)	Pend.
49	283.210	0.254	4.676	0.0000
50	287.585	0.254	4.676	0.0000
51	291.950	0.254	4.676	0.0000
52	296.325	0.254	4.676	0.0000
53	300.700	0.254	4.676	0.0000

Cable Numero 20

Definicion general

Seccion inicial ..... = 59 (Activa)
Seccion final ..... = 63 (Pasiva)

Fuerza de Pretensado ..... = 3420.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 20

Se.	X	Y (s)	Y (i)	Pend.
59	353.200	0.254	4.676	0.0000
60	357.575	0.254	4.676	0.0000
61	361.940	0.254	4.676	0.0000
62	366.315	0.254	4.676	0.0000
63	370.690	0.254	4.676	0.0000

Cable Numero 21

Definicion general

Seccion inicial ..... = 69 (Activa)
Seccion final ..... = 73 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 21

Se.	X	Y (s)	Y (i)	Pend.
69	423.190	0.254	4.676	0.0000
70	427.565	0.254	4.676	0.0000
71	431.930	0.254	4.676	0.0000
72	436.305	0.254	4.676	0.0000
73	440.680	0.254	4.676	0.0000

Cable Numero 22

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 9 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 22

Se.	X	Y (s)	Y (i)	Pend.
1	0.000	5.310	0.200	0.0000
2	4.748	5.276	0.200	0.0003
3	9.496	5.242	0.200	0.0000
4	14.244	5.209	0.200	0.0000
5	18.992	5.176	0.200	0.0000
6	23.436	5.152	0.200	0.0000
7	27.880	5.126	0.200	0.0000
8	32.324	5.101	0.200	0.0000
9	38.324	5.067	0.200	0.0000

Cable Numero 23

Definicion general

Seccion inicial ..... = 13 (Activa)
Seccion final ..... = 19 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 23

Se.	X	Y (s)	Y (i)	Pend.
13	57.656	4.971	0.200	0.0000
14	63.656	4.944	0.200	0.0000
15	70.323	4.915	0.200	0.0000
16	76.990	4.887	0.200	0.0000
17	83.657	4.866	0.200	0.0000
18	90.324	4.850	0.200	0.0000
19	96.324	4.835	0.215	0.0000

Cable Numero 24

Definicion general

Seccion inicial ..... = 23 (Activa)
Seccion final ..... = 29 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 24

Se.	X	Y (s)	Y (i)	Pend.
23	115.646	4.773	0.277	0.0001
24	121.646	4.773	0.277	0.0000
25	128.313	4.773	0.157	0.0000
26	134.980	4.773	0.157	0.0000
27	141.647	4.773	0.157	0.0000
28	148.314	4.773	0.157	0.0000
29	154.314	4.773	0.157	0.0000

Cable Numero 25

Definicion general

Seccion inicial ..... = 33 (Activa)
Seccion final ..... = 39 (Pasiva)

Fuerza de Pretensado ..... = 1140.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 25

Se.	X	Y (s)	Y (i)	Pend.
33	173.636	4.773	0.157	0.0000
34	179.636	4.773	0.157	0.0000
35	186.303	4.773	0.157	0.0000
36	192.970	4.773	0.157	0.0000
37	199.637	4.773	0.157	0.0000
38	206.304	4.773	0.157	0.0000
39	212.304	4.773	0.157	0.0000

Cable Numero 26

Definicion general

Seccion inicial ..... = 43 (Activa)
Seccion final ..... = 49 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 26

Se.	X	Y (s)	Y (i)	Pend.
43	230.710	4.773	0.157	0.0000
44	236.710	4.773	0.157	0.0000
45	248.210	4.773	0.157	0.0000
46	256.960	4.773	0.157	0.0000
47	265.710	4.773	0.157	0.0000
48	277.210	4.773	0.157	0.0000
49	283.210	4.773	0.157	0.0000

Cable Numero 27

Definicion general

Seccion inicial ..... = 53 (Activa)
Seccion final ..... = 59 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 27

Se.	X	Y (s)	Y (i)	Pend.
53	300.700	4.773	0.157	0.0000
54	306.700	4.773	0.157	0.0000
55	318.200	4.773	0.157	0.0000
56	326.950	4.773	0.157	0.0000
57	335.700	4.773	0.157	0.0000
58	347.200	4.773	0.157	0.0000
59	353.200	4.773	0.157	0.0000

Cable Numero 28

Definicion general

Seccion inicial ..... = 63 (Activa)
Seccion final ..... = 69 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 28

Se.	X	Y (s)	Y (i)	Pend.
63	370.690	4.773	0.157	0.0000
64	376.690	4.773	0.157	0.0000
65	388.190	4.773	0.157	0.0000
66	396.940	4.773	0.157	0.0000
67	405.690	4.773	0.157	0.0000
68	417.190	4.773	0.157	0.0000
69	423.190	4.773	0.157	0.0000

Cable Numero 29

Definicion general

Seccion inicial ..... = 73 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1900.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 29

Se.	X	Y (s)	Y (i)	Pend.
73	440.680	4.773	0.157	0.0000
74	446.513	4.773	0.157	0.0000
75	452.346	4.773	0.157	0.0000
76	458.179	4.773	0.157	0.0000
77	464.012	4.773	0.157	0.0000
78	469.845	4.773	0.157	0.0000
79	475.678	4.773	0.157	0.0000
80	478.799	4.773	0.157	0.0000
81	481.920	4.773	0.157	0.0000

Cable Numero 30

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 81 (Pasiva)

Fuerza de Pretensado ..... = 1844.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0000

Replanteo del cable : 30

Se.	X	Y (s)	Y (i)	Pend.
1	0.000	2.487	3.023	0.0000
2	4.748	2.487	2.989	0.0000
3	9.496	2.487	2.955	0.0000
4	14.244	2.487	2.922	0.0000
5	18.992	2.487	2.889	0.0000
6	23.436	2.487	2.865	0.0000
7	27.880	2.487	2.839	0.0000
8	32.324	2.487	2.814	0.0000
9	38.324	2.487	2.780	0.0000
10	43.157	2.487	2.755	0.0000
11	47.990	2.487	2.731	0.0000
12	52.823	2.487	2.708	0.0000
13	57.656	2.487	2.684	0.0000
14	63.656	2.487	2.657	0.0000
15	70.323	2.487	2.628	0.0000
16	76.990	2.487	2.600	0.0000
17	83.657	2.487	2.579	0.0000
18	90.324	2.487	2.563	0.0000
19	96.324	2.487	2.563	0.0000
20	101.157	2.487	2.563	0.0000
21	105.980	2.487	2.563	0.0000
22	110.813	2.487	2.563	0.0000
23	115.646	2.487	2.563	0.0000
24	121.646	2.487	2.563	0.0000
25	128.313	2.487	2.443	0.0000
26	134.980	2.487	2.443	0.0000
27	141.647	2.487	2.443	0.0000
28	148.314	2.487	2.443	0.0000
29	154.314	2.487	2.443	0.0000
30	159.147	2.487	2.443	0.0000
31	163.970	2.487	2.443	0.0000
32	168.803	2.487	2.443	0.0000
33	173.636	2.487	2.443	0.0000
34	179.636	2.487	2.443	0.0000
35	186.303	2.487	2.443	0.0000
36	192.970	2.487	2.443	0.0000
37	199.637	2.487	2.443	0.0000
38	206.304	2.487	2.443	0.0000
39	212.304	2.487	2.443	0.0000
40	217.137	2.487	2.443	0.0000
41	221.960	2.487	2.443	0.0000

Se.	X	Y (s)	Y (i)	Pend.
42	226.335	2.487	2.443	0.0000
43	230.710	2.487	2.443	0.0000
44	236.710	2.487	2.443	0.0000
45	248.210	2.487	2.443	0.0000
46	256.960	2.487	2.443	0.0000
47	265.710	2.487	2.443	0.0000
48	277.210	2.487	2.443	0.0000
49	283.210	2.487	2.443	0.0000
50	287.585	2.487	2.443	0.0000
51	291.950	2.487	2.443	0.0000
52	296.325	2.487	2.443	0.0000
53	300.700	2.487	2.443	0.0000
54	306.700	2.487	2.443	0.0000
55	318.200	2.487	2.443	0.0000
56	326.950	2.487	2.443	0.0000
57	335.700	2.487	2.443	0.0000
58	347.200	2.487	2.443	0.0000
59	353.200	2.487	2.443	0.0000
60	357.575	2.487	2.443	0.0000
61	361.940	2.487	2.443	0.0000
62	366.315	2.487	2.443	0.0000
63	370.690	2.487	2.443	0.0000
64	376.690	2.487	2.443	0.0000
65	388.190	2.487	2.443	0.0000
66	396.940	2.487	2.443	0.0000
67	405.690	2.487	2.443	0.0000
68	417.190	2.487	2.443	0.0000
69	423.190	2.487	2.443	0.0000
70	427.565	2.487	2.443	0.0000
71	431.930	2.487	2.443	0.0000
72	436.305	2.487	2.443	0.0000
73	440.680	2.487	2.443	0.0000
74	446.513	2.487	2.443	0.0000
75	452.346	2.487	2.443	0.0000
76	458.179	2.487	2.443	0.0000
77	464.012	2.487	2.443	0.0000
78	469.845	2.487	2.443	0.0000
79	475.678	2.487	2.443	0.0000
80	478.799	2.487	2.443	0.0000
81	481.920	2.487	2.443	0.0000

Definicion esfuerzos unitarios cable : 1

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
1	2766.000	0.000	2766.000
2	2766.000	0.000	2766.000
3	2766.000	0.000	2766.000
4	2766.000	0.000	2766.000
5	2766.000	0.000	2766.000
6	2766.000	0.000	2766.000
7	2766.000	0.000	2766.000
8	2766.000	0.000	2766.000
9	2766.000	0.000	2766.000
10	2766.000	0.000	2766.000
11	2766.000	0.000	2766.000
12	2766.000	0.000	2766.000
13	2766.000	0.000	2766.000
14	2766.000	0.000	2766.000
15	2766.000	0.000	2766.000
16	2766.000	0.000	2766.000
17	2766.000	0.000	2766.000
18	2766.000	0.000	2766.000
19	2766.000	0.000	2766.000
20	2766.000	0.000	2766.000
21	2766.000	0.000	2766.000
22	2766.000	0.000	2766.000
23	2766.000	0.000	2766.000
24	2766.000	0.000	2766.000
25	2766.000	0.000	2766.000
26	2766.000	0.000	2766.000
27	2766.000	0.000	2766.000
28	2766.000	0.000	2766.000
29	2766.000	0.000	2766.000
30	2766.000	0.000	2766.000
31	2766.000	0.000	2766.000
32	2766.000	0.000	2766.000
33	2766.000	0.000	2766.000
34	2766.000	0.000	2766.000
35	2766.000	0.000	2766.000
36	2766.000	0.000	2766.000
37	2766.000	0.000	2766.000
38	2766.000	0.000	2766.000
39	2766.000	0.000	2766.000
40	2766.000	0.000	2766.000
41	2766.000	0.000	2766.000
42	2766.000	0.000	2766.000
43	2766.000	0.000	2766.000
44	2766.000	0.000	2766.000
45	2766.000	0.000	2766.000
46	2766.000	0.000	2766.000
47	2766.000	0.000	2766.000
48	2766.000	0.000	2766.000

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
49	2766.000	0.000	2766.000
50	2766.000	0.000	2766.000
51	2766.000	0.000	2766.000
52	2766.000	0.000	2766.000
53	2766.000	0.000	2766.000
54	2766.000	0.000	2766.000
55	2766.000	0.000	2766.000
56	2766.000	0.000	2766.000
57	2766.000	0.000	2766.000
58	2766.000	0.000	2766.000
59	2766.000	0.000	2766.000
60	2766.000	0.000	2766.000
61	2766.000	0.000	2766.000
62	2766.000	0.000	2766.000
63	2766.000	0.000	2766.000
64	2766.000	0.000	2766.000
65	2766.000	0.000	2766.000
66	2766.000	0.000	2766.000
67	2766.000	0.000	2766.000
68	2766.000	0.000	2766.000
69	2766.000	0.000	2766.000
70	2766.000	0.000	2766.000
71	2766.000	0.000	2766.000
72	2766.000	0.000	2766.000
73	2766.000	0.000	2766.000
74	2766.000	0.000	2766.000
75	2766.000	0.000	2766.000
76	2766.000	0.000	2766.000
77	2766.000	0.000	2766.000
78	2766.000	0.000	2766.000
79	2766.000	0.000	2766.000
80	2766.000	0.000	2766.000
81	2766.000	0.000	2766.000

Alargamiento del cable ..... 3407.0 mm.

Definicion esfuerzos unitarios cable : 2

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
29	538.000	0.000	538.000
30	538.000	0.000	538.000
31	538.000	0.000	538.000
32	538.000	0.000	538.000
33	538.000	0.000	538.000
34	538.000	0.000	538.000
35	538.000	0.000	538.000
36	538.000	0.000	538.000
37	538.000	0.000	538.000
38	538.000	0.000	538.000
39	538.000	0.000	538.000
40	538.000	0.000	538.000
41	538.000	0.000	538.000
42	538.000	0.000	538.000
43	538.000	0.000	538.000
44	538.000	0.000	538.000
45	538.000	0.000	538.000
46	538.000	0.000	538.000
47	538.000	0.000	538.000
48	538.000	0.000	538.000
49	538.000	0.000	538.000
50	538.000	0.000	538.000
51	538.000	0.000	538.000
52	538.000	0.000	538.000
53	538.000	0.000	538.000
54	538.000	0.000	538.000
55	538.000	0.000	538.000
56	538.000	0.000	538.000
57	538.000	0.000	538.000
58	538.000	0.000	538.000
59	538.000	0.000	538.000
60	538.000	0.000	538.000
61	538.000	0.000	538.000
62	538.000	0.000	538.000
63	538.000	0.000	538.000
64	538.000	0.000	538.000
65	538.000	0.000	538.000
66	538.000	0.000	538.000
67	538.000	0.000	538.000
68	538.000	0.000	538.000
69	538.000	0.000	538.000
70	538.000	0.000	538.000
71	538.000	0.000	538.000
72	538.000	0.000	538.000
73	538.000	0.000	538.000
74	538.000	0.000	538.000
75	538.000	0.000	538.000
76	538.000	0.000	538.000

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
77	538.000	0.000	538.000
78	538.000	0.000	538.000
79	538.000	0.000	538.000
80	538.000	0.000	538.000
81	538.000	0.000	538.000

Alargamiento del cable ..... 2315.6 mm.

Definicion esfuerzos unitarios cable : 3

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
26	538.000	0.000	538.000
27	538.000	0.000	538.000
28	538.000	0.000	538.000
29	538.000	0.000	538.000
30	538.000	0.000	538.000
31	538.000	0.000	538.000
32	538.000	0.000	538.000
33	538.000	0.000	538.000
34	538.000	0.000	538.000
35	538.000	0.000	538.000
36	538.000	0.000	538.000
37	538.000	0.000	538.000
38	538.000	0.000	538.000
39	538.000	0.000	538.000
40	538.000	0.000	538.000
41	538.000	0.000	538.000
42	538.000	0.000	538.000
43	538.000	0.000	538.000
44	538.000	0.000	538.000
45	538.000	0.000	538.000
46	538.000	0.000	538.000
47	538.000	0.000	538.000
48	538.000	0.000	538.000
49	538.000	0.000	538.000
50	538.000	0.000	538.000
51	538.000	0.000	538.000
52	538.000	0.000	538.000
53	538.000	0.000	538.000
54	538.000	0.000	538.000
55	538.000	0.000	538.000
56	538.000	0.000	538.000
57	538.000	0.000	538.000
58	538.000	0.000	538.000
59	538.000	0.000	538.000
60	538.000	0.000	538.000
61	538.000	0.000	538.000
62	538.000	0.000	538.000
63	538.000	0.000	538.000
64	538.000	0.000	538.000
65	538.000	0.000	538.000
66	538.000	0.000	538.000
67	538.000	0.000	538.000
68	538.000	0.000	538.000
69	538.000	0.000	538.000
70	538.000	0.000	538.000
71	538.000	0.000	538.000
72	538.000	0.000	538.000
73	538.000	0.000	538.000

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
74	538.000	0.000	538.000
75	538.000	0.000	538.000
76	538.000	0.000	538.000
77	538.000	0.000	538.000
78	538.000	0.000	538.000
79	538.000	0.000	538.000
80	538.000	0.000	538.000
81	538.000	0.000	538.000

Alargamiento del cable ..... 2452.3 mm.

Definicion esfuerzos unitarios cable : 4

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
24	538.000	0.000	538.000
25	538.000	0.000	538.000
26	538.000	0.000	538.000
27	538.000	0.000	538.000
28	538.000	0.000	538.000
29	538.000	0.000	538.000
30	538.000	0.000	538.000
31	538.000	0.000	538.000
32	538.000	0.000	538.000
33	538.000	0.000	538.000
34	538.000	0.000	538.000
35	538.000	0.000	538.000
36	538.000	0.000	538.000
37	538.000	0.000	538.000
38	538.000	0.000	538.000
39	538.000	0.000	538.000
40	538.000	0.000	538.000
41	538.000	0.000	538.000
42	538.000	0.000	538.000
43	538.000	0.000	538.000
44	538.000	0.000	538.000
45	538.000	0.000	538.000
46	538.000	0.000	538.000
47	538.000	0.000	538.000
48	538.000	0.000	538.000
49	538.000	0.000	538.000
50	538.000	0.000	538.000
51	538.000	0.000	538.000
52	538.000	0.000	538.000
53	538.000	0.000	538.000
54	538.000	0.000	538.000
55	538.000	0.000	538.000
56	538.000	0.000	538.000
57	538.000	0.000	538.000
58	538.000	0.000	538.000
59	538.000	0.000	538.000
60	538.000	0.000	538.000
61	538.000	0.000	538.000
62	538.000	0.000	538.000
63	538.000	0.000	538.000
64	538.000	0.000	538.000
65	538.000	0.000	538.000
66	538.000	0.000	538.000
67	538.000	0.000	538.000
68	538.000	0.000	538.000
69	538.000	0.000	538.000
70	538.000	0.000	538.000
71	538.000	0.000	538.000

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
72	538.000	0.000	538.000
73	538.000	0.000	538.000
74	538.000	0.000	538.000
75	538.000	0.000	538.000
76	538.000	0.000	538.000
77	538.000	0.000	538.000
78	538.000	0.000	538.000
79	538.000	0.000	538.000
80	538.000	0.000	538.000
81	538.000	0.000	538.000

Alargamiento del cable ..... 2546.5 mm.

Definicion esfuerzos unitarios cable : 5

Acciones del cable

Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
59	384.000	0.000	384.000
60	384.000	0.000	384.000
61	384.000	0.000	384.000
62	384.000	0.000	384.000
63	384.000	0.000	384.000
64	384.000	0.000	384.000
65	384.000	0.000	384.000
66	384.000	0.000	384.000
67	384.000	0.000	384.000
68	384.000	0.000	384.000
69	384.000	0.000	384.000
70	384.000	0.000	384.000
71	384.000	0.000	384.000
72	384.000	0.000	384.000
73	384.000	0.000	384.000
74	384.000	0.000	384.000
75	384.000	0.000	384.000
76	384.000	0.000	384.000
77	384.000	0.000	384.000
78	384.000	0.000	384.000
79	384.000	0.000	384.000
80	384.000	0.000	384.000
81	384.000	0.000	384.000

Alargamiento del cable ..... 909.6 mm.

Definicion esfuerzos unitarios cable : 6

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
57	384.000	0.000	384.000
58	384.000	0.000	384.000
59	384.000	0.000	384.000
60	384.000	0.000	384.000
61	384.000	0.000	384.000
62	384.000	0.000	384.000
63	384.000	0.000	384.000
64	384.000	0.000	384.000
65	384.000	0.000	384.000
66	384.000	0.000	384.000
67	384.000	0.000	384.000
68	384.000	0.000	384.000
69	384.000	0.000	384.000
70	384.000	0.000	384.000
71	384.000	0.000	384.000
72	384.000	0.000	384.000
73	384.000	0.000	384.000
74	384.000	0.000	384.000
75	384.000	0.000	384.000
76	384.000	0.000	384.000
77	384.000	0.000	384.000
78	384.000	0.000	384.000
79	384.000	0.000	384.000
80	384.000	0.000	384.000
81	384.000	0.000	384.000

Alargamiento del cable ..... 1033.3 mm.

Definicion esfuerzos unitarios cable : 7

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
55	384.000	0.000	384.000
56	384.000	0.000	384.000
57	384.000	0.000	384.000
58	384.000	0.000	384.000
59	384.000	0.000	384.000
60	384.000	0.000	384.000
61	384.000	0.000	384.000
62	384.000	0.000	384.000
63	384.000	0.000	384.000
64	384.000	0.000	384.000
65	384.000	0.000	384.000
66	384.000	0.000	384.000
67	384.000	0.000	384.000
68	384.000	0.000	384.000
69	384.000	0.000	384.000
70	384.000	0.000	384.000
71	384.000	0.000	384.000
72	384.000	0.000	384.000
73	384.000	0.000	384.000
74	384.000	0.000	384.000
75	384.000	0.000	384.000
76	384.000	0.000	384.000
77	384.000	0.000	384.000
78	384.000	0.000	384.000
79	384.000	0.000	384.000
80	384.000	0.000	384.000
81	384.000	0.000	384.000

Alargamiento del cable ..... 1156.9 mm.

Definicion esfuerzos unitarios cable : 8

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
1	1383.000	0.000	1383.000
2	1382.923	0.368	1382.923
3	1383.000	0.000	1383.000
4	1383.000	0.000	1383.000
5	1383.000	0.000	1383.000
6	1383.000	0.000	1383.000
7	1383.000	0.000	1383.000
8	1383.000	0.000	1383.000
9	1383.000	0.000	1383.000
10	1382.996	0.018	1382.996
11	1383.000	0.000	1383.000
12	1383.000	0.000	1383.000
13	1383.000	0.000	1383.000
14	1383.000	0.000	1383.000
15	1383.000	0.000	1383.000
16	1383.000	0.000	1383.000
17	1383.000	0.000	1383.000
18	1383.000	0.000	1383.000
19	1383.000	0.000	1383.000
20	1382.997	0.016	1382.997
21	1382.989	0.053	1382.989
22	1382.992	0.037	1382.992
23	1382.982	0.084	1382.982
24	1383.000	0.000	1383.000
25	1383.000	0.000	1383.000
26	1383.000	0.000	1383.000
27	1383.000	0.000	1383.000
28	1383.000	0.000	1383.000
29	1383.000	0.000	1383.000
30	1383.000	0.000	1383.000
31	1383.000	0.000	1383.000
32	1383.000	0.000	1383.000
33	1383.000	0.000	1383.000
34	1383.000	0.000	1383.000
35	1383.000	0.000	1383.000
36	1383.000	0.000	1383.000
37	1383.000	0.000	1383.000
38	1383.000	0.000	1383.000
39	1383.000	0.000	1383.000
40	1383.000	0.000	1383.000
41	1383.000	0.000	1383.000
42	1383.000	0.000	1383.000
43	1383.000	0.000	1383.000
44	1383.000	0.000	1383.000
45	1383.000	0.000	1383.000
46	1383.000	0.000	1383.000
47	1383.000	0.000	1383.000
48	1383.000	0.000	1383.000

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
49	1383.000	0.000	1383.000
50	1383.000	0.000	1383.000
51	1383.000	0.000	1383.000
52	1383.000	0.000	1383.000
53	1383.000	0.000	1383.000
54	1383.000	0.000	1383.000
55	1383.000	0.000	1383.000
56	1383.000	0.000	1383.000
57	1383.000	0.000	1383.000
58	1383.000	0.000	1383.000
59	1383.000	0.000	1383.000
60	1383.000	0.000	1383.000
61	1383.000	0.000	1383.000
62	1383.000	0.000	1383.000
63	1383.000	0.000	1383.000
64	1383.000	0.000	1383.000
65	1383.000	0.000	1383.000
66	1383.000	0.000	1383.000
67	1383.000	0.000	1383.000
68	1383.000	0.000	1383.000
69	1383.000	0.000	1383.000
70	1383.000	0.000	1383.000
71	1383.000	0.000	1383.000
72	1383.000	0.000	1383.000
73	1383.000	0.000	1383.000
74	1383.000	0.000	1383.000
75	1383.000	0.000	1383.000
76	1383.000	0.000	1383.000
77	1383.000	0.000	1383.000
78	1383.000	0.000	1383.000
79	1383.000	0.000	1383.000
80	1383.000	0.000	1383.000
81	1383.000	0.000	1383.000

Alargamiento del cable ..... 3406.9 mm.

Definicion esfuerzos unitarios cable : 9

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
29	269.000	0.008	269.000
30	269.000	0.009	269.000
31	269.000	0.010	269.000
32	268.999	0.011	268.999
33	268.999	0.012	268.999
34	268.999	0.013	268.999
35	268.999	0.014	268.999
36	268.999	0.015	268.999
37	268.998	0.016	268.998
38	268.998	0.016	268.998
39	268.998	0.017	268.998
40	268.998	0.018	268.998
41	268.998	0.018	268.998
42	268.998	0.019	268.998
43	268.998	0.019	268.998
44	268.998	0.020	268.998
45	268.997	0.020	268.997
46	268.997	0.021	268.997
47	268.997	0.021	268.997
48	268.997	0.022	268.997
49	268.997	0.022	268.997
50	268.997	0.022	268.997
51	268.997	0.022	268.997
52	268.997	0.022	268.997
53	268.997	0.022	268.997
54	268.997	0.022	268.997
55	268.997	0.022	268.997
56	268.997	0.022	268.997
57	268.997	0.021	268.997
58	268.997	0.020	268.997
59	268.998	0.020	268.998
60	268.998	0.020	268.998
61	268.998	0.019	268.998
62	268.998	0.019	268.998
63	268.998	0.019	268.998
64	268.998	0.018	268.998
65	268.998	0.017	268.998
66	268.998	0.016	268.998
67	268.999	0.015	268.999
68	268.999	0.013	268.999
69	268.999	0.012	268.999
70	268.999	0.011	268.999
71	269.000	0.010	269.000
72	269.000	0.010	269.000
73	269.000	0.009	269.000
74	269.000	0.008	269.000
75	269.000	0.007	269.000
76	269.001	0.005	269.001

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
77	269.001	0.004	269.001
78	269.001	0.003	269.001
79	269.001	0.001	269.001
80	269.002	0.001	269.002
81	269.002	0.000	269.002

Alargamiento del cable ..... 2315.6 mm.

Definicion esfuerzos unitarios cable : 10

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
26	269.000	0.004	269.000
27	269.000	0.006	269.000
28	268.999	0.007	268.999
29	268.999	0.008	268.999
30	268.999	0.009	268.999
31	268.999	0.010	268.999
32	268.999	0.011	268.999
33	268.998	0.012	268.998
34	268.998	0.013	268.998
35	268.998	0.014	268.998
36	268.998	0.015	268.998
37	268.998	0.016	268.998
38	268.997	0.016	268.997
39	268.997	0.017	268.997
40	268.997	0.018	268.997
41	268.997	0.018	268.997
42	268.997	0.019	268.997
43	268.997	0.019	268.997
44	268.997	0.020	268.997
45	268.997	0.020	268.997
46	268.997	0.021	268.997
47	268.996	0.021	268.996
48	268.996	0.022	268.996
49	268.996	0.022	268.996
50	268.996	0.022	268.996
51	268.996	0.022	268.996
52	268.996	0.022	268.996
53	268.996	0.022	268.996
54	268.996	0.022	268.996
55	268.996	0.022	268.996
56	268.996	0.022	268.996
57	268.996	0.021	268.996
58	268.997	0.020	268.997
59	268.997	0.020	268.997
60	268.997	0.020	268.997
61	268.997	0.019	268.997
62	268.997	0.019	268.997
63	268.997	0.019	268.997
64	268.997	0.018	268.997
65	268.997	0.017	268.997
66	268.998	0.016	268.998
67	268.998	0.015	268.998
68	268.998	0.013	268.998
69	268.998	0.012	268.998
70	268.999	0.011	268.999
71	268.999	0.010	268.999
72	268.999	0.010	268.999
73	268.999	0.009	268.999

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
74	268.999	0.008	268.999
75	269.000	0.007	269.000
76	269.000	0.005	269.000
77	269.000	0.004	269.000
78	269.000	0.003	269.000
79	269.001	0.001	269.001
80	269.001	0.001	269.001
81	269.001	0.000	269.001

Alargamiento del cable ..... 2452.3 mm.

Definicion esfuerzos unitarios cable : 11

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
24	269.000	0.001	269.000
25	269.000	0.003	269.000
26	268.999	0.004	268.999
27	268.999	0.006	268.999
28	268.999	0.007	268.999
29	268.999	0.008	268.999
30	268.998	0.009	268.998
31	268.998	0.010	268.998
32	268.998	0.011	268.998
33	268.998	0.012	268.998
34	268.998	0.013	268.998
35	268.997	0.014	268.997
36	268.997	0.015	268.997
37	268.997	0.016	268.997
38	268.997	0.016	268.997
39	268.997	0.017	268.997
40	268.997	0.018	268.997
41	268.996	0.018	268.996
42	268.996	0.019	268.996
43	268.996	0.019	268.996
44	268.996	0.020	268.996
45	268.996	0.020	268.996
46	268.996	0.021	268.996
47	268.996	0.021	268.996
48	268.996	0.022	268.996
49	268.996	0.022	268.996
50	268.996	0.022	268.996
51	268.996	0.022	268.996
52	268.996	0.022	268.996
53	268.996	0.022	268.996
54	268.996	0.022	268.996
55	268.996	0.022	268.996
56	268.996	0.022	268.996
57	268.996	0.021	268.996
58	268.996	0.020	268.996
59	268.996	0.020	268.996
60	268.996	0.020	268.996
61	268.996	0.019	268.996
62	268.996	0.019	268.996
63	268.996	0.019	268.996
64	268.996	0.018	268.996
65	268.997	0.017	268.997
66	268.997	0.016	268.997
67	268.997	0.015	268.997
68	268.998	0.013	268.998
69	268.998	0.012	268.998
70	268.998	0.011	268.998
71	268.998	0.010	268.998

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
72	268.998	0.010	268.998
73	268.998	0.009	268.998
74	268.999	0.008	268.999
75	268.999	0.007	268.999
76	268.999	0.005	268.999
77	268.999	0.004	268.999
78	269.000	0.003	269.000
79	269.000	0.001	269.000
80	269.000	0.001	269.000
81	269.000	0.000	269.000

Alargamiento del cable ..... 1212.7 mm.

Definicion esfuerzos unitarios cable : 12

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
43	192.000	0.014	192.000
44	192.000	0.014	192.000
45	192.000	0.015	192.000
46	192.000	0.015	192.000
47	192.000	0.015	192.000
48	192.000	0.016	192.000
49	192.000	0.016	192.000
50	192.000	0.016	192.000
51	192.000	0.016	192.000
52	192.000	0.016	192.000
53	192.000	0.016	192.000
54	192.000	0.016	192.000
55	192.000	0.016	192.000
56	192.000	0.015	192.000
57	192.000	0.015	192.000
58	192.000	0.015	192.000
59	192.000	0.014	192.000
60	192.000	0.014	192.000
61	192.000	0.014	192.000
62	192.000	0.014	192.000
63	192.000	0.013	192.000
64	192.000	0.013	192.000
65	192.000	0.012	192.000
66	192.001	0.011	192.001
67	192.001	0.010	192.001
68	192.001	0.009	192.001
69	192.001	0.008	192.001
70	192.001	0.008	192.001
71	192.001	0.007	192.001
72	192.001	0.007	192.001
73	192.002	0.006	192.002
74	192.002	0.005	192.002
75	192.002	0.005	192.002
76	192.002	0.004	192.002
77	192.002	0.003	192.002
78	192.002	0.002	192.002
79	192.003	0.001	192.003
80	192.003	0.001	192.003
81	192.003	0.000	192.003

Alargamiento del cable ..... 1775.2 mm.

Definicion esfuerzos unitarios cable : 13

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
39	192.000	0.012	192.000
40	192.000	0.013	192.000
41	192.000	0.013	192.000
42	192.000	0.013	192.000
43	192.000	0.014	192.000
44	192.000	0.014	192.000
45	192.000	0.015	192.000
46	191.999	0.015	191.999
47	191.999	0.015	191.999
48	191.999	0.016	191.999
49	191.999	0.016	191.999
50	191.999	0.016	191.999
51	191.999	0.016	191.999
52	191.999	0.016	191.999
53	191.999	0.016	191.999
54	191.999	0.016	191.999
55	191.999	0.016	191.999
56	191.999	0.015	191.999
57	191.999	0.015	191.999
58	191.999	0.015	191.999
59	192.000	0.014	192.000
60	192.000	0.014	192.000
61	192.000	0.014	192.000
62	192.000	0.014	192.000
63	192.000	0.013	192.000
64	192.000	0.013	192.000
65	192.000	0.012	192.000
66	192.000	0.011	192.000
67	192.000	0.010	192.000
68	192.001	0.009	192.001
69	192.001	0.008	192.001
70	192.001	0.008	192.001
71	192.001	0.007	192.001
72	192.001	0.007	192.001
73	192.001	0.006	192.001
74	192.001	0.005	192.001
75	192.002	0.005	192.002
76	192.002	0.004	192.002
77	192.002	0.003	192.002
78	192.002	0.002	192.002
79	192.002	0.001	192.002
80	192.002	0.001	192.002
81	192.003	0.000	192.003

Alargamiento del cable ..... 1905.3 mm.

Definicion esfuerzos unitarios cable : 14

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
36	192.000	0.010	192.000
37	192.000	0.011	192.000
38	192.000	0.012	192.000
39	192.000	0.012	192.000
40	192.000	0.013	192.000
41	191.999	0.013	191.999
42	191.999	0.013	191.999
43	191.999	0.014	191.999
44	191.999	0.014	191.999
45	191.999	0.015	191.999
46	191.999	0.015	191.999
47	191.999	0.015	191.999
48	191.999	0.016	191.999
49	191.999	0.016	191.999
50	191.999	0.016	191.999
51	191.999	0.016	191.999
52	191.999	0.016	191.999
53	191.999	0.016	191.999
54	191.999	0.016	191.999
55	191.999	0.016	191.999
56	191.999	0.015	191.999
57	191.999	0.015	191.999
58	191.999	0.015	191.999
59	191.999	0.014	191.999
60	191.999	0.014	191.999
61	191.999	0.014	191.999
62	191.999	0.014	191.999
63	191.999	0.013	191.999
64	191.999	0.013	191.999
65	192.000	0.012	192.000
66	192.000	0.011	192.000
67	192.000	0.010	192.000
68	192.000	0.009	192.000
69	192.000	0.008	192.000
70	192.001	0.008	192.001
71	192.001	0.007	192.001
72	192.001	0.007	192.001
73	192.001	0.006	192.001
74	192.001	0.005	192.001
75	192.001	0.005	192.001
76	192.001	0.004	192.001
77	192.002	0.003	192.002
78	192.002	0.002	192.002
79	192.002	0.001	192.002
80	192.002	0.001	192.002
81	192.002	0.000	192.002

Alargamiento del cable ..... 2041.9 mm.

Definicion esfuerzos unitarios cable : 15

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
9	1140.000	0.000	1140.000
10	1133.079	0.000	1133.079
11	1126.200	0.000	1126.200
12	1119.363	0.000	1119.363
13	1112.567	0.000	1112.567

Alargamiento del cable ..... 140.6 mm.

Definicion esfuerzos unitarios cable : 16

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
19	1520.000	0.000	1520.000
20	1510.772	0.000	1510.772
21	1501.619	0.000	1501.619
22	1492.502	0.000	1492.502
23	1483.441	0.000	1483.441

Alargamiento del cable ..... 140.5 mm.

Definicion esfuerzos unitarios cable : 17

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
29	1520.000	0.000	1520.000
30	1510.772	0.000	1510.772
31	1501.619	0.000	1501.619
32	1492.502	0.000	1492.502
33	1483.441	0.000	1483.441

Alargamiento del cable ..... 140.5 mm.

Definicion esfuerzos unitarios cable : 18

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
39	2660.000	0.000	2660.000
40	2643.851	0.000	2643.851
41	2627.833	0.000	2627.833
42	2613.387	0.000	2613.387
43	2599.020	0.000	2599.020

Alargamiento del cable ..... 133.9 mm.

Definicion esfuerzos unitarios cable : 19

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
49	3420.000	0.000	3420.000
50	3401.199	0.000	3401.199
51	3382.544	0.000	3382.544
52	3363.949	0.000	3363.949
53	3345.457	0.000	3345.457

Alargamiento del cable ..... 127.3 mm.

Definicion esfuerzos unitarios cable : 20

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
59	3420.000	0.000	3420.000
60	3401.199	0.000	3401.199
61	3382.544	0.000	3382.544
62	3363.949	0.000	3363.949
63	3345.457	0.000	3345.457

Alargamiento del cable ..... 127.3 mm.

Definicion esfuerzos unitarios cable : 21

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
69	1140.000	0.000	1140.000
70	1133.733	0.000	1133.733
71	1127.515	0.000	1127.515
72	1121.316	0.000	1121.316
73	1115.152	0.000	1115.152

Alargamiento del cable ..... 127.3 mm.

Definicion esfuerzos unitarios cable : 22

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
1	1140.000	0.000	1140.000
2	1133.137	0.302	1133.137
3	1126.441	0.000	1126.441
4	1119.722	0.000	1119.722
5	1113.044	0.000	1113.044
6	1106.829	0.000	1106.829
7	1100.648	0.000	1100.648
8	1094.503	0.000	1094.503
9	1086.259	0.000	1086.259

Alargamiento del cable ..... 275.5 mm.

Definicion esfuerzos unitarios cable : 23

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
13	1900.000	0.000	1900.000
14	1885.690	0.000	1885.690
15	1869.916	0.000	1869.916
16	1854.274	0.000	1854.274
17	1838.762	0.000	1838.762
18	1823.380	0.000	1823.380
19	1809.648	0.000	1809.648

Alargamiento del cable ..... 277.9 mm.

Definicion esfuerzos unitarios cable : 24

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
23	1900.000	0.115	1900.000
24	1885.714	0.000	1885.714
25	1869.940	0.000	1869.940
26	1854.297	0.000	1854.297
27	1838.786	0.000	1838.786
28	1823.404	0.000	1823.404
29	1809.671	0.000	1809.671

Alargamiento del cable ..... 277.9 mm.

Definicion esfuerzos unitarios cable : 25

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
33	1140.000	0.000	1140.000
34	1131.414	0.000	1131.414
35	1121.950	0.000	1121.950
36	1112.564	0.000	1112.564
37	1103.257	0.000	1103.257
38	1094.028	0.000	1094.028
39	1085.789	0.000	1085.789

Alargamiento del cable ..... 277.9 mm.

Definicion esfuerzos unitarios cable : 26

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
43	1900.000	0.000	1900.000
44	1885.690	0.000	1885.690
45	1858.563	0.000	1858.563
46	1838.185	0.000	1838.185
47	1818.031	0.000	1818.031
48	1791.877	0.000	1791.877
49	1778.382	0.000	1778.382

Alargamiento del cable ..... 374.1 mm.

Definicion esfuerzos unitarios cable : 27

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
53	1900.000	0.000	1900.000
54	1885.690	0.000	1885.690
55	1858.563	0.000	1858.563
56	1838.185	0.000	1838.185
57	1818.031	0.000	1818.031
58	1791.877	0.000	1791.877
59	1778.382	0.000	1778.382

Alargamiento del cable ..... 374.1 mm.

Definicion esfuerzos unitarios cable : 28

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
63	1900.000	0.000	1900.000
64	1885.690	0.000	1885.690
65	1858.563	0.000	1858.563
66	1838.185	0.000	1838.185
67	1818.031	0.000	1818.031
68	1791.877	0.000	1791.877
69	1778.382	0.000	1778.382

Alargamiento del cable ..... 374.1 mm.

Definicion esfuerzos unitarios cable : 29

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
73	1900.000	0.000	1900.000
74	1886.087	0.000	1886.087
75	1872.276	0.000	1872.276
76	1858.566	0.000	1858.566
77	1844.956	0.000	1844.956
78	1831.446	0.000	1831.446
79	1818.035	0.000	1818.035
80	1810.900	0.000	1810.900
81	1803.793	0.000	1803.793

Alargamiento del cable ..... 295.9 mm.

Definicion esfuerzos unitarios cable : 30

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
1	1844.000	0.000	1844.000
2	1844.000	0.000	1844.000
3	1844.000	0.000	1844.000
4	1844.000	0.000	1844.000
5	1844.000	0.000	1844.000
6	1844.000	0.000	1844.000
7	1844.000	0.000	1844.000
8	1844.000	0.000	1844.000
9	1844.000	0.000	1844.000
10	1844.000	0.000	1844.000
11	1844.000	0.000	1844.000
12	1844.000	0.000	1844.000
13	1844.000	0.000	1844.000
14	1844.000	0.000	1844.000
15	1844.000	0.000	1844.000
16	1844.000	0.000	1844.000
17	1844.000	0.000	1844.000
18	1844.000	0.000	1844.000
19	1844.000	0.000	1844.000
20	1844.000	0.000	1844.000
21	1844.000	0.000	1844.000
22	1844.000	0.000	1844.000
23	1844.000	0.000	1844.000
24	1844.000	0.000	1844.000
25	1844.000	0.000	1844.000
26	1844.000	0.000	1844.000
27	1844.000	0.000	1844.000
28	1844.000	0.000	1844.000
29	1844.000	0.000	1844.000
30	1844.000	0.000	1844.000
31	1844.000	0.000	1844.000
32	1844.000	0.000	1844.000
33	1844.000	0.000	1844.000
34	1844.000	0.000	1844.000
35	1844.000	0.000	1844.000
36	1844.000	0.000	1844.000
37	1844.000	0.000	1844.000
38	1844.000	0.000	1844.000
39	1844.000	0.000	1844.000
40	1844.000	0.000	1844.000
41	1844.000	0.000	1844.000
42	1844.000	0.000	1844.000
43	1844.000	0.000	1844.000
44	1844.000	0.000	1844.000
45	1844.000	0.000	1844.000
46	1844.000	0.000	1844.000
47	1844.000	0.000	1844.000
48	1844.000	0.000	1844.000

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
49	1844.000	0.000	1844.000
50	1844.000	0.000	1844.000
51	1844.000	0.000	1844.000
52	1844.000	0.000	1844.000
53	1844.000	0.000	1844.000
54	1844.000	0.000	1844.000
55	1844.000	0.000	1844.000
56	1844.000	0.000	1844.000
57	1844.000	0.000	1844.000
58	1844.000	0.000	1844.000
59	1844.000	0.000	1844.000
60	1844.000	0.000	1844.000
61	1844.000	0.000	1844.000
62	1844.000	0.000	1844.000
63	1844.000	0.000	1844.000
64	1844.000	0.000	1844.000
65	1844.000	0.000	1844.000
66	1844.000	0.000	1844.000
67	1844.000	0.000	1844.000
68	1844.000	0.000	1844.000
69	1844.000	0.000	1844.000
70	1844.000	0.000	1844.000
71	1844.000	0.000	1844.000
72	1844.000	0.000	1844.000
73	1844.000	0.000	1844.000
74	1844.000	0.000	1844.000
75	1844.000	0.000	1844.000
76	1844.000	0.000	1844.000
77	1844.000	0.000	1844.000
78	1844.000	0.000	1844.000
79	1844.000	0.000	1844.000
80	1844.000	0.000	1844.000
81	1844.000	0.000	1844.000

Alargamiento del cable ..... 3407.0 mm.

Esfuerzos unitarios debidos al cable 1

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	-4612.02	-64.5	-7133.1
		2	-4197.04	-65.2	-7126.2
	2	2	-4197.04	-66.7	-7126.2
		3	-3776.37	-66.0	-7119.5
	3	3	-3776.37	-66.0	-7119.5
		4	-3358.26	-66.0	-7112.8
	4	4	-3358.26	-66.0	-7112.8
		5	-2940.66	-66.1	-7106.1
	5	5	-2940.66	-73.5	-7106.0
		6	-2534.17	-73.5	-7099.8
	6	6	-2534.17	-71.9	-7099.8
		7	-2130.21	-71.9	-7093.7
	7	7	-2130.21	-71.9	-7093.7
		8	-1729.15	-71.9	-7087.5
	8	8	-1729.15	-72.4	-7087.5
		9	-1185.21	-72.4	-7079.3
	9	9	4134.80	-64.7	-7133.1
		10	4470.19	-64.7	-7126.2
	10	10	4470.19	-66.2	-7126.2
		11	4811.45	-66.2	-7119.3
2	11	11	4811.45	8.2	-7119.2
		12	4792.03	8.2	-7112.4
	12	12	4792.03	8.2	-7112.4
		13	4774.13	8.2	-7105.6
	13	13	-2858.99	3.5	-7893.0
		14	-2748.18	3.5	-7878.7
	14	14	-2748.18	3.2	-7878.7
		15	-2627.79	3.2	-7862.9
	15	15	-2627.79	3.2	-7862.9
		16	-2511.87	3.2	-7847.3
	16	16	-2511.88	2.0	-7847.3
		17	-2411.88	2.0	-7831.8
	17	17	-2411.88	2.0	-7831.8
		18	-2328.92	2.0	-7816.4
	18	18	-2328.92	0.8	-7816.4
		19	-2246.03	0.8	-7802.6
	19	19	5557.36	0.8	-7513.0
		20	5558.55	0.8	-7503.8
	20	20	5558.55	0.8	-7503.8
		21	5559.88	0.8	-7494.6
3	21	21	5559.88	44.3	-7494.6
		22	5350.99	44.3	-7485.5
	22	22	5350.99	44.3	-7485.5
		23	5145.00	44.3	-7476.4
	23	23	-2741.29	44.1	-7893.0
		24	-2966.84	44.3	-7878.7
	24	24	-2778.10	-24.7	-8685.7
		25	-2569.44	-24.6	-8669.9

Esfuerzos unitarios debidos al cable 1

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	25	25	-2569.33	44.3	-8669.9
		26	-2821.37	44.3	-8654.3
	26	26	-2589.71	44.3	-9461.3
		27	-2842.07	44.3	-9445.8
	27	27	-2842.07	44.3	-9445.8
		28	-3094.77	44.3	-9430.4
	28	28	-3094.77	44.3	-9430.4
		29	-3322.48	44.3	-9416.7
	29	29	4585.20	44.3	-9934.0
		30	4355.02	44.3	-9924.8
	30	30	4355.02	44.3	-9924.8
		31	4125.43	44.3	-9915.6
4	31	31	4125.43	-8.6	-9915.6
		32	4151.07	-8.6	-9906.5
	32	32	4151.07	-8.6	-9906.5
		33	4176.82	-8.6	-9897.4
	33	33	-1570.03	-8.6	-9554.0
		34	-1494.63	-8.6	-9545.4
	34	34	-1494.63	-8.6	-9545.4
		35	-1411.04	-8.6	-9535.9
	35	35	-1411.04	-8.6	-9535.9
		36	-1327.66	-8.6	-9526.6
	36	36	-1813.56	-8.6	-9718.6
		37	-1730.30	-8.6	-9709.2
	37	37	-1730.30	-8.6	-9709.2
		38	-1647.24	-8.6	-9700.0
	38	38	-1647.39	-238.1	-9697.0
		39	-196.58	-237.9	-9688.7
	39	39	7203.48	-8.6	-11458.0
		40	7214.86	-8.6	-11441.8
	40	40	7214.86	-8.6	-11441.8
		41	7226.40	-8.6	-11425.8
5	41	41	7226.40	-31.4	-11425.8
		42	7336.58	-31.4	-11411.4
	42	42	7336.58	-31.4	-11411.4
		43	7446.91	-31.4	-11397.0
	43	43	-2907.77	226.3	-10887.9
		44	-4225.95	225.9	-10873.6
	44	44	-4226.21	-31.4	-10875.7
		45	-3789.59	-31.4	-10848.5
	45	45	-3789.59	-31.4	-10848.5
		46	-3458.08	-31.4	-10828.2
	46	46	-3458.08	-31.4	-10828.2
		47	-3127.18	-31.4	-10808.0
	47	47	-3127.18	-31.4	-10808.0
		48	-2693.18	-31.4	-10781.9
	48	48	-2693.42	-286.5	-10777.9
		49	-938.30	-286.2	-10764.4
	49	49	10176.47	-31.4	-12410.0
		50	10278.62	-31.4	-12391.2

Esfuerzos unitarios debidos al cable 1

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	50	50	10278.62	-31.4	-12391.2
		51	10380.73	-31.4	-12372.5
6	51	51	10380.73	43.8	-12372.5
		52	10154.12	43.8	-12353.9
	52	52	10154.12	43.8	-12353.9
		53	9927.71	43.8	-12335.4
	53	53	-1368.36	301.5	-10886.1
		54	-3137.85	301.1	-10871.8
	54	54	-3138.10	43.8	-10875.7
		55	-3566.53	43.8	-10848.5
	55	55	-2914.88	43.8	-11232.5
		56	-3241.60	43.8	-11212.2
	56	56	-3241.60	43.8	-11212.2
		57	-3568.95	43.8	-11192.0
	57	57	-2917.30	43.8	-11576.0
		58	-3348.50	43.8	-11549.9
	58	58	-3348.74	-229.4	-11547.5
		59	-1936.00	-229.1	-11534.0
	59	59	9884.96	43.8	-13562.0
		60	9657.92	43.8	-13543.2
	60	60	9657.92	43.8	-13543.2
		61	9431.59	43.8	-13524.5
7	61	61	9431.59	-24.3	-13524.5
		62	9503.15	-24.3	-13505.9
	62	62	9503.15	-24.3	-13505.9
		63	9574.90	-24.3	-13487.4
	63	63	-1721.18	260.6	-12039.4
		64	-3245.36	260.3	-12025.1
	64	64	-3245.62	-24.3	-12027.7
		65	-2890.40	-24.3	-12000.6
	65	65	-2890.40	-24.3	-12000.6
		66	-2620.90	-24.3	-11980.2
	66	66	-2620.90	-24.3	-11980.2
		67	-2352.08	-24.3	-11960.0
	67	67	-2352.08	-24.3	-11960.0
		68	-1999.80	-24.3	-11933.9
	68	68	-2000.04	-306.6	-11929.7
		69	-124.01	-306.3	-11916.3
	69	69	6715.77	-24.3	-11282.0
		70	6810.27	-24.3	-11275.7
	70	70	6810.27	-24.3	-11275.7
		71	6904.60	-24.3	-11269.5
8	71	71	6904.60	44.2	-11269.5
		72	6699.40	44.2	-11263.3
	72	72	6699.40	44.2	-11263.3
		73	6494.25	44.3	-11257.2
	73	73	-620.02	337.3	-12037.6
		74	-2549.38	337.0	-12023.7
	74	74	-2549.63	44.3	-12028.1
		75	-2769.33	44.3	-12014.3

Esfuerzos unitarios debidos al cable 1

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	75	75	-2769.33	44.3	-12014.3
		76	-2989.35	44.3	-12000.6
	76	76	-2989.35	44.3	-12000.6
		77	-3209.69	44.3	-11987.0
	77	77	-3209.69	44.3	-11987.0
		78	-3430.34	44.3	-11973.5
	78	78	-3430.34	44.3	-11973.5
		79	-3651.30	44.3	-11960.0
	79	79	-3651.30	44.3	-11960.0
		80	-3769.66	44.3	-11952.9
	80	80	-3769.66	44.3	-11952.9
		81	-3888.10	44.3	-11945.8

Cable Numero 1

Definicion general

Seccion inicial ..... = 8 (Activa)
Seccion final ..... = 14 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 1

Se.	X	Y (s)	Y (i)	Pend.
8	32.324	0.254	5.047	0.0000
9	38.324	0.254	5.013	0.0000
10	43.157	0.254	4.988	0.0000
11	47.990	0.254	4.964	0.0000
12	52.823	0.254	4.941	0.0000
13	57.656	0.254	4.917	0.0000
14	63.656	0.254	4.890	0.0000

Cable Numero 2

Definicion general

Seccion inicial ..... = 18 (Activa)
Seccion final ..... = 24 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 2

Se.	X	Y (s)	Y (i)	Pend.
18	90.324	0.254	4.796	0.0000
19	96.324	0.254	4.796	0.0000
20	101.157	0.254	4.796	0.0000
21	105.980	0.254	4.796	0.0000
22	110.813	0.254	4.796	0.0000
23	115.646	0.254	4.796	0.0000
24	121.646	0.254	4.796	0.0000

Cable Numero 3

Definicion general

Seccion inicial ..... = 28 (Activa)
Seccion final ..... = 34 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 3

Se.	X	Y (s)	Y (i)	Pend.
28	148.314	0.254	4.676	0.0000
29	154.314	0.254	4.676	0.0000
30	159.147	0.254	4.676	0.0000
31	163.970	0.254	4.676	0.0000
32	168.803	0.254	4.676	0.0000
33	173.636	0.254	4.676	0.0000
34	179.636	0.254	4.676	0.0000

Cable Numero 4

Definicion general

Seccion inicial ..... = 38 (Activa)
Seccion final ..... = 44 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 4

Se.	X	Y (s)	Y (i)	Pend.
38	206.304	0.254	4.676	0.0000
39	212.304	0.254	4.676	0.0000
40	217.137	0.254	4.676	0.0000
41	221.960	0.254	4.676	0.0000
42	226.335	0.254	4.676	0.0000
43	230.710	0.254	4.676	0.0000
44	236.710	0.254	4.676	0.0000

Cable Numero 5

Definicion general

Seccion inicial ..... = 48 (Activa)
Seccion final ..... = 54 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 5

Se.	X	Y (s)	Y (i)	Pend.
48	277.210	0.254	4.676	0.0000
49	283.210	0.254	4.676	0.0000
50	287.585	0.254	4.676	0.0000
51	291.950	0.254	4.676	0.0000
52	296.325	0.254	4.676	0.0000
53	300.700	0.254	4.676	0.0000
54	306.700	0.254	4.676	0.0000

Cable Numero 6

Definicion general

Seccion inicial ..... = 58 (Activa)
Seccion final ..... = 64 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 6

Se.	X	Y (s)	Y (i)	Pend.
58	347.200	0.254	4.676	0.0000
59	353.200	0.254	4.676	0.0000
60	357.575	0.254	4.676	0.0000
61	361.940	0.254	4.676	0.0000
62	366.315	0.254	4.676	0.0000
63	370.690	0.254	4.676	0.0000
64	376.690	0.254	4.676	0.0000

Cable Numero 7

Definicion general

Seccion inicial ..... = 68 (Activa)
Seccion final ..... = 74 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 7

Se.	X	Y (s)	Y (i)	Pend.
68	417.190	0.254	4.676	0.0000
69	423.190	0.254	4.676	0.0000
70	427.565	0.254	4.676	0.0000
71	431.930	0.254	4.676	0.0000
72	436.305	0.254	4.676	0.0000
73	440.680	0.254	4.676	0.0000
74	446.513	0.254	4.676	0.0000

Cable Numero 8

Definicion general

Seccion inicial ..... = 1 (Activa)
Seccion final ..... = 8 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 8

Se.	X	Y (s)	Y (i)	Pend.
1	0.000	5.310	0.200	0.0000
2	4.748	5.276	0.200	0.0003
3	9.496	5.242	0.200	0.0000
4	14.244	5.209	0.200	0.0000
5	18.992	5.176	0.200	0.0000
6	23.436	5.152	0.200	0.0000
7	27.880	5.126	0.200	0.0000
8	32.324	5.101	0.200	0.0000

Cable Numero 9

Definicion general

Seccion inicial ..... = 14 (Activa)
Seccion final ..... = 18 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 9

Se.	X	Y (s)	Y (i)	Pend.
14	63.656	4.944	0.200	0.0000
15	70.323	4.915	0.200	0.0000
16	76.990	4.887	0.200	0.0000
17	83.657	4.866	0.200	0.0000
18	90.324	4.850	0.200	0.0000

Cable Numero 10

Definicion general

Seccion inicial ..... = 24 (Activa)
Seccion final ..... = 28 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 10

Se.	X	Y (s)	Y (i)	Pend.
24	121.646	4.773	0.277	0.0000
25	128.313	4.773	0.157	0.0000
26	134.980	4.773	0.157	0.0000
27	141.647	4.773	0.157	0.0000
28	148.314	4.773	0.157	0.0000

Cable Numero 11

Definicion general

Seccion inicial ..... = 34 (Activa)
Seccion final ..... = 38 (Activa)

Fuerza de Pretensado ..... = 2280.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 11

Se.	X	Y (s)	Y (i)	Pend.
34	179.636	4.773	0.157	0.0000
35	186.303	4.773	0.157	0.0000
36	192.970	4.773	0.157	0.0000
37	199.637	4.773	0.157	0.0000
38	206.304	4.773	0.157	0.0000

Cable Numero 12

Definicion general

Seccion inicial ..... = 44 (Activa)
Seccion final ..... = 48 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 12

Se.	X	Y (s)	Y (i)	Pend.
44	236.710	4.773	0.157	0.0000
45	248.210	4.773	0.157	0.0000
46	256.960	4.773	0.157	0.0000
47	265.710	4.773	0.157	0.0000
48	277.210	4.773	0.157	0.0000

Cable Numero 13

Definicion general

Seccion inicial ..... = 54 (Activa)
Seccion final ..... = 58 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 13

Se.	X	Y (s)	Y (i)	Pend.
54	306.700	4.773	0.157	0.0000
55	318.200	4.773	0.157	0.0000
56	326.950	4.773	0.157	0.0000
57	335.700	4.773	0.157	0.0000
58	347.200	4.773	0.157	0.0000

Cable Numero 14

Definicion general

Seccion inicial ..... = 64 (Activa)
Seccion final ..... = 68 (Activa)

Fuerza de Pretensado ..... = 3040.0000
Coef. rozamiento (mu) ..... = 0.2100
Coef. desviacion parasita (k/mu).. = 0.0060

Replanteo del cable : 14

Se.	X	Y (s)	Y (i)	Pend.
64	376.690	4.773	0.157	0.0000
65	388.190	4.773	0.157	0.0000
66	396.940	4.773	0.157	0.0000
67	405.690	4.773	0.157	0.0000
68	417.190	4.773	0.157	0.0000

Definicion esfuerzos unitarios cable : 1

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
8	2280.000	0.000	2280.000
9	2262.828	0.000	2262.828
10	2249.090	0.000	2249.090
11	2235.436	0.000	2235.436
12	2249.090	0.000	2249.090
13	2262.828	0.000	2262.828
14	2280.000	0.000	2280.000

Alargamiento del cable ..... 228.4 mm.

Definicion esfuerzos unitarios cable : 2

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
18	2280.000	0.000	2280.000
19	2262.828	0.000	2262.828
20	2249.090	0.000	2249.090
21	2235.464	0.000	2235.464
22	2249.090	0.000	2249.090
23	2262.828	0.000	2262.828
24	2280.000	0.000	2280.000

Alargamiento del cable ..... 228.3 mm.

Definicion esfuerzos unitarios cable : 3

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
28	2280.000	0.000	2280.000
29	2262.828	0.000	2262.828
30	2249.090	0.000	2249.090
31	2235.464	0.000	2235.464
32	2249.090	0.000	2249.090
33	2262.828	0.000	2262.828
34	2280.000	0.000	2280.000

Alargamiento del cable ..... 228.3 mm.

Definicion esfuerzos unitarios cable : 4

	Acciones del cable		
Se.	Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
38	2280.000	0.000	2280.000
39	2262.828	0.000	2262.828
40	2249.090	0.000	2249.090
41	2238.018	0.000	2238.018
42	2250.389	0.000	2250.389
43	2262.828	0.000	2262.828
44	2280.000	0.000	2280.000

Alargamiento del cable ..... 221.8 mm.

Definicion esfuerzos unitarios cable : 5

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
48	2280.000	0.000	2280.000
49	2262.828	0.000	2262.828
50	2250.389	0.000	2250.389
51	2238.046	0.000	2238.046
52	2250.389	0.000	2250.389
53	2262.828	0.000	2262.828
54	2280.000	0.000	2280.000

Alargamiento del cable ..... 215.1 mm.

Definicion esfuerzos unitarios cable : 6

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
58	2280.000	0.000	2280.000
59	2262.828	0.000	2262.828
60	2250.389	0.000	2250.389
61	2238.046	0.000	2238.046
62	2250.389	0.000	2250.389
63	2262.828	0.000	2262.828
64	2280.000	0.000	2280.000

Alargamiento del cable ..... 215.1 mm.

Definicion esfuerzos unitarios cable : 7

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
68	2280.000	0.000	2280.000
69	2262.828	0.000	2262.828
70	2250.389	0.000	2250.389
71	2238.489	0.000	2238.489
72	2250.862	0.000	2250.862
73	2263.304	0.000	2263.304
74	2280.000	0.000	2280.000

Alargamiento del cable ..... 213.9 mm.

Definicion esfuerzos unitarios cable : 8

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
1	2280.000	0.000	2280.000
2	2266.274	0.604	2266.274
3	2252.882	0.000	2252.882
4	2239.445	0.000	2239.445
5	2242.020	0.000	2242.020
6	2254.609	0.000	2254.609
7	2267.269	0.000	2267.269
8	2280.000	0.000	2280.000

Alargamiento del cable ..... 235.8 mm.

Definicion esfuerzos unitarios cable : 9

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
14	2280.000	0.000	2280.000
15	2260.927	0.000	2260.927
16	2242.014	0.000	2242.014
17	2260.927	0.000	2260.927
18	2280.000	0.000	2280.000

Alargamiento del cable ..... 194.7 mm.

Definicion esfuerzos unitarios cable : 10

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
24	2280.000	0.000	2280.000
25	2260.927	0.000	2260.927
26	2242.014	0.000	2242.014
27	2260.927	0.000	2260.927
28	2280.000	0.000	2280.000

Alargamiento del cable ..... 194.7 mm.

Definicion esfuerzos unitarios cable : 11

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
34	2280.000	0.000	2280.000
35	2260.927	0.000	2260.927
36	2242.014	0.000	2242.014
37	2260.927	0.000	2260.927
38	2280.000	0.000	2280.000

Alargamiento del cable ..... 194.7 mm.

Definicion esfuerzos unitarios cable : 12

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
44	3040.000	0.000	3040.000
45	2996.268	0.000	2996.268
46	2963.416	0.000	2963.416
47	2996.268	0.000	2996.268
48	3040.000	0.000	3040.000

Alargamiento del cable ..... 294.4 mm.

Definicion esfuerzos unitarios cable : 13

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
54	3040.000	0.000	3040.000
55	2996.268	0.000	2996.268
56	2963.416	0.000	2963.416
57	2996.268	0.000	2996.268
58	3040.000	0.000	3040.000

Alargamiento del cable ..... 294.4 mm.

Definicion esfuerzos unitarios cable : 14

Se.	Acciones del cable Esf.un. (t)	Proy.v. (t)	Proy.h. (t)
64	3040.000	0.000	3040.000
65	2996.268	0.000	2996.268
66	2963.416	0.000	2963.416
67	2996.268	0.000	2996.268
68	3040.000	0.000	3040.000

Alargamiento del cable ..... 294.4 mm.

Esfuerzos en estructura total debidos a cables suplementarios

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	-7576.45	-23.8	-2280.1
		2	-7340.73	-24.4	-2266.4
	2	2	-7340.73	-24.9	-2266.3
		3	-7104.61	-24.3	-2252.9
	3	3	-7104.59	-24.3	-2252.9
		4	-6871.34	-24.3	-2239.5
	4	4	-6871.35	-24.3	-2239.5
		5	-6690.26	-24.3	-2242.1
	5	5	-6690.26	-26.7	-2242.0
		6	-6558.01	-26.7	-2254.6
	6	6	-6558.01	-26.2	-2254.6
		7	-6423.12	-26.2	-2267.3
	7	7	-6423.12	-26.2	-2267.3
		8	-6290.09	-26.2	-2280.0
	8	8	4761.07	-26.3	-2280.0
		9	4889.50	-26.3	-2262.8
	9	9	4889.49	-23.9	-2262.8
		10	4981.45	-23.9	-2249.1
	10	10	4981.45	-24.4	-2249.1
		11	5075.94	-24.3	-2235.5
2	11	11	5075.94	5.3	-2235.4
		12	5073.57	5.3	-2249.1
	12	12	5073.56	5.3	-2249.1
		13	5071.19	5.3	-2262.8
	13	13	5071.19	3.7	-2262.8
		14	5077.85	3.7	-2280.0
	14	14	-5615.34	3.6	-2280.0
		15	-5516.75	3.6	-2260.9
	15	15	-5516.75	3.6	-2260.9
		16	-5421.91	3.6	-2242.0
	16	16	-5421.92	3.3	-2242.0
		17	-5452.26	3.3	-2260.9
	17	17	-5452.26	3.3	-2260.9
		18	-5493.72	3.3	-2280.0
	18	18	4985.16	3.0	-2280.0
		19	4938.54	3.0	-2262.8
	19	19	4938.54	3.0	-2262.8
		20	4901.14	3.0	-2249.1
	20	20	4901.14	3.0	-2249.1
		21	4863.96	3.0	-2235.5
3	21	21	4863.96	13.1	-2235.5
		22	4823.30	13.1	-2249.1
	22	22	4823.30	13.1	-2249.1
		23	4782.83	13.1	-2262.8
	23	23	4782.82	13.1	-2262.8
		24	4732.77	13.1	-2280.0
	24	24	-5570.67	-5.0	-2279.9
		25	-5484.37	-4.8	-2260.9

Esfuerzos en estructura total debidos a cables suplementarios

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	25	25	-5484.24	13.1	-2260.9
		26	-5519.22	13.1	-2242.0
	26	26	-5519.22	13.1	-2242.0
		27	-5659.58	13.1	-2260.9
	27	27	-5659.58	13.1	-2260.9
		28	-5800.39	13.1	-2280.0
	28	28	4502.93	13.1	-2280.0
		29	4394.27	13.1	-2262.8
	29	29	4394.27	13.1	-2262.8
		30	4306.92	13.1	-2249.1
	30	30	4306.92	13.1	-2249.1
		31	4219.88	13.1	-2235.5
4	31	31	4219.88	-34.4	-2235.5
		32	4409.68	-34.4	-2249.1
	32	32	4409.68	-34.4	-2249.1
		33	4599.67	-34.4	-2262.8
	33	33	4599.67	-34.4	-2262.8
		34	4835.75	-34.4	-2280.0
	34	34	-5467.57	-34.4	-2280.0
		35	-5185.19	-34.4	-2260.9
	35	35	-5185.19	-34.4	-2260.9
		36	-4903.25	-34.4	-2242.0
	36	36	-4903.25	-34.4	-2242.0
		37	-4726.69	-34.4	-2260.9
	37	37	-4726.69	-34.4	-2260.9
		38	-4550.57	-34.4	-2280.0
	38	38	5752.44	-88.3	-2278.7
		39	6250.33	-87.9	-2261.6
	39	39	6250.64	-34.4	-2262.8
		40	6391.07	-34.4	-2249.1
	40	40	6391.07	-34.4	-2249.1
		41	6536.15	-34.4	-2238.0
5	41	41	6536.15	-15.7	-2238.0
		42	6627.91	-15.7	-2250.4
	42	42	6627.91	-15.7	-2250.4
		43	6719.80	-15.7	-2262.8
	43	43	6719.50	37.9	-2262.7
		44	6521.95	38.3	-2279.9
	44	44	-5898.43	-15.7	-3040.0
		45	-5596.37	-15.7	-2996.3
	45	45	-5596.37	-15.7	-2996.3
		46	-5367.72	-15.7	-2963.4
	46	46	-5367.72	-15.7	-2963.4
		47	-5322.13	-15.7	-2996.3
	47	47	-5322.13	-15.7	-2996.3
		48	-5263.74	-15.7	-3040.0
	48	48	7156.64	-69.6	-2279.2
		49	7542.24	-69.2	-2262.0
	49	49	7542.54	-15.7	-2262.8
		50	7587.78	-15.7	-2250.4

Esfuerzos en estructura total debidos a cables suplementarios

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	50	50	7587.78	-15.7	-2250.4
		51	7633.04	-15.7	-2238.0
6	51	51	7633.04	-9.1	-2238.0
		52	7695.94	-9.1	-2250.4
	52	52	7695.94	-9.1	-2250.4
		53	7759.01	-9.1	-2262.8
	53	53	7758.71	44.5	-2262.6
		54	7521.65	44.9	-2279.8
	54	54	-4898.73	-9.1	-3040.0
		55	-4672.41	-9.1	-2996.3
	55	55	-4672.41	-9.1	-2996.3
		56	-4501.38	-9.1	-2963.4
	56	56	-4501.38	-9.1	-2963.4
		57	-4513.41	-9.1	-2996.3
	57	57	-4513.41	-9.1	-2996.3
		58	-4530.76	-9.1	-3040.0
	58	58	7889.62	-63.0	-2279.3
		59	8235.71	-62.6	-2262.2
	59	59	8236.01	-9.1	-2262.8
		60	8252.44	-9.1	-2250.4
	60	60	8252.44	-9.1	-2250.4
		61	8268.95	-9.1	-2238.0
7	61	61	8268.95	50.9	-2238.0
		62	8069.21	50.9	-2250.4
	62	62	8069.21	50.9	-2250.4
		63	7869.65	50.9	-2262.8
	63	63	7869.35	104.5	-2261.2
		64	7272.10	104.9	-2278.3
	64	64	-5148.28	50.9	-3040.0
		65	-5612.32	50.9	-2996.3
	65	65	-5612.32	50.9	-2996.3
		66	-5966.56	50.9	-2963.4
	66	66	-5966.56	50.9	-2963.4
		67	-6503.86	50.9	-2996.3
	67	67	-6503.86	50.9	-2996.3
		68	-7211.57	50.9	-3040.0
	68	68	5208.80	-3.0	-2280.8
		69	5194.71	-2.6	-2263.6
	69	69	5195.01	50.9	-2262.8
		70	4948.80	50.9	-2250.4
	70	70	4948.80	50.9	-2250.4
		71	4704.10	50.9	-2238.5
8	71	71	4704.10	10.1	-2238.5
		72	4682.94	10.1	-2250.9
	72	72	4682.94	10.1	-2250.9
		73	4661.90	10.1	-2263.3
	73	73	4661.60	65.2	-2262.6
		74	4309.98	65.6	-2279.3
	74	74	359.04	10.1	0.0
		75	299.89	10.1	0.0

Esfuerzos en estructura total debidos a cables suplementarios

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	75	75	299.89	10.1	0.0
		76	240.74	10.1	0.0
	76	76	240.74	10.1	0.0
		77	181.59	10.1	0.0
	77	77	181.59	10.1	0.0
		78	122.44	10.1	0.0
	78	78	122.44	10.1	0.0
		79	63.30	10.1	0.0
	79	79	63.30	10.1	0.0
		80	31.65	10.1	0.0
	80	80	31.65	10.1	0.0
		81	0.00	10.1	0.0

Coeficientes para perdidas de pretensado

Coef. de retraccion del hormigon ..... = 0.00025
Coef. de relajacion del acero ..... = 0.04000
Coef. de fluencia del hormigon ..... = 2.50000

Coef. medio de perdidas elasticas instantaneas ..... = 0.99044
Coef. medio de perdidas diferidas ..... = 0.88832
Coef. medio de perdidas totales ..... = 0.87982

Coef. de ponderacion para pretensado inicial (Pti) ... = 1.10000
Coef. de ponderacion para pretensado final (Ptf) ... = 0.90000

Nota: (*) Resultados de tensiones sin ponderar

Comprobacion de tensiones

Estado 1 Pretensado de 2766. tn Familia 1
Estado 2 Pretensado de 538. tn Familia 1
Estado 3 Pretensado de 538. tn Familia 1
Estado 4 Pretensado de 538. tn Familia 1
Estado 5 Pretensado de 384. tn Familia 1
Estado 6 Pretensado de 384. tn Familia 1
Estado 7 Pretensado de 384. tn Familia 1
Estado 8 Pretensado de 1383. tn Familia 1
Estado 9 Pretensado de 269. tn Familia 1
Estado 10 Pretensado de 269. tn Familia 1
Estado 11 Pretensado de 269. tn Familia 1
Estado 12 Pretensado de 192. tn Familia 1
Estado 13 Pretensado de 192. tn Familia 1
Estado 14 Pretensado de 192. tn Familia 1
Estado 15 Pretensado de 1140. tn Familia 1
Estado 16 Pretensado de 1520. tn Familia 1
Estado 17 Pretensado de 1520. tn Familia 1
Estado 18 Pretensado de 2660. tn Familia 1
Estado 19 Pretensado de 3420. tn Familia 1
Estado 20 Pretensado de 3420. tn Familia 1
Estado 21 Pretensado de 1140. tn Familia 1
Estado 22 Pretensado de 1140. tn Familia 1
Estado 23 Pretensado de 1900. tn Familia 1
Estado 24 Pretensado de 1900. tn Familia 1
Estado 25 Pretensado de 1140. tn Familia 1
Estado 26 Pretensado de 1900. tn Familia 1
Estado 27 Pretensado de 1900. tn Familia 1
Estado 28 Pretensado de 1900. tn Familia 1
Estado 29 Pretensado de 1900. tn Familia 1
Estado 30 Pretensado de 1844. tn Familia 1
Estado 1 Pretensado de 2280. tn (Refuerzo)
Estado 2 Pretensado de 2280. tn (Refuerzo)
Estado 3 Pretensado de 2280. tn (Refuerzo)
Estado 4 Pretensado de 2280. tn (Refuerzo)
Estado 5 Pretensado de 2280. tn (Refuerzo)
Estado 6 Pretensado de 2280. tn (Refuerzo)
Estado 7 Pretensado de 2280. tn (Refuerzo)
Estado 8 Pretensado de 2280. tn (Refuerzo)
Estado 9 Pretensado de 2280. tn (Refuerzo)
Estado 10 Pretensado de 2280. tn (Refuerzo)
Estado 11 Pretensado de 2280. tn (Refuerzo)
Estado 12 Pretensado de 3040. tn (Refuerzo)
Estado 13 Pretensado de 3040. tn (Refuerzo)
Estado 14 Pretensado de 3040. tn (Refuerzo)

Nota:Los momentos de carga en pilas estan calculados a +/- 0.75 del canto
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Esfuerzos de pretensado Est. Inicial (*coef. perdidas elasticas)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	-11455.94	-85.6	-9137.8
		2	-10830.63	-86.8	-9118.5
	2	2	-10830.63	-88.7	-9118.4
		3	-10199.30	-87.5	-9099.7
	3	3	-10199.29	-87.5	-9099.7
		4	-9573.13	-87.5	-9080.8
	4	4	-9573.13	-87.5	-9080.8
		5	-8994.89	-87.5	-9076.5
	5	5	-8994.89	-97.1	-9076.4
		6	-8472.06	-97.1	-9081.7
	6	6	-8472.06	-95.0	-9081.7
		7	-7949.33	-95.0	-9087.1
	7	7	-7949.33	-95.0	-9087.1
		8	-7431.16	-95.0	-9092.6
	8	8	2615.84	-95.6	-9092.6
		9	3271.34	-95.6	-9068.8
	9	9	8540.47	-85.8	-9122.1
		10	8956.25	-85.8	-9102.8
	10	10	8956.25	-87.7	-9102.7
		11	9380.15	-87.7	-9083.5
2	11	11	9380.15	12.9	-9083.4
		12	9358.76	12.9	-9089.1
	12	12	9358.76	12.9	-9089.1
		13	9338.87	12.9	-9094.8
	13	13	1778.76	6.8	-9874.7
		14	1894.56	6.8	-9876.2
	14	14	-7827.01	6.5	-9876.2
		15	-7618.13	6.5	-9843.2
	15	15	-7618.13	6.5	-9843.2
		16	-7417.10	6.5	-9810.5
	16	16	-7417.11	5.0	-9810.5
		17	-7345.66	5.0	-9812.3
	17	17	-7345.66	5.0	-9812.3
		18	-7301.18	5.0	-9814.5
	18	18	2225.55	3.5	-9814.5
		19	2265.26	3.5	-9785.2
	19	19	9994.02	3.5	-9498.4
		20	9961.19	3.5	-9476.7
	20	20	9961.19	3.5	-9476.7
		21	9928.71	3.5	-9455.3
3	21	21	9928.71	55.8	-9455.3
		22	9684.85	55.8	-9458.6
	22	22	9684.85	55.8	-9458.6
		23	9444.03	55.8	-9462.1
	23	23	1633.17	55.7	-9874.7
		24	1364.27	55.9	-9876.2
	24	24	-7816.03	-29.0	-10675.4
		25	-7530.90	-28.7	-10642.5

Esfuerzos de pretensado Est. Inicial (*coef. perdidas elasticas)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	25	25	-7530.68	55.9	-10642.5
		26	-7812.11	55.9	-10609.8
	26	26	-7582.67	55.9	-11409.1
		27	-7960.22	55.9	-11410.9
	27	27	-7960.22	55.9	-11410.9
		28	-8338.51	55.9	-11413.0
	28	28	1028.61	55.9	-11413.0
		29	704.29	55.9	-11383.8
	29	29	8536.34	55.9	-11896.2
		30	8228.95	55.8	-11874.6
	30	30	8228.94	55.8	-11874.6
		31	7922.42	55.8	-11853.1
4	31	31	7922.42	-39.8	-11853.1
		32	8120.37	-39.8	-11856.5
	32	32	8120.37	-39.8	-11856.5
		33	8318.60	-39.8	-11860.0
	33	33	2626.72	-39.8	-11519.8
		34	2916.02	-39.8	-11526.9
	34	34	-6451.10	-39.8	-11526.9
		35	-6111.59	-39.8	-11500.2
	35	35	-6111.59	-39.8	-11500.2
		36	-5772.68	-39.8	-11473.7
	36	36	-6253.93	-39.8	-11663.9
		37	-6010.95	-39.8	-11671.9
	37	37	-6010.95	-39.8	-11671.9
		38	-5768.58	-39.8	-11680.1
	38	38	3598.12	-316.1	-11675.9
		39	5487.70	-315.6	-11652.1
	39	39	12817.26	-39.8	-13405.6
		40	12956.20	-39.8	-13377.1
	40	40	12956.20	-39.8	-13377.1
		41	13099.54	-39.8	-13351.2
5	41	41	13099.54	-45.3	-13351.2
		42	13292.08	-45.3	-13348.1
	42	42	13292.08	-45.3	-13348.1
		43	13484.90	-45.3	-13345.2
	43	43	3228.97	258.5	-12840.9
		44	1743.80	258.6	-12842.4
	44	44	-9548.26	-45.3	-13535.4
		45	-8841.21	-45.3	-13468.8
	45	45	-8841.21	-45.3	-13468.8
		46	-8305.00	-45.3	-13418.8
	46	46	-8305.00	-45.3	-13418.8
		47	-7935.80	-45.3	-13428.7
	47	47	-7935.80	-45.4	-13428.7
		48	-7452.88	-45.4	-13442.5
	48	48	3838.70	-347.0	-12746.9
		49	5927.59	-346.4	-12717.9
	49	49	16936.34	-45.4	-14348.5
		50	17078.64	-45.4	-14318.6

Esfuerzos de pretensado Est. Inicial (*coef. perdidas elasticas)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	50	50	17078.64	-45.4	-14318.6
		51	17220.92	-45.4	-14288.9
6	51	51	17220.92	35.1	-14288.9
		52	17053.66	35.1	-14281.7
	52	52	17053.66	35.1	-14281.7
		53	16886.76	35.1	-14274.7
	53	53	5698.44	339.0	-12839.0
		54	3730.36	339.0	-12840.5
	54	54	-7561.70	35.1	-13535.4
		55	-7780.27	35.1	-13468.8
	55	55	-7134.86	35.1	-13849.1
		56	-7302.96	35.1	-13799.1
	56	56	-7302.96	35.1	-13799.1
		57	-7638.12	35.2	-13809.0
	57	57	-6992.70	35.2	-14189.3
		58	-7435.55	35.2	-14203.2
	58	58	3856.03	-284.6	-13509.2
		59	5569.90	-283.9	-13480.3
	59	59	17278.07	35.2	-15489.5
		60	17068.14	35.2	-15459.6
	60	60	17068.14	35.2	-15459.6
		61	16858.99	35.2	-15429.9
7	61	61	16858.99	22.2	-15429.9
		62	16748.28	22.2	-15422.7
	62	62	16748.28	22.2	-15422.7
		63	16637.90	22.2	-15415.7
	63	63	5449.59	353.1	-13980.0
		64	3397.00	353.1	-13981.4
	64	64	-7895.06	22.2	-14676.4
		65	-7965.11	22.2	-14609.8
	65	65	-7965.11	22.2	-14609.8
		66	-8020.25	22.2	-14559.7
	66	66	-8020.25	22.2	-14559.7
		67	-8242.49	22.2	-14569.7
	67	67	-8242.49	22.2	-14569.7
		68	-8536.97	22.3	-14583.5
	68	68	2754.60	-306.4	-13889.2
		69	4599.87	-305.8	-13860.2
	69	69	11374.51	22.3	-13231.3
		70	11244.27	22.3	-13213.8
	70	70	11244.27	22.3	-13213.8
		71	11115.24	22.3	-13196.8
8	71	71	11115.24	53.0	-13196.8
		72	10892.75	53.0	-13201.9
	72	72	10892.75	53.0	-13201.9
		73	10670.43	53.0	-13207.1
	73	73	3623.94	393.4	-13979.5
		74	1393.36	393.4	-13980.9
	74	74	-2198.83	53.1	-11913.1
		75	-2470.20	53.1	-11899.4

Esfuerzos de pretensado Est. Inicial (*coef. perdidas elasticas)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	75	75	-2470.20	53.1	-11899.4
		76	-2741.89	53.1	-11885.8
	76	76	-2741.89	53.1	-11885.8
		77	-3013.89	53.1	-11872.3
	77	77	-3013.89	53.1	-11872.3
		78	-3286.21	53.1	-11858.9
	78	78	-3286.21	53.1	-11858.9
		79	-3558.84	53.1	-11845.7
	79	79	-3558.84	53.1	-11845.7
		80	-3704.83	53.1	-11838.6
	80	80	-3704.83	53.1	-11838.6
		81	-3850.92	53.1	-11831.6

Esfuerzos de pretensado Est. Final (*coef. perdidas totales)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
1	1	1	-10176.54	-76.0	-8117.3
		2	-9621.06	-77.1	-8100.1
	2	2	-9621.06	-78.8	-8100.1
		3	-9060.25	-77.7	-8083.4
	3	3	-9060.23	-77.7	-8083.4
		4	-8504.00	-77.7	-8066.7
	4	4	-8504.01	-77.7	-8066.7
		5	-7990.34	-77.8	-8062.9
	5	5	-7990.34	-86.2	-8062.7
		6	-7525.90	-86.2	-8067.4
	6	6	-7525.90	-84.4	-8067.5
		7	-7061.55	-84.4	-8072.2
	7	7	-7061.55	-84.4	-8072.2
		8	-6601.25	-84.4	-8077.1
	8	8	2323.71	-84.9	-8077.1
		9	2906.00	-84.9	-8056.0
	9	9	7586.67	-76.2	-8103.4
		10	7956.02	-76.2	-8086.2
	10	10	7956.02	-77.9	-8086.1
		11	8332.58	-77.9	-8069.1
2	11	11	8332.58	11.5	-8069.0
		12	8313.57	11.5	-8074.0
	12	12	8313.57	11.5	-8074.0
		13	8295.90	11.5	-8079.1
	13	13	1580.11	6.1	-8771.9
		14	1682.97	6.1	-8773.2
	14	14	-6952.89	5.8	-8773.2
		15	-6767.34	5.8	-8743.9
	15	15	-6767.34	5.8	-8743.9
		16	-6588.76	5.7	-8714.9
	16	16	-6588.77	4.4	-8714.9
		17	-6525.30	4.4	-8716.5
	17	17	-6525.30	4.4	-8716.5
		18	-6485.78	4.4	-8718.4
	18	18	1977.00	3.1	-8718.4
		19	2012.27	3.1	-8692.4
	19	19	8877.88	3.1	-8437.6
		20	8848.73	3.1	-8418.4
	20	20	8848.73	3.1	-8418.4
		21	8819.87	3.1	-8399.3
3	21	21	8819.87	49.6	-8399.3
		22	8603.25	49.6	-8402.3
	22	22	8603.25	49.6	-8402.3
		23	8389.32	49.6	-8405.4
	23	23	1450.78	49.5	-8771.9
		24	1211.91	49.6	-8773.2
	24	24	-6943.13	-25.8	-9483.2
		25	-6689.85	-25.5	-9453.9

Esfuerzos de pretensado Est. Final (*coef. perdidas totales)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	25	25	-6689.66	49.6	-9454.0
		26	-6939.65	49.6	-9424.9
	26	26	-6735.84	49.6	-10134.9
		27	-7071.22	49.6	-10136.6
	27	27	-7071.22	49.6	-10136.6
		28	-7407.26	49.6	-10138.4
	28	28	913.74	49.6	-10138.4
		29	625.64	49.6	-10112.5
	29	29	7583.01	49.6	-10567.6
		30	7309.94	49.6	-10548.4
	30	30	7309.94	49.6	-10548.4
		31	7037.65	49.6	-10529.4
4	31	31	7037.65	-35.3	-10529.4
		32	7213.49	-35.3	-10532.3
	32	32	7213.49	-35.3	-10532.3
		33	7389.58	-35.3	-10535.5
	33	33	2333.37	-35.3	-10233.3
		34	2590.36	-35.3	-10239.6
	34	34	-5730.64	-35.3	-10239.6
		35	-5429.05	-35.3	-10215.9
	35	35	-5429.05	-35.3	-10215.9
		36	-5127.99	-35.3	-10192.4
	36	36	-5555.49	-35.3	-10361.3
		37	-5339.65	-35.3	-10368.4
	37	37	-5339.65	-35.3	-10368.4
		38	-5124.34	-35.3	-10375.6
	38	38	3196.28	-280.8	-10371.9
		39	4874.83	-280.3	-10350.8
	39	39	11385.83	-35.4	-11908.5
		40	11509.25	-35.4	-11883.2
	40	40	11509.25	-35.4	-11883.2
		41	11636.58	-35.4	-11860.1
5	41	41	11636.58	-40.3	-11860.1
		42	11807.62	-40.3	-11857.4
	42	42	11807.63	-40.3	-11857.4
		43	11978.90	-40.3	-11854.8
	43	43	2868.36	229.7	-11406.9
		44	1549.05	229.7	-11408.1
	44	44	-8481.91	-40.3	-12023.8
		45	-7853.83	-40.3	-11964.6
	45	45	-7853.83	-40.3	-11964.6
		46	-7377.50	-40.3	-11920.2
	46	46	-7377.50	-40.3	-11920.2
		47	-7049.53	-40.3	-11928.9
	47	47	-7049.53	-40.3	-11929.0
		48	-6620.54	-40.3	-11941.3
	48	48	3409.99	-308.3	-11323.3
		49	5265.60	-307.7	-11297.6
	49	49	15044.89	-40.3	-12746.1
		50	15171.30	-40.3	-12719.5

Esfuerzos de pretensado Est. Final (*coef. perdidas totales)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	50	50	15171.30	-40.3	-12719.5
		51	15297.69	-40.3	-12693.1
6	51	51	15297.69	31.2	-12693.1
		52	15149.11	31.2	-12686.7
	52	52	15149.11	31.2	-12686.7
		53	15000.85	31.2	-12680.5
	53	53	5062.04	301.1	-11405.2
		54	3313.76	301.2	-11406.4
	54	54	-6717.21	31.2	-12023.8
		55	-6911.37	31.2	-11964.6
	55	55	-6338.04	31.2	-12302.5
		56	-6487.37	31.2	-12258.0
	56	56	-6487.37	31.2	-12258.0
		57	-6785.09	31.2	-12266.8
	57	57	-6211.75	31.2	-12604.7
		58	-6605.15	31.2	-12617.0
	58	58	3425.38	-252.8	-12000.5
		59	4947.85	-252.2	-11974.8
	59	59	15348.46	31.2	-13759.6
		60	15161.97	31.2	-13733.0
	60	60	15161.97	31.2	-13733.0
		61	14976.18	31.2	-13706.7
7	61	61	14976.18	19.7	-13706.7
		62	14877.83	19.7	-13700.3
	62	62	14877.83	19.7	-13700.3
		63	14779.78	19.7	-13694.0
	63	63	4840.98	313.7	-12418.7
		64	3017.63	313.7	-12420.0
	64	64	-7013.34	19.7	-13037.4
		65	-7075.57	19.8	-12978.2
	65	65	-7075.57	19.8	-12978.2
		66	-7124.55	19.8	-12933.7
	66	66	-7124.55	19.8	-12933.7
		67	-7321.96	19.8	-12942.5
	67	67	-7321.96	19.8	-12942.5
		68	-7583.56	19.8	-12954.8
	68	68	2446.97	-272.2	-12338.0
		69	4086.15	-271.6	-12312.3
	69	69	10104.21	19.8	-11753.6
		70	9988.51	19.8	-11738.1
	70	70	9988.51	19.8	-11738.1
		71	9873.89	19.8	-11723.0
8	71	71	9873.89	47.1	-11723.0
		72	9676.25	47.1	-11727.5
	72	72	9676.25	47.1	-11727.5
		73	9478.76	47.1	-11732.2
	73	73	3219.22	349.4	-12418.2
		74	1237.75	349.5	-12419.5
	74	74	-1953.26	47.1	-10582.6
		75	-2194.33	47.1	-10570.5

Esfuerzos de pretensado Est. Final (*coef. perdidas totales)

V.	Barra	Nudo	Momento (m x t)	Cortante (t)	Axil (t)
	75	75	-2194.33	47.1	-10570.5
		76	-2435.68	47.1	-10558.4
	76	76	-2435.68	47.1	-10558.4
		77	-2677.30	47.1	-10546.4
	77	77	-2677.30	47.1	-10546.4
		78	-2919.21	47.2	-10534.5
	78	78	-2919.21	47.2	-10534.5
		79	-3161.39	47.2	-10522.7
	79	79	-3161.39	47.2	-10522.7
		80	-3291.08	47.2	-10516.5
	80	80	-3291.08	47.2	-10516.5
		81	-3420.85	47.2	-10510.2

Tensiones en Construccion (kg/cm2) Estado 1

		Pti (*)		Pti		Pi		Pti+Pi	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
1	1	-26.	-65.	-29.	-72.	0.	0.	-29.	-72.
	2	-28.	-64.	-30.	-70.	-10.	18.	-41.	-52.
	3	-29.	-62.	-32.	-68.	-18.	31.	-50.	-38.
	4	-31.	-60.	-34.	-66.	-22.	38.	-56.	-28.
	5	-32.	-59.	-36.	-64.	-23.	40.	-59.	-24.
	6	-34.	-57.	-38.	-63.	-22.	37.	-59.	-25.
	7	-36.	-55.	-39.	-61.	-17.	30.	-57.	-31.
	8	-37.	-53.	-41.	-59.	-10.	17.	-51.	-42.
	9	-49.	-36.	-54.	-39.	5.	-8.	-49.	-47.
	10	-60.	-18.	-66.	-20.	21.	-35.	-45.	-55.
	11	-62.	-17.	-68.	-18.	33.	-55.	-35.	-73.
2	11	-62.	-17.	-68.	-18.	33.	-55.	-35.	-73.
	12	-62.	-17.	-68.	-18.	23.	-38.	-46.	-56.
	13	-51.	-42.	-56.	-46.	8.	-13.	-49.	-60.
	14	-41.	-67.	-45.	-74.	-6.	10.	-51.	-64.
	15	-42.	-67.	-46.	-74.	-16.	26.	-62.	-48.
	16	-42.	-67.	-47.	-74.	-19.	32.	-66.	-42.
	17	-43.	-67.	-47.	-74.	-17.	27.	-64.	-47.
	18	-44.	-67.	-48.	-74.	-7.	12.	-55.	-62.
	19	-58.	-41.	-64.	-45.	7.	-11.	-57.	-56.
	20	-72.	-16.	-79.	-18.	22.	-35.	-57.	-53.
	21	-72.	-16.	-79.	-18.	33.	-53.	-46.	-71.
3	21	-72.	-16.	-79.	-18.	33.	-53.	-46.	-71.
	22	-71.	-17.	-78.	-19.	22.	-35.	-56.	-54.
	23	-56.	-44.	-62.	-49.	7.	-11.	-55.	-60.
	24	-45.	-73.	-49.	-81.	-7.	11.	-56.	-70.
	25	-53.	-80.	-58.	-88.	-18.	27.	-76.	-61.
	26	-55.	-84.	-60.	-92.	-22.	32.	-82.	-60.
	27	-57.	-88.	-63.	-96.	-19.	28.	-82.	-68.
	28	-56.	-89.	-61.	-98.	-10.	14.	-71.	-84.
	29	-74.	-67.	-81.	-74.	5.	-7.	-77.	-80.
	30	-92.	-45.	-101.	-49.	20.	-30.	-81.	-79.
	31	-91.	-46.	-100.	-51.	32.	-47.	-68.	-98.
4	31	-91.	-46.	-100.	-51.	32.	-47.	-68.	-98.
	32	-91.	-46.	-100.	-51.	21.	-31.	-79.	-81.
	33	-77.	-63.	-85.	-69.	6.	-9.	-79.	-79.
	34	-64.	-80.	-70.	-88.	-7.	10.	-77.	-78.
	35	-64.	-79.	-70.	-87.	-15.	22.	-85.	-65.
	36	-64.	-81.	-70.	-89.	-17.	25.	-87.	-64.
	37	-64.	-82.	-70.	-91.	-12.	17.	-82.	-73.
	38	-64.	-82.	-71.	-90.	0.	0.	-71.	-90.
	39	-82.	-48.	-90.	-53.	16.	-21.	-74.	-73.
	40	-103.	-33.	-113.	-37.	32.	-43.	-81.	-79.
	41	-103.	-33.	-113.	-36.	45.	-59.	-68.	-95.
5	41	-103.	-33.	-113.	-36.	45.	-59.	-68.	-95.
	42	-103.	-32.	-113.	-36.	32.	-42.	-81.	-78.
	43	-80.	-58.	-88.	-64.	14.	-19.	-74.	-83.
	44	-62.	-107.	-68.	-118.	-5.	7.	-73.	-110.
	45	-63.	-104.	-70.	-114.	-28.	42.	-98.	-73.

Tensiones en Construccion (kg/cm2) Estado 1

		Pti (*)		Pti		Pi		Pti+Pi	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
	46	-65.	-102.	-71.	-112.	-33.	48.	-104.	-64.
	47	-66.	-100.	-72.	-109.	-26.	38.	-98.	-71.
	48	-67.	-97.	-74.	-106.	1.	-1.	-73.	-108.
	49	-93.	-48.	-102.	-53.	22.	-29.	-80.	-82.
	50	-121.	-22.	-133.	-25.	41.	-54.	-93.	-78.
	51	-122.	-22.	-134.	-24.	54.	-70.	-80.	-94.
6	51	-122.	-22.	-134.	-24.	54.	-70.	-80.	-94.
	52	-121.	-23.	-133.	-25.	41.	-54.	-91.	-79.
	53	-91.	-50.	-101.	-55.	23.	-30.	-78.	-86.
	54	-66.	-100.	-73.	-110.	3.	-4.	-70.	-114.
	55	-67.	-102.	-74.	-112.	-22.	33.	-96.	-79.
	56	-68.	-103.	-75.	-114.	-28.	41.	-103.	-72.
	57	-70.	-105.	-77.	-115.	-22.	33.	-99.	-82.
	58	-70.	-106.	-77.	-117.	2.	-4.	-75.	-121.
	59	-96.	-58.	-106.	-64.	22.	-30.	-83.	-93.
	60	-126.	-33.	-139.	-37.	41.	-53.	-98.	-90.
	61	-125.	-34.	-138.	-38.	53.	-70.	-85.	-107.
7	61	-125.	-34.	-138.	-38.	53.	-70.	-85.	-107.
	62	-125.	-34.	-138.	-37.	40.	-53.	-98.	-90.
	63	-97.	-60.	-107.	-66.	21.	-28.	-86.	-94.
	64	-74.	-109.	-82.	-120.	1.	-1.	-81.	-121.
	65	-76.	-107.	-83.	-117.	-25.	38.	-109.	-80.
	66	-77.	-105.	-84.	-115.	-32.	47.	-116.	-68.
	67	-78.	-103.	-85.	-113.	-27.	40.	-113.	-73.
	68	-79.	-101.	-87.	-111.	-4.	5.	-90.	-106.
	69	-87.	-56.	-96.	-61.	16.	-21.	-80.	-83.
	70	-100.	-34.	-110.	-38.	34.	-45.	-76.	-83.
	71	-100.	-34.	-110.	-37.	46.	-61.	-64.	-98.
8	71	-100.	-34.	-110.	-37.	46.	-61.	-64.	-98.
	72	-99.	-35.	-109.	-38.	35.	-46.	-74.	-85.
	73	-86.	-58.	-95.	-64.	18.	-24.	-76.	-88.
	74	-77.	-105.	-85.	-115.	1.	-2.	-84.	-117.
	75	-76.	-106.	-84.	-117.	-12.	18.	-96.	-99.
	76	-75.	-107.	-83.	-118.	-20.	30.	-103.	-88.
	77	-74.	-109.	-82.	-120.	-23.	34.	-104.	-86.
	78	-73.	-110.	-80.	-121.	-21.	31.	-101.	-90.
	79	-72.	-111.	-79.	-122.	-13.	20.	-93.	-103.
	80	-71.	-112.	-79.	-123.	-7.	11.	-86.	-112.
	81	-71.	-113.	-78.	-124.	0.	0.	-78.	-124.

Tensiones en Construccion (kg/cm2) Estado ultimo

		Pti (*)		Pti		Pi		Pti+Pi	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
1	1	-16.	-119.	-17.	-131.	0.	0.	-17.	-131.
	2	-18.	-117.	-19.	-129.	-10.	18.	-30.	-111.
	3	-20.	-114.	-22.	-126.	-18.	31.	-39.	-95.
	4	-22.	-112.	-24.	-123.	-22.	38.	-46.	-85.
	5	-24.	-110.	-26.	-121.	-23.	40.	-50.	-80.
	6	-26.	-108.	-29.	-118.	-22.	37.	-50.	-81.
	7	-28.	-106.	-31.	-116.	-17.	30.	-48.	-87.
	8	-49.	-72.	-54.	-79.	-10.	17.	-64.	-62.
	9	-80.	-21.	-88.	-23.	5.	-8.	-83.	-31.
	10	-92.	-3.	-101.	-4.	21.	-35.	-80.	-38.
	11	-94.	-1.	-103.	-1.	33.	-55.	-70.	-55.
2	11	-94.	-1.	-103.	-1.	33.	-55.	-70.	-55.
	12	-94.	-1.	-104.	-1.	23.	-38.	-81.	-39.
	13	-84.	-26.	-92.	-29.	8.	-13.	-84.	-42.
	14	-55.	-84.	-60.	-92.	-6.	10.	-66.	-82.
	15	-36.	-115.	-40.	-127.	-16.	26.	-55.	-101.
	16	-37.	-115.	-41.	-127.	-19.	32.	-60.	-95.
	17	-37.	-115.	-41.	-127.	-17.	27.	-58.	-100.
	18	-58.	-84.	-64.	-92.	-7.	12.	-71.	-80.
	19	-92.	-26.	-101.	-28.	7.	-11.	-94.	-39.
	20	-106.	-1.	-116.	-1.	22.	-35.	-94.	-36.
	21	-105.	-1.	-116.	-1.	33.	-53.	-83.	-54.
3	21	-105.	-1.	-116.	-1.	33.	-53.	-83.	-54.
	22	-104.	-2.	-115.	-3.	22.	-35.	-93.	-38.
	23	-90.	-30.	-99.	-33.	7.	-11.	-92.	-44.
	24	-58.	-91.	-64.	-100.	-7.	11.	-71.	-90.
	25	-45.	-132.	-50.	-145.	-18.	27.	-68.	-118.
	26	-47.	-136.	-52.	-150.	-22.	32.	-74.	-117.
	27	-49.	-141.	-54.	-155.	-19.	28.	-73.	-126.
	28	-70.	-110.	-77.	-121.	-10.	14.	-86.	-107.
	29	-110.	-55.	-120.	-61.	5.	-7.	-116.	-68.
	30	-127.	-34.	-140.	-37.	20.	-30.	-120.	-67.
	31	-126.	-36.	-138.	-39.	32.	-47.	-106.	-86.
4	31	-126.	-36.	-138.	-39.	32.	-47.	-106.	-86.
	32	-126.	-34.	-139.	-38.	21.	-31.	-118.	-68.
	33	-114.	-50.	-125.	-55.	6.	-9.	-119.	-64.
	34	-79.	-99.	-87.	-108.	-7.	10.	-94.	-98.
	35	-58.	-129.	-64.	-142.	-15.	22.	-79.	-120.
	36	-59.	-129.	-65.	-142.	-17.	25.	-82.	-117.
	37	-60.	-129.	-66.	-142.	-12.	17.	-78.	-125.
	38	-83.	-95.	-92.	-104.	0.	0.	-92.	-104.
	39	-122.	-28.	-134.	-31.	16.	-21.	-119.	-52.
	40	-143.	-13.	-158.	-14.	32.	-43.	-125.	-56.
	41	-144.	-12.	-158.	-13.	45.	-59.	-114.	-71.
5	41	-144.	-12.	-158.	-13.	45.	-59.	-114.	-71.
	42	-145.	-10.	-159.	-11.	32.	-42.	-127.	-54.
	43	-122.	-36.	-135.	-40.	14.	-19.	-120.	-59.
	44	-82.	-125.	-91.	-137.	-5.	7.	-96.	-130.
	45	-61.	-162.	-67.	-178.	-28.	42.	-95.	-136.

Tensiones en Construccion (kg/cm2) Estado ultimo

		Pti (*)		Pti		Pi		Pti+Pi	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
	46	-63.	-158.	-69.	-174.	-33.	48.	-102.	-125.
	47	-65.	-156.	-71.	-171.	-26.	38.	-97.	-133.
	48	-91.	-110.	-100.	-121.	1.	-1.	-99.	-122.
	49	-138.	-21.	-152.	-24.	22.	-29.	-131.	-52.
	50	-167.	5.	-184.	5.	41.	-54.	-143.	-48.
	51	-168.	6.	-184.	6.	54.	-70.	-131.	-64.
6	51	-168.	6.	-184.	6.	54.	-70.	-131.	-64.
	52	-167.	5.	-184.	5.	41.	-54.	-142.	-49.
	53	-138.	-22.	-152.	-25.	23.	-30.	-129.	-55.
	54	-91.	-111.	-101.	-122.	3.	-4.	-98.	-127.
	55	-69.	-154.	-76.	-169.	-22.	33.	-98.	-137.
	56	-71.	-154.	-78.	-169.	-28.	41.	-106.	-128.
	57	-72.	-156.	-79.	-171.	-22.	33.	-101.	-138.
	58	-97.	-115.	-107.	-127.	2.	-4.	-104.	-130.
	59	-145.	-27.	-159.	-30.	22.	-30.	-137.	-60.
	60	-175.	-2.	-192.	-3.	41.	-53.	-151.	-56.
	61	-174.	-3.	-191.	-4.	53.	-70.	-138.	-73.
7	61	-174.	-3.	-191.	-4.	53.	-70.	-138.	-73.
	62	-173.	-4.	-190.	-4.	40.	-53.	-150.	-57.
	63	-144.	-31.	-159.	-34.	21.	-28.	-137.	-62.
	64	-98.	-122.	-108.	-134.	1.	-1.	-108.	-135.
	65	-73.	-165.	-81.	-181.	-25.	38.	-106.	-144.
	66	-72.	-165.	-80.	-182.	-32.	47.	-112.	-134.
	67	-71.	-167.	-79.	-184.	-27.	40.	-106.	-143.
	68	-94.	-127.	-104.	-139.	-4.	5.	-107.	-134.
	69	-123.	-42.	-136.	-46.	16.	-21.	-119.	-67.
	70	-135.	-22.	-148.	-24.	34.	-45.	-114.	-69.
	71	-134.	-22.	-147.	-25.	46.	-61.	-101.	-86.
8	71	-134.	-22.	-147.	-25.	46.	-61.	-101.	-86.
	72	-133.	-24.	-146.	-26.	35.	-46.	-111.	-72.
	73	-120.	-47.	-132.	-51.	18.	-24.	-113.	-76.
	74	-96.	-98.	-105.	-108.	1.	-2.	-104.	-109.
	75	-78.	-104.	-85.	-115.	-12.	18.	-97.	-97.
	76	-76.	-106.	-84.	-116.	-20.	30.	-104.	-87.
	77	-75.	-108.	-82.	-118.	-23.	34.	-105.	-84.
	78	-74.	-109.	-81.	-120.	-21.	31.	-102.	-90.
	79	-72.	-111.	-80.	-122.	-13.	20.	-93.	-102.
	80	-72.	-112.	-79.	-123.	-7.	11.	-86.	-112.
	81	-71.	-113.	-78.	-124.	0.	0.	-78.	-124.

Tensiones en Servicio (kg/cm2) Estado inicial

		Pti (*)		Pi+Pti		Pi+Pti+M		Pi+Pti+M+Sp		Pi+Pti+M+Sn	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
1	1	-16.	-115.	-18.	-127.	-18.	-127.	-18.	-127.	-18.	-127.
	2	-18.	-113.	-31.	-106.	-34.	-100.	-43.	-84.	-31.	-105.
	3	-21.	-110.	-40.	-90.	-46.	-80.	-63.	-51.	-41.	-89.
	4	-23.	-108.	-47.	-80.	-54.	-67.	-76.	-28.	-46.	-82.
	5	-25.	-105.	-51.	-75.	-58.	-62.	-84.	-17.	-47.	-81.
	6	-27.	-103.	-51.	-76.	-58.	-64.	-86.	-17.	-44.	-88.
	7	-29.	-101.	-49.	-82.	-54.	-72.	-81.	-26.	-38.	-101.
	8	-48.	-70.	-63.	-60.	-66.	-55.	-90.	-13.	-46.	-88.
	9	-78.	-22.	-81.	-33.	-79.	-36.	-97.	-5.	-55.	-76.
	10	-89.	-5.	-77.	-40.	-70.	-53.	-84.	-28.	-43.	-98.
	11	-91.	-2.	-67.	-57.	-56.	-77.	-71.	-51.	-20.	-136.
2	11	-91.	-2.	-67.	-57.	-56.	-77.	-71.	-51.	-20.	-136.
	12	-92.	-2.	-78.	-40.	-70.	-53.	-84.	-30.	-42.	-100.
	13	-81.	-28.	-81.	-44.	-79.	-48.	-95.	-21.	-58.	-83.
	14	-54.	-82.	-65.	-81.	-67.	-77.	-93.	-35.	-48.	-108.
	15	-36.	-112.	-56.	-97.	-62.	-87.	-95.	-33.	-43.	-117.
	16	-37.	-111.	-61.	-90.	-68.	-78.	-104.	-21.	-49.	-110.
	17	-38.	-112.	-58.	-96.	-65.	-85.	-98.	-31.	-45.	-118.
	18	-57.	-82.	-70.	-79.	-72.	-74.	-100.	-30.	-49.	-112.
	19	-89.	-27.	-91.	-41.	-88.	-45.	-106.	-16.	-63.	-86.
	20	-103.	-2.	-91.	-38.	-83.	-51.	-96.	-29.	-52.	-100.
	21	-102.	-2.	-79.	-56.	-67.	-77.	-80.	-55.	-28.	-139.
3	21	-102.	-2.	-79.	-56.	-67.	-77.	-80.	-55.	-28.	-139.
	22	-102.	-4.	-90.	-40.	-81.	-53.	-93.	-35.	-51.	-102.
	23	-87.	-31.	-88.	-46.	-86.	-50.	-101.	-25.	-63.	-86.
	24	-57.	-90.	-70.	-88.	-72.	-84.	-97.	-44.	-52.	-116.
	25	-46.	-128.	-69.	-114.	-76.	-103.	-113.	-49.	-54.	-135.
	26	-48.	-132.	-75.	-112.	-83.	-100.	-123.	-40.	-62.	-131.
	27	-50.	-136.	-74.	-121.	-81.	-110.	-120.	-54.	-59.	-143.
	28	-69.	-108.	-85.	-105.	-89.	-99.	-121.	-52.	-65.	-135.
	29	-107.	-56.	-113.	-69.	-111.	-71.	-133.	-39.	-83.	-112.
	30	-124.	-35.	-116.	-68.	-109.	-79.	-126.	-53.	-75.	-129.
	31	-123.	-36.	-103.	-87.	-91.	-106.	-108.	-79.	-47.	-170.
4	31	-123.	-36.	-103.	-87.	-91.	-106.	-108.	-79.	-47.	-170.
	32	-124.	-35.	-115.	-70.	-107.	-82.	-122.	-59.	-73.	-131.
	33	-111.	-51.	-115.	-66.	-113.	-69.	-132.	-41.	-87.	-108.
	34	-78.	-97.	-92.	-96.	-95.	-93.	-124.	-49.	-72.	-127.
	35	-59.	-125.	-80.	-115.	-85.	-106.	-123.	-50.	-61.	-143.
	36	-59.	-125.	-82.	-112.	-89.	-103.	-130.	-42.	-62.	-142.
	37	-60.	-126.	-78.	-121.	-83.	-114.	-121.	-56.	-54.	-156.
	38	-82.	-94.	-90.	-103.	-90.	-103.	-122.	-55.	-57.	-152.
	39	-119.	-30.	-115.	-54.	-109.	-62.	-130.	-34.	-73.	-109.
	40	-140.	-14.	-121.	-59.	-109.	-75.	-126.	-52.	-67.	-130.
	41	-141.	-13.	-110.	-74.	-93.	-96.	-110.	-73.	-41.	-164.
5	41	-141.	-13.	-110.	-74.	-93.	-96.	-110.	-73.	-41.	-164.
	42	-141.	-12.	-123.	-56.	-111.	-72.	-127.	-51.	-69.	-127.
	43	-119.	-38.	-116.	-61.	-111.	-68.	-125.	-50.	-84.	-104.
	44	-81.	-123.	-94.	-128.	-96.	-125.	-122.	-86.	-71.	-162.
	45	-61.	-157.	-96.	-131.	-107.	-115.	-152.	-47.	-85.	-147.

Tensiones en Servicio (kg/cm2) Estado inicial

		Pti (*)		Pi+Pti		Pi+Pti+M		Pi+Pti+M+Sp		Pi+Pti+M+Sn	
V.	Sec	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf	F.Sup	F.Inf
	46	-63.	-153.	-102.	-120.	-115.	-101.	-165.	-27.	-92.	-136.
	47	-65.	-151.	-97.	-128.	-107.	-113.	-153.	-45.	-81.	-152.
	48	-89.	-109.	-97.	-121.	-97.	-122.	-126.	-78.	-64.	-170.
	49	-135.	-24.	-126.	-55.	-118.	-66.	-134.	-45.	-83.	-112.
	50	-163.	2.	-139.	-51.	-123.	-72.	-140.	-50.	-75.	-135.
	51	-164.	3.	-126.	-67.	-106.	-94.	-123.	-72.	-48.	-170.
6	51	-164.	3.	-126.	-67.	-106.	-94.	-123.	-72.	-48.	-170.
	52	-163.	3.	-138.	-52.	-122.	-73.	-137.	-53.	-74.	-136.
	53	-134.	-25.	-125.	-58.	-116.	-69.	-130.	-50.	-82.	-114.
	54	-89.	-110.	-96.	-126.	-94.	-127.	-122.	-87.	-62.	-175.
	55	-69.	-150.	-98.	-132.	-106.	-119.	-153.	-51.	-79.	-159.
	56	-70.	-150.	-106.	-123.	-116.	-107.	-166.	-33.	-90.	-147.
	57	-72.	-151.	-101.	-133.	-110.	-120.	-156.	-52.	-83.	-160.
	58	-95.	-114.	-102.	-130.	-101.	-131.	-128.	-92.	-70.	-177.
	59	-141.	-30.	-132.	-63.	-124.	-74.	-137.	-57.	-91.	-117.
	60	-171.	-5.	-147.	-59.	-131.	-80.	-146.	-61.	-84.	-142.
	61	-170.	-6.	-133.	-77.	-113.	-103.	-129.	-82.	-56.	-178.
7	61	-170.	-6.	-133.	-77.	-113.	-103.	-129.	-82.	-56.	-178.
	62	-169.	-6.	-146.	-60.	-130.	-80.	-147.	-59.	-83.	-143.
	63	-141.	-33.	-133.	-65.	-125.	-76.	-141.	-55.	-90.	-121.
	64	-96.	-121.	-105.	-134.	-105.	-135.	-135.	-91.	-72.	-183.
	65	-73.	-160.	-106.	-138.	-116.	-124.	-163.	-55.	-90.	-163.
	66	-73.	-160.	-112.	-128.	-125.	-110.	-176.	-34.	-101.	-145.
	67	-72.	-162.	-107.	-137.	-117.	-122.	-163.	-53.	-95.	-155.
	68	-93.	-124.	-106.	-132.	-107.	-130.	-134.	-90.	-83.	-166.
	69	-120.	-43.	-116.	-69.	-110.	-77.	-125.	-57.	-82.	-113.
	70	-132.	-23.	-111.	-70.	-98.	-87.	-116.	-64.	-55.	-143.
	71	-131.	-23.	-98.	-87.	-80.	-110.	-100.	-84.	-28.	-179.
8	71	-131.	-23.	-98.	-87.	-80.	-110.	-100.	-84.	-28.	-179.
	72	-130.	-25.	-108.	-74.	-94.	-91.	-113.	-67.	-51.	-148.
	73	-117.	-48.	-110.	-77.	-103.	-86.	-124.	-59.	-66.	-136.
	74	-94.	-99.	-103.	-110.	-102.	-111.	-133.	-65.	-69.	-161.
	75	-77.	-104.	-97.	-97.	-102.	-90.	-138.	-36.	-74.	-132.
	76	-76.	-106.	-104.	-87.	-112.	-75.	-150.	-19.	-89.	-109.
	77	-75.	-108.	-105.	-84.	-114.	-71.	-150.	-19.	-97.	-96.
	78	-74.	-109.	-102.	-89.	-110.	-77.	-138.	-35.	-98.	-95.
	79	-72.	-111.	-93.	-102.	-98.	-94.	-115.	-69.	-92.	-103.
	80	-72.	-112.	-86.	-112.	-89.	-108.	-98.	-94.	-86.	-112.
	81	-71.	-113.	-78.	-124.	-78.	-124.	-78.	-124.	-78.	-124.

Tensiones en Servicio (kg/cm2) Estado final

V.	Sec	Ptf (*) F.Sup	Ptf (*) F.Inf	Pf+Ptf+M F.Sup	Pf+Ptf+M F.Inf	Pf+Ptf+M+Sp F.Sup	Pf+Ptf+M+Sp F.Inf	Pf+Ptf+M+Sn F.Sup	Pf+Ptf+M+Sn F.Inf
1	1	-15.	-102.	-13.	-92.	-13.	-92.	-13.	-92.
	2	-16.	-100.	-28.	-66.	-38.	-50.	-26.	-71.
	3	-18.	-98.	-40.	-47.	-57.	-18.	-34.	-56.
	4	-20.	-96.	-47.	-35.	-70.	4.	-39.	-49.
	5	-22.	-94.	-51.	-30.	-77.	15.	-40.	-50.
	6	-24.	-92.	-50.	-33.	-78.	14.	-36.	-57.
	7	-25.	-90.	-46.	-42.	-73.	4.	-29.	-70.
	8	-43.	-62.	-51.	-34.	-76.	8.	-32.	-67.
	9	-69.	-20.	-55.	-29.	-74.	2.	-31.	-69.
	10	-79.	-4.	-43.	-51.	-57.	-27.	-16.	-96.
	11	-81.	-2.	-28.	-76.	-44.	-50.	7.	-136.
2	11	-81.	-2.	-28.	-76.	-44.	-50.	7.	-136.
	12	-82.	-2.	-43.	-53.	-57.	-29.	-15.	-100.
	13	-72.	-25.	-54.	-40.	-71.	-12.	-34.	-74.
	14	-48.	-73.	-51.	-52.	-77.	-10.	-32.	-83.
	15	-32.	-99.	-51.	-53.	-84.	1.	-32.	-84.
	16	-33.	-99.	-57.	-45.	-92.	13.	-38.	-76.
	17	-34.	-99.	-53.	-52.	-87.	2.	-33.	-84.
	18	-50.	-73.	-55.	-50.	-83.	-5.	-32.	-87.
	19	-79.	-24.	-62.	-37.	-79.	-8.	-36.	-78.
	20	-91.	-2.	-52.	-51.	-65.	-29.	-21.	-100.
	21	-91.	-2.	-36.	-76.	-49.	-54.	3.	-139.
3	21	-91.	-2.	-36.	-76.	-49.	-54.	3.	-139.
	22	-90.	-3.	-51.	-52.	-62.	-33.	-21.	-101.
	23	-77.	-27.	-60.	-41.	-75.	-16.	-37.	-77.
	24	-51.	-80.	-55.	-57.	-80.	-17.	-35.	-89.
	25	-41.	-114.	-62.	-65.	-99.	-10.	-41.	-96.
	26	-43.	-117.	-69.	-60.	-109.	0.	-47.	-92.
	27	-44.	-121.	-66.	-70.	-105.	-13.	-45.	-102.
	28	-61.	-96.	-68.	-67.	-100.	-20.	-44.	-103.
	29	-95.	-50.	-79.	-54.	-101.	-22.	-51.	-95.
	30	-110.	-31.	-72.	-69.	-89.	-43.	-38.	-119.
	31	-109.	-32.	-54.	-95.	-72.	-68.	-10.	-159.
4	31	-109.	-32.	-54.	-95.	-72.	-68.	-10.	-159.
	32	-110.	-31.	-70.	-71.	-85.	-49.	-36.	-121.
	33	-98.	-45.	-80.	-54.	-99.	-25.	-54.	-93.
	34	-69.	-86.	-72.	-63.	-101.	-20.	-48.	-98.
	35	-52.	-111.	-68.	-69.	-106.	-13.	-43.	-105.
	36	-53.	-111.	-71.	-65.	-112.	-5.	-44.	-104.
	37	-53.	-112.	-64.	-76.	-103.	-19.	-36.	-119.
	38	-73.	-83.	-66.	-75.	-98.	-27.	-33.	-124.
	39	-105.	-26.	-73.	-53.	-94.	-25.	-37.	-100.
	40	-124.	-13.	-67.	-71.	-84.	-48.	-25.	-126.
	41	-125.	-12.	-51.	-92.	-68.	-69.	1.	-160.
5	41	-125.	-12.	-51.	-92.	-68.	-69.	1.	-160.
	42	-126.	-11.	-68.	-68.	-84.	-48.	-26.	-124.
	43	-106.	-34.	-75.	-57.	-89.	-39.	-48.	-93.
	44	-72.	-109.	-72.	-88.	-98.	-49.	-47.	-125.
	45	-54.	-140.	-88.	-67.	-134.	0.	-66.	-100.

Tensiones en Servicio (kg/cm2) Estado final

V.	Sec	Ptf (*) F.Sup	Ptf (*) F.Inf	Pf+Ptf+M F.Sup	Pf+Ptf+M F.Inf	Pf+Ptf+M+Sp F.Sup	Pf+Ptf+M+Sp F.Inf	Pf+Ptf+M+Sn F.Sup	Pf+Ptf+M+Sn F.Inf
	46	-56.	-136.	-96.	-55.	-146.	19.	-73.	-90.
	47	-58.	-134.	-88.	-68.	-134.	1.	-62.	-106.
	48	-79.	-97.	-70.	-89.	-99.	-46.	-37.	-138.
	49	-120.	-21.	-77.	-59.	-93.	-38.	-43.	-105.
	50	-145.	2.	-74.	-73.	-91.	-51.	-26.	-136.
	51	-146.	3.	-57.	-95.	-73.	-73.	1.	-171.
6	51	-146.	3.	-57.	-95.	-73.	-73.	1.	-171.
	52	-145.	2.	-73.	-73.	-88.	-54.	-25.	-137.
	53	-119.	-22.	-75.	-62.	-90.	-43.	-41.	-107.
	54	-79.	-98.	-68.	-94.	-95.	-53.	-35.	-142.
	55	-61.	-133.	-86.	-74.	-132.	-6.	-59.	-114.
	56	-62.	-133.	-95.	-62.	-145.	12.	-69.	-102.
	57	-64.	-134.	-88.	-75.	-134.	-7.	-61.	-115.
	58	-84.	-102.	-73.	-97.	-99.	-57.	-41.	-143.
	59	-125.	-26.	-81.	-65.	-95.	-48.	-48.	-109.
	60	-152.	-4.	-80.	-78.	-94.	-59.	-33.	-141.
	61	-151.	-5.	-62.	-101.	-78.	-80.	-5.	-176.
7	61	-151.	-5.	-62.	-101.	-78.	-80.	-5.	-176.
	62	-150.	-6.	-79.	-79.	-96.	-57.	-32.	-141.
	63	-125.	-30.	-83.	-66.	-98.	-45.	-48.	-111.
	64	-86.	-107.	-76.	-98.	-106.	-54.	-43.	-147.
	65	-65.	-142.	-94.	-76.	-141.	-6.	-68.	-115.
	66	-65.	-142.	-103.	-62.	-154.	14.	-79.	-97.
	67	-64.	-144.	-95.	-73.	-142.	-4.	-73.	-106.
	68	-83.	-110.	-79.	-93.	-107.	-52.	-55.	-128.
	69	-107.	-38.	-74.	-64.	-89.	-44.	-46.	-101.
	70	-117.	-20.	-58.	-80.	-76.	-57.	-16.	-136.
	71	-117.	-21.	-41.	-103.	-60.	-78.	12.	-172.
8	71	-117.	-21.	-41.	-103.	-60.	-78.	12.	-172.
	72	-116.	-22.	-55.	-84.	-74.	-59.	-12.	-141.
	73	-104.	-42.	-68.	-72.	-89.	-45.	-30.	-122.
	74	-84.	-88.	-74.	-81.	-105.	-35.	-40.	-131.
	75	-69.	-93.	-79.	-59.	-115.	-5.	-50.	-100.
	76	-68.	-94.	-89.	-43.	-127.	13.	-66.	-77.
	77	-66.	-96.	-92.	-39.	-127.	14.	-75.	-64.
	78	-65.	-97.	-88.	-45.	-116.	-3.	-76.	-62.
	79	-64.	-99.	-76.	-61.	-93.	-36.	-71.	-70.
	80	-64.	-99.	-68.	-74.	-77.	-61.	-65.	-78.
	81	-63.	-100.	-57.	-90.	-57.	-90.	-57.	-90.

Resumen de tracciones maximas en Construccion (kg/cm2)

Resumen de compresiones maximas en Construccion (kg/cm2)

Seccion 60 T = -151. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 62 T = -150. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 65 T = -144. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 67 T = -143. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 50 T = -143. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 52 T = -142. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 61 T = -138. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 57 T = -138. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 63 T = -137. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 59 T = -137. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 55 T = -137. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 45 T = -136. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 64 T = -135. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 66 T = -134. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 68 T = -134. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 47 T = -133. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 1 T = -131. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 51 T = -131. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 49 T = -131. Estado ultimo F.Sup. Hipot. Pi+Pti
Seccion 58 T = -130. Estado ultimo F.Inf. Hipot. Pi+Pti
Seccion 44 T = -130. Estado ultimo F.Inf. Hipot. Pi+Pti

Resumen de tracciones maximas en Servicio (kg/cm2)

Seccion	46	T =	19.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	5	T =	15.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	6	T =	14.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	77	T =	14.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	66	T =	14.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	76	T =	13.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	16	T =	13.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	56	T =	12.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	71	T =	12.	Estado final	F.Sup. Hipot. Pf+Ptf+M+Sn
Seccion	8	T =	8.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	11	T =	7.	Estado final	F.Sup. Hipot. Pf+Ptf+M+Sn
Seccion	7	T =	4.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	4	T =	4.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	21	T =	3.	Estado final	F.Sup. Hipot. Pf+Ptf+M+Sn
Seccion	17	T =	2.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	9	T =	2.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	51	T =	1.	Estado final	F.Sup. Hipot. Pf+Ptf+M+Sn
Seccion	41	T =	1.	Estado final	F.Sup. Hipot. Pf+Ptf+M+Sn
Seccion	47	T =	1.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	15	T =	1.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp
Seccion	45	T =	0.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sp

Resumen de compresiones maximas en Servicio (kg/cm2)

Seccion	64	T =	-183.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	71	T =	-179.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	61	T =	-178.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	58	T =	-177.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	66	T =	-176.	Estado inicial	F.Sup. Hipot. Pi+Pti+M+Sp
Seccion	54	T =	-175.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	51	T =	-171.	Estado final	F.Inf. Hipot. Pf+Ptf+M+Sn
Seccion	48	T =	-170.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	31	T =	-170.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	56	T =	-166.	Estado inicial	F.Sup. Hipot. Pi+Pti+M+Sp
Seccion	68	T =	-166.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	46	T =	-165.	Estado inicial	F.Sup. Hipot. Pi+Pti+M+Sp
Seccion	41	T =	-164.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	67	T =	-163.	Estado inicial	F.Sup. Hipot. Pi+Pti+M+Sp
Seccion	65	T =	-163.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	44	T =	-162.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	74	T =	-161.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	57	T =	-160.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	55	T =	-159.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	37	T =	-156.	Estado inicial	F.Inf. Hipot. Pi+Pti+M+Sn
Seccion	47	T =	-153.	Estado inicial	F.Sup. Hipot. Pi+Pti+M+Sp

Reacciones y giros acumulados por peso propio

Estructura completa estado inicial

Apoyo	Reaccion (t)	Giro (rad*1000)
1	794.88	-0.007842
11	2376.30	0.000548
21	2162.35	-0.000264
31	1918.62	0.001122
41	2355.99	-0.003852
51	2569.24	0.001269
61	2554.46	-0.001077
71	2421.91	0.002911
81	602.16	0.007350

Reacciones y giros debidos a cargas muertas

Apoyo	Reaccion (t)	Giro (rad*1000)
1	255.85	-0.002501
11	832.19	-0.000017
21	816.54	-0.000106
31	732.50	0.000440
41	851.88	-0.001470
51	934.39	0.000483
61	928.52	-0.000407
71	878.81	0.001098
81	229.90	0.002796

Reacciones y giros por temperatura (Gradiente termico de 5.00 gr.)

Para Gradiente termico de -5.00 * -1.00

Apoyo	Reaccion (t)	Giro (rad*1000)
1	61.89	0.002782
11	-77.36	-0.000874
21	15.72	0.000260
31	1.43	-0.000061
41	-1.47	-0.000077
51	-2.72	0.000093
61	12.00	-0.000284
71	-63.32	0.001012
81	53.82	-0.003051

Reacciones y giros debidos a descenso lento de apoyos

Para estado final (nulos para estado inicial)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	0.000	0.000	0.0000000	0.0000000
11	0.000	0.000	0.0000000	0.0000000
21	0.000	0.000	0.0000000	0.0000000
31	0.000	0.000	0.0000000	0.0000000
41	0.000	0.000	0.0000000	0.0000000
51	0.000	0.000	0.0000000	0.0000000
61	0.000	0.000	0.0000000	0.0000000
71	0.000	0.000	0.0000000	0.0000000
81	0.000	0.000	0.0000000	0.0000000

Reacciones y giros por paso de ferrocarril (RENFE)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	530.818	-97.537	0.0029164	-0.0069342
11	1373.744	-133.310	0.0055501	-0.0060545
21	1426.548	-128.076	0.0071489	-0.0071192
31	1421.747	-190.401	0.0088034	-0.0078575
41	1574.352	-154.412	0.0089291	-0.0112905
51	1675.759	-137.453	0.0126362	-0.0120079
61	1671.355	-141.322	0.0117496	-0.0127933
71	1554.788	-152.059	0.0109572	-0.0082624
81	554.233	-137.853	0.0104423	-0.0057299

Reacciones y giros por paso de ferrocarril (UIC)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	380.114	-74.363	0.0022235	-0.0051505
11	1074.605	-98.371	0.0036687	-0.0046164
21	1111.083	-95.816	0.0049707	-0.0052517
31	1112.154	-146.245	0.0054960	-0.0056392
41	1240.701	-121.880	0.0059586	-0.0084055
51	1326.971	-109.972	0.0090513	-0.0092171
61	1326.911	-110.014	0.0092153	-0.0090478
71	1215.257	-119.273	0.0083968	-0.0053390
81	393.494	-105.641	0.0076341	-0.0043895

Reacciones y giros por ferrocarril (RENFE/UIC)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	530.818	-97.537	0.0029164	-0.0069342
11	1373.744	-133.310	0.0055501	-0.0060545
21	1426.548	-128.076	0.0071489	-0.0071192
31	1421.747	-190.401	0.0088034	-0.0078575
41	1574.352	-154.412	0.0089291	-0.0112905
51	1675.759	-137.453	0.0126362	-0.0120079
61	1671.355	-141.322	0.0117496	-0.0127933
71	1554.788	-152.059	0.0109572	-0.0082624
81	554.233	-137.853	0.0104423	-0.0057299

Reacciones y giros por pretensado (*coef. perdidas elasticas)

Estructura completa estado inicial

Apoyo	Reaccion (t)	Giro (rad*1000)
1	97.08	0.014542
11	-100.61	0.000197
21	-52.35	0.000988
31	95.60	-0.001874
41	5.52	0.005308
51	-80.50	-0.000938
61	12.94	0.001082
71	-30.77	-0.005451
81	53.09	-0.006285

Reacciones y giros por pretensado (*coef. perdidas totales)

Estructura completa estado final

Apoyo	Reaccion (t)	Giro (rad*1000)
1	86.24	0.012918
11	-89.37	0.000175
21	-46.50	0.000878
31	84.92	-0.001665
41	4.90	0.004715
51	-71.51	-0.000833
61	11.49	0.000961
71	-27.34	-0.004842
81	47.16	-0.005583

Reacciones y giros por sobrecarga total

(+descensos lentos estructura inicial+temperatura)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	592.712	-159.431	0.0056985	-0.0097163
11	1451.105	-210.671	0.0064245	-0.0069289
21	1442.271	-143.799	0.0074090	-0.0073793
31	1423.177	-191.831	0.0088645	-0.0079186
41	1575.824	-155.884	0.0090059	-0.0113673
51	1678.474	-140.168	0.0127287	-0.0121004
61	1683.352	-153.319	0.0120341	-0.0130778
71	1618.105	-215.376	0.0119695	-0.0092747
81	608.054	-191.674	0.0134931	-0.0087807

Reacciones y giros por sobrecarga total

(+descensos lentos estructura final+temperatura)

Apoyo	Reaccion (t) maxima	Reaccion (t) minima	Giro(rad*1000) maximo	Giro(rad*1000) minimo
1	592.712	-159.431	0.0056985	-0.0097163
11	1451.105	-210.671	0.0064245	-0.0069289
21	1442.271	-143.799	0.0074090	-0.0073793
31	1423.177	-191.831	0.0088645	-0.0079186
41	1575.824	-155.884	0.0090059	-0.0113673
51	1678.474	-140.168	0.0127287	-0.0121004
61	1683.352	-153.319	0.0120341	-0.0130778
71	1618.105	-215.376	0.0119695	-0.0092747
81	608.054	-191.674	0.0134931	-0.0087807

EFECTO DE LAS CARGAS HORIZONTALES TORSIONALES DE

a) ROZAMIENTOS TEFLON

b) INTERACCION CIMIENTO - ESTRUCTURA

c) FRENADO

d) PISTA

EFECTO HORIZONTAL DE TEFLONES.

	P PANDEO	C PERM	DOZ	σ (t/m²)
E-1	586	214	±40	± 3
P-1	2211	821	±152	±14
P-2	2344	870	±161	±26
P-3	2359	876	±161	±38
P-4	2142	795	±147	±49
P-5	1861	691	±128	±59
P-6	1939	720	±133	±69
P-7	1939	720	±133	±79
P-8	1939	720	±133	±89
P-9	1939	720	±133	±99
P-10	1939	720	±133	±109
P-11	1939	720	±133	±119
P-12	1939	720	±133	±129
P-13	1953	725	±134	±139
E-2	6001	973	—	

50 40 70 70 57 52 52 42

$DOZ = 0{,}05\,(P_{PANDEO} + C_{PERM})$

$\sigma = \pm \frac{\sum DOZ}{S} = \pm \sum \frac{DOZ}{13{,}28}$



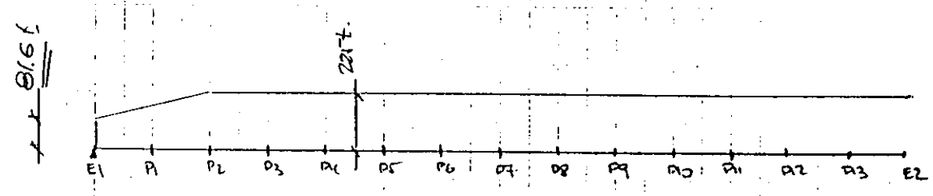
EFECTO LIMITACIÓN CARRIL-ESTRUCTURA

SE SIGUEN LOS CRITERIOS DEL APARTADO 3.4.9 DEL EC1/93

EN EL CASO DE DOS VÍAS DE CIRCULACIÓN Y JUNTA DE CARRILES EN UN EXTREMO

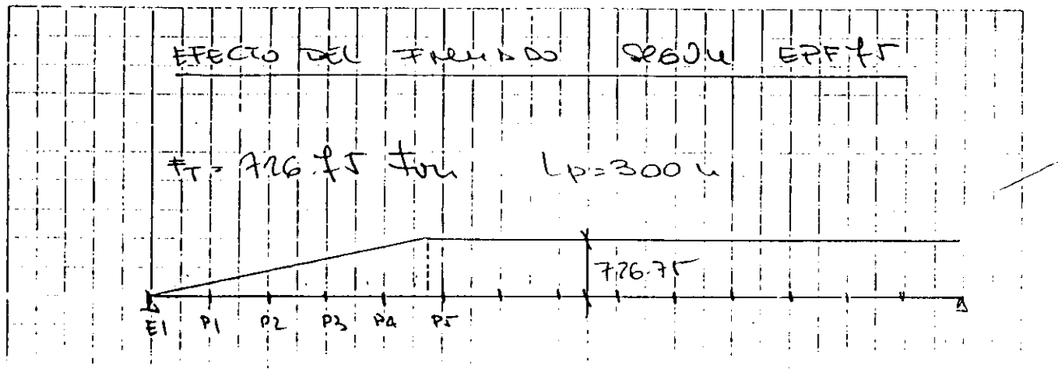
$t = (400 + 5L) \times 2 \quad (kN) = \frac{400 + 5L}{9.8} \times 2\ t < \frac{1100}{9.8} \times 2\ t$

$L_\phi = \frac{1100 - 400}{5} = 140\ m \quad (\text{SE TOMA } 120\ m)$



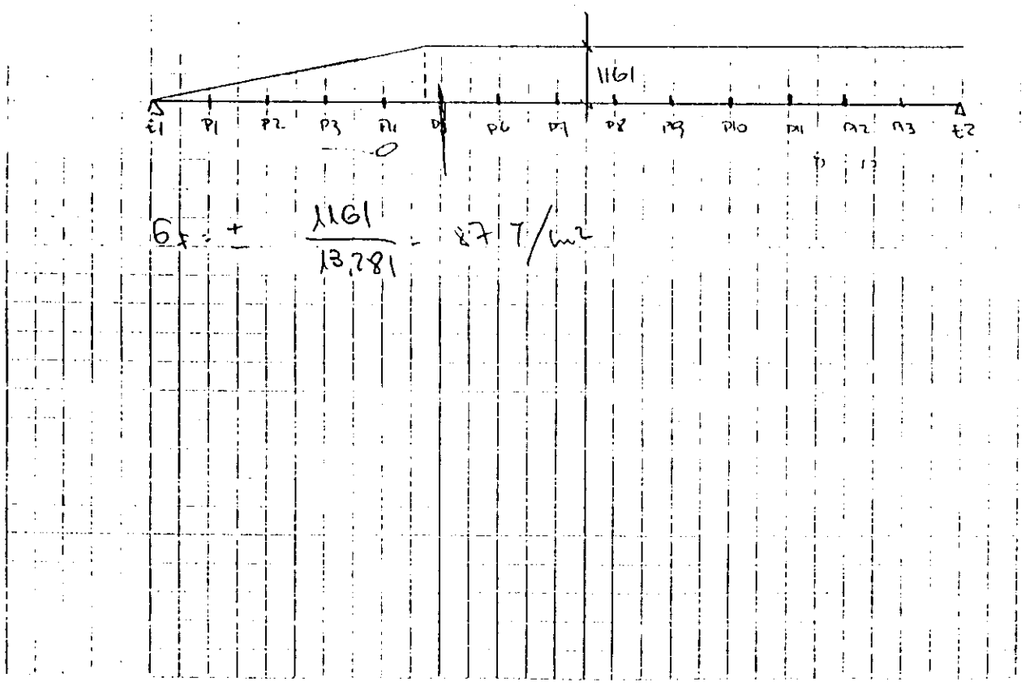
SE TOMA A LO LARGO DE TODO EL PUENTE

$\sigma = \pm \frac{225}{13{,}21} = 17\ t/m^2$



$$\sigma_F = \frac{726.75}{13.281} = 54.7\ T/m^2$$

EFECTO DEL FRENADO SEGÚN N.J.C



EFECTO DEL SISMO

NO SE CONSIDERA ACCIÓN SÍSMICA HORIZONTAL

a) SEGÚN PDS 1/1974

Coeficiente sísmico básico c=0.08.

$H = S \times Q$

Siendo $S = \alpha \eta \beta \cdot \delta$

$\alpha = 0.08$ $\eta = 1.00$ $\beta = 1.00$ $\delta = 0.0$

PARA INTRADOS

$Q = (13.281 \times 2.5 + 12.39) \times 1.30 = 37.842$ t/m

PESO TABLEROS DE APOYO

$P = 15 \times 4.8 + 4.0 \times 2 \times 2.5 = 144.0$ t

EN NUESTRO CASO

$F_L = T_T = 0.064\ (37.842 + 144.0) = 12.14$ t/m

PARA PUENTE CARGADO

Se considera actuando el 30% de la sobrecarga y del frenado en un

ber de 300 u de longitud, con lo que

$F_L = 0.064 (37842 + 1440 + 0.3 \times 300 \times 2 \times 8) = 2606.1$

Flenado compatte

$F = 1161 \times 0.3 = 348$ t

Sismo + frenado

$F_T = 2606 + 348 = 2954$ t.

Este alcanza a pesar de el conjunto de Rozamiento de Neflón + vibración carril + Frenado de calculo

$F = \Sigma ROZ + TEF + FRE = 1954 + 225 + 1161$

$= 3340$

Luego el sismo no es un hipótesis condicionante

COMPROBACIÓN DE ESFUERZOS

En el siguiente anejo se recoge el estado de tensiones de la losa debido a las hipótesis de Flotación, Viento Carga UIC y Nieve carga 875

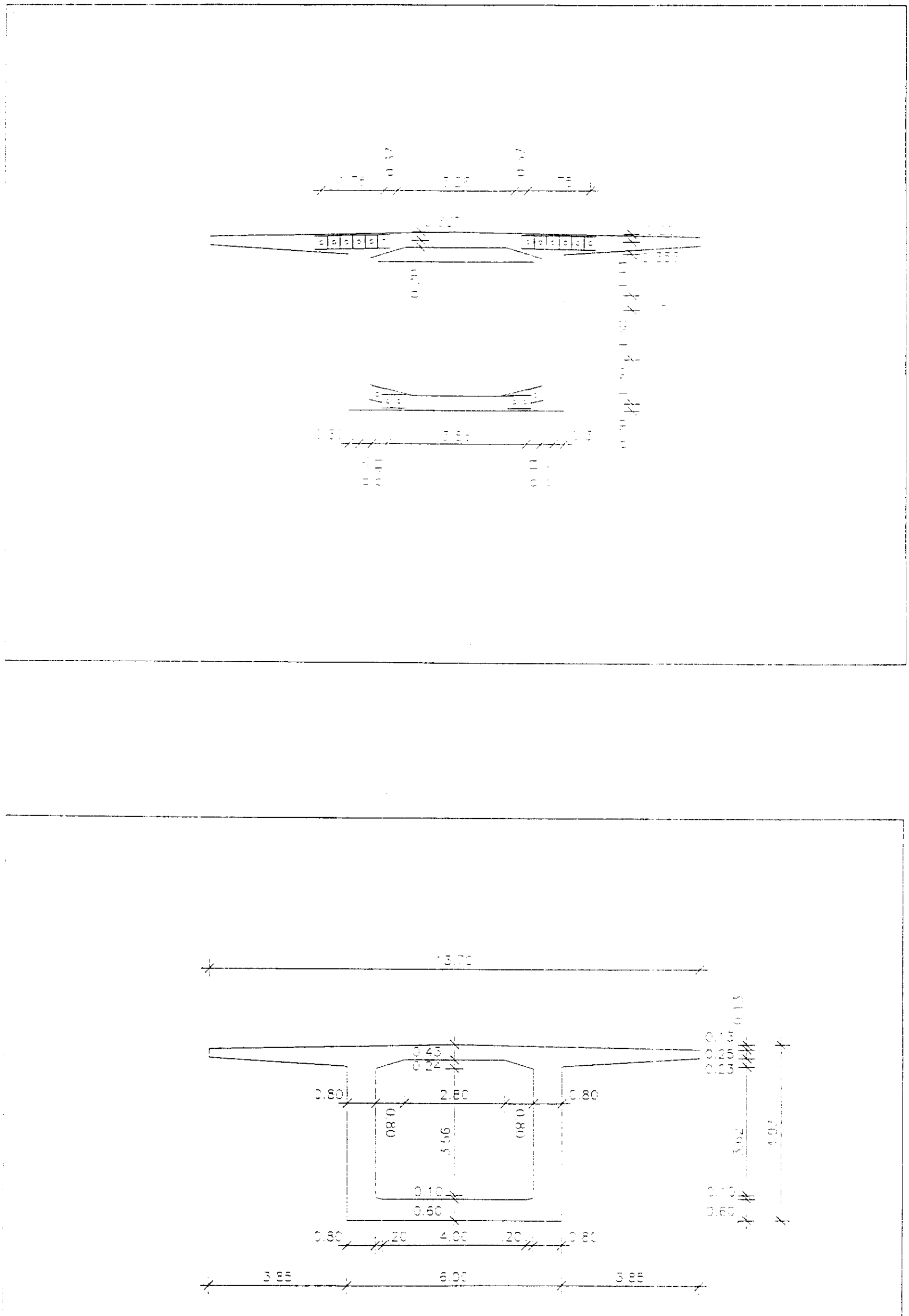
- En pilas de hipótesis de la inclinación más el efecto (en tensiones) que produce el esfuerzo longitudinal de frenado del tren se incluye como los efectos de rozamiento de neflón y acción carril-estructura
- PARA REDUCIR EL EXCESO DE TRACCIÓN que aparece en sección 6-11 y 16 en Quede 2024 el canto de 5 de la losa

$\sigma_c = - \frac{2 \times 24 \times 70}{1348} = \pm 1.2$ t/m²

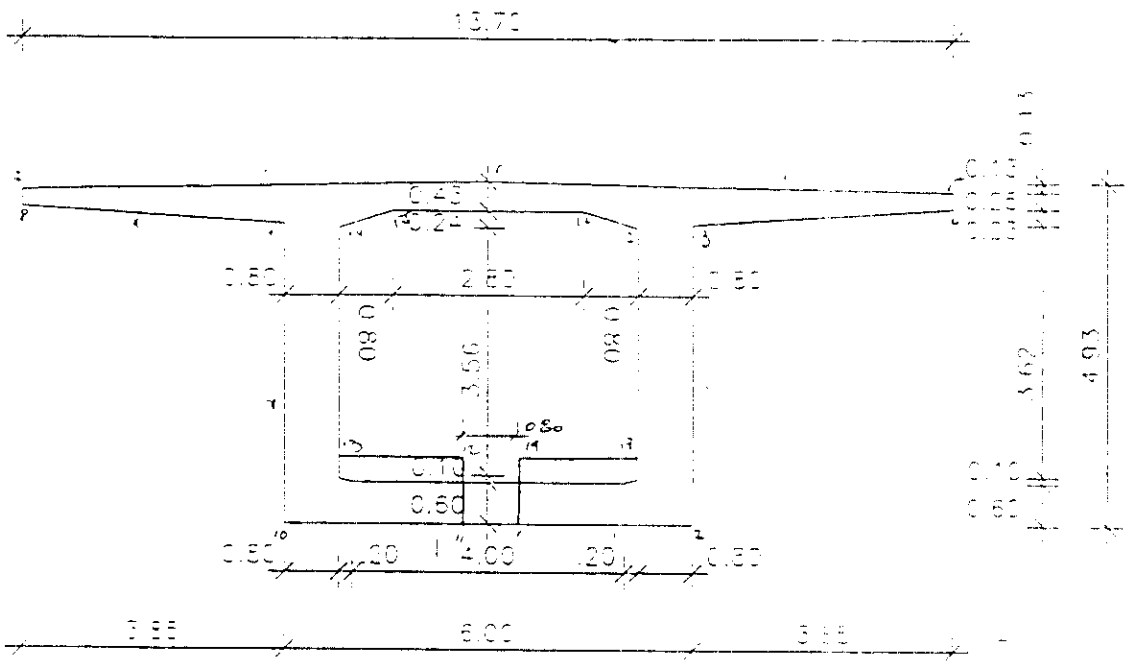
CINCALON.XLS

		PTE VACIO		PTE VACIO + SOBRECARGA U.I.C					PTE VACIO + SOBRECARGA EP75					OTROS		FIBRA SUP		FIBRA INF	
SECC	SECC	FS	FI	FS(S+)	FI(S+)	FS(S-)	FI(S-)	FREN	FS(S+)	FI(S+)	FS(S-)	FI(S-)	FREN	TEFL	CARR	MAX.	MIN.	MAX.	MIN.
C.VANO	76	-79	-41	-107	0	-62	-66	7	-127	13	-66	-77	4	1	1	-53	-133	19	-83
PILA 1	71	-32	-121	-49	-97	7	-179	7	-60	-78	12	-172	4	1	1	18	-66	-72	-188
C.VANO	66	-90	-56	-120	-14	-64	-97	7	-154	14	-79	-93	4	2	1	-54	-161	21	-107
PILA 2	61	-45	-144	-59	-123	-3	-207	7	-78	-80	-5	-176	4	3	1	8	-86	-72	-218
C.VANO	56	-71	-56	-110	2	-55	-80	7	-145	12	-69	-102	4	3	1	-44	-153	20	-110
PILA 3	51	-32	-119	-47	-98	11	-183	7	-73	-73	1	-171	4	4	1	23	-82	-64	-195
C.VANO	46	-72	-51	-111	6	-55	-76	7	-146	19	-73	-90	4	4	1	-43	-155	28	-99
PILA 4	41	-36	-104	-50	-82	3	-161	7	-68	-69	1	-160	4	5	1	16	-78	-59	-174
C.VANO	36	-57	-55	-88	-9	-40	-81	7	-112	-5	-44	-107	4	5	1	-27	-122	5	-117
P. 5/11	31	-43	-85	-58	-63	-10	-133	7	-72	-68	-10	-159	4	12	1	10	-89	-43	-176
C.VANO	26	-49	-45	-79	0	-34	-66	7	-109	0	-47	-92	4	12	1	-14	-126	20	-109
PILA 12	21	-26	-71	-38	-53	6	-118	7	-49	-54	3	-139	4	13	1	27	-67	-32	-157
C.VANO	16	-49	-40	-80	6	-33	-63	7	-92	13	-38	-76	4	13	1	-12	-110	31	-94
PILA 13	11	-22	-67	-37	-45	10	-115	7	-44	-50	7	-136	4	14	1	32	-63	-23	-155
C.VANO	6	-52	-30	-77	8	-39	-49	7	-78	14	-36	-57	4	14	1	-17	-99	33	-76

2.4.- COMPROBACIÓN A ROTURA



SECCION TRANSVERSAL SOBRE PILAS 1-2-3-4



SECCION TRANSVERSAL SOBRE PILAS 1 – 2 – 3 – 4

CINCAPPP.XLS

CARACTERISTICAS DEL PRETENSADO

SECC	NC1	NC2	NC3	SC1	SC2	SC3	YP	EXC
1	144	144	243	20592	20592	34749	2.870	-0.883
2	144	144	243	20592	20592	34749	2.870	-0.883
3	144	144	243	20592	20592	34749	2.870	-0.883
4	144	144	243	20592	20592	34749	2.870	-0.883
5	144	144	243	20592	20592	34749	2.870	-0.883
6	144	144	243	20592	20592	34749	2.870	-0.883
7	144	144	243	20592	20592	34749	2.870	-0.883
8	258	144	243	36894	20592	34749	2.411	-0.424
9	315	144	129	45045	20592	18447	1.772	0.215
10	315	144	72	45045	20592	10296	1.464	0.523
11	315	144	72	45045	20592	10296	1.464	0.523
12	315	144	72	45045	20592	10296	1.464	0.523
13	315	144	167	45045	20592	23881	1.946	0.041
14	258	144	281	36894	20592	40183	2.534	-0.547
15	144	144	281	20592	20592	40183	2.988	-1.001
16	144	144	281	20592	20592	40183	2.988	-1.001
17	144	144	281	20592	20592	40183	2.988	-1.001
18	258	144	281	36894	20592	40183	2.534	-0.547
19	336	144	167	48048	20592	23881	1.891	0.095
20	336	96	72	48048	13728	10296	1.317	0.670
21	336	96	72	48048	13728	10296	1.317	0.670
22	336	96	72	48048	13728	10296	1.317	0.670
23	336	96	167	48048	13728	23881	1.844	0.143
24	286	96	295	40898	13728	42185	2.488	-0.501
25	172	96	295	24596	13728	42185	2.936	-0.949
26	200	96	309	28600	13728	44187	2.852	-0.865
27	200	96	309	28600	13728	44187	2.852	-0.865

SECC	NC1	NC2	NC3	SC1	SC2	SC3	YP	EXC
28	314	96	309	44902	13728	44187	2.443	-0.456
29	420	96	209	60060	13728	29887	1.823	0.164
30	420	96	114	60060	13728	16302	1.399	0.588
31	420	96	114	60060	13728	16302	1.399	0.588
32	420	96	114	60060	13728	16302	1.399	0.588
33	420	96	171	60060	13728	24453	1.665	0.319
34	342	96	265	48906	13728	40755	2.286	-0.299
35	228	96	265	32604	13728	40755	2.663	-0.676
36	228	96	295	32604	13728	42185	2.695	-0.708
37	228	96	295	32604	13728	42185	2.695	-0.708
38	342	96	295	48906	13728	42185	2.318	-0.331
39	475	96	191	67925	13728	27313	1.645	0.342
40	475	96	134	67925	13728	19162	1.403	0.584
41	475	96	134	67925	13728	19162	1.403	0.584
42	475	96	134	67925	13728	19162	1.403	0.584
43	475	96	239	67925	13728	34177	1.822	0.165
44	342	96	391	48906	13728	55913	2.587	-0.600
45	228	96	391	32604	13728	55913	2.956	-0.969
46	228	96	391	32604	13728	55913	2.956	-0.969
47	228	96	391	32604	13728	55913	2.956	-0.969
48	342	96	391	48906	13728	55913	2.587	-0.600
49	513	96	239	73359	13728	34177	1.753	0.234
50	513	96	144	73359	13728	20592	1.389	0.598
51	513	96	144	73359	13728	20592	1.389	0.598
52	513	96	144	73359	13728	20592	1.389	0.598
53	513	96	239	73359	13728	34177	1.753	0.234
54	342	96	391	48906	13728	55913	2.587	-0.600

SECC	NC1	NC2	NC3	SC1	SC2	SC3	YP	EXC
55	249	96	391	35464	13728	55913	2.883	-0.896
56	249	96	391	35464	13728	55913	2.883	-0.896
57	268	96	391	38324	13728	55913	2.814	-0.827
58	382	96	391	54626	13728	55913	2.480	-0.493
59	573	96	239	81939	13728	34177	1.655	0.332
60	573	96	144	81939	13728	20592	1.307	0.680
61	573	96	144	81939	13728	20592	1.307	0.680
62	573	96	144	81939	13728	20592	1.307	0.680
63	573	96	239	81939	13728	34177	1.655	0.332
64	402	96	391	57486	13728	55913	2.431	-0.444
65	288	96	391	41184	13728	55913	2.748	-0.761
66	288	96	391	41184	13728	55913	2.748	-0.761
67	288	96	391	41184	13728	55913	2.748	-0.761
68	402	96	391	57486	13728	55913	2.431	-0.444
69	459	96	239	65637	13728	34177	1.853	0.134
70	459	96	144	65637	13728	20592	1.475	0.512
71	459	96	144	65637	13728	20592	1.475	0.512
72	459	96	144	65637	13728	20592	1.475	0.512
73	459	96	239	65637	13728	34177	1.853	0.134
74	402	96	239	57486	13728	34177	1.976	0.011
75	288	96	239	41184	13728	34177	2.287	-0.300
76	288	96	239	41184	13728	34177	2.287	-0.300
77	288	96	239	41184	13728	34177	2.287	-0.300
78	288	96	239	41184	13728	34177	2.287	-0.300
79	288	96	239	41184	13728	34177	2.287	-0.300
80	288	96	239	41184	13728	34177	2.287	-0.300
81	288	96	239	41184	13728	34177	2.287	-0.300

NC1= NUMERO DE CABLES EN CABEZA SUPERIOR

NC2= NUMERO DE CABLES CENTRALES

NC3= NUMERO DE CABLES EN CABEZA INFERIOR

SC1= SECCION TOTAL DE CABLES EN CABEZA SUPERIOR

SC2= SECCION TOTAL DE CABLES CENTRALES

SC3= SECCION TOTAL DE CABLES EN CXABEZA INFERIOR

YP= CDG DE CABLES

EXC= EXCENTRICIDAD

COMPROBACION A ROTURA

SECCIO	MPP	MCP	MSC	M*	MPR	NPR	TFS	TFI	YP	YG	EXC	MIP	MHP	M*-MHP	MRS
26	5049	1928	7077	22486	-6939	-9424	-394	-1150	2.852	1.987	-0.865	-8152	1213	23820	28453
31	-8912	-3396	-9326	-29422	7037	-10529	-1091	-324	1.399	1.987	0.588	6191	846	-28661	-36934
40	-7781	-2941	-7791	-29621	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-25508	-36958
41	-12735	-4739	-11810	-39826	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-35714	-41753
46	7531	2862	9201	31350	-7377	-11920	-560	-1364	2.956	1.987	-0.969	-11550	4173	35941	36295
50	-9799	-3701	-9344	-36550	15171	-12719	-1611	43	1.389	1.987	0.598	7606	7565	-29742	-37285
51	-15096	-5641	-13386	-46407	15297	-12693	-1615	53	1.389	1.987	0.598	7590	7707	-39471	-44533

MPP= MOMENTO FLECTOR POR PESO PROPIO

MCP= MOMENTO FLECTOR PORCARGAS PERMANENTES

MSC= MOMENTO FLECTOR POR SOBRECARGAS

M*= (MPP+MCP+MSC)* 6

MPR= MOMENTO TOTAL DE PRETENSADO

NPR= AXIL DE PRETENSADO

TFS= TENSION EN FS DEBIDA AL PRETENSADO

TFI= TENSION EN FI DEBIDA AL PRETENSADO

YP= COG DE CABLES

YG= COG DE LA SECCION

EXC= EXCENTRICIDAD DEL PRETENSADO

MHP= MOMENTO HIPERESTATICO DE LAS SECCION

M*-MHP MOMENTO REAL DE COMPARACION

MRS= MOMENTO DE ROTURA DE LA SECCION

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Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 26
---------

tension de calculo del hormigon ..... :    2667.00t/m2
tension de calculo del acero activo ..... :  154545.50t/m2
tension de calculo del acero pasivo ..... :   46363.60t/m2
tension de calculo del acero estructural .. :     0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de poligonos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas
-------------------------------

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas
-------------------------------

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural
----------------------------------

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0
```

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de 5184.00 (t)

Definicion de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -394.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. ********* (t/m2) a -2.96 (m) del c.d.g

intecsa INTERNACIONAL DE INGENIERIA Y ESTUDIOS TECNICOS S.A.

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	28600.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	44187.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.3928	1.4285	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	1.4456	1.9231	2.02
83	1.6521	1.9190	2.02	84	1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	3.3042	1.8859	2.02	92	3.5108	1.8818	2.02
93	3.7173	1.8776	2.02	94	3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	5.3694	1.8446	2.02	102	5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	6.6085	1.8198	2.02	108	6.8150	1.8157	2.02
109	6.8150	1.6330	1.12	110	6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.130	1.008	0.562	5184.165	28453.02	0.00
180.0	-0.276	1.009	1.041	5175.699	15418.03	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.195	1.009	0.799	-0.046	36961.56	0.00
180.0	-0.300	0.266	2.612	0.037	21420.78	0.00

Caso 3 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.642	1.569	-5201.093	43841.94	0.00
180.0	-0.300	0.057	4.143	-5166.798	-19796.08	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 31. ROTURA.

Tension de calculo del hormigon ..... : 2067.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares ..... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	2.0000	-2.3430
11	2.2000	-2.2430	12	2.2000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.2000	1.3170	16	-2.2000	-2.2430
17	-2.0000	-2.3430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1091.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -324.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	60060.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	16302.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4036	1.12
24	3.1789	1.4157	1.12	24	3.3928	1.4289	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	2.9650	1.4030	1.12	128	2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	1.9165	1.12
145	-2.9650	-2.1105	1.12	146	2.9650	2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	2.6925	1.12
149	-2.9650	-2.9080	2.02	150	2.7605	2.9080	2.02
151	-2.5560	-2.9080	2.02	152	2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	2.2350	-2.0392	1.12	180	2.2350	-1.8419	1.12
181	2.2350	-1.6446	1.12	182	2.2350	-1.4473	1.12
183	2.2350	-1.2500	1.12	184	2.2350	-1.0527	1.12
185	2.2350	-0.8554	1.12	186	2.2350	-0.6581	1.12
187	2.2350	-0.4608	1.12	188	2.2350	-0.2635	1.12
189	2.2350	-0.0662	1.12	190	2.2350	0.1311	1.12
191	2.2350	0.3284	1.12	192	2.2350	0.5257	1.12
193	2.2350	0.7230	1.12	194	2.2350	0.9203	1.12
195	2.2350	1.1176	1.12	196	2.2350	1.3430	1.12
197	1.9584	1.4260	1.12	198	1.6818	1.5090	1.12
199	1.4051	1.5920	1.12	200	1.1890	1.5920	1.12
201	1.0060	1.5920	1.12	202	0.8231	1.5920	1.12
203	0.6402	1.5920	1.12	204	0.4573	1.5920	1.12
205	0.2744	1.5920	1.12	206	0.0915	1.5920	1.12
207	-0.0915	1.5920	1.12	208	-0.2744	1.5920	1.12
209	-0.4573	1.5920	1.12	210	-0.6402	1.5920	1.12
211	-0.8231	1.5920	1.12	212	-1.0060	1.5920	1.12
213	1.1890	1.5920	1.12	214	1.4051	1.5920	1.12
215	-1.6818	1.5090	1.12	216	1.9584	1.4260	1.12
217	-2.2350	1.3430	1.12	218	-2.2350	1.1176	1.12
219	-2.2350	0.9203	1.12	220	2.2350	0.7230	1.12
221	-2.2350	0.5257	1.12	222	-2.2350	0.3284	1.12
223	2.2350	0.1311	1.12	224	-2.2350	-0.0662	1.12
225	-2.2350	-0.2635	1.12	226	-2.2350	-0.4608	1.12
227	-2.2350	-0.6581	1.12	228	2.2350	-0.8554	1.12
229	-2.2350	-1.0527	1.12	230	2.2350	1.2500	1.12
231	2.2350	-1.4473	1.12	232	-2.2350	-1.6446	1.12
233	-2.2350	-1.8419	1.12	234	-2.2350	-2.0392	1.12
235	-1.7969	-2.3780	1.12	236	1.6077	-2.3780	1.12
237	1.4186	-2.3780	1.12	238	-1.2294	-2.3780	1.12
239	-1.0403	-2.3780	1.12	240	-0.8511	-2.3780	1.12
241	-0.6620	-2.3780	1.12	242	-0.4729	-2.3780	1.12
243	-0.2837	-2.3780	1.12	244	-0.0946	-2.3780	1.12
245	0.0946	-2.3780	1.12	246	0.2837	-2.3780	1.12
247	0.4729	-2.3780	1.12	248	0.6620	-2.3780	1.12
249	0.8511	-2.3780	1.12	250	1.0403	-2.3780	1.12
251	1.2294	-2.3780	1.12	252	1.4186	2.3780	1.12
253	1.6077	2.3780	1.12	254	1.7969	-2.3780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.115	1.008	0.505	5184.630	8976.55	0.00
180.0	0.244	1.009	0.961	5171.886	36934.71	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.170	1.008	0.709	-0.051	17582.32	0.00
180.0	-0.300	0.398	2.118	-0.002	-44314.14	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.256	1.009	0.996	-5185.006	25758.62	0.00
180.0	-0.300	0.161	3.209	-5192.299	-44197.18	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 40

Tension de calculo del hormigon ..... : 2667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares ..... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aistadas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 4 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ... 0.00 (sex)
Angulo final ... 180.00 (sex)
Variacion cada ... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de 5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1328.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -133.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	67925.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	19192.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1700	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.127	1.008	0.553	5184.480	10930.38	0.00
180.0	-0.300	0.569	1.701	5195.413	-40270.47	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.185	1.008	0.763	-0.045	19490.18	0.00
180.0	-0.300	0.196	2.985	0.000	-40322.87	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.294	1.009	1.112	-5199.414	27547.21	0.00
180.0	-0.300	0.042	4.323	-5191.916	-36958.32	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 41. ROTURA.

Tension de calculo del hormigon ... : 2667.00t/m2
Tension de calculo del acero activo ... : 154545.50t/m2
Tension de calculo del acero pasivo ... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ... : 3800000.00t/m2
Modulo de elasticidad del acero activo ... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de [illegible] : 3
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	2.0000	-2.3430
11	2.2000	-2.2430	12	2.2000	1.3170
13	1.4000	1.5570	14	1.4000	1.5570
15	-2.2000	1.3170	16	-2.2000	-2.2430
17	-2.0000	-2.3430			

Definicion de circuitos

Circuito 1 ; Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension fibra Sup. -1388.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -133.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	67925.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	19162.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	2.9650	-0.9465	1.12	140	-2.9650	1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	2.2350	-2.0392	1.12	180	2.2350	-1.8419	1.12
181	2.2350	-1.6446	1.12	182	2.2350	-1.4473	1.12
183	2.2350	-1.2500	1.12	184	2.2350	-1.0527	1.12
185	2.2350	-0.8554	1.12	186	2.2350	-0.6581	1.12
187	2.2350	-0.4608	1.12	188	2.2350	-0.2635	1.12
189	2.2350	-0.0662	1.12	190	2.2350	0.1311	1.12
191	2.2350	0.3284	1.12	192	2.2350	0.5257	1.12
193	2.2350	0.7230	1.12	194	2.2350	0.9203	1.12
195	2.2350	1.1176	1.12	196	2.2350	1.3430	1.12
197	1.9584	1.4260	1.12	198	1.6818	1.5090	1.12
199	1.4051	1.5920	1.12	200	1.1890	1.5920	1.12
201	1.0060	1.5920	1.12	202	0.8231	1.5920	1.12
203	0.6402	1.5920	1.12	204	0.4573	1.5920	1.12
205	0.2744	1.5920	1.12	206	0.0915	1.5920	1.12
207	-0.0915	1.5920	1.12	208	-0.2744	1.5920	1.12
209	-0.4573	1.5920	1.12	210	-0.6402	1.5920	1.12
211	-0.8231	1.5920	1.12	212	-1.0060	1.5920	1.12
213	-1.1890	1.5920	1.12	214	-1.4051	1.5920	1.12
215	-1.6818	1.5090	1.12	216	-1.9584	1.4260	1.12
217	-2.2350	1.3430	1.12	218	-2.2350	1.1176	1.12
219	-2.2350	0.9203	1.12	220	-2.2350	0.7230	1.12
221	-2.2350	0.5257	1.12	222	-2.2350	0.3284	1.12
223	-2.2350	0.1311	1.12	224	-2.2350	-0.0662	1.12
225	-2.2350	-0.2635	1.12	226	-2.2350	-0.4608	1.12
227	-2.2350	-0.6581	1.12	228	-2.2350	-0.8554	1.12
229	-2.2350	-1.0527	1.12	230	-2.2350	-1.2500	1.12
231	-2.2350	-1.4473	1.12	232	-2.2350	-1.6446	1.12
233	-2.2350	-1.8419	1.12	234	-2.2350	-2.0392	1.12
235	-1.7969	-2.3780	1.12	236	-1.6077	-2.3780	1.12
237	-1.4186	-2.3780	1.12	238	-1.2294	-2.3780	1.12
239	-1.0403	-2.3780	1.12	240	-0.8511	-2.3780	1.12
241	-0.6620	-2.3780	1.12	242	-0.4729	-2.3780	1.12
243	-0.2837	-2.3780	1.12	244	-0.0946	-2.3780	1.12
245	0.0946	-2.3780	1.12	246	0.2837	-2.3780	1.12
247	0.4729	-2.3780	1.12	248	0.6620	-2.3780	1.12
249	0.8511	-2.3780	1.12	250	1.0403	-2.3780	1.12
251	1.2294	-2.3780	1.12	252	1.4186	-2.3780	1.12
253	1.6077	-2.3780	1.12	254	1.7969	-2.3780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.128	1.008	0.554	5184.854	10939.43	0.00
180.0	-0.300	0.982	1.154	5173.886	-41753.78	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.185	1.008	0.763	-0.028	19487.35	0.00
180.0	-0.300	0.322	2.379	-0.034	-46190.56	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	0.286	1.009	1.087	5192.412	27490.97	0.00
180.0	-0.300	0.126	3.470	-5195.482	-45294.80	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 46

Tension de calculo del hormigon ..... : 2667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural ... : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circulos ..... : 4
Numero total de inclusiones circulares ... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	5	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 9 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas .. 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de 5184.00 (t)

Definicion de ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. 560.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -1364.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	32604.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	55913.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	2.9650	0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	2.9650	1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

intecsa, INTERNACIONAL DE INGENIERIA Y ESTUDIOS TECNICOS

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.152	1.008	0.644	5181.672	36295.68	0.00
180.0	-0.233	1.009	0.926	5177.295	-18449.37	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.232	1.009	0.923	0.040	44630.42	0.00
180.0	-0.300	0.370	2.208	-0.018	-26663.76	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.405	2.097	-5175.989	48797.76	0.00
180.0	-0.300	0.104	3.662	-5183.591	-26349.79	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 50

Tension de calculo del hormigon ..... : 2667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 5 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ... 0.00 (sex)
Angulo final ... 180.00 (sex)
Variacion cada ... 180.00 (sex)

Definicion de Axiles (Comp. (-) frac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1611.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. 43.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	73359.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	20592.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	2.9650	0.2175	1.12	134	2.9650	0.0235	1.12
135	2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	1.9165	1.12
145	2.9650	-2.1105	1.12	146	2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	1.1247	-2.9080	2.02
159	0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	0.8225	1.5920	1.12	216	1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	1.7478	1.5095	1.12	220	2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.156	1.008	0.584	5178.352	11892.44	0.00
180.0	-0.300	0.443	1.991	5177.848	42347.51	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.195	1.009	0.800	-0.020	20407.53	0.00
180.0	-0.300	0.165	3.180	-0.005	41155.80	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.886	1.247	-5197.548	28168.63	0.00
180.0	0.300	0.029	4.499	-5169.406	-37285.74	0.00

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 51. ROTURA.

Tension de calculo del hormigon ..... : 2667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ... ... : 17
Numero total de circuitos ... ... : 4
Numero total de inclusiones circulares ... : 0

Definicion de armaduras activas
---------- -- ----------

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas
---------- -- ----------

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural
---------- -- ----------

Numero total de chapas continuas ..... : 0
Numero total de chapas aistadas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	2.0000	-2.3430
11	2.2000	-2.2430	12	2.2000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.2000	1.3170	16	-2.2000	-2.2430
17	-2.0000	-2.3430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de 5184.00 (t)

Definicion de ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1615.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. 53.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	73359.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	20592.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12

111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	2.9650	1.4030	1.12	128	2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	2.2350	-2.0392	1.12	180	2.2350	-1.8419	1.12
181	2.2350	-1.6446	1.12	182	2.2350	-1.4473	1.12
183	2.2350	-1.2500	1.12	184	2.2350	-1.0527	1.12
185	2.2350	-0.8554	1.12	186	2.2350	-0.6581	1.12
187	2.2350	-0.4608	1.12	188	2.2350	-0.2635	1.12
189	2.2350	-0.0662	1.12	190	2.2350	0.1311	1.12
191	2.2350	0.3284	1.12	192	2.2350	0.5257	1.12
193	2.2350	0.7230	1.12	194	2.2350	0.9203	1.12
195	2.2350	1.1176	1.12	196	2.2350	1.3430	1.12
197	1.9584	1.4260	1.12	198	1.6818	1.5090	1.12
199	1.4051	1.5920	1.12	200	1.1890	1.5920	1.12
201	1.0060	1.5920	1.12	202	0.8231	1.5920	1.12
203	0.6402	1.5920	1.12	204	0.4573	1.5920	1.12
205	0.2744	1.5920	1.12	206	0.0915	1.5920	1.12
207	-0.0915	1.5920	1.12	208	-0.2744	1.5920	1.12
209	0.4573	1.5920	1.12	210	-0.6402	1.5920	1.12
211	-0.8231	1.5920	1.12	212	-1.0060	1.5920	1.12
213	-1.1890	1.5920	1.12	214	-1.4051	1.5920	1.12
215	-1.6818	1.5090	1.12	216	-1.9584	1.4260	1.12
217	-2.2350	1.3430	1.12	218	-2.2350	1.1176	1.12
219	-2.2350	0.9203	1.12	220	-2.2350	0.7230	1.12
221	-2.2350	0.5257	1.12	222	-2.2350	0.3284	1.12
223	-2.2350	0.1311	1.12	224	-2.2350	-0.0662	1.12
225	-2.2350	-0.2635	1.12	226	-2.2350	-0.4608	1.12
227	-2.2350	-0.6581	1.12	228	-2.2350	-0.8554	1.12
229	-2.2350	-1.0527	1.12	230	-2.2350	-1.2500	1.12
231	-2.2350	-1.4473	1.12	232	-2.2350	-1.6446	1.12
233	-2.2350	-1.8419	1.12	234	-2.2350	-2.0392	1.12
235	-1.7969	-2.3780	1.12	236	-1.6077	-2.3780	1.12
237	-1.4186	-2.3780	1.12	238	-1.2294	-2.3780	1.12
239	-1.0403	-2.3780	1.12	240	-0.8511	-2.3780	1.12
241	-0.6620	-2.3780	1.12	242	-0.4729	-2.3780	1.12
243	-0.2837	-2.3780	1.12	244	-0.0946	-2.3780	1.12
245	0.0946	-2.3780	1.12	246	0.2837	-2.3780	1.12
247	0.4729	-2.3780	1.12	248	0.6620	-2.3780	1.12
249	0.8511	-2.3780	1.12	250	1.0403	-2.3780	1.12
251	1.2294	-2.3780	1.12	252	1.4186	-2.3780	1.12
253	1.6077	2.3780	1.12	254	1.7969	-2.3780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.136	1.008	0.585	5179.912	11918.09	0.00
180.0	-0.300	0.774	1.377	5189.583	-44533.69	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.195	1.009	0.797	-0.071	20420.55	0.00
180.0	-0.300	0.280	2.550	0.004	47482.33	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.965	1.169	-5200.164	28248.48	0.00
180.0	-0.300	0.106	3.643	-5180.533	-46084.79	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA SECCION 51. ROTURA. PASO HOMBRE
2667.  154545.5  46363.6  0.0  3800000.  21000000.
19  5  0  1  1  0  0  1
 0.4000    -2.9430
 3.0000    -2.9430
 3.0000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
 3.0000    -2.9430
-0.4000     2.9430
-0.4000    -1.9830
-2.2000    -1.9830
 2.2000     1.3170
-1.4000     1.5570
 1.4000     1.5570
 2.2000     1.3170
 2.2000    -1.9830
 0.4000    -1.9830
9   1
1  2  4  5  6  7  8  10  11
3  -1
2  4  3
3  -1
10  9  8
4  -1
1  19  12  11
8  -1
19 18 17 16 15 14 13 12
19
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
0.01
0.00  180.00  180.00
3
2250.   0.00  -2250.
-1615.0   1.987
53.0  -2.957
0   3     0.0     0
0.0     1.697     73359.0       65.00
0.0     0.000     13728.0       65.00
0.0    -2.786     20592.0       65.00
19  17  -0.035  1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
1   2   1   12  2.02  0.  0.
2   3   2   21  1.12  0.  0.
3   4   1   19  1.12  0   0
5   6   1   34  2.02  0.  0.
6   7   1   34  2.02  0.  0.
8   9   1   19  1.02  0.  0.
9   10  2   21  1.02  0.  0.
10  11  1   12  2.02  0.  0.
11  12  2   3   1.12  0.  0.
12  13  2   8   1.12  0.  0.
13  14  1   16  1.12  0.  0.
14  15  1   5   1.12  0.  0.
15  16  2   17  1.12  0.  0.
16  17  1   5   1.12  0.  0.
17  18  2   16  1.12  0.  0.
18  19  1   8   1.12  0.  0.
19  1   2   3   1.12  0.  0.
```

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 51. ROTURA. PASO HOM

Tension de calculo del hormigon ..... : 2667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural ... : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3800000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 19
Numero total de circuitos ..... : 5
Numero total de inclusiones circulares ... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 1

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	0.4000	-2.9430	2	3.0000	-2.9430
3	3.0000	1.3700	4	6.8500	1.6000
5	6.8500	1.8500	6	0.0000	1.9870
7	-6.8500	1.8500	8	-6.8500	1.6000
9	-3.0000	1.3700	10	-3.0000	-2.9430
11	-0.4000	-2.9430	12	-0.4000	-1.9830
13	-2.2000	-1.9830	14	-2.2000	1.3170
15	-1.4000	1.5570	16	1.4000	1.5570
17	2.2000	1.3170	18	2.2000	-1.9830
19	0.4000	-1.9830			

Definicion de circuitos

Circuito 1 : Numero de vertices 9 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	2	3	4	4	5
5	6	6	7	7	8	8	10
9	11						

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	2	2	4	3	3		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	9	3	8		

Circuito 4 : Numero de vertices 4 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	19	3	12	4	11

Circuito 5 : Numero de vertices 8 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	19	2	18	3	17	4	16
5	15	6	14	7	13	8	12

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 2250.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de 2250.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1615.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. 53.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	73359.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	20592.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	0.4000	-2.9080	2.02	2	0.6332	-2.9080	2.02
3	0.8664	-2.9080	2.02	4	1.0995	2.9080	2.02
5	1.3327	-2.9080	2.02	6	1.5659	-2.9080	2.02
7	1.7991	2.9080	2.02	8	2.0323	-2.9080	2.02
9	2.2655	-2.9080	2.02	10	2.4986	-2.9080	2.02
11	2.7318	-2.9080	2.02	12	2.9650	-2.9080	2.02
13	2.9650	-2.6925	1.12	14	2.9650	-2.4985	1.12
15	2.9650	-2.3045	1.12	16	2.9650	-2.1105	1.12
17	2.9650	-1.9165	1.12	18	2.9650	-1.7225	1.12
19	2.9650	-1.5285	1.12	20	2.9650	-1.3345	1.12
21	2.9650	-1.1405	1.12	22	2.9650	-0.9465	1.12
23	2.9650	-0.7525	1.12	24	2.9650	-0.5585	1.12
25	2.9650	-0.3645	1.12	26	2.9650	-0.1705	1.12
27	2.9650	0.0235	1.12	28	2.9650	0.2175	1.12
29	2.9650	0.4114	1.12	30	2.9650	0.6054	1.12
31	2.9650	0.7994	1.12	32	2.9650	0.9934	1.12
33	2.9650	1.1874	1.12	34	2.9650	1.4030	1.12
35	3.1789	1.4157	1.12	36	3.3928	1.4285	1.12
37	3.6067	1.4413	1.12	38	3.8206	1.4541	1.12
39	4.0344	1.4669	1.12	40	4.2483	1.4796	1.12
41	4.4622	1.4924	1.12	42	4.6761	1.5052	1.12
43	4.8900	1.5180	1.12	44	5.1039	1.5307	1.12
45	5.3178	1.5435	1.12	46	5.5317	1.5563	1.12
47	5.7456	1.5691	1.12	48	5.9594	1.5819	1.12
49	6.1733	1.5946	1.12	50	6.3872	1.6074	1.12
51	6.6011	1.6202	1.12	52	6.8150	1.6330	1.12
53	6.8150	1.8157	2.02	54	6.6085	1.8198	2.02
55	6.4020	1.8240	2.02	56	6.1955	1.8281	2.02
57	5.9889	1.8322	2.02	58	5.7824	1.8363	2.02
59	5.5759	1.8405	2.02	60	5.3694	1.8446	2.02
61	5.1629	1.8487	2.02	62	4.9564	1.8529	2.02
63	4.7498	1.8570	2.02	64	4.5433	1.8611	2.02
65	4.3368	1.8653	2.02	66	4.1303	1.8694	2.02
67	3.9238	1.8735	2.02	68	3.7173	1.8776	2.02
69	3.5108	1.8818	2.02	70	3.3042	1.8859	2.02
71	3.0977	1.8900	2.02	72	2.8912	1.8942	2.02
73	2.6847	1.8983	2.02	74	2.4782	1.9024	2.02
75	2.2717	1.9066	2.02	76	2.0652	1.9107	2.02
77	1.8586	1.9148	2.02	78	1.6521	1.9190	2.02
79	1.4456	1.9231	2.02	80	1.2391	1.9272	2.02
81	1.0326	1.9313	2.02	82	0.8261	1.9355	2.02
83	0.6195	1.9396	2.02	84	0.4130	1.9437	2.02
85	0.2065	1.9479	2.02	86	0.0000	1.9520	2.02
87	0.0000	1.9520	2.02	88	-0.2065	1.9479	2.02
89	-0.4130	1.9437	2.02	90	-0.6195	1.9396	2.02
91	-0.8261	1.9355	2.02	92	-1.0326	1.9313	2.02
93	-1.2391	1.9272	2.02	94	-1.4456	1.9231	2.02
95	-1.6521	1.9190	2.02	96	-1.8586	1.9148	2.02
97	-2.0652	1.9107	2.02	98	-2.2717	1.9066	2.02
99	-2.4782	1.9024	2.02	100	-2.6847	1.8983	2.02
101	-2.8912	1.8942	2.02	102	-3.0977	1.8900	2.02
103	-3.3042	1.8859	2.02	104	-3.5108	1.8818	2.02
105	-3.7173	1.8776	2.02	106	-3.9238	1.8735	2.02
107	-4.1303	1.8694	2.02	108	-4.3368	1.8653	2.02
109	-4.5433	1.8611	2.02	110	-4.7498	1.8570	2.02

111	-4.9564	1.8529	2.02	112	-5.1629	1.8487	2.02
113	-5.3694	1.8446	2.02	114	-5.5759	1.8405	2.02
115	-5.7824	1.8363	2.02	116	-5.9889	1.8322	2.02
117	-6.1955	1.8281	2.02	118	-6.4020	1.8240	2.02
119	-6.6085	1.8198	2.02	120	-6.8150	1.8157	2.02
121	-6.8150	1.6330	1.02	122	-6.6011	1.6202	1.02
123	-6.3872	1.6074	1.02	124	-6.1733	1.5946	1.02
125	-5.9594	1.5819	1.02	126	-5.7456	1.5691	1.02
127	-5.5317	1.5563	1.02	128	-5.3178	1.5435	1.02
129	-5.1039	1.5307	1.02	130	-4.8900	1.5180	1.02
131	-4.6761	1.5052	1.02	132	-4.4622	1.4924	1.02
133	-4.2483	1.4796	1.02	134	-4.0344	1.4669	1.02
135	-3.8206	1.4541	1.02	136	-3.6067	1.4413	1.02
137	-3.3928	1.4285	1.02	138	-3.1789	1.4157	1.02
139	-2.9650	1.4030	1.02	140	-2.9650	1.1874	1.02
141	-2.9650	0.9934	1.02	142	-2.9650	0.7994	1.02
143	-2.9650	0.6054	1.02	144	-2.9650	0.4114	1.02
145	-2.9650	0.2175	1.02	146	-2.9650	0.0235	1.02
147	-2.9650	-0.1705	1.02	148	-2.9650	-0.3645	1.02
149	-2.9650	-0.5585	1.02	150	-2.9650	-0.7525	1.02
151	-2.9650	-0.9465	1.02	152	-2.9650	-1.1405	1.02
153	-2.9650	-1.3345	1.02	154	-2.9650	-1.5285	1.02
155	-2.9650	-1.7225	1.02	156	-2.9650	-1.9165	1.02
157	-2.9650	-2.1105	1.02	158	-2.9650	-2.3045	1.02
159	-2.9650	-2.4985	1.02	160	-2.9650	-2.6925	1.02
161	-2.9650	-2.9080	2.02	162	-2.7350	-2.9080	2.02
163	-2.5050	-2.9080	2.02	164	-2.2750	-2.9080	2.02
165	2.0450	2.9080	2.02	166	-1.8150	-2.9080	2.02
167	-1.5850	-2.9080	2.02	168	-1.3550	-2.9080	2.02
169	-1.1250	-2.9080	2.02	170	-0.8950	-2.9080	2.02
171	-0.6650	-2.9080	2.02	172	-0.4350	-2.9080	2.02
173	-0.4350	-2.4630	1.12	174	-0.4350	-2.4630	1.12
175	-0.4350	-2.4630	1.12	176	-0.6921	-2.0180	1.12
177	-0.8758	-2.0180	1.12	178	-1.0595	-2.0180	1.12
179	-1.2432	-2.0180	1.12	180	-1.4268	-2.0180	1.12
181	-1.6105	-2.0180	1.12	182	-1.7942	-2.0180	1.12
183	-1.9779	-2.0180	1.12	184	-2.2350	-2.0180	1.12
185	-2.2350	-1.7939	1.12	186	-2.2350	-1.5699	1.12
187	-2.2350	-1.3458	1.12	188	-2.2350	-1.1217	1.12
189	-2.2350	-0.8977	1.12	190	-2.2350	-0.6736	1.12
191	-2.2350	-0.4495	1.12	192	-2.2350	-0.2254	1.12
193	-2.2350	-0.0014	1.12	194	-2.2350	0.2227	1.12
195	-2.2350	0.4468	1.12	196	-2.2350	0.6708	1.12
197	-2.2350	0.8949	1.12	198	2.2350	1.1190	1.12
199	-2.2350	1.3430	1.12	200	-2.2350	1.3430	1.12
201	-2.0275	1.4053	1.12	202	-1.8201	1.4675	1.12
203	-1.6126	1.5298	1.12	204	-1.4051	1.5920	1.12
205	-1.2295	1.5920	1.12	206	-1.0758	1.5920	1.12
207	-0.9221	1.5920	1.12	208	-0.7684	1.5920	1.12
209	-0.6147	1.5920	1.12	210	-0.4611	1.5920	1.12
211	0.3074	1.5920	1.12	212	-0.1537	1.5920	1.12
213	0.0000	1.5920	1.12	214	0.1537	1.5920	1.12
215	0.3074	1.5920	1.12	216	0.4611	1.5920	1.12
217	0.6147	1.5920	1.12	218	0.7684	1.5920	1.12
219	0.9221	1.5920	1.12	220	1.0758	1.5920	1.12
221	1.2295	1.5920	1.12	222	1.4051	1.5920	1.12
223	1.6126	1.5298	1.12	224	1.8201	1.4675	1.12
225	2.0275	1.4053	1.12	226	2.2350	1.3430	1.12
227	2.2350	1.1190	1.12	228	2.2350	0.9248	1.12
229	2.2350	0.7306	1.12	230	2.2350	0.5364	1.12
231	2.2350	0.3422	1.12	232	2.2350	0.1480	1.12
233	2.2350	-0.0462	1.12	234	2.2350	0.2404	1.12
235	2.2350	-0.4346	1.12	236	2.2350	-0.6288	1.12
237	2.2350	-0.8230	1.12	238	2.2350	-1.0172	1.12
239	2.2350	-1.2114	1.12	240	2.2350	-1.4055	1.12
241	2.2350	-1.5997	1.12	242	2.2350	-1.7939	1.12
243	2.2350	-2.0180	1.12	244	1.9729	-2.0180	1.12
245	1.7107	-2.0180	1.12	246	1.4486	-2.0180	1.12
247	1.1864	-2.0180	1.12	248	0.9243	-2.0180	1.12
249	0.6621	-2.0180	1.12	250	0.4000	-2.0180	1.12
251	0.4000	-2.4630	1.12	252	0.4000	-2.4630	1.12
253	0.4000	-2.4630	1.12				

Caso 1 : Axil de 2250.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.166	1.008	0.696	2245.249	16460.44	-21.09
180.0	-0.300	0.549	1.742	2255.035	-49455.40	-60.54

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	0.194	1.009	0.794	-0.064	20115.40	-16.03
180.0	-0.300	0.369	2.211	0.048	-50601.82	-49.03

Caso 3 : Axil de -2250.00 (t)

Ang	Dasup	Dinf	Prof.(m)	Mser	M2 (mxt)	M1 (mxt)
0.0	-0.229	1.009	0.913	-2257.461	23686.88	-9.53
180.0	3.300	0.257	2.055	-2253.277	50708.76	-37.04

CINCARRR.XLS

COMPROBACION A ROTURA

SECCIO	MPP	MCP	MSC	M*	MPR	NPR	TFS	TFI	YP	YG	EXC	MIP	MHP	M*-MHP	MRS
6	6570	2115	6762	24747	-7525	-8067	-257	-1088	2.670	1.987	0.883	-7123	-402	24386	28287
26	5049	1928	7077	22455	-6939	-9424	-394	-1150	2.652	1.987	0.865	-8152	1213	23820	33311
31	-8912	-3396	-9325	-34614	7037	-10529	-1091	-324	1.399	1.987	0.588	6191	846	-33853	-42575
40	-7781	-2941	-7791	-29621	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-25508	-39336
41	-12735	-4739	-11810	-45854	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-42742	-45989
46	7531	2852	9201	31350	-7377	-11920	-560	-1364	2.956	1.987	0.969	-11550	4173	35941	41093
50	-9799	-3701	-9344	-36550	15171	-12719	-1611	43	1.389	1.987	0.598	7606	7565	-29742	-39994
51	-15096	-5641	-13385	-54597	15297	-12693	-1615	53	1.389	1.987	0.598	7590	7707	-47661	-49455

MPP= MOMENTO FLECTOR POR PESO PROPIO

MCP= MOMENTO FLECTOR PORCARGAS PERMANENTES

MSC= MOMENTO FLECTOR POR SOBRECARGAS

M*= (MPP+MCP+MSC)*1.6

MPR= MOMENTO TOTAL DE PRETENSADO

NPR= AXIL DE PRETENSADO

TFS= TENSION EN FS DEBIDA AL PRETENSADO

TFI= TENSION EN FI DEBIDA AL PRETENSADO

YP= CDG DE CABLES

YG= CDG DE LA SECCION

EXC= EXCENTRICIDAD DEL PRETENSADO

MHP= MOMENTO HIPERESTATICO DE LAS SECCION

M*-MHP MOMENTO REAL DE COMPARACION

MRS= MOMENTO DE ROTURA DE LA SECCION

COMPROBACIÓN CORTANTE EN LOS TRAMOS

DE LOS TRAMOS EXTREMOS EXT Y EXD

ACOTAMIENTO DEL HORMIGÓN POR COMPRESIÓN

POR CORTANTE

$$V_{U1} = 0.60 \cdot f_{cd} \cdot b^2 \theta \left(\cot\alpha + \cot\theta\right) b_0 \cdot d_1$$

En vano de 58 mm (altura de $7 \times 0.60 = 4.20$)

$$\theta_b = \frac{4310 + 3800}{12.4} \times 0.8 = 495 \text{ t/m2}$$

$$\cot\theta = \sqrt{1 + \frac{49}{24}} = 1.73 \qquad \theta = 30°$$

$$V_{U1} = 0.6 \times \frac{6000}{1.5} \times 0.25 \left(0 + 1.73\right) \times 12 \times 4.60 =$$

$$= 3820 \text{ kn}$$

En vano de 40 m (altura de $7 \times 0.80 = 1.60$)

$$\theta_b = \frac{6846 + 5320}{13.4 + 16} \times 0.8 = 650 \text{ t/m2}$$

$$\cot\theta = \sqrt{1 + \frac{65}{24}} = 1.92 \qquad \theta = 27°$$

$$V_{U1} = 0.6 \times \frac{6000}{1.5} \times 0.20 \left(0 + 1.92\right) \times 16 \times 4.60 =$$

$$= 4253$$

ACOTAMIENTO DEL HORMIGÓN A COMPRESIÓN

DIAGONAL

EN LOS TRAMOS CRÍTICOS

$V_{U1} = 800 \times 54 \times (4.87 - 0.40) \times 0.9 = 8670 \text{ kN}$

Debe de cumplirse que

$$\frac{V_{SQ}}{V_{U1}} + \frac{V_{ST}}{V_{U1}} < 1$$

$\gamma_S = 1.6$ si hormigón de obra

$\gamma_S = 1.44$ si hormigón de central.

2 TRENES	NUDO	PROPI	C PERM	SOB(+)	QMAX	T.TREN	VIENT	VU1	TU1	Q/V+T/T	Q/V+T/T
ESTRIBO 2	1	-610	-238	108	1468	329	302	3826	8650	0 67	0 66
		-610	-238	620	1468	329	302	3826	8650	0 67	0 66
	2	-449	-175	109	1105	302	253	3826	8650	0 52	0 51
		-449	-175	481	1105	307	253	3826	8650	0 52	0 51
	3	-287	-112	109	780	274	205	3826	8650	0 38	0 37
		-287	-112	381	780	274	205	3826	8650	0 38	0 37
V	4	-125	-49	109	415	247	156	3826	8650	0 22	0 22
		125	49	241	415	247	156	3826	8650	0 22	0 22
A	5	37	14	109	160	226	107	3826	8650	0 11	0 11
		37	14	-101	160	220	107	3826	8650	0 11	0 11
N	6	198	77	195	470	193	59	3826	8650	0 23	0 22
		198	77	-30	470	193	59	3826	8650	0 23	0 22
O	7	360	141	335	836	165	10	3826	8650	0 38	0 34
		360	141	30	836	165	10	3826	8650	0 38	0 34
	8	522	204	458	1184	138	39	3826	8650	0 52	0 46
14		522	204	30	1184	138	39	3826	8650	0 52	0 46
	9	684	267	575	1526	111	-88	3826	8650	0 66	0 58
		684	267	30	1526	111	88	3826	8650	0 66	0 58
	10	845	330	694	1869	83	-136	3826	8650	0 80	0 69
		845	330	30	1869	83	136	3826	8650	0 80	0 69
	11	1007	393	809	2209	56	-185	3826	8650	0 93	0 81
PILA 11		1007	393	30	2209	56	185	3826	8650	0 93	0 81
	11	976	381	116	2192	296	192	3826	8650	0 97	0 91
		976	381	835	2192	296	192	3826	8650	0 97	0 91
	12	781	305	116	1768	282	167	3826	8650	0 79	0 74
		781	305	682	1768	282	167	3826	8650	0 79	0 74
	13	585	228	116	1354	268	143	3826	8650	0 62	0 58
		585	228	541	1354	268	143	3826	8650	0 62	0 58
V	14	390	152	117	938	253	118	3826	8650	0 44	0 41
		390	152	399	938	253	118	3826	8650	0 44	0 41
A	15	194	76	117	524	239	93	3826	8650	0 26	0 25
		194	76	254	524	239	93	3826	8650	0 26	0 25
N	16	1	0	132	133	225	69	3826	8650	0 10	0 10
		1	0	107	133	225	69	3826	8650	0 10	0 10
O	17	196	77	278	551	211	44	3826	8650	0 27	0 25
		196	77	86	551	211	44	3826	8650	0 27	0 25
	18	392	153	420	965	197	19	3826	8650	0 44	0 40
13		392	153	86	965	197	19	3826	8650	0 44	0 40
	19	587	229	565	1381	182	-6	3826	8650	0 61	0 55
		587	229	86	1381	182	6	3826	8650	0 61	0 55
	20	783	305	706	1794	168	-30	3826	8650	0 78	0 70
		783	305	86	1794	168	30	3826	8650	0 78	0 70
	21	978	382	845	2205	154	55	3826	8650	0 95	0 85
PILA 12		978	382	86	2205	154	-55	3826	8650	0 95	0 85
	21	990	387	116	2225	268	140	3826	8650	0 98	0 91
		990	387	848	2225	268	140	3826	8650	0 98	0 91
	22	795	310	116	1806	261	126	3826	8650	0 80	0 74
		795	310	701	1806	261	126	3826	8650	0 80	0 74
	23	600	234	116	1395	254	112	3826	8650	0 63	0 59
		600	234	561	1395	254	112	3826	8650	0 63	0 59
V	24	404	158	117	982	247	98	3826	8650	0 46	0 43
		404	158	420	982	247	98	3826	8650	0 46	0 43
A	25	209	81	117	568	240	84	3826	8650	0 28	0 27
		209	81	278	568	240	84	3826	8650	0 28	0 27
N	26	-13	5	133	154	233	71	3826	8650	0 11	0 11
		-13	-5	136	154	233	71	3826	8650	0 11	0 11
O	27	182	71	280	533	225	57	3826	8650	0 26	0 25
		182	71	106	533	225	57	3826	8650	0 26	0 25
	28	378	147	421	946	218	43	3826	8650	0 44	0 40
12		378	147	106	946	218	43	3826	8650	0 44	0 40
	29	573	224	566	1363	211	29	3826	8650	0 61	0 55
		573	224	106	1363	211	29	3826	8650	0 61	0 55
	30	768	300	707	1775	204	15	3826	8650	0 78	0 70
		768	300	106	1775	204	15	3826	8650	0 78	0 70
	31	964	376	847	2187	197	1	3826	8650	0 95	0 86
PILAS 9/11		964	376	105	2187	197	1	3826	8650	0 95	0 86
	31	925	361	172	2136	299	228	3826	8650	0 95	0 89
		925	361	850	2136	299	228	3826	8650	0 95	0 89
	32	730	285	172	1723	286	197	3826	8650	0 77	0 73
		730	285	708	1723	286	197	3826	8650	0 77	0 73
	33	534	208	172	1309	273	165	3826	8650	0 60	0 57
		534	208	567	1309	273	165	3826	8650	0 60	0 57
V	34	339	132	173	895	259	134	3826	8650	0 42	0 40
		339	132	424	895	259	134	3826	8650	0 42	0 40
A	35	143	56	173	481	246	102	3826	8650	0 25	0 24
		143	56	282	481	246	102	3826	8650	0 25	0 24
N	36	52	20	178	250	233	71	3826	8650	0 15	0 14
		52	20	136	250	233	71	3826	8650	0 15	0 14
O	37	248	97	325	670	220	39	3826	8650	0 32	0 30
		248	97	107	670	220	39	3826	8650	0 32	0 30

	38	443	173	466	1082	207	8	3826	8650	0 49	0 44
5		443	173	-107	1082	207	8	3826	8650	0 49	0 44
	39	638	249	611	1498	193	-24	3826	8650	0 66	0 59
		638	249	-107	1498	193	-24	3826	8650	0 66	0 59
	40	834	325	751	1910	180	56	3826	8650	0 83	0 74
		834	325	-107	1910	180	-56	3826	8650	0 83	0 74
	41	1029	402	891	2322	167	-87	3826	8650	1 00	0 89
PILA 4		1029	402	-106	2322	167	-87	3826	8650	1 00	0 89
	41	1146	447	130	2591	319	173	4853	8650	0 91	0 85
		1146	447	-998	2591	319	173	4853	8650	0 91	0 85
	42	910	355	130	2061	311	155	3826	8650	0 92	0 85
		910	355	-796	2061	311	155	3826	8650	0 92	0 85
	43	674	263	130	1563	304	138	3826	8650	0 71	0 66
		674	263	-626	1563	304	138	3826	8650	0 71	0 66
V	44	438	171	130	1103	296	120	3826	8650	0 52	0 48
		438	171	-494	1103	296	120	3826	8650	0 52	0 48
A	45	202	79	131	571	289	103	3826	8650	0 29	0 28
		202	79	290	571	289	103	3826	8650	0 29	0 28
N	46	34	13	134	181	281	85	3826	8650	0 13	0 13
		34	13	-114	181	281	85	3826	8650	0 13	0 13
O	47	269	105	306	680	273	67	3826	8650	0 33	0 31
		269	105	-84	680	273	67	3826	8650	0 33	0 31
	48	505	197	477	1179	266	50	3826	8650	0 54	0 50
4		505	197	83	1179	266	50	3826	8650	0 54	0 50
	49	741	289	647	1677	258	32	3826	8650	0 75	0 68
		741	289	-83	1677	258	32	3826	8650	0 75	0 68
	50	977	381	816	2174	251	15	3826	8650	0 96	0 86
		977	381	-83	2174	251	15	3826	8650	0 96	0 86
	51	1213	473	985	2671	243	-3	4853	8650	0 93	0 83
PILA 3		1213	473	83	2671	243	3	4853	8650	0 93	0 83
	51	1182	461	122	2637	255	35	4853	8650	0 92	0 83
		1182	461	994	2637	255	35	4853	8650	0 92	0 83
	52	946	369	123	2140	260	45	3826	8650	0 94	0 86
		946	369	-825	2140	260	45	3826	8650	0 94	0 86
	53	710	277	123	1643	265	55	3826	8650	0 74	0 67
		710	277	-656	1643	265	55	3826	8650	0 74	0 67
V	54	474	185	123	1145	271	65	3826	8650	0 53	0 49
		474	185	486	1145	271	65	3826	8650	0 53	0 49
A	55	238	93	123	646	276	75	3826	8650	0 32	0 30
		238	93	315	646	276	75	3826	8650	0 32	0 30
N	56	2	1	137	147	281	85	3826	8650	0 11	0 12
		2	1	-144	147	281	85	3826	8650	0 11	0 12
O	57	233	91	309	633	286	95	3826	8650	0 32	0 30
		233	91	-127	633	286	95	3826	8650	0 32	0 30
	58	469	183	480	1132	291	105	3826	8650	0 53	0 49
3		469	183	-126	1132	291	105	3826	8650	0 53	0 49
	59	705	275	650	1630	297	115	3826	8650	0 74	0 68
		705	275	126	1630	297	115	3826	8650	0 74	0 68
	60	941	367	819	2127	302	125	3826	8650	0 95	0 87
		941	367	-126	2127	302	125	3826	8650	0 95	0 87
	61	1177	459	988	2624	307	135	4853	8650	0 92	0 85
PILA 2		1177	459	-126	2624	307	135	4853	8650	0 92	0 85
	61	1203	470	71	2660	124	-259	4853	8650	0 90	0 77
		1203	470	-987	2660	124	-259	4853	8650	0 90	0 77
	62	967	378	71	2163	155	-190	3826	8650	0 93	0 81
		967	378	-808	2163	155	-190	3826	8650	0 93	0 81
	63	731	285	71	1666	187	-121	3826	8650	0 73	0 64
		731	285	-648	1666	187	-121	3826	8650	0 73	0 64
V	64	496	193	71	1167	218	-52	3826	8650	0 53	0 47
		496	193	-478	1167	218	-52	3826	8650	0 53	0 47
A	65	260	101	71	668	250	17	3826	8650	0 33	0 30
		260	101	-307	668	250	17	3826	8650	0 33	0 30
N	66	24	9	101	169	281	86	3826	8650	0 12	0 12
		24	9	-136	169	281	86	3826	8650	0 12	0 12
O	67	212	83	292	587	312	154	3826	8650	0 30	0 30
		212	83	-132	587	312	154	3826	8650	0 30	0 30
	68	448	175	496	1119	344	223	3826	8650	0 53	0 52
2		448	175	-131	1119	344	223	3826	8650	0 53	0 52
	69	684	267	614	1565	375	292	3826	8650	0 72	0 70
		684	267	131	1565	375	292	3826	8650	0 72	0 70
	70	920	359	797	2076	407	361	3826	8650	0 94	0 91
		920	359	131	2076	407	361	3826	8650	0 94	0 91
	71	1156	451	999	2606	438	430	4853	8650	0 94	0 92
PILA 1		1156	451	131	2606	438	430	4853	8650	0 94	0 92
	71	1089	425	41	2387	73	-533	3826	8650	0 98	0 80
		1089	425	-871	2387	73	-533	3826	8650	0 98	0 80
	72	921	359	41	2033	18	-414	3826	8650	0 85	0 69
		921	359	753	2033	18	-414	3826	8650	0 85	0 69
	73	752	294	41	1679	37	-295	3826	8650	0 71	0 59
		752	294	633	1679	37	-295	3826	8650	0 71	0 59
V	74	584	228	42	1322	91	-177	3826	8650	0 57	0 48

		-584	-228	510	1322	91	177	3826	8650	0 57	0 48
A	75	415	162	42	965	146	58	3826	8650	0 43	0 38
		-415	-162	388	965	146	58	3826	8650	0 43	0 38
N	76	-247	-96	42	585	201	61	3826	8650	0 28	0 26
		-247	-96	242	585	201	61	3826	8650	0 28	0 26
O	77	78	31	121	268	256	180	3826	8650	0 16	0 17
		78	31	150	268	256	180	3826	8650	0 16	0 17
1	78	90	35	267	392	311	299	3826	8650	0 27	0 25
		90	35	159	392	311	299	3826	8650	0 23	0 25
	79	259	101	412	772	365	417	3826	8650	0 39	0 42
		259	101	158	772	365	417	3826	8650	0 39	0 42
	80	427	167	511	1105	420	536	3826	8650	0 54	0 58
		427	167	158	1105	420	536	3826	8650	0 54	0 58
	81	506	232	655	1483	475	655	3826	8650	0 71	0 73
ESTRIBO 1		506	232	158	1483	475	655	3826	8650	0 71	0 73

I TREN	NUDO	PROPI	C.PERM.	SOB(+)	QMAX)	T.TREN	VIENT	VU1	TU1	Q/V+T/T	Q/V+T/T
ESTRIBO 2	1	-610	-238	108	1158	940	273	3826	8650	0 66	0 64
		-610	-238	-620	1158	940	273	3826	8650	0 66	0 64
	2	-449	-175	109	864	879	228	3826	8650	0 52	0 51
		-449	-175	-481	864	879	228	3826	8650	0 52	0 51
	3	-287	-112	109	589	819	182	3826	8650	0 40	0 39
		-287	-112	-381	589	819	182	3826	8650	0 40	0 39
V	4	125	49	109	295	756	137	3826	8650	0 26	0 26
A		125	49	-241	295	758	137	3826	8650	0 26	0 26
	5	37	14	109	106	697	92	3826	8650	0 17	0 17
N		37	14	-101	106	697	92	3826	8650	0 17	0 17
	6	198	77	195	373	637	47	3826	8650	0 27	0 25
O		198	77	-30	373	637	47	3826	8650	0 27	0 25
	7	360	141	335	668	576	1	3826	8650	0 39	0 35
		360	141	-30	668	576	1	3826	8650	0 39	0 35
	8	522	204	458	954	515	-44	3826	8650	0 49	0 44
14		522	204	-30	954	515	-44	3826	8650	0 49	0 44
	9	684	267	575	1238	454	89	3826	8650	0 60	0 53
		684	267	30	1238	454	89	3826	8650	0 60	0 53
	10	845	330	694	1522	394	-135	3826	8650	0 71	0 62
		845	330	-30	1522	394	-135	3826	8650	0 71	0 62
	11	1007	393	809	1805	333	-180	3826	8650	0 82	0 70
		1007	393	-30	1805	333	180	3826	8650	0 82	0 70
PILA 13											
	11	-976	-381	116	1775	903	169	3826	8650	0 91	0 85
		-976	-381	-835	1775	903	169	3826	8650	0 91	0 85
	12	-781	-305	116	1426	871	146	3826	8650	0 76	0 71
		-781	-305	-682	1426	871	146	3826	8650	0 76	0 71
	13	-585	-228	116	1084	839	123	3826	8650	0 61	0 57
		-585	-228	-541	1084	839	123	3826	8650	0 61	0 57
V	14	-390	-152	117	740	807	100	3826	8650	0 46	0 43
A		-390	-152	-396	740	807	100	3826	8650	0 46	0 43
	15	-194	-76	117	397	775	77	3826	8650	0 31	0 29
N		-194	-76	-254	397	775	77	3826	8650	0 31	0 29
	16	1	0	132	67	743	55	3826	8650	0 17	0 16
O		1	0	-107	67	743	55	3826	8650	0 17	0 16
	17	196	77	278	412	710	-32	3826	8650	0 30	0 28
		196	77	-86	412	710	-32	3826	8650	0 30	0 28
	18	392	153	420	755	678	9	3826	8650	0 44	0 40
13		392	153	-86	755	678	9	3826	8650	0 44	0 40
	19	587	229	565	1099	646	-14	3826	8650	0 58	0 52
		587	229	-86	1099	646	-14	3826	8650	0 58	0 52
	20	783	305	706	1441	614	-37	3826	8650	0 72	0 64
		783	305	-86	1441	614	-37	3826	8650	0 72	0 64
	21	978	382	845	1783	582	-60	3826	8650	0 85	0 76
		978	382	-86	1783	582	-60	3826	8650	0 85	0 76
PILA 12											
	21	-990	-387	116	1801	845	121	3826	8650	0 91	0 84
		-990	-387	-848	1801	845	121	3826	8650	0 91	0 84
	22	-795	-310	116	1456	830	108	3826	8650	0 76	0 70
		-795	-310	-701	1456	830	108	3826	8650	0 76	0 70
	23	-600	-234	116	1114	815	95	3826	8650	0 62	0 57
		-600	-234	-561	1114	815	95	3826	8650	0 62	0 57
V	24	-404	-158	117	772	800	82	3826	8650	0 47	0 44
A		-404	-158	-420	772	800	82	3826	8650	0 47	0 44
	25	-209	-81	117	429	785	69	3826	8650	0 32	0 30
N		-209	-81	-278	429	785	69	3826	8650	0 32	0 30
	26	13	5	111	87	770	57	3826	8650	0 18	0 17
O		13	5	-139	87	770	57	3826	8650	0 18	0 17
	27	182	71	280	393	754	44	3826	8650	0 30	0 28
		182	71	-106	393	754	44	3826	8650	0 30	0 28
	28	378	147	421	736	739	31	3826	8650	0 44	0 41
12		378	147	-106	736	739	31	3826	8650	0 44	0 41
	29	573	224	566	1080	724	18	3826	8650	0 59	0 53
		573	224	-106	1080	724	18	3826	8650	0 59	0 53
	30	768	300	707	1422	709	-5	3826	8650	0 73	0 65
		768	300	-106	1422	709	-5	3826	8650	0 73	0 65
	31	964	376	847	1763	694	-8	3826	8650	0 87	0 78
		964	376	-105	1763	694	-8	3826	8650	0 87	0 78
PILAS 5/11											
	31	925	361	172	1711	889	204	3826	8650	0 88	0 83
		925	361	850	1711	889	204	3826	8650	0 88	0 83
	32	730	285	172	1368	865	175	3826	8650	0 73	0 69
		730	285	-708	1368	865	175	3826	8650	0 73	0 69
	33	534	208	172	1026	841	145	3826	8650	0 58	0 55
		534	208	-567	1026	841	145	3826	8650	0 58	0 55
V	34	339	132	173	683	817	116	3826	8650	0 44	0 41
A		339	132	-424	683	817	116	3826	8650	0 44	0 41
	35	143	56	173	340	793	86	3826	8650	0 29	0 27
N		143	56	-282	340	793	86	3826	8650	0 29	0 27
	36	52	20	178	161	769	57	3826	8650	0 21	0 20
O		52	20	-136	161	769	57	3826	8650	0 21	0 20
	37	-38	-97	-325	506	745	27	3826	8650	0 35	0 32
		248	97	-107	506	745	27	3826	8650	0 35	0 32

	38	443	173	466	849	721	-3	3826	8650	0 49	0 44
6		443	173	107	849	721	-3	3826	8650	0 49	0 44
	39	638	249	611	1193	697	32	3826	8650	0 63	0 56
		638	249	107	1193	697	32	3826	8650	0 63	0 56
	40	834	325	751	1535	673	62	3826	8650	0 77	0 68
		834	325	666	1535	673	62	3826	8650	0 77	0 68
	41	1029	402	891	1876	649	91	3826	8650	0 90	0 80
		1029	402	186	1876	649	91	3826	8650	0 90	0 80
PILA 4											
	43	-1146	-447	130	2092	999	150	5100	8650	0 84	0 78
		-1146	-447	998	2092	999	150	5100	8650	0 84	0 78
	42	-910	-355	130	1663	985	134	3826	8650	0 88	0 81
		-910	-355	796	1663	985	134	3826	8650	0 88	0 81
	43	-674	-263	130	1250	971	117	3826	8650	0 70	0 65
		-674	-263	620	1250	971	117	3826	8650	0 70	0 65
V	44	438	171	130	857	956	101	3826	8650	0 54	0 50
		438	171	494	857	956	101	3826	8650	0 54	0 50
A	45	202	79	131	427	942	84	3826	8650	0 35	0 33
		202	79	290	427	942	84	3826	8650	0 35	0 33
N	46	34	13	134	114	928	68	3826	8650	0 22	0 21
		34	13	114	114	928	68	3826	8650	0 22	0 21
O	47	269	105	306	527	914	52	3826	8650	0 39	0 36
		269	105	84	527	914	52	3826	8650	0 39	0 36
	48	505	197	477	941	900	35	3826	8650	0 56	0 51
4		505	197	83	941	900	35	3826	8650	0 56	0 51
	49	741	289	647	1354	885	19	3826	8650	0 73	0 66
		741	289	-83	1354	885	19	3826	8650	0 73	0 66
	50	977	381	816	1766	871	2	3826	8650	0 90	0 81
		977	381	-83	1766	871	2	3826	8650	0 90	0 81
	51	1213	473	985	2179	857	-14	4853	8650	0 88	0 79
		1213	473	83	2179	857	-14	4853	8650	0 88	0 79
PILA 3											
	51	-1182	-461	122	2140	873	22	4853	8650	0 87	0 78
		-1182	-461	994	2140	873	22	4853	8650	0 87	0 78
	52	-946	-369	121	1728	884	31	3826	8650	0 89	0 80
		-946	-369	-825	1728	884	31	3826	8650	0 89	0 80
	53	-710	-277	123	1315	895	40	3826	8650	0 72	0 65
		-710	-277	656	1315	895	40	3826	8650	0 72	0 65
V	54	-474	-185	123	902	906	50	3826	8650	0 54	0 50
		-474	-185	486	902	906	50	3826	8650	0 54	0 50
A	55	-238	-93	123	489	917	59	3826	8650	0 37	0 35
		-238	-93	315	489	917	59	3826	8650	0 37	0 35
N	56	-2	-1	137	75	928	68	3826	8650	0 20	0 19
		-2	-1	-144	75	928	68	3826	8650	0 20	0 19
O	57	233	91	309	479	939	77	3826	8650	0 37	0 35
		233	91	127	479	939	77	3826	8650	0 37	0 35
	58	469	183	480	892	950	86	3826	8650	0 55	0 51
3		469	183	-126	892	950	86	3826	8650	0 55	0 51
	59	705	275	650	1305	961	96	3826	8650	0 72	0 67
		705	275	-126	1305	961	96	3826	8650	0 72	0 67
	60	941	367	819	1718	972	105	3826	8650	0 90	0 83
		941	367	-126	1718	972	105	3826	8650	0 90	0 83
	61	1177	459	988	2130	983	114	4853	8650	0 88	0 81
		1177	459	-126	2130	983	114	4853	8650	0 88	0 81
PILA 2											
	61	-1203	-470	71	2166	621	-254	4853	8650	0 83	0 70
		-1203	-470	-987	2166	621	-254	4853	8650	0 83	0 70
	62	-967	-378	71	1754	682	-190	3826	8650	0 86	0 74
		-967	-378	810	1754	682	-190	3826	8650	0 86	0 74
	63	-731	-285	71	1341	744	-125	3826	8650	0 70	0 61
		-731	-285	648	1341	744	125	3826	8650	0 70	0 61
V	64	-496	-193	71	928	805	-61	3826	8650	0 54	0 47
		-496	-193	478	928	805	-61	3826	8650	0 54	0 47
A	65	-260	-101	71	515	867	3	3826	8650	0 38	0 34
		260	101	307	515	867	3	3826	8650	0 38	0 34
N	66	-24	-9	101	101	928	68	3826	8650	0 21	0 20
		-24	-9	-136	101	928	68	3826	8650	0 21	0 20
O	67	212	83	292	441	989	132	3826	8650	0 37	0 35
		212	83	132	441	989	132	3826	8650	0 37	0 35
	68	448	175	496	871	1051	196	3826	8650	0 56	0 54
2		448	175	131	871	1051	196	3826	8650	0 56	0 54
	69	684	267	614	1258	1112	260	3826	8650	0 73	0 70
		684	267	131	1258	1112	260	3826	8650	0 73	0 70
	70	920	359	797	1677	1174	325	3826	8650	0 92	0 88
		920	359	131	1677	1174	325	3826	8650	0 92	0 88
	71	1156	451	999	2106	1235	389	4853	8650	0 92	0 90
		1156	451	131	2106	1235	389	4853	8650	0 92	0 90
PILA 1											
	71	1089	425	41	1951	121	-505	3826	8650	0 84	0 67
		1089	425	873	1951	121	-505	3826	8650	0 84	0 67
	72	921	359	41	1657	229	-394	3826	8650	0 74	0 60
		921	359	753	1657	229	-394	3826	8650	0 74	0 60
	73	752	294	41	1362	338	-284	3826	8650	0 63	0 52
		752	294	633	1362	338	-284	3826	8650	0 63	0 52
V	74	584	228	42	1067	446	-173	3826	8650	0 53	0 45

		584	228	510	1067	446	173	3826	8650	0 53	0 45
A	75	415	162	42	772	555	62	3826	8650	0 43	0 37
		415	162	388	772	555	62	3826	8650	0 43	0 37
N	76	247	96	42	464	663	49	3826	8650	0 32	0 29
		247	96	242	464	663	49	3826	8650	0 32	0 29
O	77	78	31	121	188	771	159	3826	8650	0 22	0 23
		78	31	159	188	771	159	3826	8650	0 22	0 23
	78	90	35	267	259	880	270	3826	8650	0 27	0 29
		90	35	159	259	880	270	3826	8650	0 27	0 29
	79	259	101	412	566	988	381	3826	8650	0 42	0 44
		259	101	158	566	988	381	3826	8650	0 42	0 44
	80	427	167	511	849	1097	491	3826	8650	0 56	0 58
		427	167	158	849	1097	491	3826	8650	0 56	0 58
	81	596	233	665	1156	1205	602	3826	8650	0 71	0 74
ESTRIBO 1		596	232	158	1156	1205	602	3826	8650	0 71	0 74

CÁLCULO [illegible] DE

CONTORNO

Calculo de Comprobacion a Cortante

Datos generales

Limite elastico del acero pasivo	=	5100.00	kg/cm2
Coeficiente del acero pasivo	=	1.10	
Limite elastico de acero activo	=	17000.00	kg/cm2
Coeficiente del acero activo	=	1.10	
Resistencia caracteristica del hormigon	=	400.00	kg/cm2
Coeficiente del hormigon	=	1.50	
Coef. mayoracion Cargas muertas y Peso propio	=	1.60	
Coef. mayoracion Sobrecargas	=	1.60	

Calculo de Comprobacion a Cortante

Datos secciones/anchos-recubrimientos

V	Sec	Ancho Seccion m	Ancho Eficaz m	Recubrimiento m
1	1	1.200	1.000	0.030
	2	1.200	1.000	0.030
	3	1.200	1.000	0.030
	4	1.200	1.000	0.030
	5	1.200	1.000	0.030
	6	1.200	1.000	0.030
	7	1.200	1.000	0.030
	8	1.200	1.000	0.030
	9	1.200	1.000	0.030
	10	1.200	1.000	0.030
	11	1.200	1.000	0.030
2	11	1.200	1.000	0.030
	12	1.200	1.000	0.030
	13	1.200	1.000	0.030
	14	1.200	1.000	0.030
	15	1.200	1.000	0.030
	16	1.200	1.000	0.030
	17	1.200	1.000	0.030
	18	1.200	1.000	0.030
	19	1.200	1.000	0.030
	20	1.200	1.000	0.030
	21	1.200	1.000	0.030
3	21	1.200	1.000	0.030
	22	1.200	1.000	0.030
	23	1.200	1.000	0.030
	24	1.200	1.000	0.030
	25	1.200	1.000	0.030
	26	1.200	1.000	0.030
	27	1.200	1.000	0.030
	28	1.200	1.000	0.030
	29	1.200	1.000	0.030
	30	1.200	1.000	0.030
	31	1.200	1.000	0.030
4	31	1.200	1.000	0.030
	32	1.200	1.000	0.030
	33	1.200	1.000	0.030
	34	1.200	1.000	0.030
	35	1.200	1.000	0.030
	36	1.200	1.000	0.030
	37	1.200	1.000	0.030
	38	1.200	1.000	0.030
	39	1.200	1.000	0.030
	40	1.600	1.400	0.030
	41	1.600	1.400	0.030
5	41	1.600	1.400	0.030
	42	1.600	1.400	0.030
	43	1.200	1.000	0.030
	44	1.200	1.000	0.030

Calculo de Comprobacion a Cortante

Datos secciones/anchos-recubrimientos

V.	Sec	Ancho Seccion m	Ancho Eficaz m	Recubrimiento m
	45	1.200	1.000	0.030
	46	1.200	1.000	0.030
	47	1.200	1.000	0.030
	48	1.200	1.000	0.030
	49	1.200	1.000	0.030
	50	1.600	1.400	0.030
	51	1.600	1.400	0.030
6	51	1.600	1.400	0.030
	52	1.600	1.400	0.030
	53	1.200	1.000	0.030
	54	1.200	1.000	0.030
	55	1.200	1.000	0.030
	56	1.200	1.000	0.030
	57	1.200	1.000	0.030
	58	1.200	1.000	0.030
	59	1.200	1.000	0.030
	60	1.600	1.400	0.030
	61	1.600	1.400	0.030
7	61	1.600	1.400	0.030
	62	1.600	1.400	0.030
	63	1.200	1.000	0.030
	64	1.200	1.000	0.030
	65	1.200	1.000	0.030
	66	1.200	1.000	0.030
	67	1.200	1.000	0.030
	68	1.200	1.000	0.030
	69	1.200	1.000	0.030
	70	1.600	1.400	0.030
	71	1.600	1.400	0.030
8	71	1.600	1.400	0.030
	72	1.600	1.400	0.030
	73	1.200	1.000	0.030
	74	1.200	1.000	0.030
	75	1.200	1.000	0.030
	76	1.200	1.000	0.030
	77	1.200	1.000	0.030
	78	1.200	1.000	0.030
	79	1.200	1.000	0.030
	80	1.200	1.000	0.030
	81	1.200	1.000	0.030

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. inf kg/cm2	Clase	Armad cm2/m
1	1	-9158.88	987.2	-7305.4	17500.57	14.	-114.	AB AB	15.3
	2	-4192.73	-829.5	-7289.9	-3692.06	36.	-81.	AB AB	15.2
	3	-946.79	-467.1	-7275.0	-4186.09	-50.	-60.	AB AB	15.2
	4	577.31	-105.7	-7259.9	-4675.64	-56.	-50.	AB AB	15.2
	5	345.63	255.7	-7256.5	-5146.73	-55.	-52.	AB AB	15.2
	6	8843.09	703.9	-7260.7	-5551.69	-93.	4.	AB AB	15.2
	7	4574.36	1249.9	-7265.0	-5963.96	-74.	-24.	AB AB	25.6
	8	1891.80	1777.3	-7269.4	-10388.96	-62.	-42.	AB AB	41.5
	9	-4405.28	2467.7	-7271.6	5581.83	-55.	83.	AB AB	62.3
	10	-15585.21	3027.1	-7277.5	1128.00	14.	-155.	AB AB	79.2
	11	-14713.54	3157.1	-7262.1	757.75	11.	-149.	AB AB	83.1
2	11	-14713.54	-1709.2	-7262.1	757.75	11.	-149.	AB AB	39.5
	12	1278.52	-1622.8	-7266.6	772.49	-60.	-46.	AB AB	36.9
	13	5260.25	-1254.9	-7583.0	-17333.01	-79.	-22.	AB AB	25.4
	14	4650.00	-798.3	-7895.9	11040.46	79.	-28.	AB AB	15.2
	15	4592.91	-290.9	-7869.5	-7251.29	-79.	-29.	AB AB	15.2
	16	15832.50	240.1	-7843.4	-7342.27	-128.	45.	AB C	15.2
	17	11678.06	1015.9	-7844.9	-7369.84	-109.	18.	AB AB	18.1
	18	6210.61	1782.8	-7846.5	-11184.48	-85.	-18.	AB AB	40.6
	19	679.44	2479.8	-7708.5	4001.51	-60.	-53.	AB AB	61.4
	20	-9565.69	3034.3	-7576.5	823.48	-14.	-118.	AB AB	78.3
	21	-15343.09	3163.2	-7559.4	859.67	11.	-156.	AB AB	82.2
3	21	-15343.09	-1729.5	-7559.4	859.67	11.	-156.	AB AB	39.5
	22	-5843.37	-1643.1	-7562.1	1004.82	-30.	-94.	AB AB	37.0
	23	-1879.97	-1275.3	-7729.8	4449.58	-49.	-70.	AB AB	25.8
	24	-2312.07	-818.6	-8215.4	-11355.02	-51.	-76.	AB AB	15.2
	25	-2128.39	-311.1	-8508.6	-8046.43	-54.	-77.	AB AB	15.2
	26	9301.39	222.2	-8801.9	-8482.07	-106.	-5.	AB AB	15.2
	27	5269.89	998.0	-9122.9	-8887.53	-91.	-33.	AB AB	16.6
	28	-209.11	1764.9	-9124.6	-12405.15	-67.	-69.	AB AB	37.9
	29	-5687.63	2461.3	-9306.1	6971.29	-44.	-106.	AB AB	56.9
	30	-15812.46	3015.8	-9493.6	4247.63	-1.	-173.	AB AB	71.7
	31	-14695.09	3144.8	-9476.4	4420.47	-6.	-166.	AB AB	75.3
4	31	14695.09	-1564.6	-9476.4	4420.47	-6.	-166.	AB AB	31.9
	32	1326.36	-1478.1	-9479.1	4249.99	-76.	-62.	AB AB	29.6
	33	5312.64	1110.1	9345.9	-20278.36	-93.	-35.	AB AB	19.6
	34	4623.44	-653.3	-9215.7	-14288.53	-89.	-38.	AB AB	15.2
	35	3597.56	-145.7	-9194.3	-10800.48	-84.	-45.	AB AB	15.2
	36	13942.61	349.3	-9249.1	-10992.89	130.	22.	AB AB	15.2
	37	8636.32	1144.9	-9331.5	-11155.20	-107.	-13.	AB AB	20.5
	38	2168.89	1911.7	-9338.1	-15125.60	-79.	-55.	AB AB	41.7
	39	4512.96	2608.3	-10018.4	5325.41	-55.	-104.	AB AB	59.3
	40	15633.36	3162.7	-10694.9	3137.60	-11.	-181.	AB AB	68.2
	41	19638.35	3291.6	-10674.1	2981.53	7.	-207.	AB AB	71.6
5	41	-19638.35	-2129.4	-10674.1	2981.53	7.	-207.	AB AB	41.1
	42	-7708.14	-2077.8	-10671.7	2833.85	-45.	-129.	AB AB	39.8
	43	-3418.83	1744.9	-10468.6	6528.31	-65.	-100.	AB AB	35.5

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
	44	-2849.86	-1288.3	-10545.2	-14932.00	-66.	-97.	AB	AB	23.4
	45	2564.18	-413.1	-10768.2	11335.14	-91.	-63.	AB	AB	15.2
	46	18140.49	257.6	-10728.1	-11676.97	-159.	38.	AB	C	15.2
	47	11429.86	1265.8	-10736.1	-11966.33	-130.	-5.	AB	AB	22.6
	48	-6261.10	2588.3	-10470.9	13272.25	-50	-118.	AB	AB	57.8
	49	-15019.08	3277.1	-10821.5	4637.88	-14.	-178.	AB	AB	79.9
	50	-26173.70	3778.9	-11447.5	936.96	30.	-255.	C	AB	102.0
	51	22729.62	3855.4	-11423.8	802.30	15.	-232.	AB	AB	84.2
6	51	-22729.62	-2158.5	-11423.8	802.29	15.	-232.	AB	AB	40.8
	52	-3497.25	-2106.9	-11418.0	925.39	-69.	-107.	AB	AB	39.5
	53	593.30	-1774.0	-10840.2	4786.11	-83.	-77.	AB	AB	35.8
	54	1016.41	-1317.4	-10545.2	16410.02	-83.	72.	AB	AB	24.2
	55	7022.78	-442.2	-10920.2	-12622.00	-112.	-35.	AB	AB	15.2
	56	23498.87	245.3	-11032.2	-12941.53	-185.	71.	AB	C	15.2
	57	17152.51	1253.5	-11192.2	-13208.58	-158.	28.	AB	C	33.8
	58	-140.53	2576.0	-11079.1	-17443.74	-82.	-83.	AB	AB	56.2
	59	-8567.37	3264.8	-11581.7	5593.98	-48.	-142.	AB	AB	67.8
	60	-19410.61	3766.6	-12359.7	2077.41	-7.	-218.	AB	AB	79.4
	61	-23157.13	3843.1	-12336.0	2210.91	10.	-242.	AB	AB	81.4
7	61	-23157.13	-2291.8	-12336.0	2210.91	10.	-242.	AB	AB	42.9
	62	-10673.46	-2240.3	-12330.2	2279.41	-45.	-161.	AB	AB	41.6
	63	-6000.10	-1907.4	-11752.4	6085.56	-61.	-126.	AB	AB	38.1
	64	-4776.28	-1451.0	-11457.4	14690.02	-64.	-116.	AB	AB	26.8
	65	2511.45	-576.1	-11680.4	-13610.05	-98.	-70.	AB	AB	15.2
	66	18964.98	137.7	-11640.3	-13523.55	-170.	37.	AB	C	15.2
	67	15431.86	1189.2	-11648.3	-13384.53	-154.	14.	AB	AB	20.0
	68	-3022.47	2468.7	-11383.1	15001.50	-71.	-104.	AB	AB	52.9
	69	-7202.40	3164.5	-10831.0	7194.62	-49.	-127.	AB	AB	67.7
	70	-19494.00	3699.5	-10564.3	4235.73	7.	-205.	AB	AB	82.6
	71	-19129.30	3781.0	-10550.7	4308.85	6.	-203.	AB	AB	84.8
8	71	-19129.30	-1979.0	-10550.7	4308.86	6.	-203.	AB	AB	37.4
	72	-3531.77	-1927.5	-10554.8	4522.63	-63.	-101.	AB	AB	36.0
	73	1324.23	-1594.7	-10869.7	7952.08	-86.	-72.	AB	AB	31.1
	74	5092.52	-1150.9	-10352.9	-17435.27	-99.	-44.	AB	AB	19.9
	75	9111.25	-707.2	-9513.4	-14321.63	-111.	-11.	AB	AB	15.2
	76	11975.00	-263.5	-9502.6	-14045.20	-123.	7.	AB	AB	15.2
	77	21410.13	405.2	-9491.8	-13768.65	-164.	69.	AB	C	15.2
	78	16967.77	1120.7	-9481.1	-13491.98	-145.	40.	AB	C	28.6
	79	10269.52	1760.6	-9470.5	-13215.20	-115.	-4.	AB	AB	37.3
	80	4189.11	2107.2	-9464.8	-13067.05	-89.	-43.	AB	AB	46.8
	81	-3078.76	2071.9	-9459.2	13879.75	-57.	-90.	AB	AB	45.9

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
1	1	-9158.88	-2077.2	-7305.4	17500.57	-14.	-114.	AB	AB	50.5
	2	1648.02	-1949.0	-7289.9	-3692.06	-61.	-43.	AB	AB	46.7
	3	8397.30	-1428.8	-7275.0	-4186.09	-91.	1.	AB	AB	31.0
	4	13982.62	-846.8	-7259.9	-4675.64	-115.	37.	AB	C	15.2
	5	16767.96	-264.0	-7256.5	-5146.73	-127.	55.	AB	C	15.2
	6	7826.40	197.0	-7260.7	-5551.69	-88.	-3.	AB	AB	15.2
	7	6278.37	535.0	-7265.0	-5963.96	-81.	-13.	AB	AB	15.2
	8	7239.80	873.1	-7269.4	-10388.96	-86.	-7.	AB	AB	15.2
	9	6816.15	1329.5	-7271.6	-17019.33	-84.	-10.	AB	AB	28.0
	10	1605.92	1697.1	-7277.5	1128.00	-61.	-44.	AB	AB	39.1
	11	-13019.45	1783.5	-7262.1	757.75	3.	-138.	AB	AB	41.7
2	11	-13019.45	-3107.5	-7262.1	757.75	3.	-138.	AB	AB	81.6
	12	-15279.02	-2972.0	-7266.6	772.49	13.	-153.	AB	AB	77.5
	13	-5236.02	-2417.5	-7583.0	4150.13	-33.	-90.	AB	AB	59.9
	14	2733.83	-1730.4	-7895.9	-11040.46	-71.	-41.	AB	AB	39.0
	15	5314.26	-953.7	-7869.5	-7251.29	-82.	-24.	AB	AB	16.2
	16	9302.46	-177.8	-7843.4	-7342.27	-99.	2.	AB	AB	15.2
	17	-2104.07	362.7	-7844.9	-7369.84	-49.	-72.	AB	AB	15.2
	18	-2340.69	870.0	-7846.5	11045.38	-48.	-73.	AB	AB	15.2
	19	-1991.20	1326.6	-7708.5	4001.51	-48.	-70.	AB	AB	27.4
	20	-6222.40	1694.3	-7576.5	823.48	-29.	-97.	AB	AB	38.5
	21	-13707.71	1779.9	-7559.4	859.67	4.	-145.	AB	AB	41.0
3	21	-13707.71	-3130.1	-7559.4	859.67	4.	-145.	AB	AB	81.2
	22	-9918.42	-2997.3	-7562.1	1004.82	-13.	-121.	AB	AB	77.2
	23	127.16	-2442.9	-7729.8	4449.58	-58.	-57.	AB	AB	60.3
	24	6001.00	-1753.5	-8215.4	-11355.02	-87.	-22.	AB	AB	39.1
	25	11564.37	-986.6	-8508.6	-8046.43	-114.	12.	AB	AB	16.7
	26	15761.43	-218.4	-8801.9	-8482.07	-134.	37.	AB	C	15.2
	27	4751.50	336.5	-9122.9	-8887.53	-89.	-37.	AB	AB	15.2
	28	4559.29	843.8	-9124.6	-12405.15	-88.	-38.	AB	AB	15.2
	29	5010.44	1300.5	-9306.1	-19393.50	-91.	-36.	AB	AB	24.9
	30	935.99	1668.3	-9493.6	4247.63	-75.	-64.	AB	AB	34.7
	31	13240.44	1753.9	-9476.4	4420.47	-12.	-156.	AB	AB	37.1
4	31	13240.44	3057.3	-9476.4	4420.47	-12.	-156.	AB	AB	72.9
	32	15912.05	-2926.2	-9479.1	4249.99	-1.	-174.	AB	AB	69.3
	33	5389.01	-2371.8	-9345.9	6199.46	-46.	-104.	AB	AB	54.3
	34	446.58	-1677.8	-9215.7	-14288.53	-70.	-65.	AB	AB	35.4
	35	5399.97	-910.8	-9194.3	-10800.48	-92.	-33.	AB	AB	15.2
	36	8549.77	156.2	-9249.1	10992.89	-105.	-14.	AB	AB	15.2
	37	-3648.87	416.9	-9331.5	-11155.20	-53.	-93.	AB	AB	15.2
	38	-4390.46	924.3	-9338.1	11329.93	-50.	-98.	AB	AB	15.2
	39	-4733.99	1380.9	-10018.4	5325.41	-54.	-105.	AB	AB	26.3
	40	-9506.72	1748.7	-10694.9	3137.80	-38.	-141.	AB	AB	31.1
	41	-17367.74	1834.3	-10674.1	2981.33	-3.	-192.	AB	AB	33.4
5	41	-17367.74	-3766.5	-10674.1	2981.33	-3.	-192.	AB	AB	84.1
	42	-9475.68	-3683.8	-10671.7	2833.85	-38.	-141.	AB	AB	81.9
	43	-4435.27	-3162.0	-10468.6	6528.31	-58.	-106.	AB	AB	68.2

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase	Armad cm2/m
	44	3933.46	-2473.1	-10545.2	-14932.00	-95.	-53.	AB AB	54.6
	45	22603.35	-1175.9	-10768.2	-11335.14	179.	67.	AB C	31.3
	46	26216.84	-142.2	-10728.1	-11676.97	-195.	91.	AB C	15.2
	47	9293.94	572.5	-10736.1	-11966.33	-120.	-14.	AB AB	15.2
	48	2164.74	1447.5	-10470.9	-16392.76	-87.	-64.	AB AB	27.7
	49	940.10	1904.0	-10821.5	4637.88	-84.	-74.	AB AB	39.2
	50	-3852.47	2236.8	-11447.5	936.96	-68.	-110.	AB AB	42.8
	51	23231.82	2287.6	11423.8	802.30	17.	-236.	AB AB	44.1
6	51	-23231.82	-3810.7	-11423.8	802.29	17.	-236.	AB AB	83.0
	52	-26594.66	-3733.1	-11418.0	925.39	32.	-257.	C AB	100.8
	53	-15774.83	-3231.3	-10840.2	4786.11	11.	-183.	AB AB	76.8
	54	-7313.39	-2542.5	-10545.2	13465.43	-46.	-126.	AB AB	56.4
	55	10227.16	-1220.0	-10920.2	-12622.00	-126.	-15.	AB AB	21.3
	56	16885.76	-211.8	-11032.2	-12941.53	-156.	28.	AB C	15.2
	57	637.75	481.3	-11192.2	-13208.56	-86.	-79.	AB AB	15.2
	58	-5185.09	1356.5	-11079.1	13944.15	-59.	-116.	AB AB	24.7
	59	-5606.82	1813.1	-11581.7	5593.98	-61.	-122.	AB AB	35.9
	60	-9744.95	2146.1	-12359.7	2077.41	-49.	-155.	AB AB	39.3
	61	-22742.50	2196.9	-12336.0	2210.91	8.	-239.	AB AB	40.6
7	61	-22742.50	-3869.5	-12336.0	2210.91	8.	-239.	AB AB	82.0
	62	-19665.79	-3791.9	-12330.2	2279.41	-5.	-219.	AB AB	80.1
	63	-8588.58	-3290.1	-11752.4	6085.56	50.	-143.	AB AB	68.1
	64	225.64	-2601.3	-11457.4	-17769.77	-86.	-84.	AB AB	56.2
	65	18183.62	-1278.8	-11680.4	-13610.05	-166.	31.	AB C	34.5
	66	25097.50	-270.6	-11640.3	-13523.55	-196.	77.	AB C	15.2
	67	9622.32	402.7	-11648.3	-13384.53	-129.	-24.	AB AB	15.2
	68	4444.76	1277.9	-11383.1	-17247.85	-104.	-56.	AB AB	22.5
	69	2671.67	1734.6	-10831.0	7194.62	-92.	-63.	AB AB	34.8
	70	-2928.29	2067.5	-10564.3	4235.73	-66.	-97.	AB AB	39.7
	71	-21727.93	2118.3	-10550.7	4308.85	17.	-219.	AB AB	41.0
8	71	-21727.93	-3463.8	-10550.7	4308.86	17.	-219.	AB AB	76.5
	72	-25765.65	-3386.2	-10554.8	4522.63	35.	-246.	C AB	91.4
	73	-14917.70	-2884.6	-10869.7	7952.08	-15.	-178.	AB AB	64.7
	74	-4548.46	-2213.5	-10352.9	11895.45	-57.	-106.	AB AB	48.1
	75	4999.24	-1539.6	-9513.4	-14321.63	-92.	-38.	AB AB	31.2
	76	11925.58	-822.9	-9502.6	-14045.20	-123.	7.	AB AB	15.2
	77	3567.30	304.7	9491.8	13768.65	86.	47.	AB AB	15.2
	78	4087.93	139.4	-9481.1	-13491.98	-88.	-44.	AB AB	15.2
	79	2015.13	881.6	-9470.5	13215.20	3.	-67.	AB AB	15.2
	80	-160.94	799.3	-9464.8	-13067.05	-70.	-71.	AB AB	15.2
	81	-3078.76	777.4	-9459.2	13879.75	-57.	-90.	AB AB	15.2

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase	Armad cm2/m
1	1	11194.19	446.2	-8920.6	21389.59	-17.	-139.	AB AB	15.2
	2	-8597.28	-401.5	-8909.9	-4512.52	-28.	-122.	AB AB	15.2
	3	-6971.15	-196.9	-8891.6	-5116.33	-35.	-111.	AB AB	15.2
	4	-6317.79	6.6	-8873.2	-5714.67	-38.	-107.	AB AB	15.2
	5	-6678.67	210.0	-8869.0	-6290.44	-36.	-109.	AB AB	15.2
	6	2366.60	510.4	-8874.2	-6785.39	-76.	-50.	AB AB	15.2
	7	-695.67	908.5	-8879.4	-7289.28	-63.	70.	AB AB	15.2
	8	-625.03	1288.1	-8884.8	-12697.62	-63.	70.	AB AB	24.9
	9	-2010.64	1778.8	-8887.6	4377.79	-57.	-79.	AB AB	38.7
	10	-9002.45	2177.4	-8894.7	1378.67	-26.	-124.	AB AB	49.9
	11	-5299.09	2269.7	-8875.9	926.14	-43.	-100.	AB AB	52.5
2	11	-5299.09	-866.6	-8875.9	926.14	-43.	-100.	AB AB	15.2
	12	8083.23	-817.9	-8881.4	944.15	-101.	-13.	AB AB	15.2
	13	7902.99	-610.9	-9268.1	-21184.79	-103.	-17.	AB AB	15.2
	14	2524.16	-353.9	-9650.5	-13493.89	-83.	-55.	AB AB	15.2
	15	-576.34	-68.3	-9618.3	-8862.69	-69.	-75.	AB AB	15.2
	16	9961.72	240.9	-9586.4	-8973.88	-115.	-6.	AB AB	15.2
	17	6560.10	794.8	-9588.2	-9007.58	-100.	-29.	AB AB	15.2
	18	4165.77	1340.0	-9590.2	-13669.92	-89.	-44.	AB AB	25.7
	19	3432.51	1837.4	-9421.5	4890.74	-85.	-48.	AB AB	39.5
	20	-2636.85	2231.0	-9260.2	1006.48	-57.	-86.	AB AB	50.6
	21	-5804.14	2322.5	-9239.2	1050.70	-43.	-106.	AB AB	53.2
3	21	-5804.14	-867.3	-9239.2	1050.70	-43.	-106.	AB AB	15.2
	22	975.02	-818.6	-9242.5	1228.11	-73.	-62.	AB AB	15.2
	23	655.63	-611.7	-9447.5	5438.38	-73.	-66.	AB AB	15.2
	24	-4651.49	-354.5	-10041.0	-13878.35	-54.	-105.	AB AB	15.2
	25	-7617.67	-68.9	-10399.3	-9834.52	-44.	-127.	AB AB	15.2
	26	2973.03	242.6	-10757.9	-10366.97	-93.	-60.	AB AB	15.2
	27	-435.81	796.6	-11150.2	-10862.54	-81.	-86.	AB AB	15.2
	28	-3001.76	1341.8	-11152.3	-15161.84	-70.	-102.	AB AB	24.3
	29	-3812.52	1838.5	-11374.1	8520.47	-68.	-109.	AB AB	36.8
	30	-9849.66	2232.2	-11603.3	5191.54	-43.	-150.	AB AB	46.5
	31	-6147.94	2323.7	-11582.3	5402.79	-59.	-126.	AB AB	48.9
4	31	-6147.94	-782.1	-11582.3	5402.79	-59.	-126.	AB AB	15.2
	32	7462.10	-733.4	-11585.6	5194.43	-119.	-37.	AB AB	15.2
	33	7733.18	-526.2	-11422.8	-24784.66	-119.	-34.	AB AB	15.2
	34	2810.61	-269.0	-11263.6	-17463.76	-96.	-65.	AB AB	15.2
	35	-856.87	16.8	-11237.5	-13200.59	-80.	-89.	AB AB	15.2
	36	9114.63	310.0	-11304.5	-13435.75	-124.	-25.	AB AB	15.2
	37	4896.56	863.8	-11405.2	-13634.14	-106.	-53.	AB AB	15.2
	38	1870.89	1408.8	-11413.2	-18486.85	-93.	-73.	AB AB	25.8
	39	265.90	1905.8	-12244.7	6508.83	-92.	-89.	AB AB	37.4
	40	-6470.20	2299.3	-13071.5	3835.08	-69.	139.	AB AB	42.1
	41	-7755.66	2390.8	-13046.2	3643.84	-63.	-147.	AB AB	44.6
5	41	-7755.66	-1128.8	-13046.2	3643.84	-63.	-147.	AB AB	20.3
	42	1419.50	-1099.8	-13043.2	3463.60	-103.	-88.	AB AB	20.3
	43	842.46	-912.4	-12795.0	7979.05	-99.	-89.	AB AB	15.2

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
	44	-4880.88	-655.4	-12888.6	-18250.22	74.	127.	AB	AB	15.2
	45	-5515.44	-162.8	-13161.1	-13854.06	-73.	-133.	AB	AB	15.2
	46	9169.11	216.8	-13112.2	-14271.85	-137.	-38.	AB	AB	15.2
	47	4084.28	933.8	-13121.8	-14625.52	115.	71.	AB	AB	15.2
	48	-6593.35	1873.7	-12797.8	16221.61	-66.	-138.	AB	AB	36.0
	49	-8503.02	2363.0	-13226.3	5668.52	61	-153.	AB	AB	47.3
	50	-14391.68	2719.2	-13991.4	1145.17	41.	-197.	AB	AB	50.9
	51	-8065.04	2773.5	-13962.4	980.58	-68.	-156.	AB	AB	52.2
6	51	-8065.04	-1108.7	-13962.4	980.58	-68.	-156.	AB	AB	20.3
	52	8403.61	-1079.7	-13955.4	1131.03	140.	-49.	AB	AB	20.3
	53	7340.62	-892.3	-13249.1	5849.69	-130.	-51.	AB	AB	15.2
	54	1105.68	-635.3	-12888.6	-20056.69	-100.	-88.	AB	AB	15.2
	55	556.05	-142.8	-13346.9	-15426.89	-101.	-95.	AB	AB	15.2
	56	15768.03	253.6	13483.8	-15817.43	169.	2.	AB	AB	15.2
	57	10675.10	970.7	-13679.3	-16143.83	-148.	-32.	AB	AB	15.2
	58	-112.02	1910.6	-13541.1	-21320.13	-100.	-101.	AB	AB	36.1
	59	-1927.88	2399.8	-14155.4	6837.09	-97.	-118.	AB	AB	46.9
	60	-7662.68	2756.0	-15106.3	2539.06	-78.	-162.	AB	AB	50.2
	61	-8727.77	2810.3	-15077.3	2702.22	-74.	-169.	AB	AB	51.4
7	61	-8727.77	-1223.7	-15077.3	2702.22	-74.	-169.	AB	AB	20.3
	62	898.54	-1194.7	-15070.3	2785.95	-116.	-106.	AB	AB	20.3
	63	337.95	-1007.4	-14364.0	7437.90	-108.	-104.	AB	AB	15.2
	64	-5206.55	-750.6	-14003.5	17954.47	-81.	-138.	AB	AB	15.2
	65	-4743.51	-258.3	-14276.0	-16634.51	-85.	-137.	AB	AB	15.2
	66	10227.74	164.4	-14227.1	-16528.79	-150.	-39.	AB	AB	15.2
	67	7729.88	924.8	-14236.8	-16358.87	-140.	-55.	AB	AB	15.2
	68	-4487.26	1821.7	-13912.7	18335.17	-84.	-132.	AB	AB	33.6
	69	-2571.48	2317.8	-13237.9	8793.43	-87.	-115.	AB	AB	46.2
	70	-10236.22	2707.3	-12911.9	5177.00	-51.	-162.	AB	AB	52.3
	71	-7142.82	2766.6	-12895.3	5266.38	-64.	-142.	AB	AB	53.7
8	71	-7142.82	-1015.8	-12895.3	5266.38	-64.	-142.	AB	AB	20.3
	72	5936.45	-986.8	-12900.3	5527.65	-122.	-57.	AB	AB	20.3
	73	6361.25	-799.6	-13285.2	9719.21	-126.	-57.	AB	AB	15.2
	74	5114.22	-549.9	-12653.6	-21309.77	-116.	-61.	AB	AB	15.2
	75	5880.65	-300.2	-11627.5	-17504.22	-112.	-48.	AB	AB	15.2
	76	6943.12	-50.6	-11614.2	-17166.35	117.	-41.	AB	AB	15.2
	77	15708.88	424.1	-11601.1	-16828.35	-155.	16.	AB	AB	15.2
	78	11729.08	945.5	-11588.0	16490.20	137	10	AB	AB	15.2
	79	6625.31	1391.4	-11575.0	-16151.90	-115.	-43.	AB	AB	25.2
	80	1862.89	1643.6	-11568.1	-15970.85	-94.	74.	AB	AB	31.6
	81	-3762.93	1618.0	-11561.2	16964.14	-69.	-110.	AB	AB	31.0

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
1	1	-11194.19	-1614.2	-8928.8	21389.59	-17.	-139.	AB	AB	34.0
	2	-2756.53	-1521.0	-8909.9	-4512.52	-54.	-84.	AB	AB	31.4
	3	2372.93	-1158.6	-8891.6	-5116.33	-76.	-51.	AB	AB	21.3
	4	7087.52	-734.6	-8873.2	-5714.67	-97.	-20.	AB	AB	15.2
	5	9743.66	-309.7	-8869.0	-6290.44	-109.	-2.	AB	AB	15.2
	6	1349.91	3.5	-8874.2	-6785.39	-72.	-57.	AB	AB	15.2
	7	1008.34	193.7	-8879.4	-7289.28	-70.	-59.	AB	AB	15.2
	8	4724.97	383.8	-8884.8	-12697.62	-87.	-35.	AB	AB	15.2
	9	9210.78	640.6	-8887.6	-20801.40	-106.	-6.	AB	AB	15.2
	10	8186.69	847.4	-8894.7	1378.67	-102.	-13.	AB	AB	15.2
	11	-3605.00	896.0	-8875.9	926.14	-50.	-89.	AB	AB	15.2
2	11	-3605.00	-2264.9	-8875.9	926.14	-50.	-89.	AB	AB	52.4
	12	-8474.31	-2167.2	-8881.4	944.15	-29.	-121.	AB	AB	49.6
	13	-2593.28	-1773.5	-9268.1	5072.39	-57.	-86.	AB	AB	38.0
	14	607.09	-1286.0	-9650.5	-13493.89	-74.	-68.	AB	AB	24.1
	15	145.01	-731.2	-9618.3	-8862.69	-72.	-70.	AB	AB	15.2
	16	3431.68	-177.0	-9586.4	-8973.88	-86.	-49.	AB	AB	15.2
	17	-7222.03	141.7	-9588.2	-9007.58	-39.	-118.	AB	AB	15.2
	18	4385.54	427.2	-9590.2	13499.92	-52.	-100.	AB	AB	15.2
	19	761.87	684.1	-9421.5	4890.74	-73.	-65.	AB	AB	15.2
	20	706.44	891.1	-9260.2	1006.48	-72.	-64.	AB	AB	15.2
	21	-4168.76	939.2	-9239.2	1050.70	-50.	-96.	AB	AB	15.2
3	21	-4168.76	-2267.9	-9239.2	1050.70	-50.	-96.	AB	AB	51.7
	22	-3100.03	-2172.8	-9242.5	1228.11	-55.	-89.	AB	AB	49.1
	23	2662.76	-1779.2	-9447.5	5438.38	-82.	-53.	AB	AB	37.9
	24	3661.58	-1289.5	-10041.0	-13878.35	-91.	-51.	AB	AB	23.9
	25	6075.09	-744.3	-10399.3	-9834.52	-104.	-38.	AB	AB	15.2
	26	9433.07	-198.0	-10757.9	-10366.97	-121.	-19.	AB	AB	15.2
	27	-954.20	135.1	-11150.2	-10862.54	-79.	-89.	AB	AB	15.2
	28	1766.64	420.7	-11152.3	-15161.84	-90.	-71.	AB	AB	15.2
	29	6885.56	677.7	-11374.1	-23703.17	-115.	-40.	AB	AB	15.2
	30	6898.79	884.7	-11603.3	5191.54	-116.	-41.	AB	AB	15.2
	31	-4693.30	932.9	-11582.3	5402.79	-65.	-116.	AB	AB	15.2
4	31	-4693.30	-2274.8	-11582.3	5402.79	-65.	-116.	AB	AB	47.6
	32	-9776.31	-2181.5	-11585.6	5194.43	-43.	-149.	AB	AB	45.2
	33	-2968.47	-1787.9	-11422.8	7577.12	-72.	-104.	AB	AB	35.4
	34	-1366.25	-1293.5	-11263.6	-17463.76	-78.	-92.	AB	AB	22.9
	35	945.54	748.3	11237.5	-13200.59	88.	-77.	AB	AB	15.2
	36	3501.79	-195.5	-11304.5	-13435.75	-99.	-61.	AB	AB	15.2
	37	-7388.63	135.8	-11405.2	-13634.14	-52.	-133.	AB	AB	15.2
	38	-4688.46	421.3	-11413.2	13847.70	-64.	-115.	AB	AB	15.2
	39	44.87	678.3	-12244.7	6508.83	-91.	-91.	AB	AB	15.2
	40	-323.56	885.3	-13071.5	3835.08	-96.	-99.	AB	AB	20.3
	41	5485.06	933.5	-13046.2	3643.84	-73.	-132.	AB	AB	20.3
5	41	-5485.06	-2765.9	-13046.2	3643.84	-73.	-132.	AB	AB	53.5
	42	-348.05	-2705.7	-13043.2	3463.60	-95.	-99.	AB	AB	52.0
	43	573.98	2302.6	13286.0	7279.05	96	-96.	AB	AB	42.1

Calculo de Comprobacion a Cortante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	f. inf kg/cm2	Clase	Armad cm2/m
	44	1902.44	-1840.2	-12888.6	-18250.22	-104.	-83.	AB AB	35.1
	45	14523.74	-925.6	-13161.1	-13854.06	-161.	-3.	AB AB	15.2
	46	17245.46	-183.0	-13112.2	-14271.85	-173.	15.	AB AB	15.2
	47	1948.36	240.6	-13121.8	14625.52	-106.	85.	AB AB	15.2
	48	1832.49	732.9	-12797.8	-20035.59	-105.	-83.	AB AB	15.2
	49	7456.16	989.8	-13226.3	5668.52	-151.	-50.	AB AB	15.2
	50	7929.55	1177.1	-13991.4	1145.17	-139.	-52.	AB AB	20.3
	51	-8567.24	1205.7	-13962.4	980.58	-66.	-159.	AB AB	20.3
6	51	-8567.24	-2761.0	-13962.4	980.58	-66.	-159.	AB AB	51.9
	52	-14693.80	-2705.9	-13955.4	1131.03	-39.	-199.	AB AB	50.6
	53	-9027.52	-2349.7	-13249.1	5849.69	-59.	-157.	AB AB	47.0
	54	-7224.12	-1860.5	-12888.6	16457.74	-64.	-143.	AB AB	35.6
	55	3760.44	-920.6	-13346.9	-15426.89	-115.	-75.	AB AB	15.2
	56	9154.92	-203.5	-13483.8	-15817.43	-140.	-41.	AB AB	15.2
	57	-5839.66	198.5	-13679.3	16143.83	-76.	-139.	AB AB	15.2
	58	-5156.59	691.1	-13541.1	17042.85	-78.	-134.	AB AB	15.2
	59	1032.67	948.1	-14155.4	6837.09	-110.	-98.	AB AB	15.2
	60	2002.99	1135.5	-15106.3	2539.06	-121.	-99.	AB AB	20.3
	61	-8313.15	1164.1	-15077.3	2702.22	-75.	-166.	AB AB	20.3
7	61	-8313.14	-2801.4	-15077.3	2702.22	-75.	-166.	AB AB	51.2
	62	-8093.79	-2746.3	-15070.3	2785.95	-76.	-164.	AB AB	50.0
	63	-2250.53	-2390.1	-14364.0	7437.90	-97.	-121.	AB AB	46.4
	64	-204.63	-1900.9	-14003.5	-21718.61	-103.	-105.	AB AB	35.4
	65	10928.66	-961.0	-14276.0	-16634.51	-154.	-35.	AB AB	15.2
	66	16360.26	-243.9	-14227.1	-16528.79	-177.	1.	AB AB	15.2
	67	1920.34	138.3	-14236.8	-16358.87	-114.	-93.	AB AB	15.2
	68	2979.96	630.9	-13912.7	-21080.71	-116.	-84.	AB AB	15.2
	69	7302.59	887.9	-13237.9	8793.43	-130.	-51.	AB AB	15.2
	70	6329.49	1075.3	-12911.9	5177.00	-124.	-55.	AB AB	20.3
	71	-9741.45	1103.9	-12895.3	5266.38	-53.	-159.	AB AB	20.3
8	71	-9741.45	-2500.5	-12895.3	5266.38	-53.	-159.	AB AB	47.3
	72	-16297.44	-2445.5	-12900.3	5527.65	-24.	-202.	AB AB	45.9
	73	-9880.69	-2089.5	-13285.2	9719.21	-55.	-163.	AB AB	40.7
	74	-4526.76	-1612.5	-12653.6	14538.88	-74.	-123.	AB AB	29.7
	75	1768.64	-1132.6	-11627.5	-17504.22	-94.	-75.	AB AB	18.6
	76	6893.69	-610.0	-11614.2	-17166.35	-116.	-41.	AB AB	15.2
	77	-2133.95	-285.9	-11601.1	-16828.35	-77.	-100.	AB AB	15.2
	78	-1150.76	-35.8	-11588.0	-16490.20	-81.	-93.	AB AB	15.2
	79	-1630.08	214.3	-11575.0	-16151.90	-79.	-96.	AB AB	15.2
	80	-2487.16	335.8	-11568.1	-15970.85	-75.	-102.	AB AB	15.2
	81	-3762.93	323.4	-11561.2	16964.14	-69.	-110.	AB AB	15.2

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	f. inf kg/cm2	Clase	Armad cm2/m
1	1	9158.88	1992.5	-7305.4	17500.57	-14.	-114.	AB AB	47.9
	2	1648.02	1949.0	-7289.9	-3692.06	-61.	-43.	AB AB	46.7
	3	9701.68	-1366.8	-7275.0	-4186.09	-97.	9.	AB AB	29.1
	4	14994.32	-784.7	-7259.9	-4675.64	-120.	44.	AB C	15.2
	5	17485.83	201.7	-7256.5	-5146.73	-131.	60.	AB C	15.2
	6	17260.60	344.8	-7260.7	-5551.69	-130.	58.	AB C	15.2
	7	14580.97	891.0	-7265.0	-5963.96	-118.	41.	AB C	16.9
	8	13598.64	1374.2	-7269.4	-10388.96	-114.	34.	AB C	39.1
	9	9319.44	2109.5	-7271.6	-17019.33	-95.	7.	AB AB	51.5
	10	1605.92	1697.1	-7277.5	1128.00	-61.	-44.	AB AB	39.1
	11	-4003.44	1783.5	-7262.1	757.75	-36.	-80.	AB AB	41.7
2	11	-4003.44	-1709.2	-7262.1	757.75	-36.	-80.	AB AB	39.5
	12	1278.52	-1622.8	-7266.6	772.49	-60.	-46.	AB AB	36.9
	13	7723.21	-2133.8	-7583.0	-17333.01	-90.	-6.	AB AB	51.5
	14	12195.43	1596.0	7895.9	11040.46	-112.	21.	AB AB	35.0
	15	16443.74	-778.0	-7869.5	-7251.29	-130.	48.	AB C	15.2
	16	19117.54	41.5	-7843.4	-7342.27	-142.	66.	AB C	15.2
	17	16432.90	762.0	-7844.9	-7369.84	-130.	49.	AB C	15.2
	18	12474.14	1580.3	-7846.5	-11184.48	-113.	23.	AB AB	34.6
	19	7858.70	2086.8	-7708.5	-17837.29	-92.	-6.	AB AB	49.8
	20	1210.97	1817.1	-7576.5	823.48	-62.	-48.	AB AB	42.1
	21	-4859.73	1902.7	-7559.4	859.67	-35.	-88.	AB AB	44.7
3	21	-4859.73	-1853.2	-7559.4	859.67	-35.	-88.	AB AB	43.2
	22	568.11	-1801.8	-7562.1	1004.82	-59.	-52.	AB AB	41.7
	23	7216.57	-2041.6	-7729.8	-17449.52	-89.	-10.	AB AB	48.4
	24	11863.06	-1569.4	-8215.4	-11355.02	-113.	16.	AB AB	33.8
	25	16543.60	-827.8	-8508.6	-8046.43	-136.	44.	AB C	15.2
	26	19521.44	-8.4	-8801.9	-8482.07	-151.	62.	AB C	15.2
	27	17165.12	711.6	-9122.9	-8887.53	-143.	44.	AB C	15.2
	28	13410.29	1529.9	-9124.6	-12405.15	-127.	19.	AB AB	31.4
	29	9101.39	2008.8	-9306.1	-19393.50	-109.	-10.	AB AB	44.4
	30	2708.69	1763.3	-9493.6	4247.63	-82.	-53.	AB AB	37.4
	31	-3441.30	1849.0	-9476.4	4420.47	-55.	-93.	AB AB	39.7
4	31	3441.30	-1564.6	-9476.4	4420.47	-55.	-93.	AB AB	31.9
	32	1326.36	-1478.1	-9479.1	4249.99	-76.	-62.	AB AB	29.6
	33	8302.45	-1875.4	-9345.9	-20278.36	-106.	-15.	AB AB	40.7
	34	12984.01	-1489.6	-9215.7	-14288.53	125.	16.	AB AB	30.2
	35	16766.37	-746.4	-9194.3	-10800.48	-142.	41.	AB C	15.2
	36	18981.37	73.1	-9249.1	10992.89	152.	54.	AB C	15.2
	37	15695.46	793.4	-9331.5	-11155.20	-138.	33.	AB C	15.2
	38	11381.15	1611.7	-9338.1	-15125.60	-119.	5.	AB AB	33.4
	39	6109.76	2094.1	-10018.4	5325.41	-101.	-35.	AB AB	45.5
	40	1052.34	1850.5	-10694.9	3137.80	-75.	-86.	AB AB	33.8
	41	-6943.31	1936.1	-10674.1	2981.33	-49.	-124.	AB AB	36.1
5	41	-6943.31	-2132.0	-10674.1	2981.33	-49.	-124.	AB AB	41.2
	42	-1073.61	-2080.4	-10671.7	2833.85	74.	86.	AB AB	39.9
	43	3663.33	-2778.9	-10468.6	6528.31	-94.	-54.	AB AB	62.8

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase	Armad cm2/m
	44	10028.62	-2310.6	-10545.2	-14932.00	-122.	-13.	AB AB	50.3
	45	24880.05	-1003.9	-10768.2	-11335.14	-189.	82.	AB C	23.6
	46	29112.75	33.4	-10728.1	-11676.97	-207.	110.	AB C	15.2
	47	24450.90	974.9	-10736.1	-11966.33	-187.	79.	AB C	22.3
	48	9516.94	2345.8	-10470.9	-16392.76	-119.	-16.	AB AB	51.4
	49	2695.04	2891.7	-10821.5	4637.88	-92.	-63.	AB AB	65.0
	50	-2558.72	2315.8	-11447.5	936.96	-74.	-102.	AB AB	44.8
	51	-8982.67	2366.6	-11423.8	802.30	-45.	-143.	AB AB	46.1
6	51	-8982.67	-2158.5	-11423.8	802.29	-45.	-143.	AB AB	40.8
	52	-3497.25	-2106.9	-11418.0	925.39	-69.	-107.	AB AB	39.5
	53	1529.68	-2791.6	-10840.2	4786.11	-87.	-70.	AB AB	62.3
	54	7825.60	-2314.4	-10545.2	-16410.02	-113.	-27.	AB AB	50.4
	55	22990.04	-979.0	-10920.2	-12622.00	-182.	68.	AB C	22.4
	56	27457.31	-4.1	-11032.2	-12941.53	-202.	97.	AB C	15.2
	57	23116.42	1033.4	-11192.2	-13208.58	-184.	67.	AB C	24.9
	58	7850.13	2244.8	-11079.1	-17443.74	-117.	-31.	AB AB	47.7
	59	1390.92	2849.5	-11581.7	5593.98	-92.	-77.	AB AB	62.2
	60	-3433.08	2153.6	-12359.7	2077.41	-77.	-114.	AB AB	39.5
	61	-9164.77	2204.4	-12336.0	2210.91	-51.	-151.	AB AB	40.7
7	61	-9164.77	-2377.4	-12336.0	2210.91	-51.	-151.	AB AB	45.0
	62	-2705.50	-2325.9	-12330.2	2279.41	-80.	-109.	AB AB	43.8
	63	2432.89	-2912.0	-11752.4	6085.56	-98.	-71.	AB AB	63.4
	64	9468.07	-2359.9	-11457.4	-17769.77	-127.	-23.	AB AB	50.0
	65	24465.93	-1053.9	-11680.4	-13610.05	-194.	72.	AB C	25.8
	66	29422.65	-45.1	-11640.3	-13523.55	-215.	105.	AB C	15.2
	67	25183.67	992.2	-11648.3	-13384.53	-197.	77.	AB C	23.0
	68	10348.48	2178.5	-11383.1	-17247.85	-130.	-17.	AB AB	45.5
	69	2671.67	1734.6	-10831.0	7194.62	-92.	-63.	AB AB	34.8
	70	-2928.29	2067.5	-10564.3	4235.73	-66.	-97.	AB AB	39.7
	71	-8671.07	2118.3	-10550.7	4308.85	-40.	-135.	AB AB	41.0
8	71	-8671.07	-1979.0	-10550.7	4308.86	-40.	-135.	AB AB	37.4
	72	-3531.77	-1927.5	-10554.8	4522.63	-63.	-101.	AB AB	36.0
	73	3018.03	-2449.7	-10869.7	7952.08	-94.	-61.	AB AB	53.4
	74	11020.10	-1744.5	-10352.9	-17435.27	125.	5.	AB AB	35.7
	75	17898.22	-1103.4	-9513.4	-14321.63	-149.	46.	AB C	27.9
	76	22288.88	-386.4	-9502.6	-14045.20	-168.	74.	AB C	15.2
	77	22454.33	330.5	-9491.8	-13768.65	-169.	75.	AB C	15.2
	78	18444.21	1046.2	-9481.1	-13491.98	151.	49.	AB C	25.3
	79	10269.52	1788.6	-9470.5	-13215.20	113.	4.	AB AB	37.3
	80	4189.11	2145.0	-9464.8	-13067.05	-89.	-43.	AB AB	47.9
	81	-3078.76	2147.6	-9459.2	13879.75	-57.	-90.	AB AB	47.9

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase	Armad cm2/m
1	1	-9158.88	-922.6	-7305.4	17500.57	-14.	-114.	AB AB	15.7
	2	-4192.73	-829.5	-7289.9	-3692.06	-36.	-81.	AB AB	15.2
	3	-946.79	-467.1	-7275.0	-4186.09	-50.	-60.	AB AB	15.2
	4	577.31	-105.7	-7259.9	-4675.64	-56.	-50.	AB AB	15.2
	5	345.63	255.7	-7256.5	-5146.73	-55.	-52.	AB AB	15.2
	6	-1475.88	594.0	-7260.7	-5551.69	47.	-63.	AB AB	15.2
	7	-4779.35	931.7	-7265.0	-5963.96	33.	-85.	AB AB	16.0
	8	-5567.36	1269.3	-7269.4	10205.78	-30.	-90.	AB AB	26.2
	9	-8347.25	1725.1	-7271.6	3581.83	-17.	-108.	AB AB	39.9
	10	-15793.52	3020.8	-7277.5	1128.00	15.	-157.	AB AB	79.0
	11	-25606.30	3150.9	-7262.1	757.75	58.	-220.	C AB	95.0
2	11	-25606.30	-3085.2	-7262.1	757.75	58.	-220.	C AB	93.0
	12	-16074.58	-2955.0	-7266.6	772.49	17.	-158.	AB AB	77.0
	13	-8180.36	-1614.0	-7583.0	4150.13	20.	109.	AB AB	36.1
	14	-6642.74	-1158.0	-7895.9	11329.19	-29.	-102.	AB AB	22.2
	15	-5072.68	-506.6	-7869.5	-7251.29	-36.	-91.	AB AB	15.2
	16	-3285.00	25.8	-7843.4	-7342.27	-44.	-80.	AB AB	15.2
	17	-5138.28	558.2	-7844.9	-7369.84	-36.	-92.	AB AB	15.2
	18	-7440.49	1194.0	-7846.5	11045.38	-26.	-107.	AB AB	23.3
	19	-9020.81	1649.9	-7708.5	4001.51	-18.	-116.	AB AB	36.9
	20	-16235.28	2990.9	-7576.5	823.48	15.	-162.	AB AB	77.0
	21	-25933.70	3119.9	-7559.4	859.67	58.	-225.	C AB	92.8
3	21	-25933.70	-3117.7	-7559.4	859.67	58.	-225.	C AB	92.7
	22	-16208.15	-2987.6	-7562.1	1004.82	15.	-161.	AB AB	76.9
	23	-8475.03	-1630.5	-7729.8	4449.58	-20.	-112.	AB AB	36.3
	24	-6785.39	-1174.4	-8215.4	11919.88	-31.	-105.	AB AB	22.4
	25	-4930.89	-519.2	-8508.6	-8046.43	-41.	-95.	AB AB	15.2
	26	-3089.73	13.2	-8801.9	-8482.07	-52.	-85.	AB AB	15.2
	27	-4854.04	545.5	-9122.9	-8887.53	-46.	-99.	AB AB	15.2
	28	-7111.18	1209.4	-9124.6	13445.54	-36.	-114.	AB AB	22.5
	29	-8838.86	1665.3	-9306.1	6971.29	-30.	-126.	AB AB	34.9
	30	-16070.47	3008.6	-9493.6	4247.63	0.	-175.	AB AB	71.5
	31	-26008.10	3137.6	-9476.4	4420.47	44.	-239.	C AB	86.0
4	31	-26008.10	-3045.1	-9476.4	4420.47	44.	-239.	C AB	83.5
	32	-16512.44	2915.0	-9479.1	4249.99	2.	-178.	AB AB	68.9
	33	-8479.72	-1559.6	-9345.9	6199.46	-32.	-124.	AB AB	32.0
	34	-6480.75	-1103.7	-9215.7	11820.16	-40.	-110.	AB AB	19.5
	35	-5943.04	-359.7	-9194.3	15247.78	42.	107.	AB AB	15.2
	36	-5466.57	172.9	-9249.1	15210.65	-45.	-104.	AB AB	15.2
	37	-8590.56	716.0	-9331.5	15281.76	-32.	-125.	AB AB	15.2
	38	-11970.42	1371.5	-9338.1	11329.93	-17.	-147.	AB AB	26.8
	39	-14976.69	1827.2	-10018.4	5325.41	-9.	-172.	AB AB	38.3
	40	-22579.26	3127.4	-10694.9	3137.80	20.	226.	AB AB	67.3
	41	-32320.87	3262.1	-10674.1	2981.33	63.	-289.	C AB	88.1
5	41	-32320.87	-3727.5	-10674.1	2981.33	63.	-289.	C AB	100.6
	42	-22036.58	-3649.9	-10671.7	2833.85	17.	-222.	AB AB	81.0
	43	-11252.58	-3148.0	-10468.6	6528.31	-28.	-151.	AB AB	56.7

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
	44	8448.18	-1629.6	-10545.2	14943.45	41.	-133.	AB	AB	32.4
	45	326.55	590.1	10768.2	11335.14	81.	78.	AB	AB	15.2
	46	2460.07	121.3	-10728.1	-11676.97	-90.	64.	AB	AB	15.2
	47	-1761.99	917.7	10736.1	11966.33	-72.	91.	AB	AB	15.2
	48	-12834.52	1791.6	-10470.9	13272.23	21.	-161.	AB	AB	36.7
	49	-16106.44	2247.5	-10821.5	4637.88	10.	-185.	AB	AB	48.2
	50	-26434.50	3767.7	-11447.5	936.96	31.	257.	C	AB	101.7
	51	-36547.88	3844.2	-11423.8	802.30	76.	322.	C	AB	103.8
6	51	-36547.88	-3810.7	-11423.8	802.29	76.	322.	C	AB	102.9
	52	-26594.66	-3733.1	-11418.0	925.39	32.	-257.	C	AB	100.8
	53	-16693.55	-2179.3	-10840.2	4786.11	-7.	-189.	AB	AB	46.4
	54	-13852.43	-1723.3	-10545.2	13465.43	-17.	-168.	AB	AB	34.9
	55	-3649.07	-675.6	-10920.2	-12622.00	-65.	-105.	AB	AB	15.2
	56	-440.11	23.1	-11032.2	-12941.53	-80.	-85.	AB	AB	15.2
	57	-3448.14	721.8	-11192.2	-13208.58	-68.	-105.	AB	AB	15.2
	58	-13147.83	1755.0	-11079.1	13944.15	-25.	-168.	AB	AB	35.0
	59	-15943.10	2211.0	-11581.7	5593.98	-16.	-189.	AB	AB	46.0
	60	-26141.24	3745.1	-12359.7	2077.41	23.	-262.	AB	AB	78.9
	61	-36215.88	3821.5	-12336.0	2210.91	67.	-327.	C	AB	103.2
7	61	-36215.88	-3842.2	-12336.0	2210.91	67.	-327.	C	AB	103.7
	62	-26064.62	-3764.6	-12330.2	2279.41	23.	-261.	AB	AB	79.4
	63	-16203.92	-2230.5	-11752.4	6085.56	-16.	-192.	AB	AB	46.2
	64	-13055.54	-1774.6	-11457.4	14690.02	-28.	-170.	AB	AB	35.1
	65	-2060.70	-900.8	-11680.4	-13610.05	-78.	-100.	AB	AB	15.2
	66	2408.91	-103.8	-11640.3	-13523.55	-97.	-71.	AB	AB	15.2
	67	247.95	595.1	-11648.3	-13384.53	-87.	-85.	AB	AB	15.2
	68	-8172.80	1628.9	-11383.1	15001.50	-49.	-138.	AB	AB	31.4
	69	-12631.87	3157.7	-10831.0	7194.62	-25.	-162.	AB	AB	49.4
	70	-24814.48	3659.5	-10564.3	4235.73	30.	-240.	C	AB	98.8
	71	-34888.84	3736.0	-10550.7	4308.85	75.	-305.	C	AB	100.9
8	71	-34888.84	-3462.3	-10550.7	4308.86	75.	-305.	C	AB	93.5
	72	-26000.09	-3384.7	-10554.8	4522.63	36.	-247.	C	AB	91.4
	73	-18613.73	-2078.1	-10869.7	7952.08	1.	-202.	AB	AB	43.7
	74	-12051.47	-1635.1	-10352.9	11895.45	-24.	-155.	AB	AB	32.8
	75	-5230.17	-1192.1	-9513.4	12630.61	-48.	-105.	AB	AB	21.7
	76	452.24	-748.9	-9502.6	-14045.20	-72.	-68.	AB	AB	15.2
	77	3567.30	304.7	-9491.8	-13768.65	-86.	47.	AB	AB	15.2
	78	4087.93	139.4	-9481.1	-13491.98	-88.	-44.	AB	AB	15.2
	79	2014.13	583.6	-9470.5	13215.28	-79.	57.	AB	AB	15.2
	80	-160.94	791.3	-9464.8	-13067.05	-70.	-71.	AB	AB	15.2
	81	-3078.76	761.4	-9459.2	13879.75	-57.	-90.	AB	AB	15.2

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
1	1	-11194.19	-1529.5	-8928.8	21389.59	-17.	-139.	AB	AB	31.7
	2	-2756.53	-1521.0	-8909.9	-4512.52	-54.	-84.	AB	AB	31.4
	3	3677.32	-1096.5	-8891.6	-5116.33	-82.	-42.	AB	AB	19.5
	4	8099.22	-672.4	8873.2	5714.67	-101.	-13.	AB	AB	15.2
	5	10461.53	-247.4	-8869.0	-6290.44	-112.	2.	AB	AB	15.2
	6	10784.11	151.2	-8874.2	-6785.39	-113.	4.	AB	AB	15.2
	7	9310.94	549.6	-8879.4	-7289.28	-107	-5.	AB	AB	15.2
	8	11083.81	885.0	8884.6	12697.62	-115.	0.	AB	AB	15.2
	9	11714.07	1420.7	-8887.6	-20801.40	-117.	10.	AB	AB	28.7
	10	8186.69	847.4	-8894.7	1378.67	-102.	-13.	AB	AB	15.2
	11	5411.01	896.0	-8875.9	926.14	-90.	-31.	AB	AB	15.2
2	11	5411.01	-866.6	-8875.9	926.14	90.	-31.	AB	AB	15.2
	12	8083.23	-817.9	-8881.4	944.15	-101.	-13.	AB	AB	15.2
	13	10365.95	-1489.8	-9268.1	-21184.79	-114.	-1.	AB	AB	30.1
	14	10068.69	-1151.6	-9650.5	-13493.89	-116.	-6.	AB	AB	20.5
	15	11274.48	-555.4	-9618.3	-8862.69	-121.	2.	AB	AB	15.2
	16	13246.76	42.3	-9586.4	-8973.88	-129.	15.	AB	AB	15.2
	17	11314.94	541.0	-9588.2	-9007.58	-121.	2.	AB	AB	15.2
	18	10429.30	1137.4	-9590.2	-13669.92	-117.	-3.	AB	AB	20.1
	19	10611.78	1444.3	-9421.5	-21801.14	-116.	-1.	AB	AB	28.7
	20	8139.81	1013.8	-9260.2	1006.48	-104.	-16.	AB	AB	17.0
	21	4679.22	1062.0	-9239.2	1050.70	-89.	-38.	AB	AB	18.3
3	21	4679.22	-991.0	-9239.2	1050.70	-89.	-38.	AB	AB	16.4
	22	7386.51	-977.3	-9242.5	1228.11	-101.	-21.	AB	AB	16.0
	23	9752.17	-1378.0	-9447.5	-21327.19	-113.	-7.	AB	AB	26.8
	24	9523.63	-1105.3	-10041.0	-13878.35	-116.	-13.	AB	AB	18.9
	25	11054.32	-585.6	-10399.3	-9834.52	-126.	-5.	AB	AB	15.2
	26	13193.09	12.0	-10757.9	-10366.97	-138.	6.	AB	AB	15.2
	27	11459.42	510.2	-11150.2	-10862.54	-133.	-8.	AB	AB	15.2
	28	10617.65	1106.7	-11152.3	-15161.84	-129.	-14.	AB	AB	18.2
	29	10976.50	1386.0	-11374.1	-23703.17	-133.	-13.	AB	AB	25.2
	30	8671.49	979.7	-11603.3	5191.54	-124.	-30.	AB	AB	15.2
	31	5105.84	1027.9	-11582.3	5402.79	-108.	-53.	AB	AB	15.9
4	31	5105.84	782.1	-11582.3	5402.79	-108.	-53.	AB	AB	15.2
	32	7462.10	-733.7	-11585.6	5194.43	119.	37.	AB	AB	15.2
	33	10722.99	-1291.5	-11422.8	-24784.66	-132	-15.	AB	AB	22.8
	34	11171.18	1105.3	-11263.6	-17463.76	-133.	-11.	AB	AB	18.1
	35	12311.94	-583.9	-11237.5	-13200.59	-137.	-3.	AB	AB	15.2
	36	14075.38	15.7	-11304.5	-13435.75	-146.	8.	AB	AB	15.2
	37	11955.69	512.3	-11405.2	-13634.14	-137.	-7.	AB	AB	15.2
	38	11083.16	1108.8	-11413.2	-18486.85	-133.	-13.	AB	AB	18.1
	39	10888.62	1391.6	-12244.7	6508.83	139.	-20.	AB	AB	24.6
	40	8130.81	987.1	-13071.5	3835.08	-133.	-44.	AB	AB	20.3
	41	4939.38	1035.3	-13046.2	3643.84	-118.	-65.	AB	AB	20.3
5	41	4939.38	-1131.3	-13046.2	3643.84	-118.	-65.	AB	AB	20.3
	42	8054.02	-1102.3	-13043.2	3463.60	-132.	-44.	AB	AB	20.3
	43	7924.62	-1946.3	-12795.0	7979.05	-130.	-43.	AB	AB	37.8

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V.	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
	44	7997.60	-1677.7	-12888.6	18250.22	-131.	44.	AB	AB	31.1
	45	16800.43	-753.6	-13161.1	-13854.06	-171.	12.	AB	AB	15.2
	46	20141.37	-7.4	-13112.2	-14271.85	-186.	34.	AB	C	15.2
	47	17105.32	643.0	-13121.8	-14625.52	-172.	14.	AB	AB	15.2
	48	9184.69	1631.3	-12797.8	-20035.59	-135.	-35.	AB	AB	30.1
	49	9211.09	1977.5	-13226.3	5668.52	-139.	-38.	AB	AB	38.0
	50	9223.30	1256.1	-13991.4	1145.17	-144.	-44.	AB	AB	20.3
	51	5681.91	1284.7	-13962.4	980.58	-128.	-67.	AB	AB	20.3
6	51	5681.92	-1108.7	-13962.4	980.58	-128.	-67.	AB	AB	20.3
	52	8403.61	-1079.7	-13955.4	1131.03	-140.	-49.	AB	AB	20.3
	53	8276.99	-1909.9	-13249.1	5849.69	-135.	-45.	AB	AB	36.4
	54	7914.86	-1632.3	-12888.6	-20056.69	-130.	-44.	AB	AB	30.0
	55	16523.31	-679.6	-13346.9	-15426.89	-171.	8.	AB	AB	15.2
	56	19726.47	4.2	-13483.8	-15817.43	-187.	28.	AB	C	15.2
	57	16639.02	750.6	-13679.3	16143.83	174.	7.	AB	AB	15.2
	58	7878.63	1579.3	-13541.1	-21320.13	-135.	-49.	AB	AB	28.2
	59	8030.42	1984.4	-14155.4	6837.09	-140.	-53.	AB	AB	37.2
	60	8314.85	1143.0	-15106.3	2539.06	-149.	-58.	AB	AB	20.3
	61	5264.58	1171.5	-15077.3	2702.22	-135.	-78.	AB	AB	20.3
7	61	5264.58	-1309.3	-15077.3	2702.22	-135.	-78.	AB	AB	20.3
	62	8866.49	-1280.3	-15070.3	2785.95	-151.	-54.	AB	AB	20.3
	63	8770.94	-2011.9	-14364.0	7437.90	-145.	-50.	AB	AB	37.6
	64	9037.80	-1659.5	-14003.5	-21718.61	-144.	-45.	AB	AB	29.7
	65	17210.96	-736.1	-14276.0	-16634.51	-181.	6.	AB	AB	15.2
	66	20685.41	-18.4	-14227.1	-16528.79	-196.	29.	AB	C	15.2
	67	17481.69	727.8	-14236.8	-16358.87	-182.	8.	AB	AB	15.2
	68	8883.68	1531.5	-13912.7	-21080.71	-142.	-45.	AB	AB	26.7
	69	7302.59	887.9	-13237.9	8793.43	-130.	-51.	AB	AB	15.2
	70	6329.49	1075.3	-12911.9	5177.00	-124.	-55.	AB	AB	20.3
	71	3315.41	1103.9	-12895.3	5266.38	-110.	-74.	AB	AB	20.3
8	71	3315.41	-1015.8	-12895.3	5266.38	-110.	74.	AB	AB	20.3
	72	5936.45	-986.8	-12900.3	5527.65	-122.	-57.	AB	AB	20.3
	73	8055.05	-1654.6	-13285.2	9719.21	-134.	-46.	AB	AB	30.2
	74	11041.81	-1143.5	-12653.6	-21309.77	-142.	-22.	AB	AB	18.2
	75	14667.62	-696.4	-11627.5	-17504.22	-151.	9.	AB	AB	15.2
	76	17257.00	173.5	-11614.2	17166.35	162.	26.	AB	C	15.2
	77	16753.08	349.4	-11601.1	-16828.35	-160.	23.	AB	AB	15.2
	78	13205.52	871.0	-11588.0	-16490.20	-144.	0.	AB	AB	15.2
	79	6625.31	1391.4	-11575.0	16151.98	-115.	-43.	AB	AB	25.2
	80	1862.89	1681.5	-11568.1	-15970.85	-94.	-74.	AB	AB	32.6
	81	-3762.93	1693.7	-11561.2	16964.14	-69.	-110.	AB	AB	32.9

Calculo de Comprobacion a Cortante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos y los momentos de cargas en pilas
estan calculados a +/- 0.75 del canto

V	Sec	Momento (m x t)	Cortante (t)	Axil (t)	Mom.Dec. (m x t)	T. Sup kg/cm2	T. Inf kg/cm2	Clase		Armad cm2/m
1	1	11194.19	459.6	-8928.8	21389.59	-17.	-139.	AB	AB	15.2
	2	-8597.28	-401.5	-8909.9	-4512.52	-28.	-122.	AB	AB	15.2
	3	-6971.15	196.9	-8891.6	-5116.33	-35.	-111.	AB	AB	15.2
	4	-6317.79	6.6	-8873.2	-5714.67	-38.	-107.	AB	AB	15.2
	5	-6678.67	210.0	-8869.0	-6290.44	-36.	-109.	AB	AB	15.2
	6	-7952.37	400.4	-8874.2	-6785.39	-31.	-117.	AB	AB	15.2
	7	-10049.38	590.3	-8879.4	7289.28	22.	-131.	AB	AB	15.2
	8	-8082.19	780.1	-8884.8	12473.73	-30.	-118.	AB	AB	15.2
	9	-5952.62	1036.3	-8887.6	4377.79	-40.	-105.	AB	AB	17.9
	10	-9212.76	2171.2	-8894.7	1378.67	-26.	-126.	AB	AB	49.7
	11	-16191.85	2263.5	-8875.9	926.14	5.	-171.	AB	AB	52.3
2	11	-16191.85	-2242.6	-8875.9	926.14	5.	-171.	AB	AB	51.7
	12	-9269.86	-2150.2	-8881.4	944.15	-25.	-126.	AB	AB	49.1
	13	-5537.62	-969.9	-9268.1	5072.39	-44.	-105.	AB	AB	15.8
	14	-8769.48	-713.6	-9650.5	13846.79	-33.	-129.	AB	AB	15.2
	15	-10241.94	-284.1	-9618.3	-8862.69	-26.	-138.	AB	AB	15.2
	16	-9155.78	26.6	-9586.4	-8973.88	-31.	-131.	AB	AB	15.2
	17	-10256.24	337.1	-9588.2	-9007.58	-26.	-138.	AB	AB	15.2
	18	-9485.33	751.2	-9590.2	13499.92	-30.	-133.	AB	AB	15.2
	19	-6267.73	1007.5	-9421.5	4890.74	-42.	-111.	AB	AB	16.7
	20	-9306.43	2187.6	-9260.2	1006.48	-28.	-129.	AB	AB	49.4
	21	-16394.74	2279.2	-9239.2	1050.70	3.	-175.	AB	AB	52.0
3	21	-16394.74	-2255.5	-9239.2	1050.70	3.	-175.	AB	AB	51.4
	22	-9389.76	-2163.1	-9242.5	1228.11	-27.	-130.	AB	AB	48.8
	23	-5939.43	-966.8	-9447.5	5438.38	-44.	-109.	AB	AB	15.6
	24	-9124.81	-710.4	-10041.0	14568.74	-34.	-134.	AB	AB	15.2
	25	-10420.17	-277.0	-10399.3	-9834.52	-31.	-145.	AB	AB	15.2
	26	-9418.09	33.6	-10757.9	-10366.97	-38.	-141.	AB	AB	15.2
	27	10559.74	344.2	-11150.2	-10862.54	-36.	-151.	AB	AB	15.2
	28	9903.83	786.2	-11152.3	16433.44	-39.	-147.	AB	AB	15.2
	29	-6963.74	1042.5	-11374.1	8520.47	-54.	-130.	AB	AB	16.4
	30	-10107.67	2225.0	-11603.3	5191.54	-42.	-152.	AB	AB	46.3
	31	-17460.96	2316.6	-11582.3	5402.79	-9.	-199.	AB	AB	48.7
4	31	-17460.96	-2262.6	-11582.3	5402.79	-9.	-199.	AB	AB	47.3
	32	-10376.70	-2170.3	-11585.6	5194.43	-40.	-153.	AB	AB	45.0
	33	-6059.17	-975.7	-11422.8	7577.12	-58.	-124.	AB	AB	15.2
	34	-8293.58	-719.4	-11263.6	14446.86	-47.	-137.	AB	AB	15.2
	35	-10397.47	-197.3	-11237.5	18636.07	-38.	-151.	AB	AB	15.2
	36	-10294.55	113.5	-11304.5	18590.79	-39.	-151.	AB	AB	15.2
	37	-12330.33	434.9	-11405.2	18677.71	-31.	-165.	AB	AB	15.2
	38	-12268.42	868.6	-11413.2	13847.70	-31.	-164.	AB	AB	15.2
	39	-10197.83	1124.7	-12244.7	6508.83	-46.	-157.	AB	AB	18.0
	40	-13396.10	2264.0	-13071.5	3835.08	-38.	-184.	AB	AB	41.3
	41	-20438.19	2361.3	-13046.2	3643.84	-7	-230.	AB	AB	43.7
5	41	-20438.19	-2726.9	-13046.2	3643.84	-7.	-230.	AB	AB	52.5
	42	12908.94	-2671.8	-13043.2	3463.60	-40.	-181.	AB	AB	51.2
	43	-6991.29	-2315.5	-12795.0	7979.05	-64.	-140.	AB	AB	46.8

RESUMEN ARMADURA DE CORTANTE (1)

		1	2	3	4	5	6	7	8	MAX
1	1	15.30	50.50	15.20	34.00	47.90	15.70	31.70	15.20	50.50
	2	15.20	46.70	15.20	31.40	46.70	15.20	31.40	15.20	46.70
	3	15.20	31.00	15.20	21.30	29.10	15.20	19.50	15.20	31.00
	4	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	5	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	6	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	7	25.60	15.20	15.20	15.20	16.90	16.00	15.20	15.20	25.60
	8	41.50	15.20	24.90	15.20	39.10	26.20	15.20	15.20	41.50
	9	62.30	28.90	38.70	15.20	51.50	39.90	28.70	17.90	62.30
	10	79.20	39.10	49.90	15.20	39.10	79.00	15.20	49.70	79.20
	11	83.10	41.70	52.50	15.20	41.70	95.00	15.20	52.30	95.00
2	11	39.50	81.60	15.20	52.40	39.50	93.00	15.20	51.70	93.00
	12	36.90	77.50	15.20	49.60	36.90	77.00	15.20	49.10	77.50
	13	25.40	59.90	15.20	38.00	51.50	36.10	30.10	15.80	59.90
	14	15.20	39.00	15.20	24.10	35.00	22.20	20.50	15.20	39.00
	15	15.20	16.20	15.20	15.20	15.20	15.20	15.20	15.20	16.20
	16	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	17	18.10	15.20	15.20	15.20	15.20	15.20	15.20	15.20	18.10
	18	40.60	15.20	25.70	15.20	34.60	23.30	20.10	15.20	40.60
	19	61.40	27.40	39.50	15.20	49.80	36.90	28.70	16.70	61.40
	20	78.30	38.50	50.60	15.20	42.10	77.00	17.00	49.40	78.30
	21	82.20	41.00	53.20	15.20	44.70	92.80	18.30	52.00	92.80
3	21	39.50	81.20	15.20	51.70	43.20	92.70	16.40	51.40	92.70
	22	37.00	77.20	15.20	49.10	41.70	76.90	16.00	48.80	77.20
	23	25.80	60.30	15.20	37.90	48.40	36.30	26.80	15.60	60.30
	24	15.20	39.10	15.20	23.90	33.80	22.40	18.90	15.20	39.10
	25	15.20	16.70	15.20	15.20	15.20	15.20	15.20	15.20	16.70
	26	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	27	16.60	15.20	15.20	15.20	15.20	15.20	15.20	15.20	16.60
	28	37.90	15.20	24.30	15.20	31.40	22.50	18.20	15.20	37.90
	29	56.90	24.90	36.80	15.20	44.40	34.90	25.20	16.40	56.90
	30	71.70	34.70	46.50	15.20	37.40	71.50	15.20	46.30	71.70
	31	75.30	37.10	48.90	15.20	39.70	86.00	15.90	48.70	86.00
4	31	31.90	72.90	15.20	47.60	31.90	83.50	15.20	47.30	83.50
	32	29.60	69.30	15.20	45.20	29.60	68.90	15.20	45.00	69.30
	33	19.60	54.30	15.20	35.40	40.70	32.00	22.80	15.20	54.30
	34	15.20	35.40	15.20	22.90	30.20	19.50	18.10	15.20	35.40
	35	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	36	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	37	20.50	15.20	15.20	15.20	15.20	15.20	15.20	15.20	20.50
	38	41.70	15.20	25.80	15.20	33.40	26.80	18.10	15.20	41.70
	39	59.30	26.30	37.40	15.20	45.50	38.30	24.60	18.00	59.30
	40	68.20	31.10	42.10	20.30	33.80	67.30	20.30	41.30	68.20
	41	71.60	33.40	44.40	20.30	36.10	88.10	20.30	43.70	88.10

RESUMEN ARMADURA DE CORTANTE (2)

		1	2	3	4	5	6	7	8	MAX
5	41	41.10	84.10	20.30	53.50	41.20	100.60	20.30	52.50	100.60
	42	39.80	81.90	20.30	52.00	39.90	81.00	20.30	51.20	81.90
	43	35.50	68.20	15.20	47.10	62.80	56.70	37.80	46.80	68.20
	44	23.40	54.60	15.20	35.10	50.30	32.40	31.10	15.20	54.60
	45	15.20	31.30	15.20	15.20	23.60	15.20	15.20	15.20	31.30
	46	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	47	22.60	15.20	15.20	15.20	22.30	15.20	15.20	15.20	22.60
	48	57.80	27.70	36.00	15.20	51.40	36.70	30.10	16.50	57.80
	49	79.90	39.20	47.30	15.20	65.00	48.20	38.00	22.50	79.90
	50	102.00	42.80	50.90	20.30	44.80	101.70	20.30	50.60	102.00
	51	84.20	44.10	52.20	20.30	46.10	103.80	20.30	51.90	103.80
6	51	40.80	83.00	20.30	51.90	40.80	102.90	20.30	51.90	102.90
	52	39.50	100.80	20.30	50.60	39.50	100.80	20.30	50.60	100.80
	53	35.80	76.80	15.20	47.00	62.30	46.40	36.40	21.60	76.80
	54	24.20	56.40	15.20	35.60	50.40	34.90	30.00	15.60	56.40
	55	15.20	21.30	15.20	15.20	22.40	15.20	15.20	15.20	22.40
	56	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	57	33.80	15.20	15.20	15.20	24.90	15.20	15.20	15.20	33.80
	58	56.20	24.70	36.10	15.20	47.70	35.00	28.20	16.50	56.20
	59	67.80	35.90	46.90	15.20	62.20	46.00	37.20	22.20	67.80
	60	79.40	39.30	50.20	20.30	39.50	78.90	20.30	49.70	79.40
	61	81.40	40.60	51.40	20.30	40.70	103.20	20.30	50.90	103.20
7	61	42.90	82.00	20.30	51.20	45.00	103.70	20.30	50.60	103.70
	62	41.60	80.10	20.30	50.00	43.80	79.40	20.30	49.40	80.10
	63	38.10	68.10	15.20	46.40	63.40	46.20	37.60	21.70	68.10
	64	26.80	56.20	15.20	35.40	50.00	35.10	29.70	15.90	56.20
	65	15.20	34.50	15.20	15.20	25.80	15.20	15.20	15.20	34.50
	66	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	67	20.00	15.20	15.20	15.20	23.00	15.20	15.20	15.20	23.00
	68	52.90	22.50	33.60	15.20	45.50	31.40	26.70	15.20	52.90
	69	67.70	34.80	46.20	15.20	34.80	49.40	15.20	46.00	67.70
	70	82.60	39.70	52.30	20.30	39.70	98.80	20.30	51.30	98.80
	71	84.80	41.00	53.70	20.30	41.00	100.90	20.30	52.60	100.90
8	71	37.40	76.50	20.30	47.30	37.40	93.50	20.30	47.20	93.50
	72	36.00	91.40	20.30	45.90	36.00	91.40	20.30	45.90	91.40
	73	31.10	64.70	15.20	40.70	53.40	43.70	30.20	21.20	64.70
	74	19.90	48.10	15.20	29.70	35.70	32.80	18.20	15.60	48.10
	75	15.20	31.20	15.20	18.60	27.90	21.70	15.20	15.20	31.20
	76	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	77	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
	78	28.60	15.20	15.20	15.20	25.30	15.20	15.20	15.20	28.60
	79	37.30	15.20	25.20	15.20	37.30	15.20	25.20	15.20	37.30
	80	46.80	15.20	31.60	15.20	47.90	15.20	32.60	15.20	47.90
	81	45.90	15.20	31.00	15.20	47.90	15.20	32.90	15.20	47.90

CÁLCULO ESTRUCTURAL DE

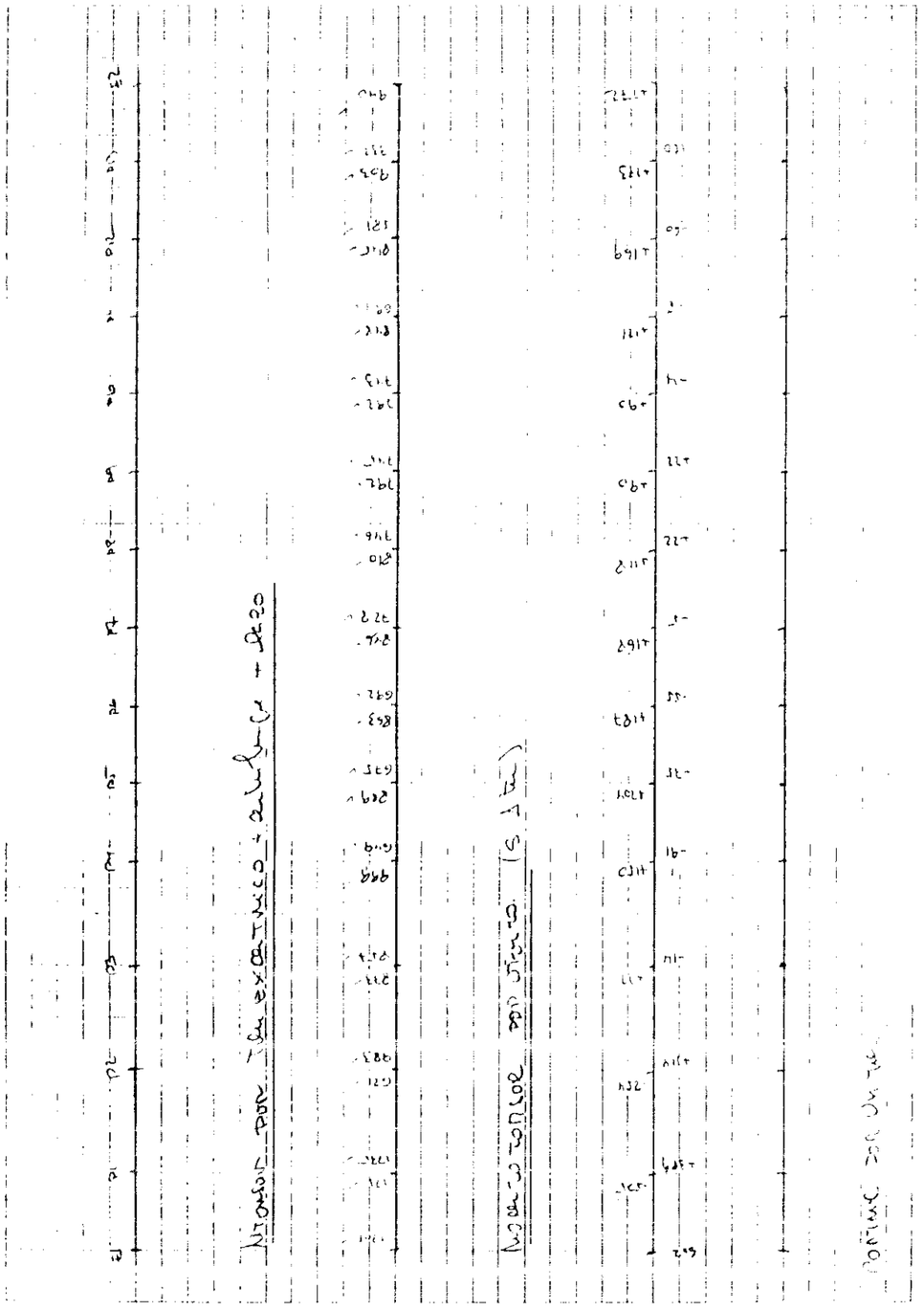
TORRETA

intecsa

PROYECTO: HOJA DE

FECHA

EJECUTANTE:



intecsa

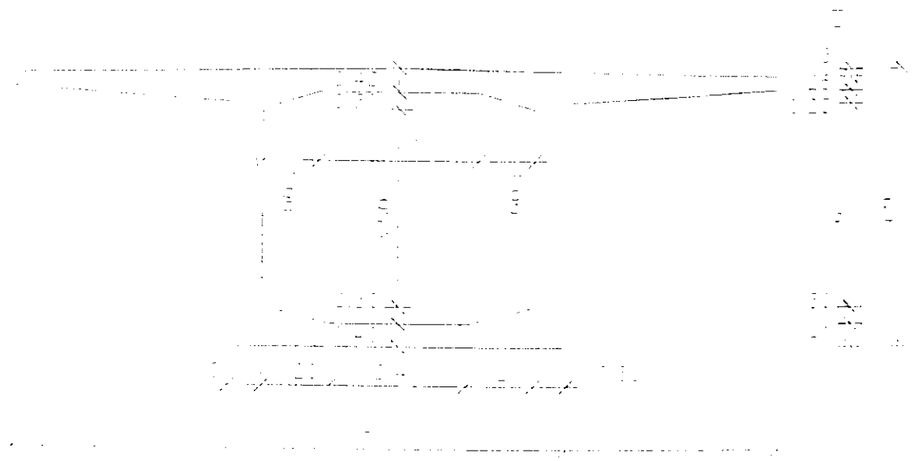
PROYECTO: HOJA DE

FECHA

EJECUTANTE:

ANALISIS POR TORSION

EN UNA SECCION TRANSVERSAL TIPO



$h_e = \frac{4.80 - 2 \times 0.95}{5} = 0.94$ } $h_e = 0.80$

$h_e = \frac{4.20}{6} = 0.80$

$0.36 \times f_{cd} = 0.36 \times \frac{4000}{1.5} = 96\ kg/cm^2 \rightarrow 90\ kg/cm^2$

$T_u = 900 \times (4.80 - 0.80)(6.00 - 0.60) \times 0.40 = 8553\ m$

(como sabor de acotamiento del tramo)

ARMADURA TRANSVERSAL

$T_D = 2 \cdot Be \cdot w_{tt} \cdot 4.2$

$w_{tt} = \frac{T}{2 \times 4.40 \times 5.40 \times 4.2} = \frac{T}{199.5}$ cm²/ml

ARMADURA LONGITUDINAL

$T_D = 2 \cdot Be \cdot w_{tl} \cdot \frac{fl}{fu}$

$w_{tl} = \frac{T \times 1.15}{2 \times 4.40 \times 5.40 \times 5.1} = \frac{T}{210.7}$ cm²/ml

EN NUESTRO CASO, Y EN LOS DOS CASOS DE TORSIÓN DE 2 TRAM. (+ LOSA + CENTRAL + PILAR), O DE LA SOLA TRAM. EXCENTRICO (+ LOSA + CENTRAL + PILAR) SE HAN CONSIDERADO LA SIGUIENTE HIPÓTESIS Y COEF. DE MAYORACIÓN

a) SOLO TRAM. (CARGA VERTICAL + TORSOR CONSIDERADO) $\gamma_f = 1.6$

b) TRAM. (CARGA VERT. + TORSOR CONSIDERADO

b) TRAM. (CARGA VERT. + TORSOR CONSIDERADO) $\gamma_f = 1.44$

SIENDO EN LOS CUADROS SIGUIENTES

T. TRAM → TORSOR DEBIDO AL PAÑO DE TRAM.

T. VIENTO → TORSOR DEBIDO AL VIENTO

$W_T(3)$ Y $W_L(3)$ ARMADURAS TRANSVERSAL Y LONGITUDINAL EN cm²/ml POR PAÑO DE TRAM.

$W_{T(3)} = \frac{1.6 \times (T.Tram)}{199.5}$

$W_{T(4)} = \frac{1.6 \times (T.Tram)}{210.7}$

$W_{T(3+4)}$ Y $W_{L(3+4)}$ ARMADURAS TRANSVERSAL Y LONGITUDINAL EN cm²/ml POR PAÑO DE TRAM. + TORSOR

$W_{T(3+4)} = \frac{1.44 \times (T.Tram + T.Viento)}{199.5}$

$W_{L(3+4)} = \frac{1.44 \times (T.Tram + T.Viento)}{210.7}$

CALCULO DE ARMADURAS POR TORSION

2 TRENES	NUDO	T.TREN	T.VIENTO	WT(3)	WL(3)	WT(3+4)	WL(3+4)
ESTRIBO 1							
	1	329	302	2.64	2.50	4.55	4.31
		329	302	2.64	2.50	4.55	4.31
	2	302	253	2.42	2.29	4.01	3.79
		302	253	2.42	2.29	4.01	3.79
	3	274	205	2.20	2.08	3.46	3.27
		274	205	2.20	2.08	3.46	3.27
V	4	247	156	1.98	1.88	2.91	2.75
		247	156	1.98	1.88	2.91	2.75
A	5	220	107	1.76	1.67	2.36	2.23
		220	107	1.76	1.67	2.36	2.23
N	6	193	59	1.54	1.46	1.81	1.72
		193	59	1.54	1.46	1.81	1.72
O	7	165	10	1.32	1.25	1.26	1.20
		165	10	1.32	1.25	1.26	1.20
	8	138	-39	1.11	1.05	0.71	0.68
14		138	-39	1.11	1.05	0.71	0.68
	9	111	-88	0.89	0.84	0.17	0.16
		111	-88	0.89	0.84	0.17	0.16
	10	83	-136	0.67	0.63	-0.38	-0.36
		83	-136	0.67	0.63	-0.38	-0.36
	11	56	-185	0.45	0.43	-0.93	-0.88
		56	-185	0.45	0.43	-0.93	-0.88
PILA 13							
	11	296	192	2.37	2.25	3.52	3.34
		296	192	2.37	2.25	3.52	3.34
	12	282	167	2.26	2.14	3.24	3.07
		282	167	2.26	2.14	3.24	3.07
	13	268	143	2.15	2.03	2.96	2.80
		268	143	2.15	2.03	2.96	2.80
V	14	253	118	2.03	1.92	2.68	2.54
		253	118	2.03	1.92	2.68	2.54
A	15	239	93	1.92	1.82	2.40	2.27
		239	93	1.92	1.82	2.40	2.27
N	16	225	69	1.80	1.71	2.12	2.01
		225	69	1.80	1.71	2.12	2.01
O	17	211	44	1.69	1.60	1.84	1.74
		211	44	1.69	1.60	1.84	1.74
	18	197	19	1.58	1.49	1.56	1.47
13		197	19	1.58	1.49	1.56	1.47
	19	182	-6	1.46	1.39	1.28	1.21
		182	-6	1.46	1.39	1.28	1.21
	20	168	-30	1.35	1.28	1.00	0.94
		168	-30	1.35	1.28	1.00	0.94
	21	154	-55	1.24	1.17	0.71	0.68
		154	-55	1.24	1.17	0.71	0.68
PILA 12							
	21	268	140	2.15	2.04	2.94	2.79
		268	140	2.15	2.04	2.94	2.79
	22	261	126	2.09	1.98	2.79	2.64
		261	126	2.09	1.98	2.79	2.64
	23	254	112	2.04	1.93	2.64	2.50
		254	112	2.04	1.93	2.64	2.50
V	24	247	98	1.98	1.87	2.49	2.36
		247	98	1.98	1.87	2.49	2.36
A	25	240	84	1.92	1.82	2.34	2.21
		240	84	1.92	1.82	2.34	2.21
N	26	233	71	1.86	1.77	2.19	2.07
		233	71	1.86	1.77	2.19	2.07
O	27	225	57	1.81	1.71	2.04	1.93
		225	57	1.81	1.71	2.04	1.93
	28	218	43	1.75	1.66	1.88	1.78
12		218	43	1.75	1.66	1.88	1.78
	29	211	29	1.69	1.60	1.73	1.64
		211	29	1.69	1.60	1.73	1.64
	30	204	15	1.64	1.55	1.58	1.50
		204	15	1.64	1.55	1.58	1.50
	31	197	1	1.58	1.50	1.43	1.35
		197	1	1.58	1.50	1.43	1.35
PILAS 6/11							

CINCATO1.XLS

CALCULO DE ARMADURAS POR TORSION

2 TRENES	NUDO	T.TREN	T.VIENTO	WT(3)	WL(3)	WT(3+4)	WL(3+4)
PILAS 5/11							
	31	299	228	2.40	2.27	3.80	3.60
		299	228	2.40	2.27	3.80	3.60
	32	286	197	2.29	2.17	3.48	3.30
		286	197	2.29	2.17	3.48	3.30
	33	273	165	2.19	2.07	3.16	2.99
V		273	165	2.19	2.07	3.16	2.99
	34	259	134	2.08	1.97	2.84	2.69
A		259	134	2.08	1.97	2.84	2.69
	35	246	102	1.97	1.87	2.51	2.38
N		246	102	1.97	1.87	2.51	2.38
	36	233	71	1.87	1.77	2.19	2.07
O		233	71	1.87	1.77	2.19	2.07
	37	220	39	1.76	1.67	1.87	1.77
		220	39	1.76	1.67	1.87	1.77
	38	207	8	1.66	1.57	1.55	1.46
5		207	8	1.66	1.57	1.55	1.46
	39	193	-24	1.55	1.47	1.22	1.16
		193	-24	1.55	1.47	1.22	1.16
	40	180	-56	1.45	1.37	0.90	0.85
		180	-56	1.45	1.37	0.90	0.85
	41	167	-87	1.34	1.27	0.58	0.55
		167	-87	1.34	1.27	0.58	0.55
PILA 4							
	41	319	173	2.56	2.42	3.55	3.36
		319	173	2.56	2.42	3.55	3.36
	42	311	155	2.50	2.36	3.37	3.19
		311	155	2.50	2.36	3.37	3.19
	43	304	138	2.44	2.31	3.19	3.02
V		304	138	2.44	2.31	3.19	3.02
	44	296	120	2.38	2.25	3.01	2.85
A		296	120	2.38	2.25	3.01	2.85
	45	289	103	2.31	2.19	2.82	2.67
N		289	103	2.31	2.19	2.82	2.67
	46	281	85	2.25	2.13	2.64	2.50
O		281	85	2.25	2.13	2.64	2.50
	47	273	67	2.19	2.08	2.46	2.33
		273	67	2.19	2.08	2.46	2.33
	48	266	50	2.13	2.02	2.28	2.16
4		266	50	2.13	2.02	2.28	2.16
	49	258	32	2.07	1.96	2.10	1.98
		258	32	2.07	1.96	2.10	1.98
	50	251	15	2.01	1.90	1.91	1.81
		251	15	2.01	1.90	1.91	1.81
	51	243	-3	1.95	1.85	1.73	1.64
		243	-3	1.95	1.85	1.73	1.64
PILA 3							
	51	255	35	2.05	1.94	2.09	1.98
		255	35	2.05	1.94	2.09	1.98
	52	260	45	2.09	1.98	2.20	2.09
		260	45	2.09	1.98	2.20	2.09
	53	265	55	2.13	2.02	2.31	2.19
		265	55	2.13	2.02	2.31	2.19
V	54	271	65	2.17	2.05	2.42	2.29
		271	65	2.17	2.05	2.42	2.29
A	55	276	75	2.21	2.09	2.53	2.40
		276	75	2.21	2.09	2.53	2.40
N	56	281	85	2.25	2.13	2.64	2.50
		281	85	2.25	2.13	2.64	2.50
O	57	286	95	2.30	2.17	2.75	2.61
		286	95	2.30	2.17	2.75	2.61
	58	291	105	2.34	2.21	2.86	2.71
3		291	105	2.34	2.21	2.86	2.71
	59	297	115	2.38	2.25	2.97	2.81
		297	115	2.38	2.25	2.97	2.81
	60	302	125	2.42	2.29	3.08	2.92
		302	125	2.42	2.29	3.08	2.92
	61	307	135	2.46	2.33	3.19	3.02
		307	135	2.46	2.33	3.19	3.02
PILA 2							

CINCAT01.XLS

CALCULO DE ARMADURAS POR TORSION

2 TRENES	NUDO	T TREN	T VIENTO	WT(3)	WL(3)	WT(3+4)	WL(3+4)
PILA 2							
	61	124	259	0 99	0 94	-0 97	-0 92
		124	259	0 99	0 94	-0 97	-0 92
	62	155	190	1 25	1 18	-0 25	-0 24
		155	190	1 25	1 18	-0 25	-0 24
	63	187	121	1 50	1 42	0 47	0 45
		187	121	1 50	1 42	0 47	0 45
V	64	218	52	1 75	1 66	1 20	1 13
		218	52	1 75	1 66	1 20	1 13
A	65	250	17	2 00	1 90	1 92	1 82
		250	17	2 00	1 90	1 92	1 82
N	66	281	86	2 25	2 13	2 65	2 50
		281	86	2 25	2 13	2 65	2 50
O	67	312	154	2 51	2 37	3 37	3 19
		312	154	2 51	2 37	3 37	3 19
	68	344	223	2 76	2 61	4 09	3 88
2		344	223	2 76	2 61	4 09	3 88
	69	375	292	3 01	2 85	4 82	4 56
		375	292	3 01	2 85	4 82	4 56
	70	407	361	3 26	3 09	5 54	5 25
		407	361	3 26	3 09	5 54	5 25
	71	438	430	3 51	3 33	6 27	5 93
		438	430	3 51	3 33	6 27	5 93
PILA 1							
	71	-73	533	-0 59	-0 55	-4 37	-4 14
		-73	533	-0 59	-0 55	-4 37	-4 14
	72	18	414	0 15	0 14	-3 12	-2 96
		18	414	0 15	0 14	-3 12	-2 96
	73	37	295	0 29	0 28	-1 87	-1 77
		37	295	0 29	0 28	-1 87	-1 77
V	74	91	177	0 73	0 69	-0 61	-0 58
		91	177	0 73	0 69	-0 61	-0 58
A	75	146	58	1 17	1 11	0 64	0 60
		146	58	1 17	1 11	0 64	0 60
N	76	201	61	1 61	1 53	1 89	1 79
		201	61	1 61	1 53	1 89	1 79
O	77	256	180	2 05	1 94	3 14	2 98
		256	180	2 05	1 94	3 14	2 98
	78	311	299	2 49	2 36	4 40	4 16
1		311	299	2 49	2 36	4 40	4 16
	79	365	417	2 93	2 77	5 65	5 35
		365	417	2 93	2 77	5 65	5 35
	80	420	536	3 37	3 19	6 90	6 54
		420	536	3 37	3 19	6 90	6 54
	81	475	655	3 81	3 61	8 16	7 72
		475	655	3 81	3 61	8 16	7 72
ESTRIBO 1							

CINCAT02.XLS

CALCULO DE ARMADURAS DE TORSION

I TREN	NUDO	T.TREN	T.VIENTO	WT(3)	WL(3)	WT(3+4)	WL(3+4)
PILAS 5/11							
	31	889	204	7 13	6 75	7 89	7 47
		889	204	7 13	6 75	7 89	7 47
	32	865	175	6 94	6 57	7 50	7 10
		865	175	6 94	6 57	7 50	7 10
	33	841	145	6 74	6 39	7 12	6 74
		841	145	6 74	6 39	7 12	6 74
V	34	817	116	6 55	6 20	6 73	6 37
		817	116	6 55	6 20	6 73	6 37
A	35	793	86	6 36	6 02	6 34	6 01
		793	86	6 36	6 02	6 34	6 01
N	36	769	57	6 17	5 84	5 96	5 64
		769	57	6 17	5 84	5 96	5 64
O	37	745	27	5 97	5 66	5 57	5 28
		745	27	5 97	5 66	5 57	5 28
	38	721	-3	5 78	5 48	5 19	4 91
5		721	-3	5 78	5 48	5 19	4 91
	39	697	-32	5 59	5 29	4 80	4 54
		697	-32	5 59	5 29	4 80	4 54
	40	673	-62	5 40	5 11	4 41	4 18
		673	-62	5 40	5 11	4 41	4 18
	41	649	-91	5 21	4 93	4 03	3 81
		649	-91	5 21	4 93	4 03	3 81
PILA 4							
	41	999	150	8 01	7 59	8 29	7 85
		999	150	8 01	7 59	8 29	7 85
	42	985	134	7 90	7 48	8 07	7 64
		985	134	7 90	7 48	8 07	7 64
	43	971	117	7 78	7 37	7 85	7 43
		971	117	7 78	7 37	7 85	7 43
V	44	956	101	7 67	7 26	7 63	7 23
		956	101	7 67	7 26	7 63	7 23
A	45	942	84	7 56	7 15	7 41	7 02
		942	84	7 56	7 15	7 41	7 02
N	46	928	68	7 44	7 05	7 19	6 81
		928	68	7 44	7 05	7 19	6 81
O	47	914	52	7 33	6 94	6 97	6 60
		914	52	7 33	6 94	6 97	6 60
	48	900	35	7 21	6 83	6 75	6 39
4		900	35	7 21	6 83	6 75	6 39
	49	885	19	7 10	6 72	6 53	6 18
		885	19	7 10	6 72	6 53	6 18
	50	871	2	6 99	6 62	6 31	5 97
		871	2	6 99	6 62	6 31	5 97
	51	857	-14	6 87	6 51	6 08	5 76
		857	-14	6 87	6 51	6 08	5 76
PILA 3							
	51	873	22	7 00	6 63	6 46	6 12
		873	22	7 00	6 63	6 46	6 12
	52	884	31	7 09	6 71	6 61	6 25
		884	31	7 09	6 71	6 61	6 25
	53	895	40	7 18	6 80	6 75	6 39
		895	40	7 18	6 80	6 75	6 39
V	54	906	50	7 27	6 88	6 90	6 53
		906	50	7 27	6 88	6 90	6 53
A	55	917	59	7 35	6 96	7 04	6 67
		917	59	7 35	6 96	7 04	6 67
N	56	928	68	7 44	7 05	7 19	6 81
		928	68	7 44	7 05	7 19	6 81
O	57	939	77	7 53	7 13	7 33	6 95
		939	77	7 53	7 13	7 33	6 95
	58	950	86	7 62	7 21	7 48	7 08
3		950	86	7 62	7 21	7 48	7 08
	59	961	96	7 71	7 30	7 63	7 22
		961	96	7 71	7 30	7 63	7 22
	60	972	105	7 80	7 38	7 77	7 36
		972	105	7 80	7 38	7 77	7 36
	61	983	114	7 88	7 46	7 92	7 50
		983	114	7 88	7 46	7 92	7 50
PILA 2							

CALCULO DE ARMADURAS DE TORSION

I TREN	NUDO	T.TREN	T.VIENTO	WT(3)	WL(3)	WT(3+4)	WL(3+4)
PILA 2							
	61	621	-254	4 98	4 72	2 65	2 51
		621	-254	4 98	4 72	2 65	2 51
	62	682	-190	5 47	5 18	3 56	3 37
		682	-190	5 47	5 18	3 56	3 37
	63	744	125	5 97	5 65	4 46	4 23
		744	-125	5 97	5 65	4 46	4 23
V	64	805	-61	6 46	6 11	5 37	5 09
		805	-61	6 46	6 11	5 37	5 09
A	65	867	3	6 95	6 58	6 28	5 94
		867	3	6 95	6 58	6 28	5 94
N	66	928	68	7 44	7 05	7 19	6 80
		928	68	7 44	7 05	7 19	6 80
O	67	989	132	7 94	7 51	8 09	7 66
		989	132	7 94	7 51	8 09	7 66
	68	1051	196	8 43	7 98	9 00	8 52
2		1051	196	8 43	7 98	9 00	8 52
	69	1112	260	8 92	8 45	9 91	9 38
		1112	260	8 92	8 45	9 91	9 38
	70	1174	325	9 41	8 91	10 81	10 24
		1174	325	9 41	8 91	10 81	10 24
	71	1235	389	9 90	9 38	11 72	11 10
		1235	389	9 90	9 38	11 72	11 10
PILA 1							
	71	121	-505	0 97	0 92	-2 77	-2 62
		121	-505	0 97	0 92	-2 77	-2 62
	72	229	-394	1 84	1 74	-1 19	-1 13
		229	-394	1 84	1 74	-1 19	-1 13
	73	338	-284	2 71	2 57	0 39	0 37
		338	-284	2 71	2 57	0 39	0 37
V	74	446	-173	3 58	3 39	1 97	1 87
		446	-173	3 58	3 39	1 97	1 87
A	75	555	-62	4 45	4 21	3 55	3 37
		555	-62	4 45	4 21	3 55	3 37
N	76	663	49	5 32	5 03	5 14	4 86
		663	49	5 32	5 03	5 14	4 86
O	77	771	159	6 19	5 86	6 72	6 36
		771	159	6 19	5 86	6 72	6 36
1	78	880	270	7 06	6 68	8 30	7 86
		880	270	7 06	6 68	8 30	7 86
	79	988	381	7 93	7 50	9 88	9 35
		988	381	7 93	7 50	9 88	9 35
	80	1097	491	8 79	8 33	11 46	10 85
		1097	491	8 79	8 33	11 46	10 85
	81	1205	602	9 66	9 15	13 04	12 35
ESTRIBO 1		1205	602	9 66	9 15	13 04	12 35

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PROYECTO

HOJA ___ DE ___
FECHA

CALCULO ARMADURA DE

Calculo de Comprobacion a Rasante

Datos generales

Limite elastico del acero pasivo	=	5100.00	kg/cm2
Coeficiente del acero pasivo	=	1.10	
Limite elastico de acero activo	=	17000.00	kg/cm2
Coeficiente del acero activo	=	1.10	
Resistencia caracteristica del hormigon	=	400.00	kg/cm2
Coeficiente del hormigon	=	1.50	
Coef. mayoracion Cargas muertas y Peso propio	=	1.60	
Coef. mayoracion Sobrecargas	=	1.60	

Calculo de Comprobacion a Rasante

Datos secciones/momentos estaticos

V.	Sec	M.Estatico m3	M.Estatico m3	M.Estatico m3
1	1	2.629	1.967	3.073
	2	2.629	1.967	3.073
	3	2.629	1.967	3.073
	4	2.629	1.967	3.073
	5	2.629	1.967	3.073
	6	2.629	1.967	3.073
	7	2.629	1.967	3.073
	8	2.629	1.967	3.073
	9	2.629	1.967	3.073
	10	2.629	1.967	3.073
	11	2.629	1.967	3.073
2	11	2.629	1.967	3.073
	12	2.629	1.967	3.073
	13	2.629	1.967	3.073
	14	2.629	1.967	3.073
	15	2.629	1.967	3.073
	16	2.629	1.967	3.073
	17	2.629	1.967	3.073
	18	2.629	1.967	3.073
	19	2.629	1.967	3.073
	20	2.629	1.967	3.073
	21	2.629	1.967	3.073
3	21	2.629	1.967	3.073
	22	2.629	1.967	3.073
	23	2.629	1.967	3.073
	24	2.629	1.967	3.073
	25	2.629	1.967	3.073
	26	2.629	1.967	3.073
	27	2.629	1.967	3.073
	28	2.629	1.967	3.073
	29	2.629	1.967	3.073
	30	2.629	1.967	3.073
	31	2.629	1.967	3.073
4	31	2.629	1.967	3.073
	32	2.629	1.967	3.073
	33	2.629	1.967	3.073
	34	2.629	1.967	3.073
	35	2.629	1.967	3.073
	36	2.629	1.967	3.073
	37	2.629	1.967	3.073
	38	2.629	1.967	3.073
	39	2.629	1.967	3.073
	40	2.629	1.967	3.073
	41	2.629	1.967	3.073
5	41	2.629	1.967	3.073
	42	2.629	1.967	3.073
	43	2.629	1.967	3.073
	44	2.629	1.967	3.073

Calculo de Comprobacion a Rasante

Datos secciones/momentos estaticos

V.	Sec	M.Estatico m3	M.Estatico m3	M.Estatico m3
	45	2.629	1.967	3.073
	46	2.629	1.967	3.073
	47	2.629	1.967	3.073
	48	2.629	1.967	3.073
	49	2.629	1.967	3.073
	50	2.629	1.967	3.073
	51	2.629	1.967	3.073
6	51	2.629	1.967	3.073
	52	2.629	1.967	3.073
	53	2.629	1.967	3.073
	54	2.629	1.967	3.073
	55	2.629	1.967	3.073
	56	2.629	1.967	3.073
	57	2.629	1.967	3.073
	58	2.629	1.967	3.073
	59	2.629	1.967	3.073
	60	2.629	1.967	3.073
	61	2.629	1.967	3.073
7	61	2.629	1.967	3.073
	62	2.629	1.967	3.073
	63	2.629	1.967	3.073
	64	2.629	1.967	3.073
	65	2.629	1.967	3.073
	66	2.629	1.967	3.073
	67	2.629	1.967	3.073
	68	2.629	1.967	3.073
	69	2.629	1.967	3.073
	70	2.629	1.967	3.073
	71	2.629	1.967	3.073
8	71	2.629	1.967	3.073
	72	2.629	1.967	3.073
	73	2.629	1.967	3.073
	74	2.629	1.967	3.073
	75	2.629	1.967	3.073
	76	2.629	1.967	3.073
	77	2.629	1.967	3.073
	78	2.629	1.967	3.073
	79	2.629	1.967	3.073
	80	2.629	1.967	3.073
	81	2.629	1.967	3.073

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a 1/ 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	909.2	3.298	12.6	2.447	9.4	3.855	14.7
	2	829.5	3.009	11.5	2.251	8.6	3.517	13.4
	3	467.1	1.694	6.5	1.268	4.8	1.980	7.5
	4	105.7	0.383	1.5	0.287	1.1	0.448	1.7
	5	255.7	0.927	3.5	0.694	2.6	1.084	4.1
	6	703.9	2.553	9.7	1.910	7.3	2.984	11.4
	7	1249.9	4.533	17.3	3.392	12.9	5.299	20.2
	8	1777.3	6.446	24.6	4.823	18.4	7.535	28.7
	9	2467.7	8.950	34.1	6.697	25.5	10.462	39.9
	10	3027.1	10.979	41.8	8.215	31.3	12.833	48.9
	11	3157.1	11.451	43.6	8.568	32.6	13.385	51.0
2	11	1709.2	6.199	23.6	4.638	17.7	7.246	27.6
	12	1622.8	5.886	22.4	4.404	16.8	6.880	26.2
	13	1254.9	4.552	17.3	3.406	13.0	5.320	20.3
	14	798.3	2.895	11.0	2.166	8.3	3.384	12.9
	15	290.9	1.055	4.0	0.789	3.0	1.233	4.7
	16	240.1	0.871	3.3	0.652	2.5	1.018	3.9
	17	1015.9	3.685	14.0	2.757	10.5	4.307	16.4
	18	1782.8	6.466	24.6	4.838	18.4	7.558	28.8
	19	2479.8	8.994	34.3	6.729	25.6	10.513	40.1
	20	3034.3	11.005	41.9	8.234	31.4	12.864	49.0
	21	3163.2	11.473	43.7	8.584	32.7	13.411	51.1
3	21	1729.5	6.273	23.9	4.693	17.9	7.332	27.9
	22	1643.1	5.959	22.7	4.459	17.0	6.966	26.5
	23	1275.3	4.626	17.6	3.461	13.2	5.407	20.6
	24	818.6	2.969	11.3	2.221	8.5	3.470	13.2
	25	311.1	1.129	4.3	0.844	3.2	1.319	5.0
	26	222.2	0.806	3.1	0.603	2.3	0.942	3.6
	27	998.0	3.620	13.8	2.708	10.3	4.231	16.1
	28	1764.9	6.401	24.4	4.791	18.2	7.483	28.5
	29	2461.3	8.927	34.0	6.679	25.4	10.435	39.8
	30	3015.8	10.938	41.7	8.184	31.2	12.786	48.7
	31	3144.8	11.406	43.5	8.534	32.5	13.332	50.8
4	31	1564.6	5.675	21.6	4.246	16.2	6.633	25.3
	32	1478.1	5.361	20.4	4.011	15.3	6.266	23.9
	33	1110.1	4.026	15.3	3.013	11.5	4.706	17.9
	34	653.3	2.369	9.0	1.773	6.8	2.770	10.6
	35	145.7	0.528	2.0	0.395	1.5	0.618	2.4
	36	369.3	1.340	5.1	1.002	3.8	1.566	6.0
	37	1144.9	4.153	15.8	3.107	11.8	4.854	18.5
	38	1911.7	6.934	26.4	5.188	19.8	8.105	30.9
	39	2608.3	9.461	36.0	7.078	27.0	11.058	42.1
	40	3162.7	11.471	43.7	8.583	32.7	13.408	51.1
	41	3291.6	11.939	45.5	8.933	34.0	13.955	53.2
5	41	2129.4	7.723	29.4	5.779	22.0	9.028	34.4
	42	2077.8	7.536	28.7	5.639	21.5	8.809	33.6
	43	1744.9	6.329	24.1	4.735	18.0	7.398	28.2
	44	1288.3	4.673	17.8	3.496	13.3	5.462	20.8

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	413.1	1.498	5.7	1.121	4.3	1.751	6.7
	46	257.6	0.934	3.6	0.699	2.7	1.092	4.2
	47	1265.8	4.591	17.5	3.435	13.1	5.366	20.4
	48	2588.3	9.388	35.8	7.024	26.8	10.973	41.8
	49	3277.1	11.886	45.3	8.893	33.9	13.894	52.9
	50	3778.9	13.706	52.2	10.255	39.1	16.021	61.0
	51	3855.4	13.984	53.3	10.462	39.9	16.345	62.3
6	51	2158.5	7.829	29.8	5.857	22.3	9.151	34.9
	52	2106.9	7.642	29.1	5.718	21.8	8.932	34.0
	53	1774.0	6.434	24.5	4.814	18.3	7.521	28.7
	54	1317.4	4.778	18.2	3.575	13.6	5.585	21.3
	55	442.2	1.604	6.1	1.200	4.6	1.875	7.1
	56	245.3	0.890	3.4	0.666	2.5	1.040	4.0
	57	1253.5	4.546	17.3	3.402	13.0	5.314	20.2
	58	2576.0	9.343	35.6	6.990	26.6	10.921	41.6
	59	3264.8	11.842	45.1	8.860	33.8	13.841	52.7
	60	3766.6	13.662	52.0	10.221	38.9	15.969	60.8
	61	3843.1	13.939	53.1	10.429	39.7	16.293	62.1
7	61	2291.8	8.312	31.7	6.219	23.7	9.716	37.0
	62	2240.3	8.125	31.0	6.079	23.2	9.496	36.2
	63	1907.4	6.918	26.4	5.176	19.7	8.087	30.8
	64	1451.0	5.263	20.0	3.937	15.0	6.151	23.4
	65	576.1	2.089	8.0	1.563	6.0	2.442	9.3
	66	137.7	0.499	1.9	0.374	1.4	0.584	2.2
	67	1189.2	4.313	16.4	3.227	12.3	5.042	19.2
	68	2468.7	8.954	34.1	6.699	25.5	10.466	39.9
	69	3164.5	11.478	43.7	8.587	32.7	13.416	51.1
	70	3699.5	13.418	51.1	10.039	38.2	15.684	59.7
	71	3781.0	13.714	52.2	10.261	39.1	16.030	61.1
8	71	1979.0	7.178	27.3	5.370	20.5	8.390	32.0
	72	1927.5	6.991	26.6	5.231	19.9	8.172	31.1
	73	1594.7	5.784	22.0	4.327	16.5	6.761	25.8
	74	1150.9	4.174	15.9	3.123	11.9	4.879	18.6
	75	707.2	2.565	9.8	1.919	7.3	2.998	11.4
	76	263.5	0.956	3.6	0.715	2.7	1.117	4.3
	77	405.2	1.470	5.6	1.100	4.2	1.718	6.5
	78	1120.7	4.065	15.5	3.041	11.6	4.751	18.1
	79	1760.6	6.386	24.3	4.778	18.2	7.464	28.4
	80	2107.2	7.643	29.1	5.718	21.8	8.933	34.0
	81	2071.9	7.515	28.6	5.623	21.4	8.784	33.5

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	2077.2	7.534	28.7	5.637	21.5	8.806	33.5
	2	1949.0	7.069	26.9	5.289	20.1	8.263	31.5
	3	1428.8	5.182	19.7	3.877	14.8	6.058	23.1
	4	846.8	3.071	11.7	2.298	8.8	3.590	13.7
	5	264.0	0.957	3.6	0.716	2.7	1.119	4.3
	6	197.0	0.715	2.7	0.535	2.0	0.835	3.2
	7	535.0	1.941	7.4	1.452	5.5	2.268	8.6
	8	873.1	3.167	12.1	2.369	9.0	3.701	14.1
	9	1329.5	4.822	18.4	3.608	13.7	5.636	21.5
	10	1697.1	6.155	23.4	4.605	17.5	7.195	27.4
	11	1783.5	6.469	24.6	4.840	18.4	7.561	28.8
2	11	3307.5	11.271	42.9	8.433	32.1	13.174	50.2
	12	2972.0	10.780	41.1	8.065	30.7	12.600	48.0
	13	2417.5	8.768	33.4	6.560	25.0	10.249	39.0
	14	1730.4	6.276	23.9	4.696	17.9	7.336	27.9
	15	953.7	3.459	13.2	2.588	9.9	4.043	15.4
	16	177.8	0.645	2.5	0.482	1.8	0.754	2.9
	17	362.7	1.316	5.0	0.984	3.7	1.538	5.9
	18	870.0	3.156	12.0	2.361	9.0	3.688	14.1
	19	1326.6	4.811	18.3	3.600	13.7	5.624	21.4
	20	1694.3	6.145	23.4	4.598	17.5	7.183	27.4
	21	1779.9	6.456	24.6	4.830	18.4	7.546	28.7
3	21	3130.1	11.353	43.2	8.494	32.4	13.270	50.6
	22	2997.3	10.871	41.4	8.134	31.0	12.707	48.4
	23	2442.9	8.860	33.8	6.629	25.3	10.357	39.5
	24	1753.5	6.360	24.2	4.759	18.1	7.434	28.3
	25	986.6	3.578	13.6	2.677	10.2	4.183	15.9
	26	218.4	0.792	3.0	0.593	2.3	0.926	3.5
	27	336.5	1.220	4.6	0.913	3.5	1.426	5.4
	28	843.8	3.061	11.7	2.290	8.7	3.578	13.6
	29	1300.5	4.717	18.0	3.529	13.4	5.513	21.0
	30	1668.3	6.051	23.1	4.527	17.2	7.073	26.9
	31	1753.9	6.361	24.2	4.760	18.1	7.436	28.3
4	31	3057.3	11.089	42.2	8.297	31.6	12.962	49.4
	32	2926.2	10.613	40.4	7.941	30.3	12.406	47.3
	33	2371.8	8.602	32.8	6.436	24.5	10.055	38.3
	34	1677.8	6.085	23.2	4.553	17.3	7.113	27.1
	35	910.8	3.304	12.6	2.472	9.4	3.861	14.7
	36	136.2	0.494	1.9	0.370	1.4	0.577	2.2
	37	416.9	1.512	5.8	1.131	4.3	1.767	6.7
	38	924.3	3.352	12.8	2.508	9.6	3.918	14.9
	39	1380.9	5.008	19.1	3.747	14.3	5.854	22.3
	40	1748.7	6.342	24.2	4.745	18.1	7.414	28.2
	41	1834.3	6.653	25.3	4.978	19.0	7.777	29.6
5	41	3766.6	13.661	52.0	10.221	38.9	15.968	60.8
	42	3683.8	13.361	50.9	9.997	38.1	15.618	59.5
	43	3162.0	11.468	43.7	8.581	32.7	13.405	51.1
	44	2473.1	8.970	34.2	6.711	25.6	10.485	39.9

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	1175.9	4.265	16.2	3.191	12.2	4.985	19.0
	46	142.2	0.516	2.0	0.386	1.5	0.603	2.3
	47	572.5	2.076	7.9	1.554	5.9	2.427	9.2
	48	1447.5	5.250	20.0	3.928	15.0	6.137	23.4
	49	1904.0	6.906	26.3	5.167	19.7	8.072	30.8
	50	2236.8	8.113	30.9	6.070	23.1	9.483	36.1
	51	2287.6	8.297	31.6	6.208	23.6	9.698	36.9
6	51	3810.7	13.821	52.7	10.341	39.4	16.156	61.5
	52	3733.1	13.540	51.6	10.130	38.6	15.826	60.3
	53	3231.3	11.720	44.6	8.769	33.4	13.699	52.2
	54	2542.5	9.222	35.1	6.900	26.3	10.779	41.1
	55	1220.0	4.425	16.9	3.311	12.6	5.172	19.7
	56	211.8	0.768	2.9	0.575	2.2	0.898	3.4
	57	481.3	1.746	6.7	1.306	5.0	2.041	7.8
	58	1356.5	4.920	18.7	3.681	14.0	5.751	21.9
	59	1813.1	6.576	25.1	4.920	18.7	7.687	29.3
	60	2146.1	7.784	29.7	5.824	22.2	9.098	34.7
	61	2196.9	7.968	30.4	5.962	22.7	9.314	35.5
7	61	3869.5	14.035	53.5	10.501	40.0	16.405	62.5
	62	3791.9	13.753	52.4	10.290	39.2	16.076	61.2
	63	3290.1	11.933	45.5	8.928	34.0	13.949	53.1
	64	2601.3	9.435	35.9	7.059	26.9	11.028	42.0
	65	1278.8	4.638	17.7	3.470	13.2	5.421	20.7
	66	270.6	0.981	3.7	0.734	2.8	1.147	4.4
	67	402.7	1.461	5.6	1.093	4.2	1.707	6.5
	68	1277.9	4.635	17.7	3.468	13.2	5.418	20.6
	69	1734.6	6.291	24.0	4.707	17.9	7.354	28.0
	70	2067.5	7.499	28.6	5.611	21.4	8.765	33.4
	71	2118.3	7.683	29.3	5.749	21.9	8.981	34.2
8	71	3463.8	12.563	47.9	9.400	35.8	14.685	55.9
	72	3386.2	12.282	46.8	9.189	35.0	14.356	54.7
	73	2884.6	10.462	39.9	7.828	29.8	12.229	46.6
	74	2213.5	8.028	30.6	6.007	22.9	9.384	35.7
	75	1539.6	5.584	21.3	4.178	15.9	6.527	24.9
	76	822.9	2.985	11.4	2.233	8.5	3.489	13.3
	77	304.7	1.105	4.2	0.827	3.2	1.292	4.9
	78	139.4	0.506	1.9	0.378	1.4	0.591	2.3
	79	583.6	2.117	8.1	1.584	6.0	2.474	9.4
	80	799.3	2.899	11.0	2.169	8.3	3.389	12.9
	81	777.4	2.819	10.7	2.110	8.0	3.296	12.6

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	446.2	1.619	6.2	1.211	4.6	1.892	7.2
	2	401.5	1.456	5.5	1.090	4.2	1.702	6.5
	3	196.9	0.714	2.7	0.534	2.0	0.835	3.2
	4	6.6	0.024	0.1	0.018	0.1	0.028	0.1
	5	210.0	0.762	2.9	0.570	2.2	0.890	3.4
	6	510.4	1.851	7.1	1.385	5.3	2.164	8.2
	7	908.5	3.295	12.6	2.465	9.4	3.852	14.7
	8	1288.1	4.672	17.8	3.495	13.3	5.461	20.8
	9	1776.8	6.452	24.6	4.827	18.4	7.541	28.7
	10	2177.4	7.897	30.1	5.909	22.5	9.231	35.2
	11	2269.7	8.232	31.4	6.159	23.5	9.622	36.7
2	11	866.6	3.143	12.0	2.352	9.0	3.674	14.0
	12	817.9	2.967	11.3	2.220	8.5	3.468	13.2
	13	610.9	2.216	8.4	1.658	6.3	2.590	9.9
	14	353.9	1.283	4.9	0.960	3.7	1.500	5.7
	15	68.3	0.248	0.9	0.185	0.7	0.289	1.1
	16	240.9	0.874	3.3	0.654	2.5	1.021	3.9
	17	794.8	2.883	11.0	2.157	8.2	3.370	12.8
	18	1340.0	4.860	18.5	3.636	13.9	5.681	21.6
	19	1837.4	6.664	25.4	4.986	19.0	7.790	29.7
	20	2231.0	8.092	30.8	6.054	23.1	9.458	36.0
	21	2322.5	8.424	32.1	6.303	24.0	9.847	37.5
3	21	867.3	3.146	12.0	2.353	9.0	3.677	14.0
	22	818.6	2.969	11.3	2.221	8.5	3.471	13.2
	23	611.7	2.219	8.5	1.660	6.3	2.593	9.9
	24	354.5	1.286	4.9	0.962	3.7	1.503	5.7
	25	68.9	0.250	1.0	0.187	0.7	0.292	1.1
	26	242.6	0.880	3.4	0.658	2.5	1.029	3.9
	27	796.6	2.889	11.0	2.162	8.2	3.377	12.9
	28	1341.8	4.867	18.5	3.641	13.9	5.688	21.7
	29	1838.5	6.668	25.4	4.989	19.0	7.794	29.7
	30	2232.2	8.096	30.8	6.057	23.1	9.463	36.1
	31	2323.7	8.428	32.1	6.306	24.0	9.851	37.5
4	31	782.1	2.837	10.8	2.122	8.1	3.316	12.6
	32	733.4	2.660	10.1	1.990	7.6	3.109	11.8
	33	526.2	1.909	7.3	1.428	5.4	2.231	8.5
	34	269.0	0.976	3.7	0.730	2.8	1.140	4.3
	35	18.8	0.067	0.2	0.046	0.2	0.071	0.3
	36	310.0	1.124	4.3	0.841	3.2	1.314	5.0
	37	885.4	3.333	12.9	3.344	0.9	5.682	14.8
	38	1408.8	5.110	19.5	3.823	14.6	5.973	22.8
	39	1905.8	6.912	26.3	5.172	19.7	8.080	30.8
	40	2299.3	8.340	31.8	6.240	23.8	9.748	37.1
	41	2390.8	8.672	33.0	6.488	24.7	10.136	38.6
5	41	1128.8	4.094	15.6	3.063	11.7	4.785	18.2
	42	1099.8	3.989	15.2	2.984	11.4	4.662	17.8
	43	912.4	3.309	12.6	2.476	9.4	3.868	14.7
	44	655.4	2.377	9.1	1.778	6.8	2.778	10.6

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Pt(+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	162.8	0.590	2.2	0.442	1.7	0.690	2.6
	46	216.8	0.786	3.0	0.588	2.2	0.919	3.5
	47	933.8	3.387	12.9	2.534	9.7	3.959	15.1
	48	1873.7	6.796	25.9	5.085	19.4	7.944	30.3
	49	2363.0	8.570	32.6	6.412	24.4	10.018	38.2
	50	2719.2	9.863	37.6	7.379	28.1	11.528	43.9
	51	2773.5	10.059	38.3	7.526	28.7	11.758	44.8
6	51	1108.7	4.021	15.3	3.009	11.5	4.701	17.9
	52	1079.7	3.916	14.9	2.930	11.2	4.578	17.4
	53	892.3	3.236	12.3	2.422	9.2	3.783	14.4
	54	635.3	2.304	8.8	1.724	6.6	2.694	10.3
	55	142.8	0.518	2.0	0.387	1.5	0.605	2.3
	56	253.6	0.920	3.5	0.688	2.6	1.075	4.1
	57	970.7	3.521	13.4	2.634	10.0	4.115	15.7
	58	1910.6	6.930	26.4	5.185	19.8	8.100	30.9
	59	2399.8	8.704	33.2	6.512	24.8	10.174	38.8
	60	2756.0	9.996	38.1	7.479	28.5	11.684	44.5
	61	2810.3	10.193	38.8	7.626	29.1	11.914	45.4
7	61	1223.7	4.438	16.9	3.321	12.7	5.188	19.8
	62	1194.7	4.333	16.5	3.242	12.4	5.065	19.3
	63	1007.4	3.654	13.9	2.734	10.4	4.271	16.3
	64	750.6	2.722	10.4	2.037	7.8	3.182	12.1
	65	258.3	0.937	3.6	0.701	2.7	1.095	4.2
	66	164.4	0.596	2.3	0.446	1.7	0.697	2.7
	67	924.8	3.354	12.8	2.510	9.6	3.921	14.9
	68	1821.7	6.607	25.2	4.944	18.8	7.723	29.4
	69	2317.8	8.407	32.0	6.290	24.0	9.827	37.4
	70	2707.3	9.819	37.4	7.347	28.0	11.478	43.7
	71	2766.6	10.034	38.2	7.508	28.6	11.729	44.7
8	71	1015.8	3.684	14.0	2.757	10.5	4.307	16.4
	72	986.8	3.579	13.6	2.678	10.2	4.184	15.9
	73	799.6	2.900	11.0	2.170	8.3	3.390	12.9
	74	549.9	1.994	7.6	1.492	5.7	2.331	8.9
	75	300.2	1.089	4.1	0.815	3.1	1.273	4.8
	76	50.6	0.184	0.7	0.137	0.5	0.215	0.8
	77	424.1	1.538	5.9	1.151	4.4	1.798	6.8
	78	945.5	3.429	13.1	2.566	9.8	4.009	15.3
	79	1391.4	5.047	19.2	3.776	14.4	5.899	22.5
	80	1643.6	5.962	22.7	4.460	17.0	6.968	26.5
	81	1618.0	5.869	22.4	4.391	16.7	6.860	26.1

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	1614.2	5.855	22.3	4.380	16.7	6.844	26.1
	2	1521.0	5.517	21.0	4.128	15.7	6.448	24.6
	3	1158.6	4.202	16.0	3.144	12.0	4.912	18.7
	4	734.6	2.664	10.1	1.993	7.6	3.114	11.9
	5	309.7	1.123	4.3	0.840	3.2	1.313	5.0
	6	3.5	0.013	0.0	0.009	0.0	0.015	0.1
	7	193.7	0.702	2.7	0.526	2.0	0.821	3.1
	8	383.8	1.392	5.3	1.042	4.0	1.627	6.2
	9	660.6	2.323	8.9	1.738	6.6	2.716	10.3
	10	847.4	3.074	11.7	2.300	8.8	3.593	13.7
	11	896.0	3.250	12.4	2.432	9.3	3.799	14.5
2	11	2264.9	8.215	31.3	6.146	23.4	9.602	36.6
	12	2167.2	7.861	29.9	5.881	22.4	9.188	35.0
	13	1773.5	6.432	24.5	4.813	18.3	7.519	28.6
	14	1286.0	4.664	17.8	3.490	13.3	5.452	20.8
	15	731.2	2.652	10.1	1.984	7.6	3.100	11.8
	16	177.0	0.642	2.4	0.480	1.8	0.750	2.9
	17	141.7	0.514	2.0	0.384	1.5	0.601	2.3
	18	427.2	1.549	5.9	1.159	4.4	1.811	6.9
	19	684.1	2.481	9.5	1.856	7.1	2.900	11.0
	20	891.1	3.232	12.3	2.418	9.2	3.778	14.4
	21	939.2	3.407	13.0	2.549	9.7	3.982	15.2
3	21	2267.9	8.226	31.3	6.154	23.4	9.615	36.6
	22	2172.8	7.881	30.0	5.896	22.5	9.212	35.1
	23	1779.2	6.453	24.6	4.828	18.4	7.543	28.7
	24	1289.5	4.677	17.8	3.499	13.3	5.467	20.8
	25	744.3	2.700	10.3	2.020	7.7	3.156	12.0
	26	198.0	0.718	2.7	0.537	2.0	0.839	3.2
	27	135.1	0.490	1.9	0.367	1.4	0.573	2.2
	28	420.7	1.526	5.8	1.142	4.3	1.783	6.8
	29	677.7	2.458	9.4	1.839	7.0	2.873	10.9
	30	884.7	3.209	12.2	2.401	9.1	3.751	14.3
	31	932.9	3.384	12.9	2.532	9.6	3.955	15.1
4	31	2274.8	8.251	31.4	6.173	23.5	9.644	36.7
	32	2181.5	7.912	30.1	5.920	22.6	9.249	35.2
	33	1787.9	6.485	24.7	4.852	18.5	7.580	28.9
	34	1293.5	4.691	17.9	3.510	13.4	5.484	20.9
	35	748.3	2.714	10.3	2.031	7.7	3.173	12.1
	36	195.5	0.709	2.7	0.531	2.0	0.829	3.2
	37	135.8	0.492	1.9	0.368	1.4	0.576	2.2
	38	421.3	1.528	5.8	1.143	4.4	1.786	6.8
	39	678.3	2.460	9.4	1.841	7.0	2.876	11.0
	40	885.3	3.211	12.2	2.402	9.2	3.753	14.3
	41	933.5	3.386	12.9	2.533	9.7	3.958	15.1
5	41	2765.9	10.032	38.2	7.506	28.6	11.726	44.7
	42	2705.7	9.814	37.4	7.342	28.0	11.471	43.7
	43	2329.4	8.449	32.2	6.321	24.1	9.876	37.6
	44	1840.2	6.674	25.4	4.994	19.0	7.801	29.7

Calculo de Comprobacion a Rasante (Q(max/min) -- Momentos)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	925.6	3.357	12.8	2.512	9.6	3.924	14.9
	46	183.0	0.664	2.5	0.497	1.9	0.776	3.0
	47	240.6	0.873	3.3	0.653	2.5	1.020	3.9
	48	732.9	2.658	10.1	1.989	7.6	3.107	11.8
	49	989.8	3.590	13.7	2.686	10.2	4.196	16.0
	50	1177.1	4.269	16.3	3.194	12.2	4.990	19.0
	51	1205.7	4.373	16.7	3.272	12.5	5.112	19.5
6	51	2761.0	10.014	38.1	7.492	28.5	11.705	44.6
	52	2705.9	9.814	37.4	7.343	28.0	11.472	43.7
	53	2349.7	8.522	32.5	6.376	24.3	9.961	37.9
	54	1860.5	6.748	25.7	5.049	19.2	7.888	30.0
	55	920.6	3.339	12.7	2.498	9.5	3.903	14.9
	56	203.5	0.738	2.8	0.552	2.1	0.863	3.3
	57	198.5	0.720	2.7	0.539	2.1	0.842	3.2
	58	691.1	2.507	9.5	1.875	7.1	2.930	11.2
	59	948.1	3.439	13.1	2.573	9.8	4.019	15.3
	60	1135.5	4.118	15.7	3.081	11.7	4.814	18.3
	61	1164.1	4.222	16.1	3.159	12.0	4.935	18.8
7	61	2801.4	10.161	38.7	7.602	29.0	11.877	45.2
	62	2746.3	9.961	37.9	7.453	28.4	11.643	44.4
	63	2390.1	8.669	33.0	6.486	24.7	10.133	38.6
	64	1900.9	6.894	26.3	5.158	19.7	8.059	30.7
	65	961.0	3.485	13.3	2.608	9.9	4.074	15.5
	66	243.9	0.885	3.4	0.662	2.5	1.034	3.9
	67	138.3	0.502	1.9	0.375	1.4	0.586	2.2
	68	630.9	2.288	8.7	1.712	6.5	2.675	10.2
	69	887.9	3.220	12.3	2.410	9.2	3.764	14.3
	70	1075.3	3.900	14.9	2.918	11.1	4.559	17.4
	71	1103.9	4.004	15.3	2.996	11.4	4.680	17.8
8	71	2500.5	9.069	34.6	6.786	25.9	10.601	40.4
	72	2445.5	8.870	33.8	6.636	25.3	10.368	39.5
	73	2089.5	7.579	28.9	5.670	21.6	8.858	33.7
	74	1612.5	5.848	22.3	4.376	16.7	6.836	26.0
	75	1132.6	4.108	15.6	3.074	11.7	4.802	18.3
	76	610.0	2.212	8.4	1.655	6.3	2.586	9.9
	77	285.9	1.037	3.9	0.776	3.0	1.212	4.6
	78	35.8	0.130	0.5	0.097	0.4	0.152	0.6
	79	214.3	0.777	3.0	0.582	2.2	0.909	3.5
	80	335.8	1.218	4.6	0.911	3.5	1.424	5.4
	81	321.4	1.173	4.5	0.878	3.3	1.371	5.2

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	1992.5	7.227	27.5	5.407	20.6	8.447	32.2
	2	1949.0	7.069	26.9	5.289	20.1	8.263	31.5
	3	1366.8	4.957	18.9	3.709	14.1	5.795	22.1
	4	784.7	2.846	10.8	2.129	8.1	3.327	12.7
	5	201.7	0.731	2.8	0.547	2.1	0.855	3.3
	6	344.8	1.251	4.8	0.936	3.6	1.462	5.6
	7	891.0	3.232	12.3	2.418	9.2	3.777	14.4
	8	1374.2	4.984	19.0	3.729	14.2	5.826	22.2
	9	2109.5	7.651	29.1	5.725	21.8	8.946	34.1
	10	1697.1	6.155	23.4	4.605	17.5	7.195	27.4
	11	1783.5	6.469	24.6	4.840	18.4	7.561	28.8
2	11	1709.2	6.199	23.6	4.638	17.7	7.246	27.6
	12	1622.8	5.886	22.4	4.404	16.8	6.880	26.2
	13	2133.8	7.739	29.5	5.790	22.1	9.046	34.5
	14	1596.0	5.789	22.1	4.331	16.5	6.767	25.8
	15	778.0	2.822	10.7	2.111	8.0	3.298	12.6
	16	41.5	0.151	0.6	0.113	0.4	0.176	0.7
	17	762.0	2.764	10.5	2.068	7.9	3.231	12.3
	18	1580.3	5.732	21.8	4.288	16.3	6.700	25.5
	19	2086.8	7.569	28.8	5.663	21.6	8.847	33.7
	20	1817.1	6.591	25.1	4.931	18.8	7.704	29.3
	21	1902.7	6.901	26.3	5.163	19.7	8.067	30.7
3	21	1853.2	6.722	25.6	5.029	19.2	7.857	29.9
	22	1801.8	6.535	24.9	4.890	18.6	7.639	29.1
	23	2041.6	7.405	28.2	5.540	21.1	8.656	33.0
	24	1569.4	5.692	21.7	4.259	16.2	6.653	25.3
	25	827.8	3.003	11.4	2.247	8.6	3.510	13.4
	26	8.4	0.030	0.1	0.023	0.1	0.036	0.1
	27	711.6	2.581	9.8	1.931	7.4	3.017	11.5
	28	1529.9	5.549	21.1	4.152	15.8	6.486	24.7
	29	2008.8	7.286	27.8	5.451	20.8	8.516	32.4
	30	1763.3	6.396	24.4	4.785	18.2	7.476	28.5
	31	1849.0	6.706	25.5	5.018	19.1	7.839	29.9
4	31	1564.6	5.675	21.6	4.246	16.2	6.633	25.3
	32	1478.1	5.361	20.4	4.011	15.3	6.266	23.9
	33	1875.4	6.802	25.9	5.089	19.4	7.951	30.3
	34	1489.6	5.403	20.6	4.042	15.4	6.315	24.1
	35	746.4	2.707	10.3	2.025	7.7	3.164	12.1
	36	73.1	0.265	1.0	0.198	0.8	0.310	1.2
	37	793.4	2.878	11.0	2.153	8.2	3.364	12.8
	38	1611.7	5.846	22.3	4.374	16.7	6.833	26.0
	39	2094.1	7.595	28.9	5.683	21.6	8.878	33.8
	40	1850.5	6.712	25.6	5.022	19.1	7.845	29.9
	41	1936.1	7.022	26.8	5.254	20.0	8.208	31.3
5	41	2132.0	7.733	29.5	5.785	22.0	9.039	34.4
	42	2080.4	7.546	28.7	5.646	21.5	8.820	33.6
	43	2778.9	10.079	38.4	7.541	28.7	11.781	44.9
	44	2310.6	8.381	31.9	6.270	23.9	9.796	37.3

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	1003.9	3.641	13.9	2.724	10.4	4.256	16.2
	46	33.4	0.121	0.5	0.091	0.3	0.141	0.5
	47	974.9	3.536	13.5	2.646	10.1	4.133	15.7
	48	2345.8	8.508	32.4	6.366	24.3	9.945	37.9
	49	2891.7	10.488	40.0	7.847	29.9	12.259	46.7
	50	2315.8	8.399	32.0	6.284	23.9	9.818	37.4
	51	2366.6	8.584	32.7	6.422	24.5	10.033	38.2
6	51	2158.5	7.829	29.8	5.857	22.3	9.151	34.9
	52	2106.9	7.642	29.1	5.718	21.8	8.932	34.0
	53	2791.6	10.125	38.6	7.575	28.9	11.835	45.1
	54	2314.4	8.394	32.0	6.280	23.9	9.812	37.4
	55	979.0	3.551	13.5	2.657	10.1	4.150	15.8
	56	4.1	0.015	0.1	0.011	0.0	0.017	0.1
	57	1033.4	3.748	14.3	2.804	10.7	4.381	16.7
	58	2244.8	8.142	31.0	6.092	23.2	9.517	36.3
	59	2849.5	10.335	39.4	7.733	29.5	12.080	46.0
	60	2153.6	7.811	29.8	5.844	22.3	9.130	34.8
	61	2204.4	7.995	30.5	5.982	22.8	9.345	35.6
7	61	2377.4	8.623	32.8	6.452	24.6	10.079	38.4
	62	2325.9	8.436	32.1	6.312	24.0	9.861	37.6
	63	2912.0	10.562	40.2	7.902	30.1	12.345	47.0
	64	2359.9	8.559	32.6	6.404	24.4	10.005	38.1
	65	1053.9	3.822	14.6	2.860	10.9	4.468	17.0
	66	45.1	0.164	0.6	0.122	0.5	0.191	0.7
	67	992.2	3.599	13.7	2.693	10.3	4.207	16.0
	68	2178.5	7.901	30.1	5.912	22.5	9.236	35.2
	69	1734.6	6.291	24.0	4.707	17.9	7.354	28.0
	70	2067.5	7.499	28.6	5.611	21.4	8.765	33.4
	71	2118.3	7.683	29.3	5.749	21.9	8.981	34.2
8	71	1979.0	7.178	27.3	5.370	20.5	8.390	32.0
	72	1927.5	6.991	26.6	5.231	19.9	8.172	31.1
	73	2449.7	8.885	33.8	6.648	25.3	10.386	39.6
	74	1744.5	6.327	24.1	4.734	18.0	7.396	28.2
	75	1103.4	4.002	15.2	2.994	11.4	4.678	17.8
	76	386.4	1.402	5.3	1.049	4.0	1.638	6.2
	77	330.5	1.199	4.6	0.897	3.4	1.401	5.3
	78	1046.2	3.795	14.5	2.839	10.8	4.435	16.9
	79	1760.6	6.386	24.3	4.778	18.2	7.464	28.4
	80	2145.0	7.780	29.6	5.821	22.2	9.094	34.6
	81	2147.6	7.789	29.7	5.828	22.3	9.105	34.7

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	922.6	3.346	12.7	2.504	9.5	3.911	14.9
	2	879.5	3.009	11.5	2.251	8.6	3.517	13.4
	3	467.1	1.694	6.5	1.268	4.8	1.980	7.5
	4	105.7	0.383	1.5	0.287	1.1	0.448	1.7
	5	255.7	0.927	3.5	0.694	2.6	1.084	4.1
	6	594.8	2.154	8.2	1.612	6.1	2.518	9.6
	7	931.7	3.379	12.9	2.528	9.6	3.950	15.0
	8	1269.5	4.604	17.5	3.444	13.1	5.381	20.5
	9	1725.1	6.257	23.8	4.682	17.8	7.314	27.9
	10	3020.8	10.957	41.7	8.198	31.2	12.807	48.8
	11	3150.9	11.428	43.5	8.551	32.6	13.358	50.9
2	11	3085.2	11.190	42.6	8.372	31.9	13.080	49.8
	12	2955.0	10.718	40.8	8.019	30.5	12.528	47.7
	13	1614.0	5.854	22.3	4.380	16.7	6.842	26.1
	14	1158.0	4.200	16.0	3.142	12.0	4.909	18.7
	15	506.6	1.838	7.0	1.375	5.2	2.148	8.2
	16	25.8	0.094	0.4	0.070	0.3	0.109	0.4
	17	558.2	2.024	7.7	1.515	5.8	2.366	9.0
	18	1194.0	4.331	16.5	3.240	12.3	5.062	19.3
	19	1649.9	5.984	22.8	4.477	17.1	6.995	26.6
	20	2990.9	10.848	41.3	8.116	30.9	12.680	48.3
	21	3119.9	11.316	43.1	8.466	32.3	13.227	50.4
3	21	3117.7	11.308	43.1	8.461	32.2	13.218	50.4
	22	2987.6	10.836	41.3	8.107	30.9	12.666	48.3
	23	1630.5	5.914	22.5	4.425	16.9	6.912	26.3
	24	1174.4	4.260	16.2	3.187	12.1	4.979	19.0
	25	519.2	1.883	7.2	1.409	5.4	2.201	8.4
	26	13.2	0.048	0.2	0.036	0.1	0.056	0.2
	27	545.5	1.979	7.5	1.480	5.6	2.313	8.8
	28	1209.4	4.387	16.7	3.282	12.5	5.127	19.5
	29	1665.3	6.040	23.0	4.519	17.2	7.060	26.9
	30	3008.6	10.912	41.6	8.165	31.1	12.755	48.6
	31	3137.6	11.380	43.4	8.515	32.4	13.302	50.7
4	31	3045.1	11.045	42.1	8.264	31.5	12.910	49.2
	32	2915.0	10.573	40.3	7.910	30.1	12.358	47.1
	33	1559.6	5.657	21.5	4.232	16.1	6.612	25.2
	34	1103.7	4.003	15.2	2.995	11.4	4.679	17.8
	35	399.7	1.305	5.0	0.976	3.7	1.525	5.8
	36	172.9	0.627	2.4	0.469	1.8	0.733	2.8
	37	718.1	2.604	9.9	1.948	7.4	3.046	11.6
	38	1371.5	4.975	19.0	3.722	14.2	5.815	22.2
	39	1827.2	6.627	25.2	4.959	18.9	7.747	29.5
	40	3127.4	11.343	43.2	8.487	32.3	13.259	50.5
	41	3262.1	11.832	45.1	8.852	33.7	13.830	52.7
5	41	3727.5	13.520	51.5	10.115	38.5	15.803	60.2
	42	3649.9	13.238	50.4	9.905	37.7	15.474	58.9
	43	3148.6	11.418	43.5	8.543	32.5	13.346	50.8
	44	1629.8	5.911	22.5	4.423	16.8	6.910	26.3

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 1.6*Ppf+1.6*Cm +0.9*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd	b(min)	Armad	b(min)	Armad	b(min)	Armad
		t	cm	cm2/m	cm	cm2/m	cm	cm2/m
	45	590.1	2.140	8.2	1.601	6.1	2.502	9.5
	46	121.3	0.440	1.7	0.329	1.3	0.514	2.0
	47	917.7	3.329	12.7	2.490	9.5	3.891	14.8
	48	1791.6	6.498	24.8	4.862	18.5	7.595	28.9
	49	2247.5	8.152	31.1	6.099	23.2	9.528	36.3
	50	3767.7	13.666	52.1	10.224	39.0	15.973	60.9
	51	3844.2	13.943	53.1	10.432	39.7	16.298	62.1
6	51	3810.7	13.821	52.7	10.341	39.4	16.156	61.5
	52	3733.1	13.540	51.6	10.130	38.6	15.826	60.3
	53	2179.3	7.904	30.1	5.914	22.5	9.239	35.2
	54	1723.3	6.251	23.8	4.677	17.8	7.306	27.8
	55	675.6	2.450	9.3	1.833	7.0	2.864	10.9
	56	23.1	0.084	0.3	0.063	0.2	0.098	0.4
	57	721.8	2.618	10.0	1.959	7.5	3.060	11.7
	58	1755.0	6.365	24.2	4.763	18.1	7.441	28.3
	59	2211.0	8.019	30.5	6.000	22.9	9.374	35.7
	60	3745.1	13.583	51.7	10.163	38.7	15.877	60.5
	61	3821.5	13.861	52.8	10.371	39.5	16.202	61.7
7	61	3842.2	13.936	53.1	10.427	39.7	16.289	62.1
	62	3764.6	13.654	52.0	10.216	38.9	15.960	60.8
	63	2230.5	8.090	30.8	6.053	23.1	9.456	36.0
	64	1774.6	6.436	24.5	4.816	18.3	7.524	28.7
	65	900.8	3.267	12.4	2.444	9.3	3.819	14.5
	66	103.8	0.377	1.4	0.282	1.1	0.440	1.7
	67	595.1	2.158	8.2	1.615	6.2	2.523	9.6
	68	1628.9	5.908	22.5	4.420	16.8	6.906	26.3
	69	3157.7	11.453	43.6	8.569	32.6	13.387	51.0
	70	3659.5	13.273	50.6	9.931	37.8	15.515	59.1
	71	3736.0	13.551	51.6	10.138	38.6	15.839	60.3
8	71	3462.3	12.558	47.8	9.396	35.8	14.679	55.9
	72	3384.7	12.276	46.8	9.185	35.0	14.350	54.7
	73	2078.1	7.537	28.7	5.639	21.5	8.810	33.6
	74	1635.1	5.931	22.6	4.437	16.9	6.932	26.4
	75	1192.1	4.324	16.5	3.235	12.3	5.054	19.3
	76	748.9	2.716	10.3	2.032	7.7	3.175	12.1
	77	304.7	1.105	4.2	0.827	3.2	1.292	4.9
	78	139.4	0.506	1.9	0.378	1.4	0.591	2.3
	79	583.6	2.117	8.1	1.584	6.0	2.474	9.4
	80	791.3	2.870	10.9	2.147	8.2	3.355	12.8
	81	781.4	2.761	10.5	2.066	7.9	3.228	12.3

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd	b(min)	Armad	b(min)	Armad	b(min)	Armad
		t	cm	cm2/m	cm	cm2/m	cm	cm2/m
1	1	1529.5	5.548	21.1	4.151	15.8	6.485	24.7
	2	1521.0	5.517	21.0	4.128	15.7	6.448	24.6
	3	1096.5	3.977	15.2	2.976	11.3	4.649	17.7
	4	672.4	2.439	9.3	1.825	7.0	2.851	10.9
	5	247.4	0.897	3.4	0.671	2.6	1.049	4.0
	6	151.2	0.549	2.1	0.410	1.6	0.641	2.4
	7	549.6	1.993	7.6	1.491	5.7	2.330	8.9
	8	885.0	3.210	12.2	2.402	9.1	3.752	14.3
	9	1420.7	5.153	19.6	3.855	14.7	6.023	22.9
	10	847.4	3.074	11.7	2.300	8.8	3.593	13.7
	11	896.0	3.250	12.4	2.432	9.3	3.799	14.5
2	11	866.6	3.143	12.0	2.352	9.0	3.674	14.0
	12	817.9	2.967	11.3	2.220	8.5	3.468	13.2
	13	1489.8	5.403	20.6	4.043	15.4	6.316	24.1
	14	1151.6	4.177	15.9	3.125	11.9	4.882	18.6
	15	555.4	2.014	7.7	1.507	5.7	2.355	9.0
	16	42.3	0.153	0.6	0.115	0.4	0.179	0.7
	17	541.0	1.962	7.5	1.468	5.6	2.294	8.7
	18	1137.4	4.126	15.7	3.087	11.8	4.822	18.4
	19	1444.3	5.239	20.0	3.919	14.9	6.123	23.3
	20	1013.8	3.677	14.0	2.751	10.5	4.298	16.4
	21	1062.0	3.852	14.7	2.882	11.0	4.502	17.2
3	21	991.0	3.594	13.7	2.689	10.2	4.201	16.0
	22	977.3	3.545	13.5	2.652	10.1	4.143	15.8
	23	1378.0	4.998	19.0	3.739	14.2	5.842	22.3
	24	1105.3	4.009	15.3	3.000	11.4	4.686	17.9
	25	585.6	2.124	8.1	1.589	6.1	2.483	9.5
	26	12.0	0.044	0.2	0.033	0.1	0.051	0.2
	27	510.2	1.851	7.0	1.385	5.3	2.163	8.2
	28	1106.7	4.014	15.3	3.003	11.4	4.692	17.9
	29	1386.0	5.027	19.2	3.761	14.3	5.876	22.4
	30	979.7	3.554	13.5	2.659	10.1	4.154	15.8
	31	1027.9	3.728	14.2	2.789	10.6	4.358	16.6
4	31	782.1	2.837	10.8	2.122	8.1	3.316	12.6
	32	733.4	2.660	10.1	1.990	7.6	3.109	11.8
	33	1291.5	4.684	17.8	3.505	13.4	5.475	20.9
	34	1105.3	4.009	15.3	3.000	11.4	4.686	17.9
	35	583.9	2.118	8.1	1.584	6.0	2.475	9.4
	36	13.7	0.050	0.2	0.037	0.1	0.058	0.2
	37	512.3	1.858	7.1	1.390	5.3	2.172	8.3
	38	1108.8	4.022	15.3	3.009	11.5	4.701	17.9
	39	1391.6	5.047	19.2	3.776	14.4	5.900	22.5
	40	987.1	3.580	13.6	2.679	10.2	4.185	15.9
	41	1035.3	3.755	14.3	2.809	10.7	4.389	16.7
5	41	1131.3	4.103	15.6	3.070	11.7	4.796	18.3
	42	1102.3	3.998	15.2	2.991	11.4	4.673	17.8
	43	1946.3	7.059	26.9	5.282	20.1	8.252	31.4
	44	1677.7	6.085	23.2	4.553	17.3	7.113	27.1

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(+)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	753.6	2.733	10.4	2.045	7.8	3.195	12.2
	46	7.4	0.027	0.1	0.020	0.1	0.032	0.1
	47	643.0	2.332	8.9	1.745	6.6	2.726	10.4
	48	1631.3	5.917	22.5	4.427	16.9	6.916	26.3
	49	1977.5	7.172	27.3	5.366	20.4	8.384	31.9
	50	1256.1	4.556	17.4	3.409	13.0	5.325	20.3
	51	1284.7	4.659	17.8	3.486	13.3	5.446	20.7
6	51	1108.7	4.021	15.3	3.009	11.5	4.701	17.9
	52	1079.7	3.916	14.9	2.930	11.2	4.578	17.4
	53	1909.9	6.927	26.4	5.183	19.7	8.097	30.8
	54	1632.3	5.921	22.6	4.430	16.9	6.920	26.4
	55	679.6	2.465	9.4	1.844	7.0	2.881	11.0
	56	4.2	0.015	0.1	0.011	0.0	0.018	0.1
	57	750.6	2.722	10.4	2.037	7.8	3.182	12.1
	58	1579.3	5.728	21.8	4.286	16.3	6.696	25.5
	59	1984.4	7.198	27.4	5.385	20.5	8.413	32.0
	60	1143.0	4.146	15.8	3.102	11.8	4.846	18.5
	61	1171.5	4.249	16.2	3.179	12.1	4.967	18.9
7	61	1309.3	4.749	18.1	3.553	13.5	5.551	21.1
	62	1280.3	4.644	17.7	3.474	13.2	5.428	20.7
	63	2011.9	7.297	27.8	5.460	20.8	8.530	32.5
	64	1659.5	6.019	22.9	4.503	17.2	7.035	26.8
	65	736.1	2.670	10.2	1.998	7.6	3.121	11.9
	66	18.4	0.067	0.3	0.050	0.2	0.078	0.3
	67	727.8	2.640	10.1	1.975	7.5	3.086	11.8
	68	1531.5	5.555	21.2	4.156	15.8	6.493	24.7
	69	887.9	3.220	12.3	2.410	9.2	3.764	14.3
	70	1075.3	3.900	14.9	2.918	11.1	4.559	17.4
	71	1103.9	4.004	15.3	2.996	11.4	4.680	17.8
8	71	1015.8	3.684	14.0	2.757	10.5	4.307	16.4
	72	986.8	3.579	13.6	2.678	10.2	4.184	15.9
	73	1654.6	6.001	22.9	4.490	17.1	7.015	26.7
	74	1143.5	4.147	15.8	3.103	11.8	4.848	18.5
	75	696.4	2.526	9.6	1.890	7.2	2.953	11.2
	76	173.5	0.629	2.4	0.471	1.8	0.736	2.8
	77	349.4	1.267	4.8	0.948	3.6	1.481	5.6
	78	871.0	3.159	12.0	2.364	9.0	3.695	14.1
	79	1391.4	5.047	19.2	3.776	14.4	5.899	22.5
	80	1681.5	6.099	23.2	4.563	17.4	7.129	27.2
	81	1403.7	5.142	19.7	3.848	14.7	6.011	23.0

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
1	1	459.6	1.667	6.3	1.247	4.8	1.948	7.4
	2	401.5	1.456	5.5	1.090	4.2	1.702	6.5
	3	196.9	0.714	2.7	0.534	2.0	0.835	3.2
	4	6.6	0.024	0.1	0.018	0.1	0.028	0.1
	5	210.0	0.762	2.9	0.570	2.2	0.890	3.4
	6	400.4	1.452	5.5	1.087	4.1	1.698	6.5
	7	590.3	2.141	8.2	1.602	6.1	2.503	9.5
	8	780.1	2.829	10.8	2.117	8.1	3.307	12.6
	9	1036.3	3.759	14.3	2.812	10.7	4.393	16.7
	10	2171.2	7.875	30.0	5.892	22.4	9.205	35.1
	11	2263.5	8.210	31.3	6.142	23.4	9.596	36.6
2	11	2242.6	8.134	31.0	6.086	23.2	9.507	36.2
	12	2150.2	7.799	29.7	5.835	22.2	9.116	34.7
	13	969.9	3.518	13.4	2.632	10.0	4.112	15.7
	14	713.6	2.588	9.9	1.936	7.4	3.025	11.5
	15	284.1	1.030	3.9	0.771	2.9	1.204	4.6
	16	26.6	0.096	0.4	0.072	0.3	0.113	0.4
	17	337.1	1.223	4.7	0.915	3.5	1.429	5.4
	18	751.2	2.725	10.4	2.039	7.8	3.185	12.1
	19	1007.5	3.654	13.9	2.734	10.4	4.271	16.3
	20	2187.6	7.935	30.2	5.937	22.6	9.275	35.3
	21	2279.2	8.266	31.5	6.185	23.6	9.663	36.8
3	21	2255.5	8.181	31.2	6.121	23.3	9.562	36.4
	22	2163.1	7.846	29.9	5.870	22.4	9.171	34.9
	23	966.8	3.507	13.4	2.624	10.0	4.099	15.6
	24	710.4	2.577	9.8	1.928	7.3	3.012	11.5
	25	277.0	1.005	3.8	0.752	2.9	1.174	4.5
	26	33.6	0.122	0.5	0.091	0.3	0.142	0.5
	27	344.2	1.248	4.8	0.934	3.6	1.459	5.6
	28	786.2	2.852	10.9	2.134	8.1	3.333	12.7
	29	1042.5	3.781	14.4	2.829	10.8	4.420	16.8
	30	2225.0	8.070	30.7	6.038	23.0	9.433	35.9
	31	2316.6	8.402	32.0	6.286	23.9	9.821	37.4
4	31	2262.6	8.207	31.3	6.140	23.4	9.593	36.5
	32	2170.3	7.872	30.0	5.890	22.4	9.201	35.1
	33	975.7	3.539	13.5	2.648	10.1	4.137	15.8
	34	719.4	2.609	9.9	1.952	7.4	3.050	11.6
	35	197.3	0.715	2.7	0.535	2.0	0.836	3.2
	36	113.5	0.412	1.6	0.308	1.2	0.481	1.8
	37	434.9	1.577	6.0	1.180	4.5	1.844	7.0
	38	868.6	3.150	12.0	2.357	9.0	3.682	14.0
	39	1124.7	4.079	15.5	3.052	11.6	4.768	18.2
	40	2264.0	8.212	31.3	6.144	23.4	9.599	36.6
	41	2361.3	8.564	32.6	6.408	24.4	10.011	38.1
5	41	2726.9	9.890	37.7	7.400	28.2	11.561	44.0
	42	2671.8	9.691	36.9	7.250	27.6	11.327	43.2
	43	2315.5	8.398	32.0	6.284	23.9	9.817	37.4
	44	996.9	3.616	13.8	2.705	10.3	4.227	16.1

Calculo de Comprobacion a Rasante (M(max/min) -- Cortante)

Hipotesis : 0.9*Ppf+0.9*Cm +1.1*Ptf+1.6*S(-)

Nota : Los cortantes en apoyos estan calculados a +/- 0.75 del canto

V.	Sec	Vrd t.	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m	b(min) cm	Armad cm2/m
	45	339.8	1.232	4.7	0.922	3.5	1.440	5.5
	46	80.5	0.292	1.1	0.219	0.8	0.341	1.3
	47	585.8	2.125	8.1	1.590	6.1	2.484	9.5
	48	1077.0	3.906	14.9	2.923	11.1	4.566	17.4
	49	1333.3	4.836	18.4	3.618	13.8	5.653	21.5
	50	2708.0	9.822	37.4	7.349	28.0	11.481	43.7
	51	2762.3	10.019	38.2	7.496	28.6	11.711	44.6
6	51	2761.0	10.014	38.1	7.492	28.5	11.705	44.6
	52	2705.9	9.814	37.4	7.343	28.0	11.472	43.7
	53	1297.6	4.707	17.9	3.521	13.4	5.501	21.0
	54	1041.3	3.777	14.4	2.826	10.8	4.415	16.8
	55	376.2	1.365	5.2	1.021	3.9	1.595	6.1
	56	31.4	0.114	0.4	0.085	0.3	0.133	0.5
	57	439.0	1.592	6.1	1.191	4.5	1.861	7.1
	58	1089.6	3.952	15.1	2.957	11.3	4.619	17.6
	59	1345.9	4.882	18.6	3.652	13.9	5.706	21.7
	60	2734.5	9.918	37.8	7.421	28.3	11.593	44.2
	61	2788.7	10.115	38.5	7.568	28.8	11.823	45.0
7	61	2774.1	10.062	38.3	7.528	28.7	11.761	44.8
	62	2719.0	9.862	37.6	7.379	28.1	11.527	43.9
	63	1330.5	4.826	18.4	3.611	13.8	5.641	21.5
	64	1074.2	3.896	14.8	2.915	11.1	4.554	17.3
	65	583.0	2.114	8.1	1.582	6.0	2.471	9.4
	66	77.1	0.280	1.1	0.209	0.8	0.327	1.2
	67	330.7	1.199	4.6	0.897	3.4	1.402	5.3
	68	981.9	3.561	13.6	2.665	10.2	4.163	15.9
	69	2311.0	8.382	31.9	6.271	23.9	9.798	37.3
	70	2667.3	9.674	36.9	7.238	27.6	11.308	43.1
	71	2721.6	9.871	37.6	7.386	28.1	11.538	44.0
8	71	2499.1	9.064	34.5	6.782	25.8	10.595	40.4
	72	2444.1	8.865	33.8	6.632	25.3	10.362	39.5
	73	1283.0	4.654	17.7	3.482	13.3	5.439	20.7
	74	1034.1	3.751	14.3	2.806	10.7	4.384	16.7
	75	785.1	2.848	10.8	2.131	8.1	3.329	12.7
	76	536.0	1.944	7.4	1.454	5.5	2.272	8.7
	77	285.9	1.037	3.9	0.776	3.0	1.212	4.6
	78	35.8	0.130	0.5	0.097	0.4	0.152	0.6
	79	214.3	0.777	3.0	0.582	2.2	0.909	3.5
	80	327.8	1.189	4.5	0.890	3.4	1.390	5.3
	81	307.4	1.115	4.2	0.834	3.2	1.303	5.0

2.6.1.- Secciones aligeradas del tablero

intecsa

PROYECTO

EJECUTANTE

HOJA ___ DE ___

FECHA ___

ESTABILIDAD DE CANAL

CARGAS PERMANENTES

A) PESO PROPIO PP = S × 2.5

B) BARRERA 0.098 × 1.6

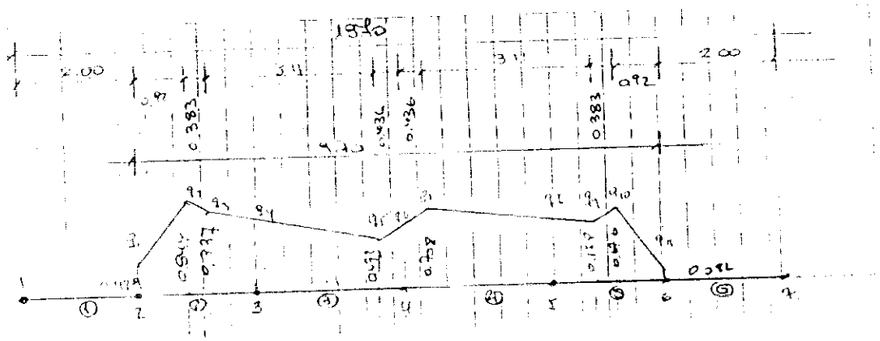
intecsa

PROYECTO

EJECUTANTE

HOJA ___ DE ___

FECHA ___



BARRA ②

$q_1 = 0.429 \times 1.6 = 0.686$ t/ml

$q_2 = 0.844 \times 1.6 = 1.350$ t/ml

$q_3 = 0.737 \times 1.6 = 1.179$ t/ml

$q_4 = 0.590 \times 1.6 = 0.944$ t/ml

BARRA ③

$q_4 = 0.59 \times 1.6 = 0.944$ t/ml

$q_5 = 0.473 \times 1.6 = 0.757$ t/ml

$q_6 = 0.591 \times 1.6 = 0.945$ t/ml

BARRA ④

$q_6 = 0.591 \times 1.6 = 0.945$ t/ml

$q_7 = 0.708 \times 1.6 = 1.132$ t/ml

$q_8 = 0.606 \times 1.6 = 0.970$ t/ml

BARRA ⑤

$q_8 = 0.606 \times 1.6 = 0.97$ t/ml

$q_9 = 0.568 \times 1.6 = 0.909$ t/ml

$q_{10} = 0.636 \times 1.6 = 1.022$ t/ml

$q_{11} = 0.082 \times 1.6 = 0.131$ t/ml

intecsa
INTERNACIONAL DE INGENIERIA Y ESTUDIOS TECNICOS S.A.

PROYECTO: HOJA DE
FECHA
EJECUTANTE:

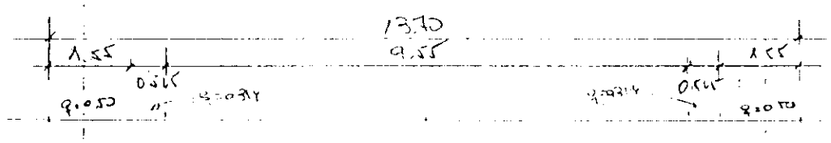
g) REVESTIMIENTO DE VÍAS SUPERIORES

Se adopta como TPP de 1ª categoría

A) SOBRECARGAS DE EXPLOTACIÓN Y DAÑOS

$q_{proyectado} = 0.277/0.55 = 0.523$ t/ml

$q_{para} = 0.500$ t/ml



BARRA 2 → $q_1 = 0.50$ de 0 a 1.55
$q_2 = 0.523$ de 1.55 a 2.075

BARRA 6 → $q_1 = 0.523$ de 0 a 0.515
$q_2 = 0.50$ de 0.515 a 2.575

V) SOPORTES DE CATENARIA

TOMA EL EFECTO LOCAL EN TORNO SOBRE PILA Y CV DE 40 m

6) IMPOSTAS Y BÓVEDAS

q 0.31 t/ml en 1.7 de 1.7

7) BÓVEDAS P: 2x0.95 + 0.35 t/m² del tipo del talud

intecsa

PROYECTO: HOJA DE
FECHA
EJECUTANTE:

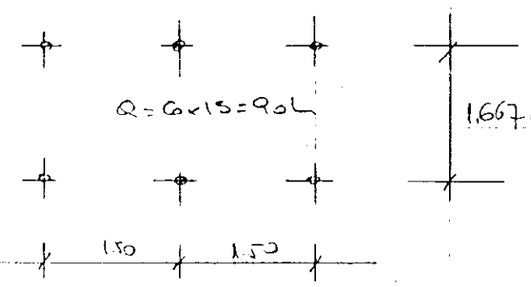
8) EFECTO DEL VIENTO

$q = 0.2 \times 3.5 = 0.7$ t/m²

$Re = R_I = \frac{0.70 \times 1.15}{1.52} = \pm 0.81$ t/ml

9) SOBRECARGA MÓVIL

- TREN TIPO I DE UN IDEM



BALASTADO COEF DE IMPACTO

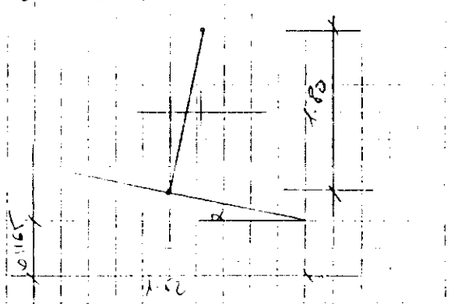
$Q = 2 \times 15 \times 1.20 / 1.50 = 24.0$ t/ml

DESEQUILIBRIO DE CARGA POR EFECTO DE PERALTE

$Q = 180 \sin\alpha = 0.116$ t

$K_I = \frac{1}{0.50} \frac{0.16 - 0.116}{1.52} = 0.84$

$K_D = \frac{1}{0.50} \frac{0.16 + 0.116}{1.52} = 1.16$



DESEQUILIBRIO DE CARGA POR FUERZA CENTRIFUGA

$F_C = D \cdot \frac{2v^2}{127 \times 11000} = 0.022\ P$

$\mu = 0.022 P \times 1.8 = 0.039\ P$

$R_J = + \frac{0.039}{1.6} P = 0.033\ P$

$R_D = - 0.033\ P$

$V_J = \frac{0.50 + 0.033}{0.50} = \underline{1.07}$

$V_D = \frac{0.50 - 0.033}{0.50} = \underline{0.93}$

— TRAMO II DE LA ESPIRAL

$Q = 12 \times 1.20 = 14.4\ t_m/ml$

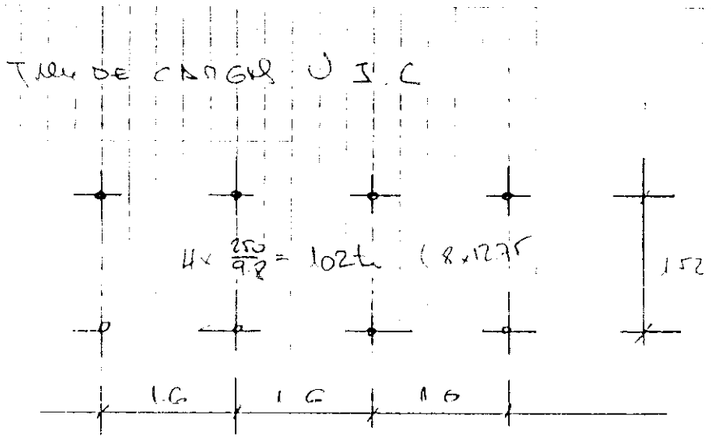
Desequilibrio de carga uniforme

(Ver tramo I)

Desequilibrio de carga no uniforme

(Ver tramo II)

— TRAMO DE CAMBIO U.I.C



APLICANDO COEF. IMPACTO

$Q = 25.5 \times 1.20 / 1.6 = 19.12\ t/ml$

DESEQUILIBRIO POR DERIVE

$K_J = 0.84$

$K_D = 1.16$

Desequilibrio por fuerza centrífuga

$K = \left(1 - \frac{V-120}{1000}\right)\left(\frac{814}{V} + 1.47\right)\left(1 - \sqrt{\frac{2.88}{L}}\right) =$

$= \left(1 - \frac{230}{1000}\right)\left(\frac{814}{350} + 1.47\right)\left(1 - \sqrt{\frac{2.88}{64}}\right) = 1.09$

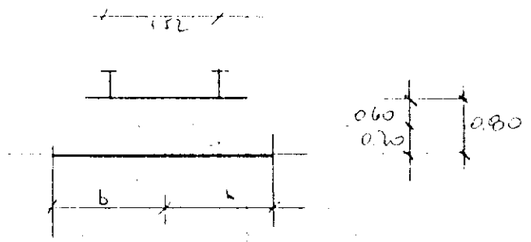
$F_C = 0.69 \times P_{VIC} \times \frac{350^2}{127 \times 1000} = 0.061\ P_{VIC}$

$M = 0.061\ P_{VIC} \times 1.80 = 0.109\ P_{VIC}$

$\gamma_1 = \frac{0.50 + 0.29}{0.80} = 1.11$

$\gamma_2 = \frac{0.50 - 0.29}{0.80} = 0.78$

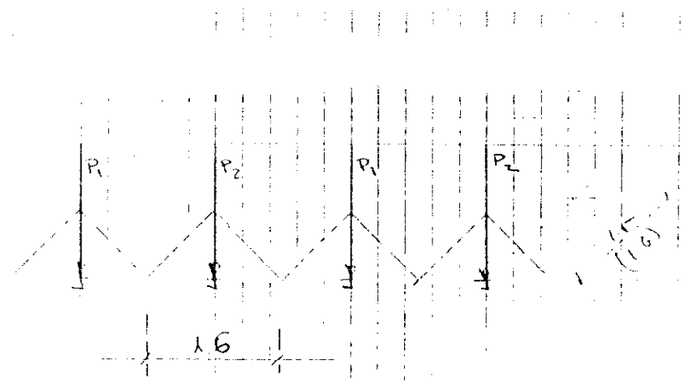
APLICANDO DE MANERA HASTA LA FALLA DE UN SOLO



$I_x = 0.60\,(\text{MOMENTO}) + 0.75\,(\text{INERCIA}) = 0.80$

$b = 2 \times 0.80 = 1.60$

REDUCIENDO ESTOS A MOMENTO DE INERCIA, SE TIENE:



VIGA IPE 45 (I) 6 CLAVOS DE 1500 kg

a) $a_0 = 200\ kg/m$

$P_1 = \left(\frac{1.5 \times 1.20 \times 0.84 \times 1.07}{1.5} - 0.81\right)\frac{1}{1.6} = 1.25\ t/m^2$ ✓

$P_2 = \left(\frac{1.5 \times 1.20 \times 1.16 \times 0.93}{1.5} + 0.81\right)\frac{1}{1.6} = 8.60\ t/m^2$ ✓

b) $a_0 = 0$

$P_1 = \left(\frac{1.5 \times 0.84}{1.5} + 0.81\right)\frac{1}{1.6} = 5.75\ t/m^2$

$P_2 = \left(\frac{1.5 \times 1.16}{1.5} + 0.81\right)\frac{1}{1.6} = 7.75\ t/m^2$

VIGA IPE 45 (II) 12 CLAVOS (300 kg) + 30 CLAVOS (150 kg)

a) $a_0 = 800$ ←

$P_1 = (6.00 \times 1.20 \times 0.84 \times 1.07 + 0.81)\frac{1}{1.6} = 4.55\ t/m^2$

$P_2 = (6.00 \times 1.20 \times 1.16 \times 0.93 + 0.81)\frac{1}{1.6} = 5.30\ t/m^2$

$P_8 = (5.00 \times 1.20 \times 0.84 \times 1.22 + 0.81) \frac{1}{1.6} = 3.87\ t/m^2$

$P_4 = (5.00 \times 1.20 \times 1.16 \times 0.93 + 0.81) \frac{1}{1.6} = 4.55\ t/m^2$

b) a $U=0$

$P_1 = (6.00 \times 0.84 + 0.81) \frac{1}{1.6} = 3.66\ t/m^2$

$P_2 = (6.00 \times 1.16 + 0.81) \frac{1}{1.6} = 4.85\ t/m^2$

$P_3 = (5.00 \times 0.84 + 0.81) \frac{1}{1.6} = 3.13\ t/m^2$

$P_4 = (5.00 \times 1.16 + 0.81) \frac{1}{1.6} = 4.13\ t/m^2$

Tren U.I.C./71: Bogie de 12.75 t + 8.15 t/m²

a) a $U=350$ km/h

$P_1 = \left(\frac{12.75 \times 1.20 \times 0.84 \times 1.22}{1.6} + 0.81\right) \frac{1}{1.6} = 6.53\ t/m^2$

$P_2 = \left(\frac{12.75 \times 1.20 \times 1.16 \times 0.98}{1.6} + 0.81\right) \frac{1}{1.6} = 5.91\ t/m^2$

$P_3 = \left(\frac{4.08 \times 1.20 \times 0.84 \times 1.22}{1.6} + 0.81\right) \frac{1}{1.6} = 3.20\ t/m^2$

$P_4 = \left(\frac{4.08 \times 1.20 \times 1.16 \times 0.98}{1.6} + 0.81\right) \frac{1}{1.6} = 3.77\ t/m^2$

b) a $U=0$ km/h

$P_1 = \left(\frac{12.75 \times 0.84}{1.6} + 0.81\right) \frac{1}{1.6} = 4.69\ t/m^2$

$P_2 = \left(\frac{12.75 \times 1.16}{1.6} + 0.81\right) \frac{1}{1.6} = 6.78\ t/m^2$

$P_3 = (4.08 \times 0.84 + 0.81) \frac{1}{1.6} = 2.65\ t/m^2$

$P_4 = (4.08 \times 1.16 + 0.81) \frac{1}{1.6} = 3.00\ t/m^2$

Tren U.I.C. (cont.): 1530 t/m en 25.00 m

a $U=0$

$P_3 = (3.61 \times 0.84 + 0.81) \frac{1}{1.6} = 4.52\ t/m^2$

$P_4 = (3.61 \times 1.16 + 0.81) \frac{1}{1.6} = 6.05\ t/m^2$

10) DESCARRILAMIENTO DE VEHICULOS

Se considera una carga de 22 to a 2.80 m

del eje de la viga es 20cm a

$d = 1.49 + \frac{1.52}{2} + 2.80 + 0.30 (\text{rigido}) = 5.35$ m del eje del talon

Esta carga se mayorada con $\gamma = 1.00$ por grupo tipo de acción y $\gamma = 1.1$ por ubicación de ubicación

11) Acción sísmica

Sobre el tren IPTF

$$Pe = P_{\perp} = \pm \frac{0.06 \times 30 \times 1.80}{1.50} = \pm 2.30 \text{ t/m}$$

RECIBO DE ESFUERZOS

PARA OBTENER LOS ESFUERZOS QUE SE PRODUCEN EN LA SECCIÓN TRANSVERSAL POR LA ACTUACIÓN DE LAS CARGAS EXTERNAMENTE DESCRITAS SE HAN UTILIZADO 2 MODELOS MATEMÁTICOS DIFERENTES

a) PARA LA ACTUACIÓN DE LAS CARGAS DEBIDAS, O HIDRÁULICAS, ES DECIR

- PESO PROPIO DE LA SECCIÓN
- BALASTO, VÍAS Y TRAVIESAS
- CONDUCTOS DE EVACUACIÓN Y DRENAJE
- SUBBASE Y BANQUETAS
- SOBRECARGA EN ACERAS

SE HA UTILIZADO UN MODELO MATEMÁTICO TIPO "MARCO" EN EL QUE SE HALLA LA DEFORMACIÓN DE LOS

ESTUDIADOS RESPECTO AL MODELO REAL-
TIVO DE LA MITAD DE LA SECCIÓN TRANS-
VERSAL

b) PARA LA RÓTULA DE LA SOBRECARGA
DE TREN DOBLE ESTE MODELO REAL-
TIVO PUEDE TENER INTERPRETACIÓN, DE
EL CONSIDERANDO EL MODELO MATEMÁ-
TICO TIPO "LÁMINA PLEGADA" APLICADA
A UN MEDIO ISOSTÁTICO DE LONGITUD
LA DISTANCIA TEÓRICA ENTRE PUNTOS
DE MOMENTO NULO ES DECIR:

$L = \frac{3}{5}\,40 = 42.00$ metros

LAS SOBRECARGAS CONSIDERADAS EN ESTE
CASO HAN SIDO LAS SIGUIENTES

- UN TREN TIPO A DE LA IAPF-75
- DOS TRENES TIPO A DE LA IAPF-75
- UN TREN UIC MODEL 4
- DOS TRENES UIC MODEL 4
- UN TREN UIC/SW2
- DOS TRENES UIC/SW2

TODOS ELLOS CON LA EXCENTRICIDAD DE
EJENDO DE VÍAS, FUERZA CENTRÍFUGA Y FRENADO
EL COEFICIENTE DE IMPACTO NO SE HA APLI-
CADO A LA CARGA UIC/SW2 YA QUE
ESTA CARGA TIENE CARÁCTER ESTÁTICO (6.3.3)
LA COMPROBACIÓN A FATIGA CONSISTE EN
HALLAR LA VARIACIÓN DE TENSIÓN EN EL
CASO POR EFECTO DE LA CARGA MÓVIL A
950 KG/M² PARA EL VOLADIZO Y A
1825 KG/M² PARA EL VANO DE LA
SECCIÓN TRANSVERSAL EMPLEADA

intecsa

PROYECTO:

EJECUTANTE:

HOJA ___ DE ___

FECHA

En el caso de modelos bidimensionales, en el centro de vano de losa superior:

$\Delta f_{max} = 180$ Nb/mm²

$\gamma_G = 1$ $\gamma_n = 1$ $\gamma_m = 1.20$ $\gamma_F = 1.12$

$\lambda_T = 0.8$ $\gamma_T = 1.12$ $\beta_T = 0.78$

Según Vf

$$\Delta f_{sx} = \frac{180 \times 1 \times 1 \times 1}{1.76 \times 1.12 \times 1.12 \times 0.8 \times 0.78} = 1225 \text{ Kg/cm}^2$$

Según UIC 774-3 R (Ap 8)

$$\Delta\sigma_{ad} = \frac{\Delta f_{sn} \cdot \gamma_n \cdot \gamma_v}{\gamma_m \cdot \gamma_f} \cdot \frac{\Delta}{\gamma_T \cdot \lambda_T \cdot \beta_T}$$

Siendo

$\Delta\sigma_{ad}$ = VALOR DE TENSIÓN EN EL ACERO AL PASO DEL TREN

Δf_{sn} = 180 Nb/mm² (valor del acero a fatiga)

γ_D = 1 (Coef reducción cambios de tensión)

γ_v = 1 (Coef reducción por Nº ciclos de carga)

γ_m = 1.20 (Coef seguridad por fatiga)

γ_f = 1.12 (Coef seguridad de carga)

λ_T = 1.20 (Coef de tráfico)

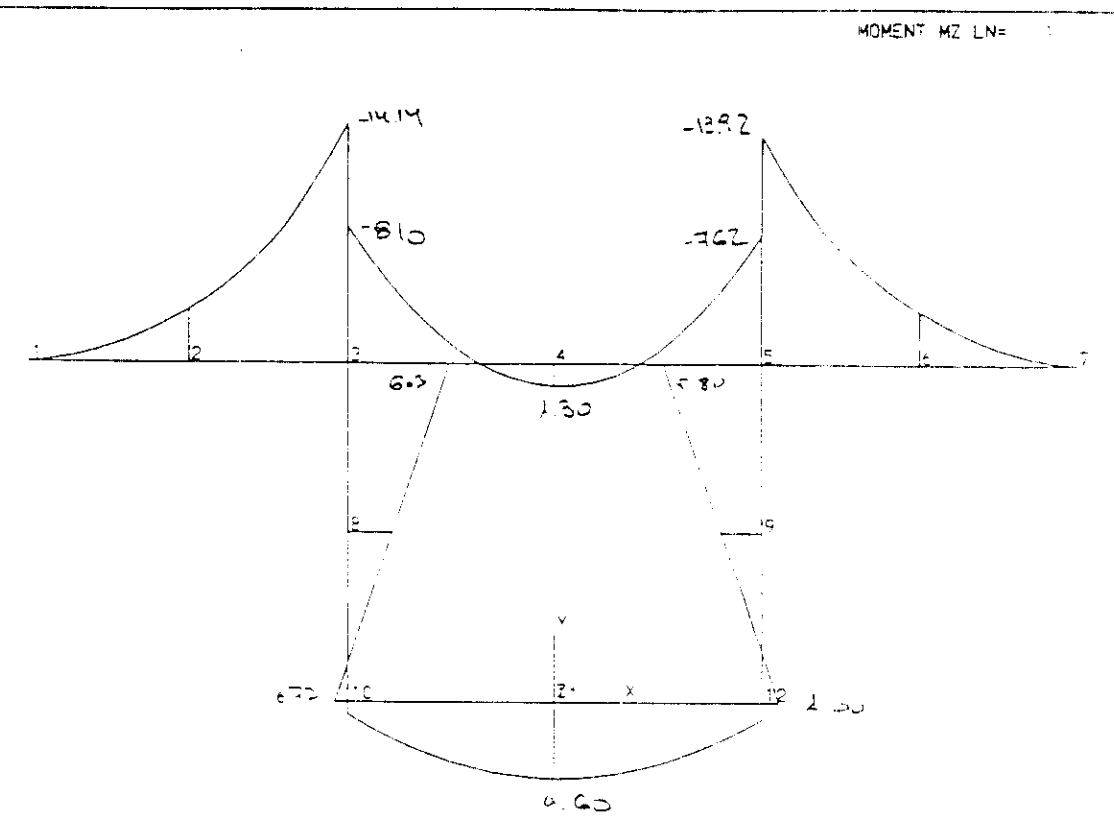
γ = 1.12 (Intensidad de tráfico)

β_T = 1.0 (Vuelo con 2 vías de circulación)

$$\Delta\sigma_{ad} = \frac{180 \times 1 \times 1 \times 1}{1.76 \times 1.12 \times 1.12 \times 1.20 \times 1} = 90 \text{ Kg/cm}^2$$

STRUCTURE DATA

TYPE = PLANE
NJ = 12
NM = 12
NE = 0
NS = 2
NL = 2
XMAX= 13.0
YMAX= 4.5
ZMAX= 0.0



CARGA VIVA

METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)

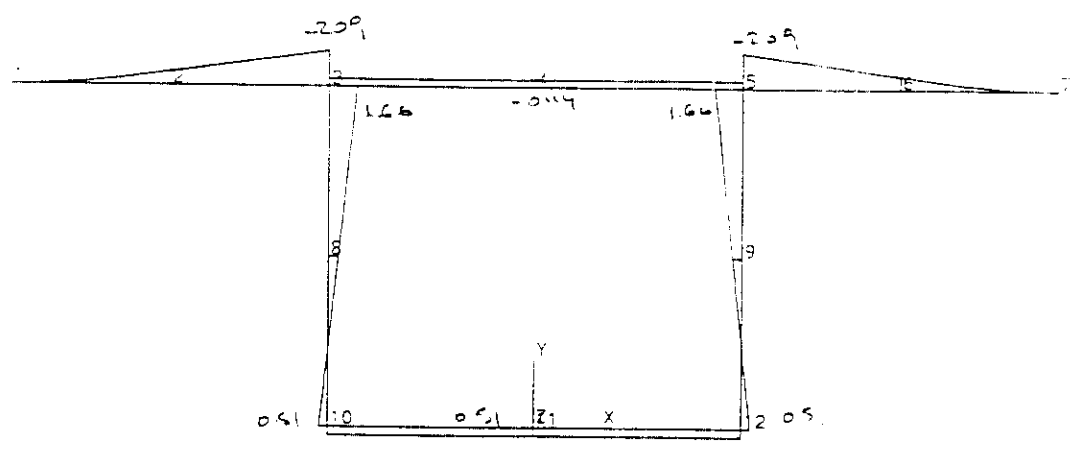
TITLE PUENTE SOBRE EL CINCA - SECCION TRANSVE

DATE APR 10 1997

MOMENT MZ LN= 3

STRUCTURE DATA

TYPE = PLANE
NJ = 12
NM = 12
NE = 0
NS = 2
NL = 2
XMAX= 13.7
YMAX= 4.5
ZMAX= 0.0



SOBRECARGA ACERAS

METE MTON

COMPANY INTECSA

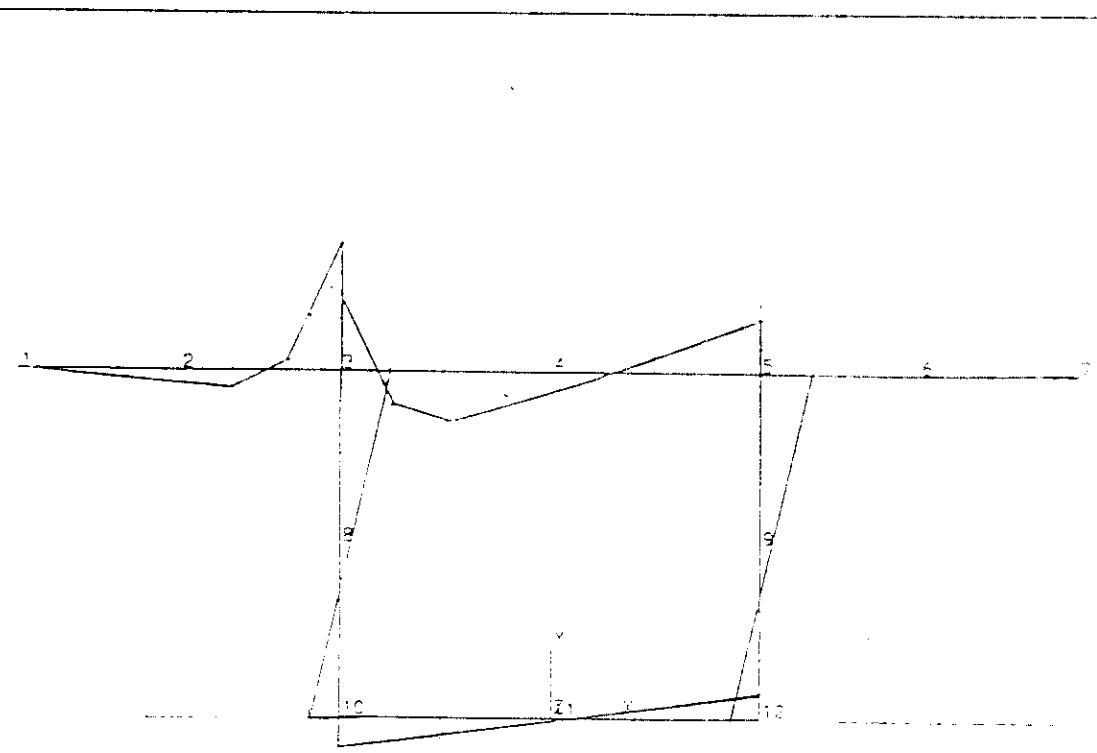
S T A A D P D - P L O T (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - SECCION TRANSVER

DATE APR 10 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 12
NM = 12
NE = 0
NS = 2
NL = 2
XMAX= 13.7
YMAX= 4.5
ZMAX= 0.0

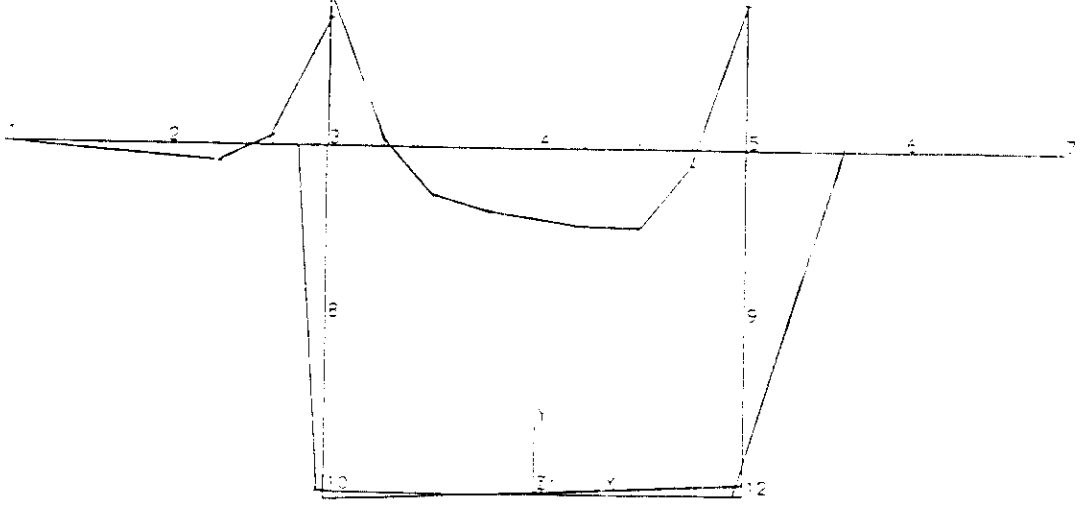


OUTLINE TIPO 1 DE LA IDEA

COMPANY INTEGSA — STAADPRO - PLOT REV 17.0a — DATE APR 8 1997
TITLE PUENTE SOBRE EL DINOA - SECCION TRANSVERSAL

STRUCTURE DATA

TYPE = PLANE
NJ = 12
NM = 12
NE = 0
NS = 2
NL = 2
XMAX= 13.7
YMAX= 4.5
ZMAX= 0.0



DOS NUEVOS TIPO 1 DE LA IDEA

COMPANY INTEGSA — STAADPRO - PLOT REV 17.0a — DATE APR 8 1997
TITLE PUENTE SOBRE EL DINOA - SECCION TRANSVERSAL

STRUCTURE DATA

TYPE = PLANE

NJ = 12

NM = 12

NE = 0

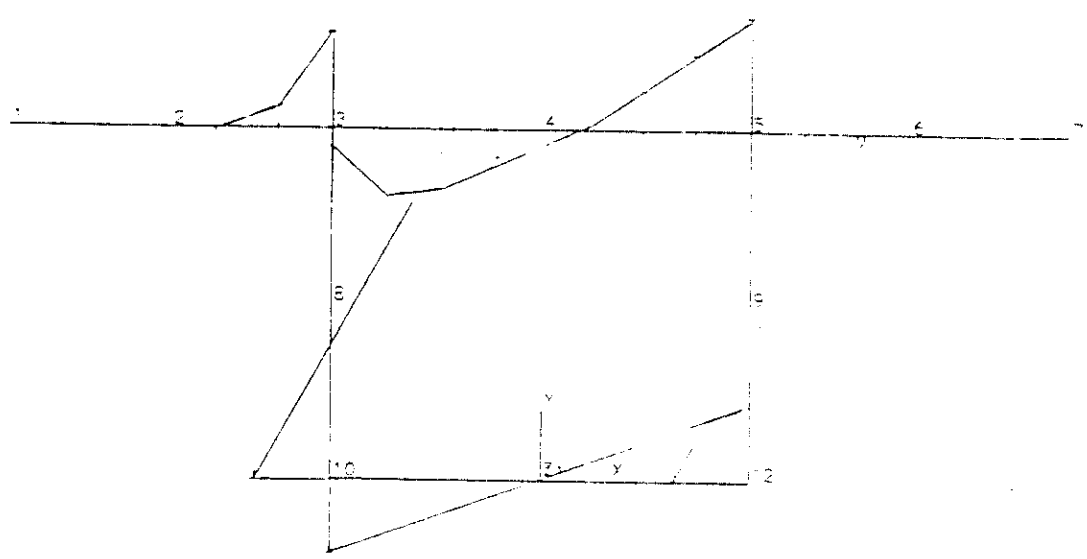
NS = 2

NL = 2

XMAX= 13.7

YMAX= 4.5

ZMAX= 0.0



JUNTOS TIPO B DELANTEROS

COMPANY INTECSA

STAADPRO - PLOT (REV 1.0a)

TITLE PUENTE SOBRE EL DINDA - SECCION TRANSVER

DATE APR 8 1997

STRUCTURE DATA

TYPE = PLANE

NJ = 12

NM = 12

NT = 0

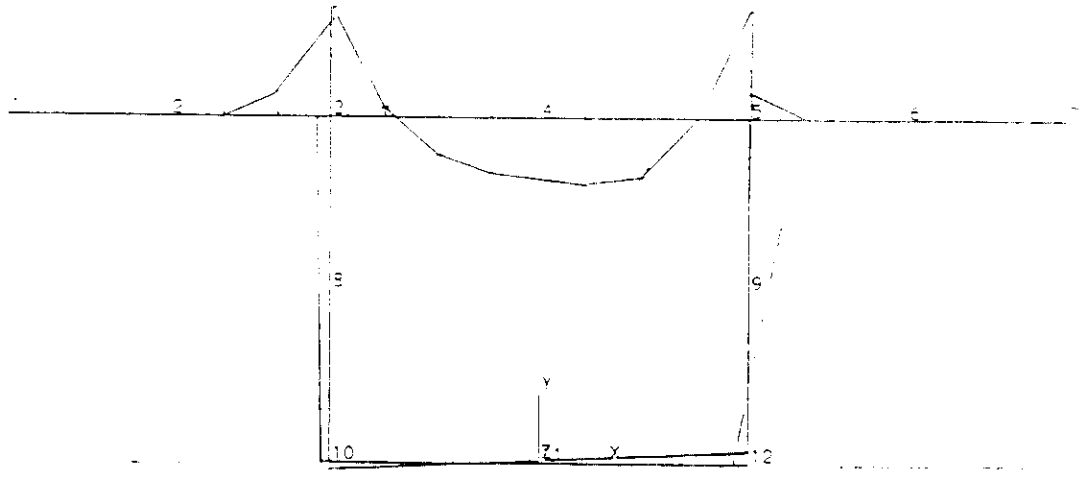
NS = 2

NL = 2

XMAX= 13.7

YMAX= 4.5

ZMAX= 0.0



2 JUNTOS TIPO B DELANTEROS

COMPANY INTECSA

STAADPRO - PLOT (REV 1.0a)

TITLE PUENTE SOBRE EL DINDA - SECCION TRANSVER

DATE APR 8 1997

STRUCTURE DATA

TYPE = PLANE

NJ = 12

NM = 12

NE = 0

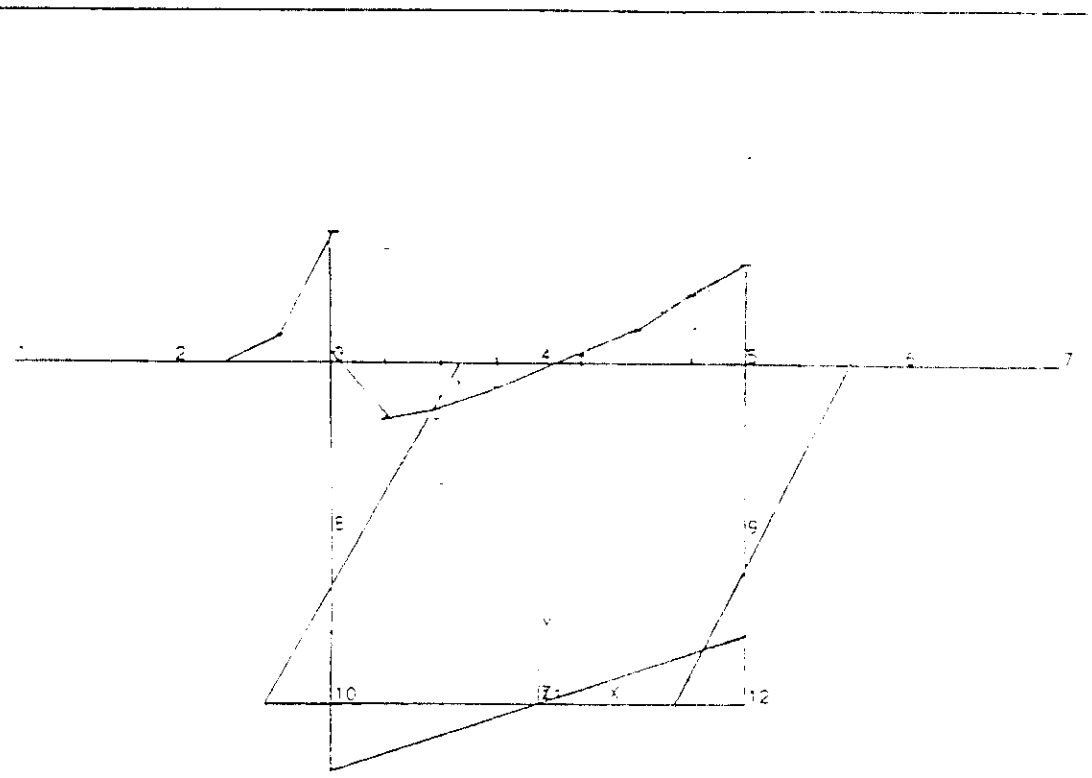
NS = 2

NL = 2

XMAX = 13.7

YMAX = 4.5

ZMAX = 0.0



1 Tramo ic Model 4

COMPAN INTECSA

STAADPD - PLOT (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - SECCION TRANSVER

DATE APR 8 1997

STRUCTURE DATA

TYPE = PLANE

NJ = 12

NM = 12

NE = 0

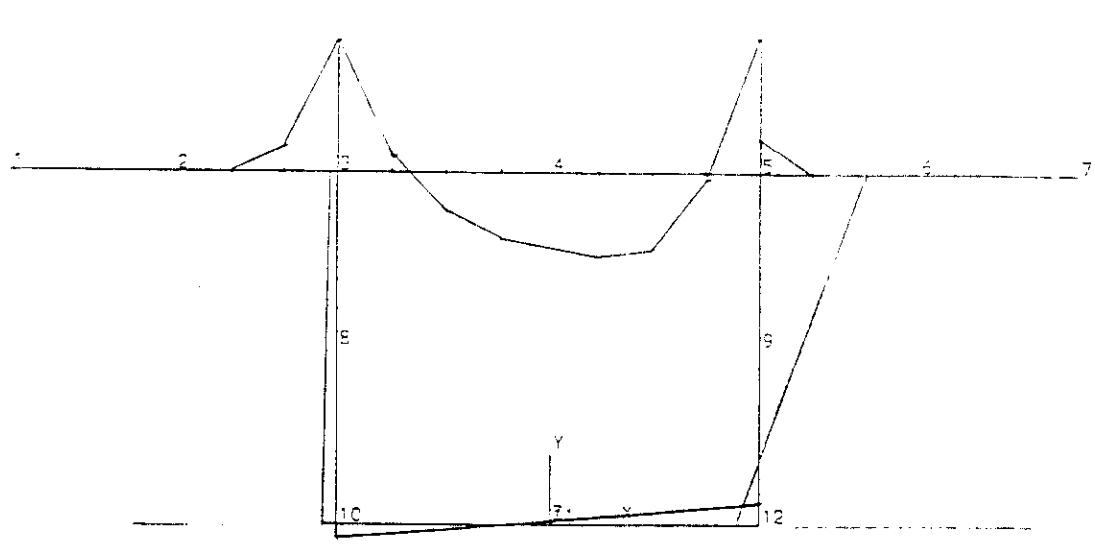
NS = 2

NL = 2

XMAX = 13.7

YMAX = 4.5

ZMAX = 0.0



2 Tramo ic Model 4

COMPAN INTECSA

STAADPD - PLOT (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - SECCION TRANSVER

DATE APR 8 1997

STRUCTURE DATA

TYPE = PLANE

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NM = 12

NE = 0

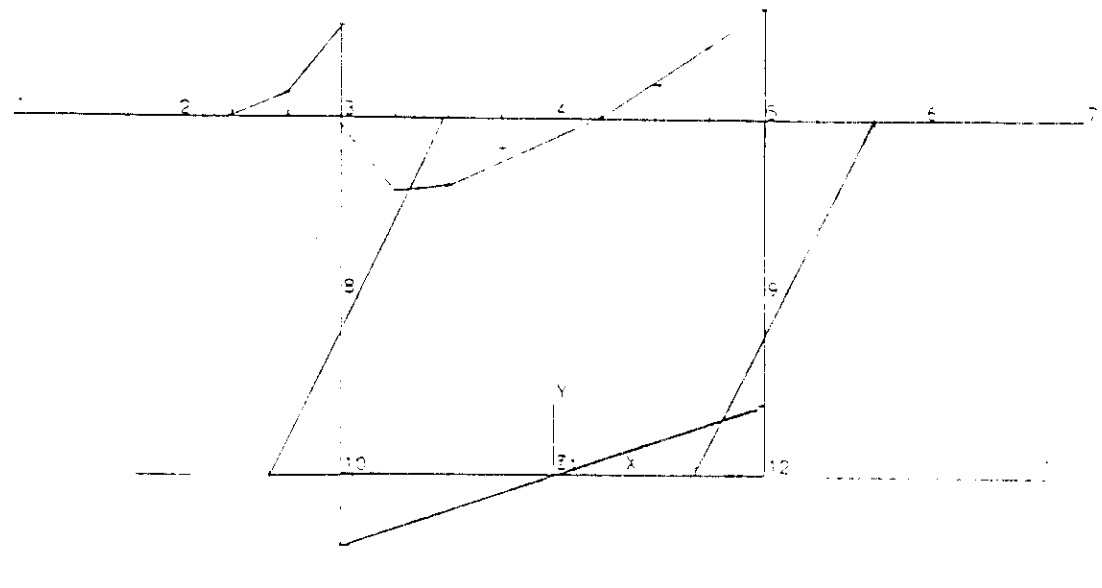
NS = 2

NL = 2

XMAX= 13.7

YMAX= 4.5

ZMAX= 0.0



After UIC model SW2

STRUCTURE DATA

TYPE = PLANE

NJ = 12

NM = 12

NE = 0

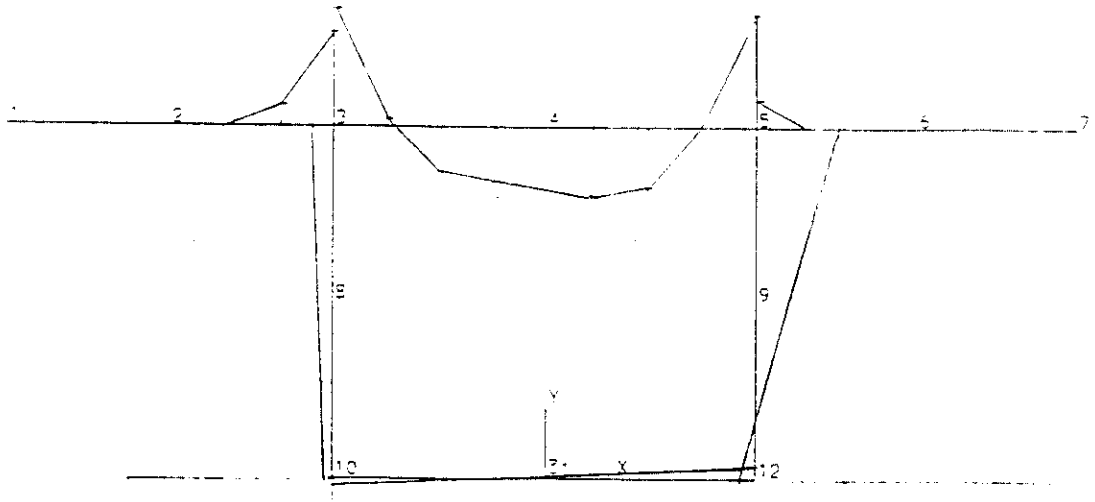
NS = 2

NL = 2

XMAX= 13.7

YMAX= 4.5

ZMAX= 0.0



2 Trees UIC model SW2

CINCATRA.XLS

ENVOLVENTE DE MOMENTOS FLECTORES DE TRENES

	1 IPRT75/A	2 IPRT75/A	1 IPRT75/B	2 IPRT75/B	1 UIC/7	2 UIC/7	1 UIC/SW2	2 UIC/SW2	MAXIMO	MINIMO
	1	2	3	4	5	6	7	8		
1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	2	1.07	1.02	0.01	0.36	0.34	0.03	0.01	1.07	0.00
2	1	1.07	1.02	0.02	0.36	0.34	0.03	0.02	1.07	0.00
2	2	-0.50	-0.59	1.44	-1.65	-1.65	-1.41	-1.41	0.00	-1.65
3	1	-2.50	-0.59	1.44	-1.62	-1.65	-1.41	-1.41	0.00	-1.65
3	2	-2.50	-7.53	-5.77	-7.90	-7.96	-5.66	-5.66	0.00	-7.96
4	1	-4.67	-9.47	1.18	-9.43	-9.30	0.48	-7.00	1.18	-9.47
4	2	2.17	-0.22	4.06	3.29	3.29	4.02	-0.36	4.06	-1.07
5	1	2.17	-0.22	4.06	3.29	3.29	4.02	-0.36	4.06	-1.07
5	2	2.67	2.76	3.63	2.27	3.20	3.76	2.46	3.76	0.00
6	1	2.67	2.76	3.63	2.27	3.20	3.76	2.46	3.76	0.00
6	2	1.33	3.50	1.47	1.23	1.23	1.65	3.37	3.78	0.00
7	1	1.33	3.50	1.47	1.23	1.23	1.65	3.37	3.78	0.00
7	2	0.36	4.65	-0.15	-0.21	-0.21	0.03	4.03	5.01	-0.21
8	1	0.36	4.65	-0.15	-0.21	-0.21	0.03	4.03	5.01	-0.21
8	2	-0.79	4.71	-2.32	-2.11	-2.11	-2.12	3.47	4.71	-2.32
9	1	-0.79	4.71	-2.32	-2.11	-2.11	-2.12	3.47	4.71	-2.32
9	2	-1.92	0.74	-4.49	-4.02	-4.02	-4.29	0.04	0.74	-4.49
10	1	-1.92	0.74	-4.49	-4.02	-4.02	-4.29	0.04	0.74	-4.49
10	2	-3.15	-4.73	-6.68	-5.96	-5.96	-5.49	-4.71	0.00	-8.73
11	1	-3.15	-4.73	-6.68	-5.96	-5.96	-5.49	-4.71	0.00	-8.73
11	2	-0.06	-2.88	-0.01	-0.02	-0.02	-0.01	-1.86	0.00	-2.86
12	1	-0.06	-2.88	-0.01	-0.02	-0.02	-0.01	-1.86	0.00	-2.86
12	2	-0.03	0.16	-0.01	-0.02	-0.02	-0.01	0.01	0.16	-0.03
1	1	-0.03	0.16	-0.01	-0.02	-0.02	-0.01	0.01	0.16	-0.03
1	2	-0.03	0.05	-0.01	-0.01	-0.01	-0.01	0.01	0.05	-0.02
2	1	-0.03	0.05	-0.01	-0.01	-0.01	-0.01	0.01	0.05	-0.02
2	2	-0.02	-0.25	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.02
3	1	-0.02	-0.25	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.02
3	2	0.00	1.93	-6.94	-7.48	-7.48	-6.16	1.31	1.93	-7.48
4	1	-2.71	0.22	4.51	4.20	4.20	4.21	0.43	4.51	0.00
4	2	-1.74	-2.83	-6.67	-5.64	-5.64	-6.46	-2.83	0.96	-8.67
5	1	-3.09	-5.84	4.47	4.05	4.05	4.21	0.79	4.47	0.00
5	2	1.69	0.22	4.51	2.95	2.95	2.94	0.24	4.51	0.00
6	1	1.74	0.22	4.51	2.95	2.95	2.94	0.24	4.51	0.00
6	2	1.18	0.16	3.17	1.72	1.72	1.66	0.05	3.17	0.00
7	1	1.18	0.16	3.17	1.72	1.72	1.66	0.05	3.17	0.00
7	2	0.67	-0.36	1.83	0.51	0.51	0.19	-0.13	1.83	-0.13
8	1	0.67	-0.36	1.83	0.51	0.51	0.19	-0.13	1.83	-0.13
8	2	0.18	-2.06	0.51	-0.10	-0.10	-0.08	-0.46	0.51	-0.46
9	1	0.18	-2.06	0.51	-0.10	-0.10	-0.08	-0.46	0.51	-0.46
9	2	-0.16	-2.17	-0.46	-0.26	-0.26	-0.26	-0.47	0.00	-0.48
20	1	-0.16	-2.17	-0.46	-0.26	-0.26	-0.26	-0.47	0.00	-0.48
20	2	-0.66	-2.27	-1.80	-0.47	-0.47	-0.44	-0.47	0.00	-1.80
21	1	-0.66	-2.27	-1.80	-0.47	-0.47	-0.44	-0.47	0.00	-1.80
21	2	-1.16	-2.38	-3.13	-2.68	-2.82	-2.94	-0.62	0.00	-3.13
22	1	-1.16	-2.38	-3.13	-2.68	-2.82	-2.94	-0.62	0.00	-3.13
22	2	-1.69	-2.55	-4.47	-4.09	-4.05	-4.21	-0.79	0.00	-4.47

infecsa PROYECTO: HOJA 1 DE
EJECUTANTE: FECHA

DISEÑO ESTRUCTURAL SECCIÓN VÍA EN TÚNEL

1) SECCIÓN TIPO ST3

a) TÚNEL INFERIOR

CENTRO DE PRESIÓN (0.60)

CARGAS PERMANENTES $\mu = 4.60$ t/ml ✓

SOBRECARGA $\mu = 0.51$ t/ml ✓

SOBRE TRENES $\mu = 0.17$ t/ml

TENSOR $\omega = 990$ g/ml

$\mu = 4.60 + 0.51 + 0.17 = 5.72$ t/ml

$\mu' = 5.28 \times 1.6 = 8.45$ t/ml

$\omega_T = 577$ g/ml

EMUNTORIO SUP $1/2\,990 = 495$ ∠016/20

AGUADA SUP $1/2\,990 + 577 = 1017$ ∠016/20

EXCENTRICIDAD $e = 0.20$

CARGAS PERMANENTES $\mu = +100$ t/ml

SOBRECARGA $\mu = 0.51$ t/ml

PROYECTO: HOJA 2 DE

EJECUTANTE: FECHA

SOB TIRAS $\mu = 4.51$ mt/ml

BASANTE $\omega = 59.2$ cm²/ml

TENSOR $\omega = 9.90$ cm²/ml

$\mu = 1.00 + 0.71 + 4.11 = 6.02$

$\mu' = 1.6 \times 6.02 = 9.63$ mt

$\omega_f = 3.24$ cm²/ml

SECCION TOTAL NECESARIA

$\omega = 59.2 + 9.9 + 3.24 = 72.3$ cm²/ml

Se dispone 2Ø25/20 + 1Ø16/20 + 2Ø16/20 = 79.4 cm²

b) ALMAS LATERALES e:0.80

A MITAD DE ALTURA

CARGAS PERM $\mu = 0.11 + 0.5(6.30 + 0.11) = 2.63$ t

SOB ACEROS $\mu = 0.51 + 0.5(1.66 + 0.51) = 0.11$ mt

SOB TIRAS $\mu = 4.50 + 0.5(6.94 + 4.50) = 11.22$ mt

CORTANTE $\omega = 504$ cm²/ml (TOTAL) (TIR)

TORSION $\omega = 565$ cm²/ml (TOTAL) (TIR)

PROYECTO: HOJA 3 DE

EJECUTANTE: FECHA

$M = 2.63 + 0.51 + 1.22 = 4.42$ mt

$\mu = 1.6 \times 4.42 = 7.07$ mt

$\omega_f = 2.07$ cm²/ml

ARMADURA TOTAL NECESARIA

$\omega = 504 + 565 + 207 = 58.12$ cm²/ml

Se dispone cercos Ø20/10 → 62.8 cm²/ml

EN EXTREMOS e=0.80

CARGAS PERMANENTES $\mu = 6.03$ mt

SOB ACEROS $\mu = 1.66$ mt

SOB TIRAS $\mu = 7.48$ mt

CORTANTE $\omega = 504 \times \left(1 - \frac{1.39^2}{1.99^2}\right) = 25.7$ cm²/ml

TORSION $\omega = 565$ cm²/ml

$\mu = 6.03 + 1.66 + 7.48 = 15.17$ mt

$\mu = 15.17 \times 1.6 = 24.27$

$\omega_f = 7.10$ cm²/ml

ARMADURA TOTAL PROCESADA

$w = 25.60 + 7.81 + 1.10 = 34.51$ kg

De la descarga $cb20/10 = 62.10$ cm²/ml

d) VOLADIZO $\theta = 11 + 0.43 + 0.15 = 11.58$

CARGA PERM.	$\mu = -14.14$ mt/ml
SOB. ACERAS	$\mu = -2.09$ mt/ml
SOB. TIERRAS	$\mu = -1.96$ mt/ml
RESULTE	$w = 122$ cm²/ml

$\mu = 14.14 + 2.09 + 1.96 = 24.19$ mt/ml

$\mu' = 1.6 \times 24.19 = 38.70$ mt

$w_F = 16.18$ cm²/ml

POR CONDICIÓN DE FATIGA

$w_F > \frac{1.96}{0.95 \times 0.50} = 16.15$ cm²/ml

ARMADURA TOTAL PROCESADA

$w_T = 16.15 + 52.2 = 68$ cm²/ml

De proyecto $6\phi 25/m = 6 \times 10.65 = 64/m = 63.9$ cm²/ml

d) LOSA SUPERIOR

Espesor de losa	$\theta = 0.43$
CARGA PERMANENTE	$\mu = +1.30$ mt/ml
SOBRECARGAS ACERAS	$\mu = -0.44$ mt/ml
SOBRE C. TIERRA	$\mu = 5.01$ mt/ml
TOTALES	$w = 9.90$ cm²/ml

$\mu = 1.30 + 5.01 = 6.31$ mt/ml

$\mu' = 6.31 \times 1.6 = 10.0$

$w_F = 6.15$ cm²/ml

POR FATIGA

$w_F > \frac{5.01}{\text{Resorte}} = 6.86$ cm²/ml

De Diseño $\phi 16/15 = 13.46$ cm²/ml

Ø ARMADURA $\theta = 0.43 + 0.248 + 0.36 = 0.68$

CARGA PERMANENTE $\mu = -8.10$ mt/ml

SOB. ACERAS $\mu = -0.44$ mt/ml

SOB. TIERRAS $\mu = -9.42$ mt/ml

BASICA $w = 39.1 \text{ cm}^2/\text{ml}$

TORSION $w = 9.90 \text{ cm}^2/\text{ml}$

$\mu = 8.10 + 0.44 + 9.47 = 18.01$

$w = 16 \times 18.01 = 288.1 \text{ ml/ml}$

$w_T = 103 \text{ cm}^2/\text{ml}$

POR FATIGA $w_T > \frac{947}{1.925 \times 0.63} = 8.23 \text{ cm}^2/\text{ml}$.

ARMADURA TOTAL EN LA SECCION

$w_T = 8.23 + 39.1 + 9.90 = 57.23 \text{ cm}^2/\text{ml}$

En la dirección $\phi 25/15 + \phi 16/15 + \phi 16/15 = 59.66$

2) Sección TIPO ST2

a) TABLA MEFEMOR

CENTRO DE PLACA	(Coda)
CARGA PERMANENTE	$\mu = 4.60 \text{ mt/ml}$
SOB. ACERAS	$\mu = 0.51 \text{ mt/ml}$
SOB TRENES	$\mu = 0.17 \text{ mt/ml}$
TORSOR	$w = 8.75 \text{ cm}^2/\text{ml}$

$\mu = 4.60 + 0.51 + 0.17 = 5.28 \text{ mt/ml}$

$\mu = 16 \times 5.28 = 84.5 \text{ mt/ml}$

$w_T = 5.27 \text{ cm}^2/\text{ml}$

ARMAD SUP $\frac{1}{2} 875 + 44 \text{ cm}^2/\text{ml}$ $\phi 16/15$

ARMA INF $\frac{1}{2} 875 + 527 = 962 \text{ cm}^2/\text{ml}$ $\phi 16/15$

ARMADURA EQUIVALENTE

CARGA PERMANENTE $\mu = 4.60 \text{ mt/ml}$

SOB aceras $\mu = 0.51 \text{ mt/ml}$

Sob Tiros $\mu = -4.51$ mt/ml

Vasos $\omega = 52.9$ cm²/ml

Torsor $\omega = 8.75$ cm²/ml

$\mu' = 6.02 \cdot 1.6 = 9.63$ mt/ml

$\omega_T = 8.24$ cm²/ml

Seccion total necesaria

$\omega_T = 52.90 + 8.75 + 3.24 = 64.9$ cm²/ml

ϕ disco $4616/12.5 = 64.64$ cm²/ml

5) ALMAS LATERALES e=0,60

A CUATRO DE ALTURA

CARGA PERM $\mu = -0.77 + 0.5(6.30 + 0.77) = 2.63$ t

SOB CARGAS $\mu = -0.11 + 0.5(1.66 + 0.61) = 0.52$ mt

Sob-Tiros $\mu = -4.50 + 0.5(6.94 + 4.50) = 1.22$ mt

Cortante $\omega = 40$ cm²/ml

Torsion $\omega = 8.75$ cm²/ml

$\mu = 2.63 + 0.52 + 1.22 = 4.42$ mt

$\mu' = 1.6 \times 4.42 = 7.07$ mt

$\omega_T = 7.07$ cm²/ml

ARMADO TOTAL NECESARIO

$\omega_T = 40,0 + 8.75 + 2.07 = 50.82$ cm²/ml

ϕ Discos cerrados $\phi 20/12.5 = 50.24$

EN EXTREMOS e=060

CARGAS PERMANENTES $\mu = 6.03$ mt

Sob cargas $\mu = 1.66$ mt

Sob Tiros $\mu = 1.48$ mt

Cortante $\omega = 40\left(1 - \frac{1.39^2}{1.917^2}\right)$

Torsion $\omega = 8.75$ cm²/ml

$\mu = 6.03 + 1.66 + 1.48 = 15.17$ mt/ml

$\mu = 15.17 \times 1.6 = 24.24$ cm²/ml

$\omega_T = 9.60$ cm²/ml

ARMADURA TOTAL PRECEDENTE

$w = 2.01 + 2.25 + 9.60 = 38.35$ cm²/ml

8 diám. cm. Ø20/12.5

e) VOLADIZO $e = 0.14 + 0.23 + 0.25 = 0.554$

CARGA PERMANENTE	$M = -1.14$ mt/ml
SOBRECARGA	$M = -2.09$ mt/ml
Sob. tierras	$M = -1.96$ mt/ml
RESULTE	$M = -5.19$ mt/ml

$M = 1.14 + 2.09 + 1.96 = 24.19$ mt

$M' = 1.6 \times 24.19 = 38.70$ mt/ml

$w_f = 16.8$ cm²/ml

POR CONDICIÓN DE FATIGA

$w_f = \frac{1.96}{0.95 \times 0.40} = 16.15$ cm²/ml

ARMADURA TOTAL PRECEDENTE

$w_T = 16.15 + 11.53 = 62.05$ cm²/ml

8 diám. Ø12/15 Ø16/15 + Ø16/15 = 66.0 cm²

d) LOSA SUPERIOR

CENTRO DE APOYO	$e = 0.43$
CARGA PERMANENTE	$M = 1.30$ mt/ml
Sob. ACERA	$M = -0.44$ mt/ml
Sob. tierras	$M = 5.01$ mt/ml
TOTAL	$w = 9.25$ cm²/ml

$M = 1.30 + 5.01 = 6.31$ mt/ml

$M' = 1.6 \times 6.31 = 10.0$ mt/ml

$w_f = 6.15$ cm²/ml

POR FATIGA

$w_f = \frac{10.1}{1.875 \times 0.4} = 6.86$ cm²/ml

8 diám Ø16/15

EN APOYOS $e = 0.68$

CARGA PERMANENTE	$M = -8.10$ mt
SOBRECARGA	$M = -0.44$ mt
SOB. tierras	$M = -9.42$ mt

PESO PROPIO $w = 3.39$ t/m²

TOTAL $w = 8.10$ t/m²

$M = 8.10 \times 0.44 \times 9.45 = 18.01$ mt

$M' = 1.6 \times 18.01 = 28.81$ mt/m

$w_F = 10.31$ t/m²

DOS TRENES

$$w > \frac{9.47}{0.65 \times 1.225} = 11.97 \text{ t/m}^2 \quad \phi 16/15$$

ARMADO TOTAL EN LA SECCION

$w_T = 10.31 + 3.39 + 8.15 = 21.96$ t/m²

Se dispone $\phi 25/15 + \phi 16/15 + \phi 16/15 = 21.96$ t/m²

3) SECCION TIPO ST1

a) PLACA INFERIOR

CENTRO DE PLACA ($e = 0.40$)

CARGAS PERMANENTES $M = 4.60$ mt/m

SOBRECARGA $M = 0.51$ mt/m

SOBRETENSION $M = 0.17$ mt/m

TOTAL $w = 7.64$ t/m²

$M = 4.60 + 0.51 + 0.17 = 5.28$ mt/m

$M' = 5.28 \times 1.6 = 8.45$ mt/m

$w_F = 5.22$ t/m²

ARMADO SUPERIOR $1/2\ \phi 16 = 3.82$ t/m²

ARMADO INFERIOR $1/2\ \phi 16 + \phi 22 = 9.01$ t/m²

Apoyo $e = 0.70$

CARGAS PERMANENTES $M = +1.00$ mt/m

SOBRECARGAS $M = 0.51$ mt/m

SOBRETENSIONES $M = -4.51$ mt/m

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PROYECTO:

HOJA 14 DE

PEDIANTE:

FECHA:

Pisique $\omega = 4.18$ cm/ml

Cortante $\omega = 1.64$ cm/ml

$\mu = 1.00 + 0.51 + 4.51 = 6.02$ mt/ml

$\omega = 16 / 6.02 = 9.63$ kg/ml

$\omega_F = 3.24$ cm/ml

Seccion total necesaria

$\omega = 4.18 + 1.64 + 3.24 = 5.264$ cm/ml

Se dispone $\phi 16/15 \Rightarrow 5.386$ cm/ml

b) ALMAS LATERALES $e = 0.60$

A mitad de altura

CARGA PERM	$\mu = 2.63$ mt/ml
SOB ACCID	$\mu = 0.54$ mt/ml
SOB TREVES	$\mu = 1.22$ mt/ml
CORTANTE	$\omega = 2.89$ cm/ml
TORSOR	$\omega = 1.64$ cm/ml

$\mu = 2.63 + 0.54 + 1.22 = 4.42$ mt

$\mu = 1.6 \times 4.42 = 1.07$ mt

$\omega_F = 2.07$ cm/ml

ARMADURA TOTAL NECESARIA

$\omega = 2.89 + 1.64 + 2.07 = 38.61$ cm/ml

Se dispone $\phi 20/15 \Rightarrow 2 \times 3.14 \times 6.66 = 111.82$/ml

LOS EXTREMOS $e = 0.60$

CARGA PERMANENTE	$\mu = 6.03$ mt
SOB ACCID	$\mu = 1.66$ mt
SOB TREN	$\mu = 7.48$ mt
CORTANTE	$\omega = 7.89 \times \left(1 - \frac{12.92}{19.97}\right) = 1.47$
	$\omega = 5.65$ cm/ml
TORSOR	

$\mu = 6.03 + 1.66 + 7.48 = 15.17$ mt

$\mu = 1.6 \times 15.17 = 24.27$ mt

$\omega_F = 9.66$ cm/ml

ARMADURA TOTAL NECESARIA

$W_T = 14.17 + 7.65 + 9.80 = 29.95 \text{ cm}^2/\text{ml}$

Se dispone $\phi 20/15$

c) VOLADIZO $e = 0.15$ m

CARGA PERMANENTE	$\mu = 1.14$ mt/ml
SOB. ACCID.	$\mu = 2.09$ mt/ml
SOB. NIEVE	$\mu = 1.96$ mt/ml
DISEÑO	$\mu = 35.8$ cm²/ml

$\mu = 1.14 + 2.09 + 1.96 = 24.19$ mt

$\mu' = 24.19 \times 1.6 = 38.70$ mt/ml

$W_F = 16.8$ cm²/ml

POR CONDICION DE FATIGA

$W_F > \frac{1.96}{0.95 \times 0.50} = 16.15$ cm²/ml ($\phi 20/15$)

ARMADURA TOTAL NECESARIA

$W_T = 16.15 + 35.8 = 51.95$ cm²

Se dispone $\phi 20/15 + \phi 16/15 = \phi 16/15 = 47.36$ cm²/ml

losa SUPERIOR

CENTRO DE VANO $e = 0.63$

CARGAS PERMANENTES	$\mu = 1.30$ mt/ml
SOB. ACCID.	$\mu = -0.69$ mt/ml
SOB. NIEVE	$\mu = 5.01$ mt/ml
TOTALES	$W = 1.64$ cm²/ml

$\mu = 1.30 + 5.01 = 6.31$ mt/ml

$\mu' = 1.6 \times 6.31 = 10.0$ mt/ml

$W_F = 6.15$ cm²/ml

POR FATIGA

$W_F > \frac{5.01}{1.875 \times 0.40} = 6.80$ cm²/ml

Se dispone $\phi 16/15$

EN APOYOS $e = 0.68$

CARGA PERMANENTE	$\mu = -8.10$ mt/ml
SOB. ACCID.	$\mu = -0.44$ mt/ml
SOB. NIEVE	$\mu = 9.47$ mt/ml

PESO DE LA SECCION $w = 268$ ton/ml

TORRETA $w = 1.61$ ton/ml

$M_{max} = 8.50 \times 0.44 + 9.47 = 18.01$

$M_{max} = 16 \times 18.01 = 288.16$ mt

$W_E = 1031$ cm³

POR FATIGA

$W_F > \frac{947}{0.65 \times 1.425} = 1498$ cm³ (Ø6/15

PESO DE TODA LA SECCION

$W_T = 1.98 + 2.68 + 1.61 = 6.27$ ton/ml

Se ha dispuesto Ø7.0/15 + Ø16/15 + 6/16/15 = 4192 cm²

4) Seccion TIPO ST Ø

VER SECCION ST Ø DE VANO DE 70.00 m

DIMENSIONAMIENTO SECCION VANO 580 m

1) SECCION TIPO ST 2

a) TORRE INTERMEDIA

CENTRO DE PLACA	$M = 4.60$ mt/ml
POR ACCION	$M = 0.51$ mt/ml
POR VIENTO	$M = 0.14$ mt/ml
TORSOR	$\omega = 8.75$ mt/m

VER SECCION ST3 en 70 m

b) DIAGS INTERMEDIAS e = 0.60

POR ALTURA	$M = 2.63$ mt/ml
CARG PERMANENTE	$M = 0.57$ mt/ml
POR VIENTO	$M = 1.22$ mt/ml
CONTINUE	$\omega = 39.6$
TORSOR	$\omega = 1.61$ cm²/ml

VER SECCION ST 2 e 70 m

EN EXTREMOS

CARGAS PERMANENTES $\mu = 6.08 \text{ mt/m}$

SOBRECARGA $\mu = 1.66 \text{ mt/m}$

SOBRECARGA $\mu = 7.18 \text{ mt/m}$

CORTANTE $\omega = 39.6\left(1 - \frac{1.387^2}{19.2^2}\right) = 39$

TORSION $\omega = 565 \text{ cm/m}$

VER SECCION ST2 e.70 m

c) VOLADIZO e: 0.55 m

CARGA PERMANENTE $\mu = -14.14 \text{ mt/m}$

SOBRECARGA $\mu = -2.09 \text{ mt/m}$

SOBRECARGA $\mu = -7.96 \text{ mt/m}$

CORTANTE $\omega = 43.7 \text{ cm/m}$

VER SECCION ST2 e.70 m

d) LOSA SUPERIOR

CENTRO DE VANO e: 0.43 m

CARGAS PERMANENTES $\mu = 1.30 \text{ mt/m}$

SOBRECARGA $\mu = -0.44 \text{ mt/m}$

SOBRECARGA $\mu = 5.01 \text{ mt/m}$

TORSION $\omega = 875 \text{ cm/m}$

$\mu = 1.30 + 5.01 = 6.31 \text{ mt/m}$

$M = 1.6 \times 6.31 = 10.0 \text{ mt/m}$

VER SECCION ST2 e.70 m

EN EMPOTRE e: 0.69

CARGA PERMANENTE $\mu = -8.10 \text{ mt/m}$

SOBRECARGA $\mu = -0.44 \text{ mt/m}$

SOBRECARGA $\mu = 6.67$

CORTANTE $\omega = 327 \text{ cm/m}$

TORSION $\omega = 875 \text{ cm/m}$

VER SECCION ST2 VANO 70 m

2) SECCIÓN TIPO ST1

a) PILAS INTERIOR

CENTRO DE PILAS (e=0.40)

CARGA PERMANENTE	μ= 1.60 mt/m
SOB ACERA	μ= 0.51 mt/m
SOB TANDEM	μ= 0.11 mt/m
TORSOR	ω= 1.61 mt/m

Ver sección ST1 en vano 90 m

ARRANQUE (e=0.70)

CARGA PERMANENTE	μ= 1.00 mt/m
SOB ACERA	μ= 0.51 mt/m
SOB TANDEM	μ= 0.51 mt/m
RESBALE	ω= 30.1 cm²/m
TORSOR	ω= 1.64 mt/m

Ver sección ST1 en vano 70 m

b) PILAS EXTREMAS e=0.60

ALTURA ALTURA

CARGA PERMANENTE	μ= 2.63 mt/m
SOB ACERA	μ= 0.51 mt/m
SOB TANDEM	μ= 1.22 mt/m
CONTORNO	ω= 30.7 cm²/m
TORSOR	ω= 1.61 mt/m

Ver sección ST1 vano 90 m

EN EXTREMOS

CARGA PERMANENTE	μ= 6.03 mt
SOB ACERA	μ= 1.66 mt
SOB TANDEM	μ= 1.48 mt
CONTORNO	$\omega = 30.7\left(1-\frac{138.7^2}{199^2}\right) = 15.6$
TORSOR	ω= 1.65 cm²/m

Ver sección TIPO ST1 en vano 70 m

c) VOLADIZO e=0.55

CARGA PERM	μ = 1414 mt
SOB ACERAS	μ = 200 mt
SOB TREN	μ = 496 mt
RESIST	ω = 360 cm²/m

Ver Sección ST1 vano 10m

d) LOSA SUPERIOR

PESO DE LOSA e=0.13m	
CARGA PERMANENTE	μ = 1.30 mt/m
SOB ACERAS	μ = -0.60 mt/m
SOB TREN	μ = 501 mt/m
TORSION	ω = 164 cm²/m

Ver Sección ST1 vano 10m

EN DIRECCIÓN LONG

CARGA PERMANENTE	μ = -8.10 mt/m
SOB ACERAS	μ = -0.44 mt/m

Sob tren	μ = 947 mt/m
Resist	ω = 270 cm²/m
torsion	ω = 164 cm²/m

Ver Sección ST1 en vano 10m

3) Sección tipo STφ'

a) TABLA I: EFEMOR (e:0 m)

CENTRO DE PLACA	$\mu = 4.60$ mt/m
SOB ACERO	$\mu = 0.51$ mt/m
SOB TIRANTES	$\mu = 0.14$ mt/m
TORSOR	$\omega < 8.75$ cm²/m

$\mu = 4.60 + 0.51 + 0.14 = 5.28$ mt/m

$\mu' = 5.28 \times 1.6 = 8.45$ mt/m

$\omega_T = 5.22$ mt/m

ARMADO SUP	$1/2\ 8.75 = 4.37$	∠ φ16/15
ARMADO INF	$4.37 + 5.22 = 9.59$	∠ φ16/15

ARMADO e:0.10

CARGAS PERMANENTES	$\mu = 1.00$ mt/m
SOB ACERO	$\mu = 0.11$ mt/m
SOB TIRANTES	$\mu = 1.51$ mt/m
TORSOR	$\omega = 3.09$ cm²/m

TORSOR $\omega < 8.75$ cm²/m

$\mu = 5.00 + 0.51 + 0.51 = 6.02$ mt/m

$\mu' = 1.6 \times 6.02 = 9.63$ mt/m

$\omega_T = 8.24$ cm²/m ∠ φ16/15

SECCIÓN TOTAL NECESARIA

$\omega_T = 8.24 + 8.75 + 3.09 = 15.08$ cm²/m

Se dispone φ16/15 → 13.86 cm²/m

b) ALAS INTERIOR e:0.60

ALTURA DE ALTURA

CARGAS PERM	$\mu = 2.63$ mt/m
SOB ACERO	$\mu = 0.51$ mt/m
SOB TIRANTES	$\mu = 1.22$ mt/m
CORTANTE	$\omega = 2.85$ cm²/m
TORSOR	$\omega < 5.65$ cm²/m

$\mu = 2.63 + 0.51 + 1.22 = 4.42$ mt/m

$\mu' = 4.42 \times 1.6 = 7.07$ mt/m

ω_T = 2.54 ton/ml

ARMADURA TOTAL LONGITUDINAL

ω_T = 20.85 + 5.65 + 2.54 = 78.54

1ª DISPOSICIÓN Ø20/20 → 31.40 ton/ml

EN EXTREMOS e=0.60

CARGA PERMANENTE	μ = 6.03 mt
SOB. SOBRECARGA	μ = 1.66 mt
SOB. VIENTO	μ = 7.48 mt

CORTANTE ω = 20.85 (1 − 1.38²/19.77²) = 19.06

TORSOR ω = 5.65 ton/ml

μ = 6.03 + 1.66 + 7.48 = 15.17 mt/ml

μ' = 15.17 × 1.6 = 24.27 mt/ml

ω_T = 9.60 ton/ml

ARMADURA TOTAL NECESARIA

ω_T = 19.06 + 5.65 + 9.60 = 25.85 < Ø20/20

e) VOLADIZO e=0.55 m

CARGA PERMANENTE	μ = −14.14 mt/ml
SOB. SOBRECARGA	μ = −7.09 mt/ml
SOB. VIENTO	μ = −7.96 mt/ml
PANDEO	ω = 2.64 ton/ml

μ = −14.14 − 7.09 − 7.96 = 24.19 mt/ml

μ' = 24.19 × 1.6 = 38.70 mt/ml

ω_T = 16.8 ton/ml

POR FATIGA

$\omega_F > \frac{7.96}{0.95 \times 0.50}$ = 16.75 ton/ml

ARMADURA TOTAL NECESARIA

ω_T = 2.64 + 16.75 = 43.15 ton/ml

1ª DISPOSICIÓN Ø20/15 + Ø16/15 + Ø16/15 = 47.8 ton/ml

d) LOSA SUPERIOR

CANTO DE LOSA	e = 0.43
CARGA PERMANENTE	μ = +1.30 mt/ml

intecsa PROYECTO: HOJA ___ DE ___
FECHA
EJECUTANTE:

SOBRE RECTOR: M = -0.44 mt/ml

SOBRE TRAMO: M = 5.01 mt/ml

TORTON: w < 1.81 cm²/ml

M = 1.30 + 5.01 = 6.31 mt/ml

M' = 1.6 × 6.31 = 10.09

$w_F = 6.15$ cm²/ml

DON ANTIGA

$w_F > \frac{5.01}{1.225 \times 0.60} = 6.86$ cm²/ml

Se dispone Ø16/20

EL RECUBRIMIENTO: 0.068

CARGA DE MUERTE: M = -8.10 mt

Sob acera: M = -0.44 mt

Sob tramo: M = -9.47 mt

PESO PROPIO: w = 12.68 cm²/ml

TORTON: w = 7.85 cm²/ml

M = 8.10 + 0.44 + 9.47 = 18.01 mt/ml

M' = 1.6 × 18.01 = 28.81 mt/ml

intecsa PROYECTO: HOJA ___ DE ___
FECHA
EJECUTANTE:

$w_F = 9.21$ cm²/ml

DON ANTIGA

$w_F > \frac{9.47}{1.225 \times 0.60} = 12.89$ cm²/ml

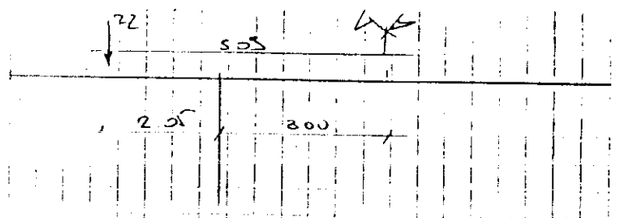
ARMADURA TOTAL EN LA SECCION

$w_T = 9.21 + 2.69 + 1.85 = 13.8$ cm²/ml

Se dispone Ø20/15 + 2 Ø16/20 = 20.93 + 20.2 = 41.1

COMPROBACION SITUACION DE DESCIMBRADO

1) $Q = 22.10$ t ACTUANDO A 2.8 m del eje de losa adosa del ripado con. pendiente



$M_{EC} = 1.49 + 5.16 + 12.80 = 55$

El momento de volcadizos

$M = \frac{\pi \cdot 2}{3} = 2.09$ m³/ml

Este momento se aplica con $\gamma=1$ en lo que se comprueba con

$\mu = 4.0 \text{ kt/m} < 1.96 \times 1.6$

2) CARGA DE 22.0 t en el centro de la losa

Sumamos

Según EH-91 caso $L_x > 3 \times L_y$ $(K = 2/3)$

$b = \frac{3}{4} 1.60 + \frac{3}{4} \times \frac{2}{3} \times 6.00 = 1.20 + 3.0 = 4.20$

$\mu = \frac{1}{4.20} \times \frac{22.0 \times 6}{8} = 3.92 \text{ mt/m} < 5 \times 1.6$

3) CARGA lineal de 5 t/m a 2.2 del eje de la viga

$\mu = 5 \times 2.05 = 10.25 < 1.6 \times 1.96 = 12.74$

4) CARGA lineal de 5 t/m en el centro de la losa

Sumamos

$\mu = \frac{5 \times 1.40}{2} = 3.27 < 5.0 \times 1.6$

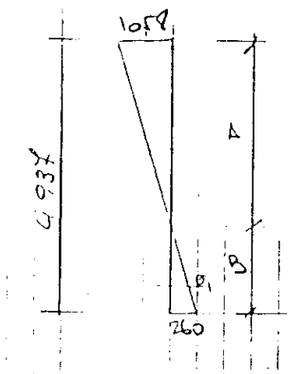
ARMADURA LONGITUDINAL

a) POR FLEXIÓN LONGITUDINAL

DEL MOMENTO DE TORSIÓN EN EL HORMIGÓN

(construcción no hay tracciones / el caso de la fase de empuje no tratada en el capítulo correspondiente)

Sección 6 $\quad \sigma_S = -990 - \frac{922}{13.48} = -1058 \text{ T/m}^2$



$\sigma_1 = +330 - \frac{922}{13.48} = +260 \text{ T/m}^2$

El término $\frac{922}{13.48}$ es el momento adicional de 2674 ϕ36 situado en el eje de las armaduras.

$\frac{B}{260} = \frac{A}{1058} = \frac{4.937}{13.12}$ $\quad B = 097$

$\sigma_1 = 260 \times \frac{0.37}{0.97} = 153 \text{ T/m}^2$

EL PRETENSADO EN LA ZONA TRACCIONADA SE

$A_{Tp} = (6 \times 12 + 11 \times 19) \times 1{,}43 = 457\ cm^2 > 146{,}4\ cm^2$

Sección 11

$$\sigma_s = 320 - \frac{922}{13{,}48} = +252\ t/m^2$$

$$\sigma_i = -1550 - \frac{922}{13{,}48} = -1616\ t/m^2$$

$$\frac{B}{252} = \frac{\Delta}{1616} = \frac{4.937}{1.968} \qquad B = 0{,}64$$

$$\sigma_i = 252 \times \frac{0{,}64 - 0{,}61}{0{,}64} = 11{,}7\ t/m^2$$

EL AREA TRACCIONADA ES

$$A_{ef} = 0{,}64 \times 120 + 13{,}70\,(0{,}43) = 0{,}854 + 5{,}89$$

$$= 6.694\ m^2 = 66940\ cm^2$$

$$\frac{A_{ef}}{20} = 334{,}7\ cm^2$$

El pretensado en la zona traccionada

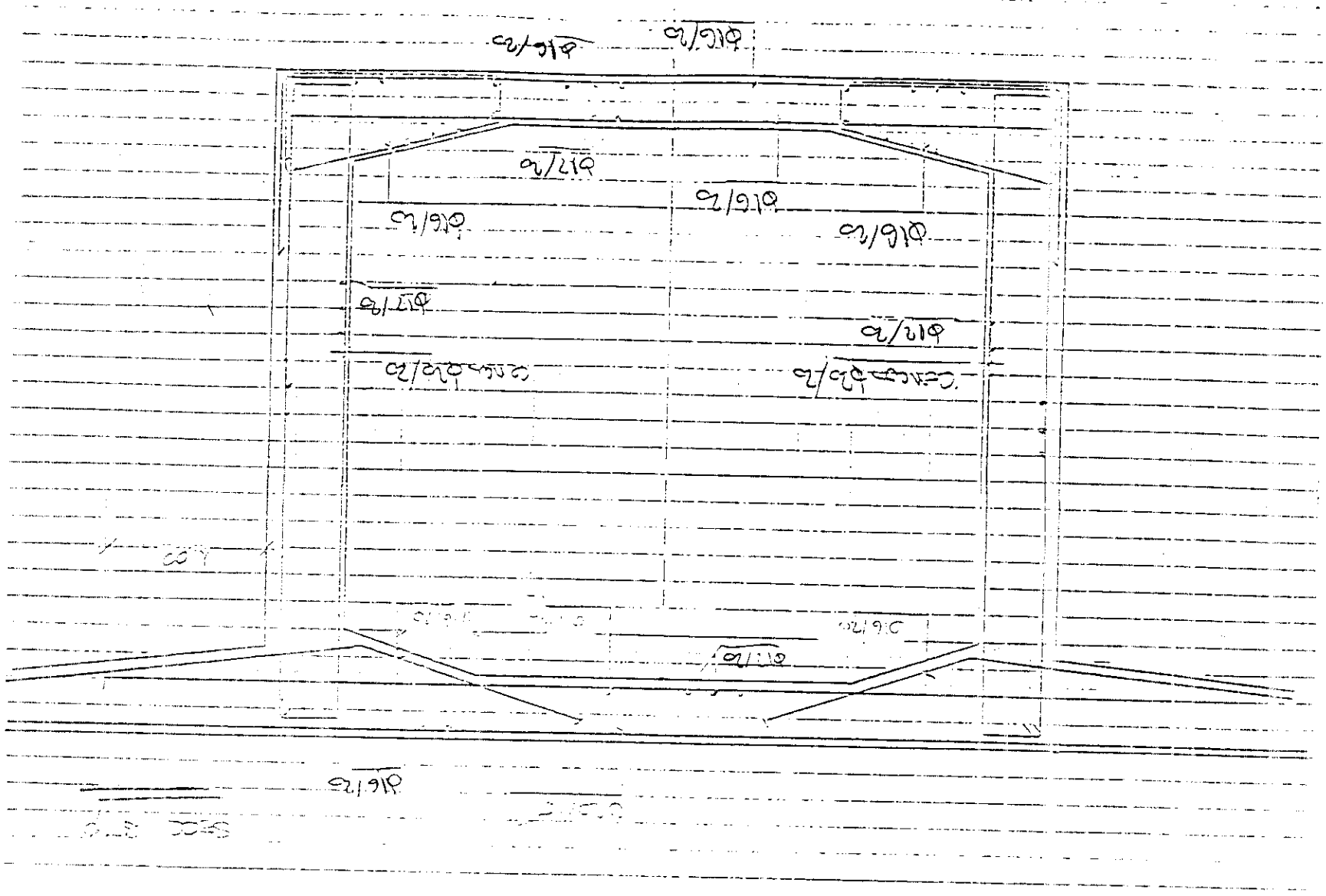
$A_p = (12 \times 12 + 9 \times 19) \times 1{,}43 = 450\ cm^2 > 334{,}7\ cm^2$

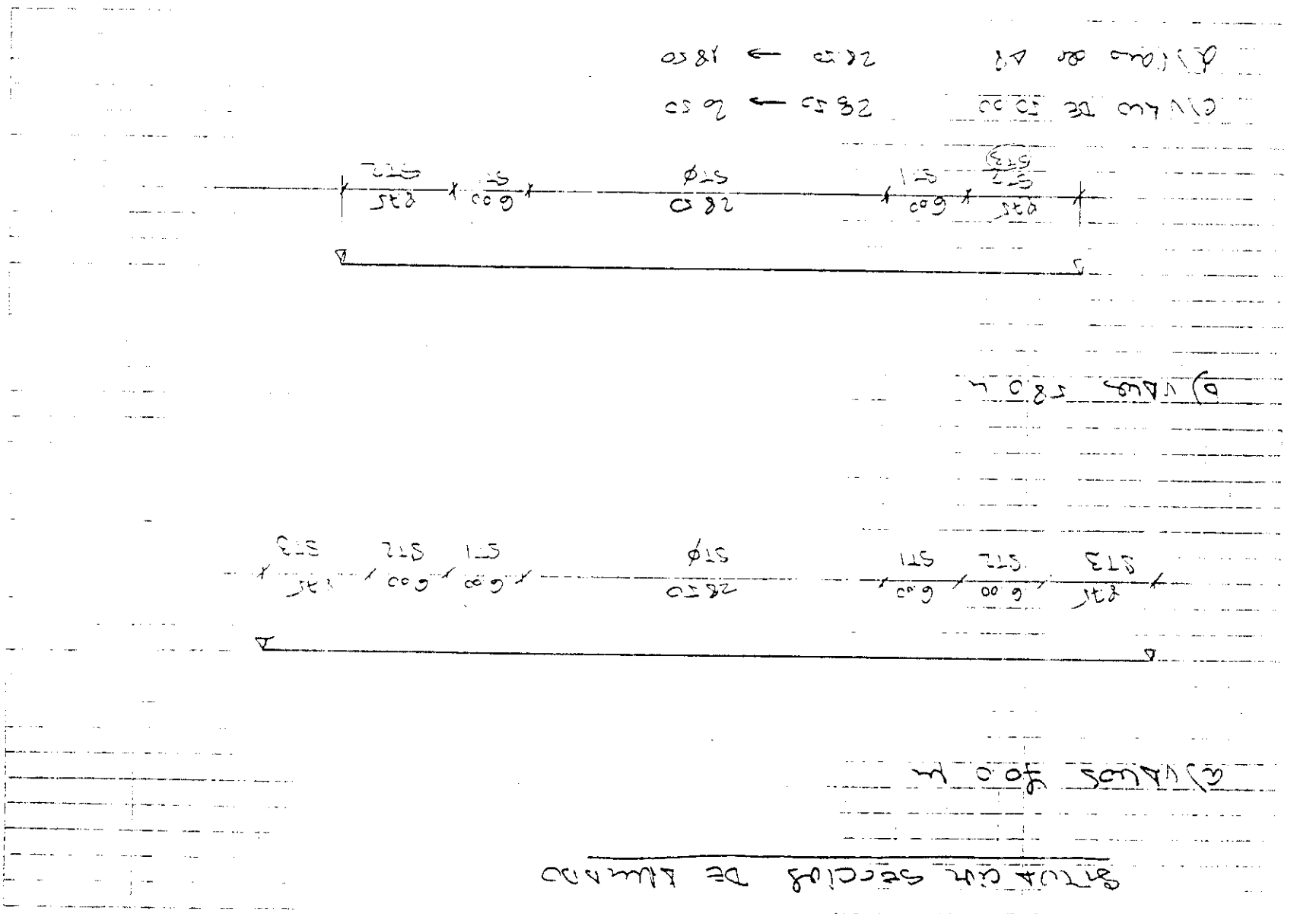
Sección 21 (Valor inferior a los anteriormente obtenidos)

Armadura:

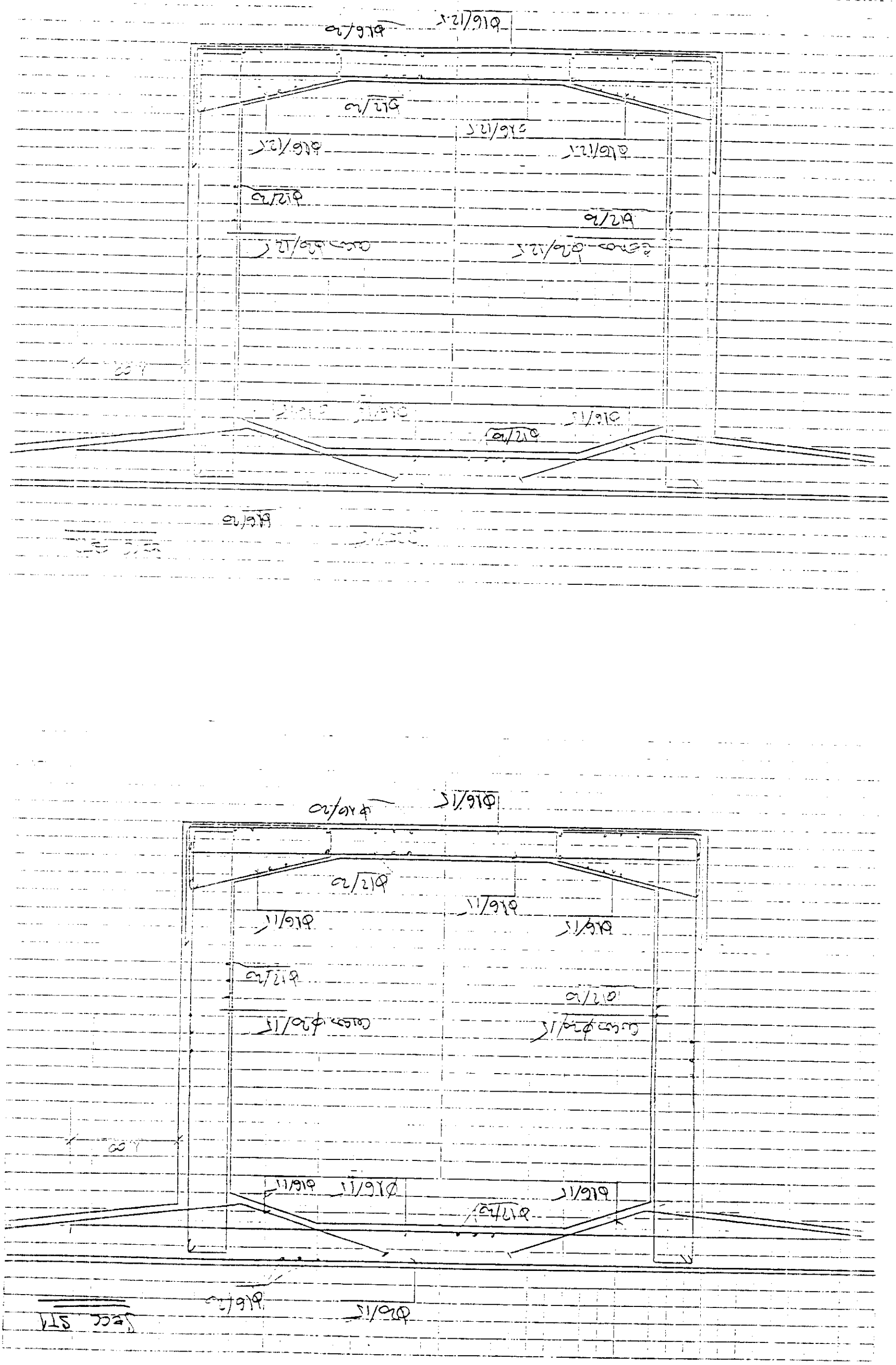
Se dispone como armadura principal $\phi 12/20$ a todo el perímetro tanto exterior como interior a excepción de las dos caras exteriores (superior e inferior) que se disponen $\phi 16/20$ debido a la armadura longitudinal mínima sea inferior al 25% DE LA TRACCIÓN EXISTENTE en la zona.

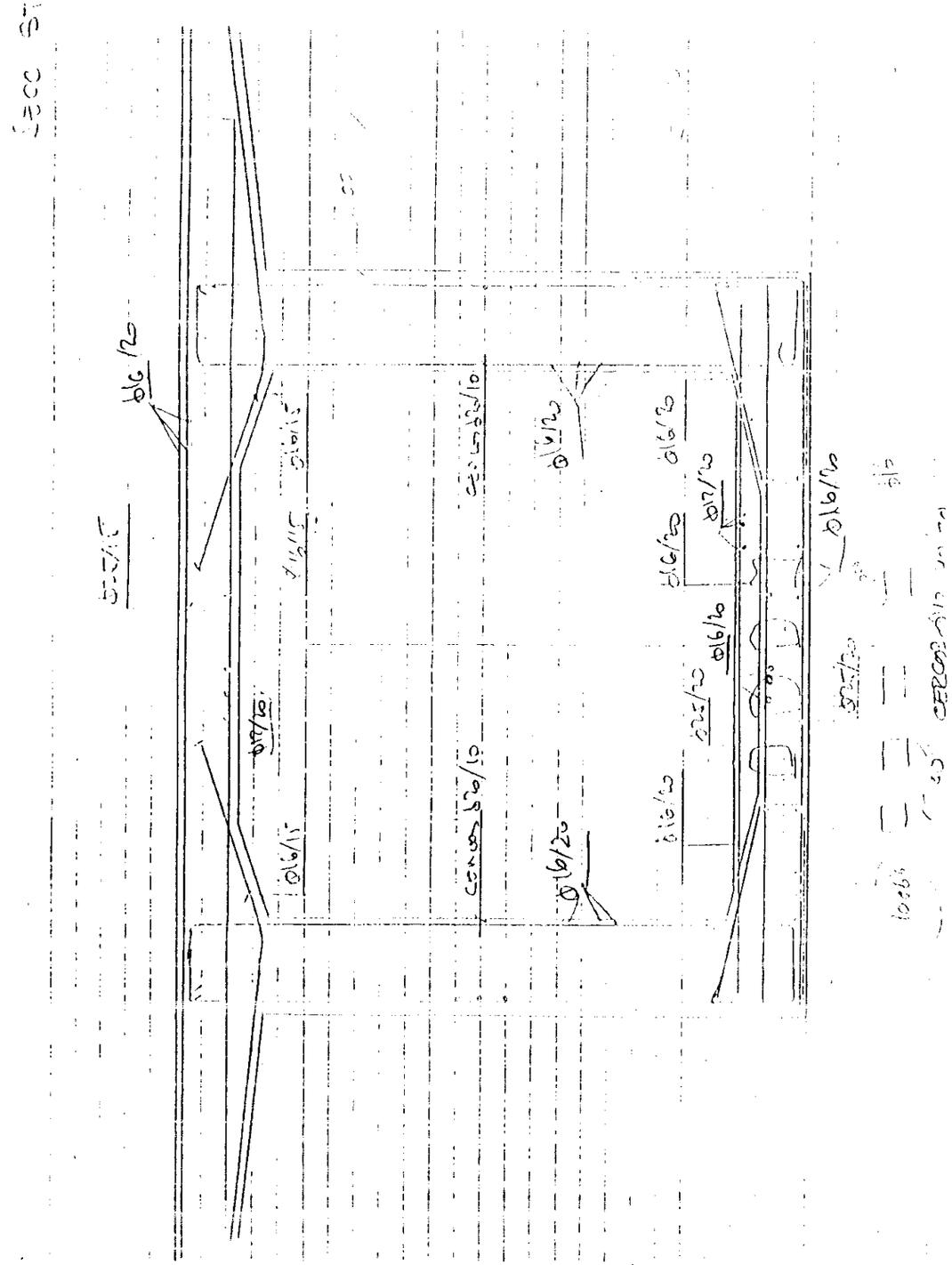
En el caso más desfavorable tenemos como armadura longitudinal $2\phi 12/20 = 11{,}3\ cm^2$ superior a la necesaria por tracción





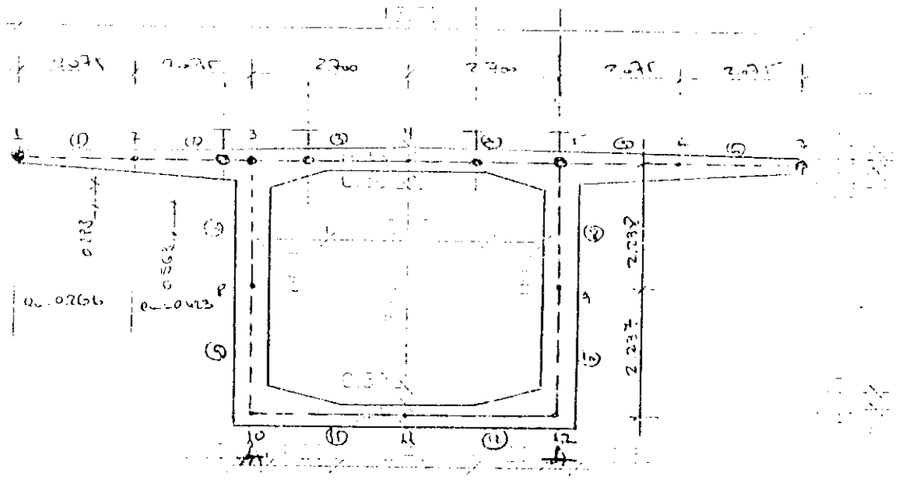
intecsa
PROYECTO
DE
VIVIENDA





intecsa PROYECTO HOJA DE
EJECUTANTE FECHA

MODELO MATEMÁTICO Y CÁLCULO DE LA SECCIÓN
TRANSVERSAL COMO MARCO



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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    APR  8, 1997        *
*          Time=    12:26:24            *
*                                       *
*****************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - SECCION TRANSVERSAL
2. UNIT METER MTON
3. JOINT COORDINATES
4.   1   -6.850   4.475  0.000
5.   2   -4.775   4.475  0.000
6.   3   -2.700   4.475  0.000
7.   4    0.000   4.475  0.000
8.   5    2.700   4.475  0.000
9.   6    4.775   4.475  0.000
10.  7    6.850   4.465  0.000
11.  8   -2.700   2.237  0.000
12.  9    2.700   2.237  0.000
13.  10  -2.700   0.000  0.000
14.  11   0.000   0.000  0.000
15.  12   2.700   0.000  0.000
16. MEMBER INCIDENCES
17.  1    1    2
18.  2    2    3
19.  3    3    4
20.  4    4    5
21.  5    5    6
22.  6    6    7
23.  7    3    8
24.  8    5    9
25.  9    8    10
26.  10   9    12
27.  11   10   11
28.  12   11   12
29. MEMBER PROPERTY
30.  1 6          PR   AX  0.266   IZ  0.00156
31.  2 5          PR   AX  0.423   IZ  0.00630
32.  3 4          PR   AX  0.497   IZ  0.01008
33.  7 8 9 10     PR   AX  0.600   IZ  0.01800
34.  11 12        PR   AX  0.400   IZ  0.05333
35. CONSTANTS
36. E    3350000.  ALL
37. DEN  2.55      ALL
38. POI  0.20      ALL
39. SUPPORTS
40. 10 12         PINNED
41. LOADING 1 CARGAS PERMANENTES
42. *PESO PROPIO
43. SELFWEIGHT   Y   -1
44. *BALASTO
45. MEMBER LOAD
46. 2       TRA  GY -0.686  -1.350   0.000   0.920
47. 2       TRA  GY -1.350  -1.179   0.920   1.303
```



```
48. 2       TRA  GY -1.179  -0.944   1.303   2.075
49. 3       TRA  GY -0.944  -0.757   0.000   2.264
50. 3       TRA  GY -0.757  -0.945   2.264   2.700
51. 4       TRA  GY -0.945  -1.132   0.000   0.436
52. 4       TRA  GY -1.132  -0.970   0.436   2.700
53. 5       TRA  GY -0.970  -0.909   0.000   0.846
54. 5       TRA  GY -0.909  -1.082   0.846   1.229
55. 5       TRA  GY -1.082  -0.131   1.229   2.075
56. *INCREMENTO POR VIAS Y TRAVIESAS
57. MEMBER LOAD
58. 2       UNI  GY  0.41    1.303   2.075
59. 3       UNI  GY -0.41    0.000   2.338
60. 4       UNI  GY -0.41    0.436   2.700
61. 5       UNI  GY -0.41    0.000   0.846
62. *CONDUCTOS DE EVACUACION Y PASEOS
63. MEMBER LOAD
64. 1       UNI  GY  0.500   0.000   1.550
65. 1       UNI  GY -0.315   1.550   2.075
66. 6       UNI  GY -0.315   0.000   0.525
67. 6       UNI  GY -0.500   0.525   2.075
68. *IMPOSTAS Y BARANDILLAS
69. JOINT LOAD
70. 1       FY   -0.310
71. 7       FY   -0.310
72. *MOLDURAS
73. MEMBER LOAD
74. 2       CON  GY -0.950       1.275
75. 5       CON  GY -0.950       0.800
76. LOADING 2 SOBRECARGA EN ACERAS
77. MEMBER LOAD
78. 1       UNI  GY -0.400   0.000  1.550
79. 6       UNI  GY -0.400   0.525  2.075
80. PERFORM ANALISIS
```

```
      P R O B L E M   S T A T I S T I C S
      -----------------------------------

 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    12/   12/    2
 ORIGINAL/FINAL BAND-WIDTH =    5/    3
 TOTAL PRIMARY LOAD CASES  =    2, TOTAL DEGREES OF FREEDOM =    32
 SIZE OF STIFFNESS MATRIX =     384 DOUBLE PREC. WORDS
 TOTAL REQUIRED DISK SPACE =   12.03 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.            12:26:26
++ PROCESSING GLOBAL STIFFNESS MATRIX.             12:26:26
++ PROCESSING TRIANGULAR FACTORIZATION.            12:26:26
++ CALCULATING JOINT DISPLACEMENTS.                12:26:26
++ CALCULATING MEMBER  FORCES.                     12:26:26

81. LOAD LIST  ALL
82. PRINT MEMBER FORCES ALL
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	1	1	0.00	-0.31	0.00	0.00	0.00	0.00
		2	0.00	2.66	0.00	0.00	0.00	-3.15
	2	1	0.00	0.00	0.00	0.00	0.00	0.00
		2	0.00	0.62	0.00	0.00	0.00	-0.81
2	1	2	0.00	-2.66	0.00	0.00	0.00	3.15
		3	0.00	8.40	0.00	0.00	0.00	-14.14
	2	2	0.00	-0.62	0.00	0.00	0.00	0.81
		3	0.00	0.62	0.00	0.00	0.00	-2.09
3	1	3	-1.52	6.91	0.00	0.00	0.00	8.10
		4	1.52	-0.24	0.00	0.00	0.00	1.30
	2	3	-0.48	0.00	0.00	0.00	0.00	0.44
		4	0.48	0.00	0.00	0.00	0.00	-0.44
4	1	4	-1.52	0.24	0.00	0.00	0.00	-1.30
		5	1.52	6.95	0.00	0.00	0.00	-7.62
	2	4	-0.48	0.00	0.00	0.00	0.00	0.44
		5	0.48	0.00	0.00	0.00	0.00	-0.44
5	1	5	0.00	7.88	0.00	0.00	0.00	13.42
		6	0.00	-2.66	0.00	0.00	0.00	-3.15
	2	5	0.00	0.62	0.00	0.00	0.00	2.09
		6	0.00	-0.62	0.00	0.00	0.00	-0.81
6	1	6	-0.01	2.66	0.00	0.00	0.00	3.15
		7	0.00	-0.31	0.00	0.00	0.00	0.00
	2	6	0.00	0.62	0.00	0.00	0.00	0.81
		7	0.00	0.00	0.00	0.00	0.00	0.00
7	1	3	15.32	1.52	0.00	0.00	0.00	6.03
		8	-18.74	-1.52	0.00	0.00	0.00	-2.63
	2	3	0.62	0.48	0.00	0.00	0.00	1.66
		8	-0.62	-0.48	0.00	0.00	0.00	-0.57
8	1	5	14.83	-1.52	0.00	0.00	0.00	-5.80
		9	-18.25	1.52	0.00	0.00	0.00	2.40
	2	5	0.62	-0.48	0.00	0.00	0.00	-1.66
		9	-0.62	0.48	0.00	0.00	0.00	0.57
9	1	8	18.74	1.52	0.00	0.00	0.00	2.63
		10	-22.16	-1.52	0.00	0.00	0.00	0.77
	2	8	0.62	0.48	0.00	0.00	0.00	0.57
		10	-0.62	-0.48	0.00	0.00	0.00	0.51
10	1	9	18.25	-1.52	0.00	0.00	0.00	-2.40
		12	-21.68	1.52	0.00	0.00	0.00	-1.00

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	2	9	0.62	-0.48	0.00	0.00	0.00	-0.57
		12	-0.62	0.48	0.00	0.00	0.00	-0.51
11	1	10	0.00	2.80	0.00	0.00	0.00	-0.77
		11	0.00	-0.04	0.00	0.00	0.00	4.60
	2	10	0.00	0.00	0.00	0.00	0.00	-0.51
		11	0.00	0.00	0.00	0.00	0.00	0.51
12	1	11	0.00	0.04	0.00	0.00	0.00	-4.60
		12	0.00	2.71	0.00	0.00	0.00	1.00
	2	11	0.00	0.00	0.00	0.00	0.00	-0.51
		12	0.00	0.00	0.00	0.00	0.00	0.51

********** END OF LATEST ANALYSIS RESULT **********

83. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y ROTAN	Z-ROTAN
1	1	-0.00243	-0.38414	0.00000	0.00000	0.00000	0.00135
	2	0.00008	-0.07852	0.00000	0.00000	0.00000	0.00029
2	1	-0.00243	-0.12988	0.00000	0.00000	0.00000	0.00089
	2	-0.00008	-0.02434	0.00000	0.00000	0.00000	0.00018
3	1	-0.00243	-0.00417	0.00000	0.00000	0.00000	0.00015
	2	-0.00008	-0.00014	0.00000	0.00000	0.00000	0.00003
4	1	-0.00218	-0.00219	0.00000	0.00000	0.00006	-0.00001
	2	0.00000	0.00457	0.00000	0.00000	0.00000	0.00000
5	1	-0.00194	-0.00406	0.00000	0.00000	0.00000	-0.00013
	2	0.00008	-0.00014	0.00000	0.00000	0.00000	-0.00003
6	1	-0.00194	-0.12194	0.00000	0.00000	0.00000	-0.00084
	2	0.00008	-0.02434	0.00000	0.00000	0.00000	-0.00018
7	1	-0.00311	-0.36689	0.00000	0.00000	0.00000	-0.00131
	2	-0.00018	-0.07851	0.00000	0.00000	0.00000	-0.00029
8	1	0.00971	-0.00228	0.00000	0.00000	0.00000	-0.00002
	2	0.00234	-0.00007	0.00000	0.00000	0.00000	-0.00001
9	1	-0.01093	-0.00222	0.00000	0.00000	0.00000	0.00003
	2	-0.00234	-0.00007	0.00000	0.00000	0.00000	0.00001
10	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00005
	2	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
11	1	0.00000	-0.00812	0.00000	0.00000	0.00000	0.00000
	2	0.00000	-0.00104	0.00000	0.00000	0.00000	0.00000
12	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001

********** END OF LATEST ANALYSIS RESULT **********

84. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	1	-1.52	24.96	0.00	0.00	0.00	0.00
	2	-0.48	0.62	0.00	0.00	0.00	0.00
12	1	1.52	24.30	0.00	0.00	0.00	0.00
	2	0.48	0.62	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

85. PLOT BENDING FILE
86. FINISH

********** END OF STAAD-III **********

**** DATE= APR 8,1997 TIME= 12:26:28 ****

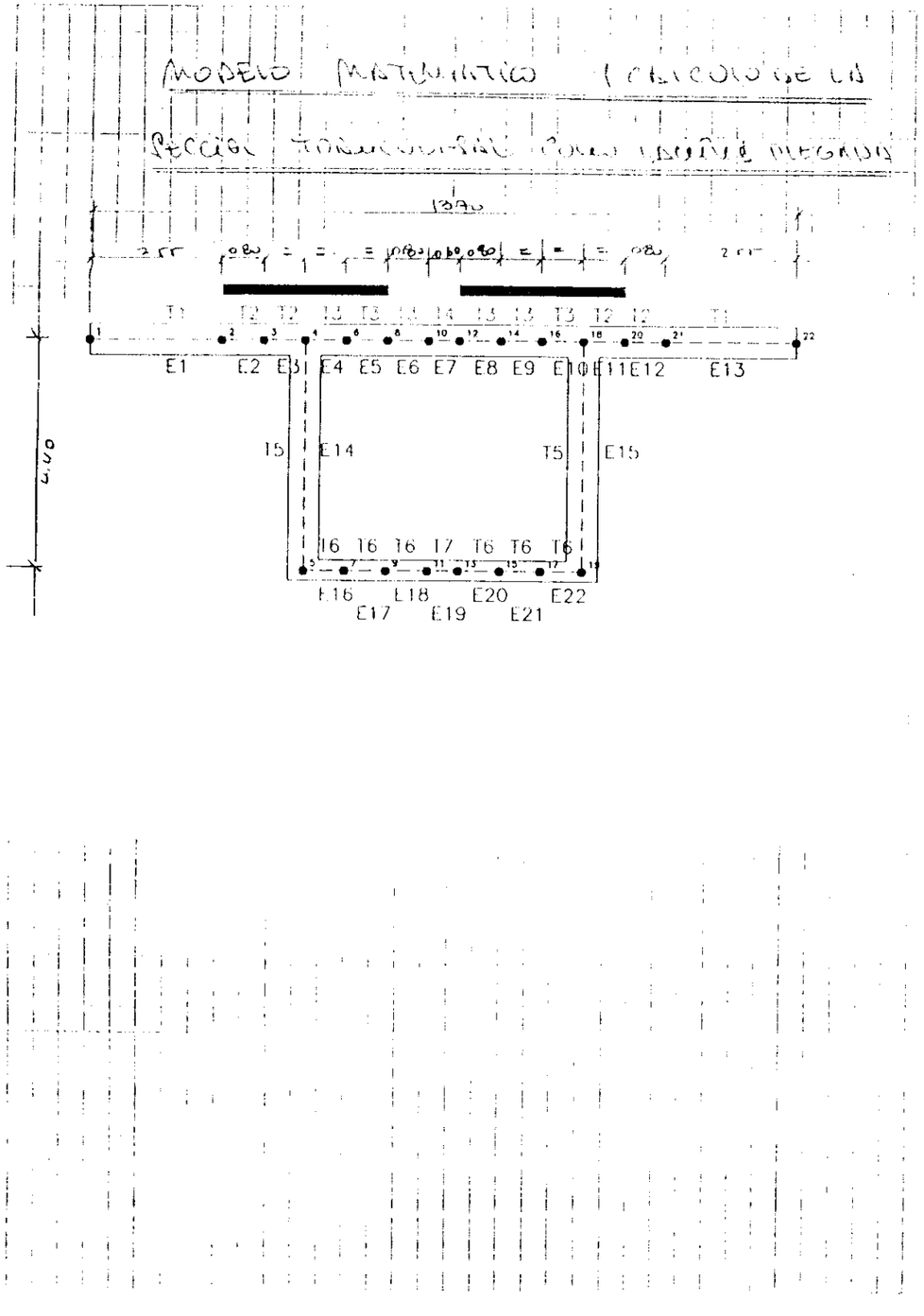
****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL:(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****

intecsa

PROYECTO

HOJA ___ DE ___

FECHA




```
PUENTE SOBRE EL CINCA. FLEX TRANS. 1 TREN 1PF75(1)
42.000,    7,    22,    22,    1,    20,    1
21.000
1,   2.550,   0.000,   0.300,   3250000.0,   0.20
2,   0.800,   0.000,   0.300,   3250000.0,   0.20
3,   0.800,   0.000,   0.500,   3250000.0,   0.20
4,   0.600,   0.000,   0.500,   3250000.0,   0.20
5,   0.000,   4.400,   0.600,   3250000.0,   0.20
6,   0.800,   0.000,   0.400,   3250000.0,   0.20
7,   0.600,   0.000,   0.400,   3250000.0,   0.20
1,  1,  2,  1,  1,   0.000,   0.000,   0.000
2,  2,  3,  2,  1,   0.000,   0.000,   0.000
3,  3,  4,  2,  1,   0.000,   0.000,   0.000
4,  4,  6,  3,  1,   0.000,   0.000,   0.000
5,  6,  8,  3,  1,   0.000,   0.000,   0.000
6,  8, 10,  3,  1,   0.000,   0.000,   0.000
7, 10, 12,  4,  1,   0.000,   0.000,   0.000
8, 12, 14,  3,  1,   0.000,   0.000,   0.000
9, 14, 16,  3,  1,   0.000,   0.000,   0.000
10, 16, 18,  3,  1,   0.000,   0.000,   0.000
11, 18, 20,  2,  1,   0.000,   0.000,   0.000
12, 20, 21,  2,  1,   0.000,   0.000,   0.000
13, 21, 22,  1,  1,   0.000,   0.000,   0.000
14,  4,  5,  5,  1,   0.000,   0.000,   0.000
15, 18, 19,  5,  1,   0.000,   0.000,   0.000
16,  5,  7,  4,  1,   0.000,   0.000,   0.000
17,  7,  9,  6,  1,   0.000,   0.000,   0.000
18,  9, 11,  6,  1,   0.000,   0.000,   0.000
19, 11, 13,  7,  1,   0.000,   0.000,   0.000
20, 13, 15,  6,  1,   0.000,   0.000,   0.000
21, 15, 17,  6,  1,   0.000,   0.000,   0.000
22, 17, 19,  6,  1,   0.000,   0.000,   0.000
8
2,   0.000,   7.250,   21.000,   4.500
3,   0.000,   7.250,   21.000,   4.500
4,   0.000,   8.600,   21.000,   4.500
5,   0.000,   8.600,   21.000,   4.500
8,   0.000,   0.000,   21.000,   4.500
9,   0.000,   0.000,   21.000,   4.500
10,  0.000,   0.000,   21.000,   4.500
11,  0.000,   0.000,   21.000,   4.500
1,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
2,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
3,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
4,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
5,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
6,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
7,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
8,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
9,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
10,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
11,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
12,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
13,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
14,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
15,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
16,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
17,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
18,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
19,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
20,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
21,  0.000,   0.000,   0.000,   0.000   0 0 0 0
22,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
```

1
3, 0.000, 0.000, 0.000, 0.000 21.000, 0.000

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL CINCA. FLEX TRANS. 1 TREN 1PF75(I)

CINCA TR 1
1PF75
1 TREN TIPO 1

LUZ	=	42.000
NUMERO DE TIPOS DE PLACA	=	7
NUMERO DE ELEMENTOS	=	22
NUMERO DE JUNTAS	=	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	1
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA . CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A .

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	2	1	.000	.000	.000
4	4	6	3	1	.000	.000	.000
5	6	8	3	1	.000	.000	.000
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

1

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE	CARGA-H	CARGA-V	COLOCACION	ANCHO DE CARGA

2	.000	7.250	21.000	4.500
3	.000	7.250	21.000	4.500
4	.000	8.600	21.000	4.500
5	.000	8.600	21.000	4.500
8	.000	.000	21.000	4.500
9	.000	.000	21.000	4.500
10	.000	.000	21.000	4.500
11	.000	.000	21.000	4.500

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0038	.3038	.0003	.0000
2	.0030	.2309	.0003	.0000
3	.0027	.1997	.0004	.0000
4	.0023	.1772	.0000	.0000
5	.0045	.1740	.0000	.0000
6	.0019	.1759	.0000	.0000
7	.0050	.1710	.0001	.0000
8	.0016	.1720	.0001	.0000
9	.0053	.1641	.0001	.0000
10	.0013	.1635	.0001	.0000
11	.0056	.1550	.0001	.0000
12	.0012	.1556	.0001	.0000
13	.0058	.1477	.0001	.0000
14	.0010	.1469	.0001	.0000
15	.0061	.1388	.0001	.0000
16	.0008	.1359	.0001	.0000
17	.0063	.1324	.0001	.0000
18	.0007	.1306	.0000	.0000
19	.0065	.1302	.0000	.0000
20	.0004	.1280	.0000	.0000
21	.0002	.1258	.0000	.0000
22	-.0003	.1201	.0000	.0000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	.8342	.0000	.0000	.0000	-.0536	12.5294	.0000	.0000	.00	.00	.0
2	.9200	1.0729	.0000	.0000	-.8908	14.9762	-.5502	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	.9200	1.0729	.0000	.0000	-.8908	14.9762	-.5502	.0000	.00	.00	.0
2	.3448	-.5042	.0000	.0000	5.4167	16.6232	-1.1657	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	.3448	-.5042	.0000	.0000	5.4167	16.6232	-1.1657	.0000	.00	.00	.0
2	-1.3027	-7.3825	.0000	.0000	12.6050	19.1952	-2.2881	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	-.1301	-4.6735	.0000	.0000	-13.0405	32.0854	-3.3466	.0000	.00	.00	.0
2	1.4646	2.1681	.0000	.0000	-4.8123	27.6142	-1.4683	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	1.4646	2.1681	.0000	.0000	-4.8123	27.6142	-1.4683	.0000	.00	.00	.0
2	1.7456	2.9746	.0000	.0000	2.5157	24.7913	-.4193	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(r
1	1.7456	2.9746	.0000	.0000	2.5157	24.7913	-.4193	.0000	.00	.00	.0

2	1.2661	1.3256	.0000	.0000	1.9782	22.9314	.1938	.0000	.00	.00	.002

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.2661	1.3256	.0000	.0000	1.9782	22.9314	.1938	.0000	.00	.00	.002
2	.8973	.3554	.0000	.0000	1.7616	21.9565	.4796	.0000	.00	.00	.002

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8973	.3554	.0000	.0000	1.7616	21.9565	.4796	.0000	.00	.00	.002
2	.4301	-.7922	.0000	.0000	1.6272	21.0647	.7022	.0000	.00	.00	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4301	-.7922	.0000	.0000	1.6272	21.0647	.7022	.0000	.00	.00	.001
2	.0046	-1.9170	.0000	.0000	1.6222	20.5465	.7839	.0000	.00	.00	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0046	-1.9170	.0000	.0000	1.6222	20.5465	.7839	.0000	.00	.00	.001
2	-.3644	-3.1501	.0000	.0000	1.7364	20.3579	.7399	.0000	.00	.00	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0455	-.0593	.0000	.0000	-.0261	12.0349	-.4551	.0000	.00	.00	.001
2	.0408	-.0345	.0000	.0000	-.0163	11.4596	-.2684	.0000	.00	.00	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0408	-.0345	.0000	.0000	-.0163	11.4596	-.2684	.0000	.00	.00	.001
2	.0389	-.0201	.0000	.0000	-.0105	11.0050	-.1404	.0000	.00	.00	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0389	-.0201	.0000	.0000	-.0105	11.0050	-.1404	.0000	.00	.00	.00
2	.0360	.0000	.0000	.0000	-.0022	10.1096	.0000	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-.5473	-2.7090	.0000	.0000	-1.0836	44.4325	25.6341	.0000	.00	.18	.00
2	.4486	1.7358	.0000	.0000	-1.0734	-61.5537	.7327	.0000	.00	.17	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-.6301	-3.0908	.0000	.0000	-1.3105	24.6149	1.8150	.0000	.00	.13	.00
2	.4283	1.6873	.0000	.0000	-1.0770	-35.8806	-.6704	.0000	.00	.13	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.6309	1.7358	.0000	.0000	.7341	-40.9179	1.0781	.0000	.00	.00	.00
2	.5084	1.1795	.0000	.0000	.6840	-35.7004	-.4350	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.5084	1.1795	.0000	.0000	.6840	-35.7004	-.4350	.0000	.00	.00	.00
2	.3789	.6684	.0000	.0000	.6535	-32.0232	-1.2304	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.3789	.6684	.0000	.0000	.6535	-32.0232	-1.2304	.0000	.00	-.01	.00
2	.2476	.1811	.0000	.0000	.6374	-29.3554	-1.5933	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.2476	.1811	.0000	.0000	.6374	-29.3554	-1.5933	.0000	.00	-.01	.00
2	.1500	-.1784	.0000	.0000	.6332	-27.8206	-1.6779	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1500	-.1784	.0000	.0000	.6332	-27.8206	-1.6779	.0000	.00	-.01	.001
2	.0233	-.6605	.0000	.0000	.6371	-26.2247	-1.6170	.0000	.00	-.01	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0233	-.6605	.0000	.0000	.6371	-26.2247	1.6170	.0000	.00	-.01	.001
2	-.0966	-1.1584	.0000	.0000	.6520	-25.0066	-1.4126	.0000	.00	.01	.001

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0966	-1.1584	.0000	.0000	.6520	-25.0066	-1.4126	.0000	.00	-.01	.001
2	-.2057	-1.6873	.0000	.0000	.6792	-24.0524	-1.1067	.0000	.00	-.01	.001

```
PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TRENES IPF75(1)
42.000,    7,    22,    22,    1,    20,    1
21.000
1,   2.550,   0.000,   0.300,   3250000.0,   0.20
2,   0.800,   0.000,   0.300,   3250000.0,   0.20
3,   0.800,   0.000,   0.500,   3250000.0,   0.20
4,   0.600,   0.000,   0.500,   3250000.0,   0.20
5,   0.000,   4.400,   0.600,   3250000.0,   0.20
6,   0.800,   0.000,   0.400,   3250000.0,   0.20
7,   0.600,   0.000,   0.400,   3250000.0,   0.20
1,   1,   2,   1,   1,   0.000,   0.000,   0.000
2,   2,   3,   2,   1,   0.000,   0.000,   0.000
3,   3,   4,   2,   1,   0.000,   0.000,   0.000
4,   4,   6,   3,   1,   0.000,   0.000,   0.000
5,   6,   8,   3,   1,   0.000,   0.000,   0.000
6,   8,  10,   3,   1,   0.000,   0.000,   0.000
7,  10,  12,   4,   1,   0.000,   0.000,   0.000
8,  12,  14,   3,   1,   0.000,   0.000,   0.000
9,  14,  16,   3,   1,   0.000,   0.000,   0.000
10, 16,  18,   3,   1,   0.000,   0.000,   0.000
11, 18,  20,   2,   1,   0.000,   0.000,   0.000
12, 20,  21,   2,   1,   0.000,   0.000,   0.000
13, 21,  22,   1,   1,   0.000,   0.000,   0.000
14,  4,   5,   5,   1,   0.000,   0.000,   0.000
15, 18,  19,   5,   1,   0.000,   0.000,   0.000
16,  5,   7,   6,   1,   0.000,   0.000,   0.000
17,  7,   9,   6,   1,   0.000,   0.000,   0.000
18,  9,  11,   6,   1,   0.000,   0.000,   0.000
19, 11,  13,   7,   1,   0.000,   0.000,   0.000
20, 13,  15,   6,   1,   0.000,   0.000,   0.000
21, 15,  17,   6,   1,   0.000,   0.000,   0.000
22, 17,  19,   6,   1,   0.000,   0.000,   0.000
8
2,   0.000,   7.250,   21.000,   4.500
3,   0.000,   7.250,   21.000,   4.500
4,   0.000,   8.600,   21.000,   4.500
5,   0.000,   8.600,   21.000,   4.500
8,   0.000,   7.250,   21.000,   4.500
9,   0.000,   7.250,   21.000,   4.500
10,  0.000,   8.600,   21.000,   4.500
11,  0.000,   8.600,   21.000,   4.500
1,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
2,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
3,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
4,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
5,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
6,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
7,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
8,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
9,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
10,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
11,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
12,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
13,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
14,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
15,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
16,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
17,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
18,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
19,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
20,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
21,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
22,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
```

3, 0.000, 0.000, 0.000, 0.000 21.000, 0.000

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TRENES IP

CINCA TR2
IPF 75
2 TRENES TIPO 1

LUZ	=	42.000
NUMERO DE TIPOS DE PLACA	=	7
NUMERO DE ELEMENTOS	=	22
NUMERO DE JUNTAS	=	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	1
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	2	1	.000	.000	.000
4	4	6	3	1	.000	.000	.000
5	6	8	3	1	.000	.000	.000
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

1

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 0

ELE	CARGA-H	CARGA-V	COLOCACION	ANCHO DE CARGA

2	.000	7.250	21.000	4.500
3	.000	7.250	21.000	4.500
4	.000	8.600	21.000	4.500
5	.000	8.600	21.000	4.500
8	.000	7.250	21.000	4.500
9	.000	7.250	21.000	4.500
10	.000	8.600	21.000	4.500
11	.000	8.600	21.000	4.500

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

1

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0050	.4208	.0002	.0000
2	.0037	.3571	.0003	.0000
3	.0031	.3296	.0004	.0000
4	.0025	.3115	.0000	.0000
5	-.0025	.3078	.0000	.0000
6	.0019	.3190	-.0001	.0000
7	-.0018	.3053	.0000	.0000
8	.0015	.3284	-.0001	.0000
9	-.0013	.3027	.0000	.0000
10	.0011	.3339	.0000	.0000
11	-.0008	.3004	.0000	.0000
12	.0008	.3346	.0000	.0000
13	-.0004	.2990	.0000	.0000
14	.0004	.3288	.0001	.0000
15	.0000	.2980	.0000	.0000
16	.0000	.3161	.0002	.0000
17	.0005	.2982	.0000	.0000
18	-.0005	.3034	.0001	.0000
19	.0012	.3001	.0000	.0000
20	-.0011	.3013	.0000	.0000
21	-.0017	.3004	.0000	.0000
22	-.0030	.2982	.0000	.0000

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	.8459	.0000	.0000	.0000	-.0482	22.6556	.0000	.0000	.00	.00	.0
2	.9384	1.0215	.0000	.0000	-.8633	26.1948	-.7308	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	.9384	1.0215	.0000	.0000	-.8633	26.1948	-.7308	.0000	.00	.00	.0
2	.3675	-.5929	.0000	.0000	5.4593	28.3983	-1.5125	.0000	.00	.00	.0

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	.3675	-.5929	.0000	.0000	5.4593	28.3983	-1.5125	.0000	.00	.00	.0
2	-1.2683	-7.5348	.0000	.0000	12.6725	31.6815	-2.8846	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	-.7881	-9.4652	.0000	.0000	-16.4884	53.2970	-2.3356	.0000	.00	.00	.0
2	1.5755	-.2233	.0000	.0000	-8.0199	48.6260	-.2441	.0000	.00	.00	.0

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	1.5755	-.2233	.0000	.0000	-8.0199	48.6260	-.2441	.0000	.00	.00	.0
2	2.7405	2.7856	.0000	.0000	-.7579	46.0425	.8621	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

2	3.2089	3.4962	.0000	.0000	-1.7046	44.8510	1.3922	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	3.2089	3.4962	.0000	.0000	-1.7046	44.8510	1.3922	.0000	.00	.00	003
2	3.5492	4.6724	.0000	.0000	-2.5434	44.7016	1.5089	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3.5492	4.6724	.0000	.0000	-2.5434	44.7016	1.5089	.0000	.00	.00	.003
2	3.3529	4.7068	.0000	.0000	2.8619	45.4812	1.3032	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3.3529	4.7068	.0000	.0000	2.8619	45.4812	1.3032	.0000	.00	.00	.003
2	1.8894	.7371	.0000	.0000	8.5838	47.6048	.5695	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.8894	.7371	.0000	.0000	8.5838	47.6048	.5695	.0000	.00	.00	.003
2	-.7216	-8.7313	.0000	.0000	16.9236	51.7245	-1.0546	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.3576	-2.8947	.0000	.0000	-7.9857	30.5769	-2.9217	.0000	.00	.00	.003
2	.2669	.1633	.0000	.0000	.1914	27.7135	-1.5922	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.2669	.1633	.0000	.0000	.1914	27.7135	1.5922	.0000	.00	.00	.003
2	.2439	.0538	.0000	.0000	.0958	25.7870	-.8020	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.2439	.0538	.0000	.0000	.0958	25.7870	-.8020	.0000	.00	00	003
2	.1938	.0000	.0000	.0000	-.0052	22.9055	.0000	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3011	1.9305	.0000	.0000	.8142	70.3732	29.2812	.0000	.00	51	000
2	.0601	.2155	.0000	.0000	.2111	-98.9504	.1959	.0000	.00	.31	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-1.1470	-5.8366	.0000	.0000	-2.5715	67.3682	25.2289	.0000	.00	.30	.000
2	.0841	.5314	.0000	.0000	-1.0580	-95.7634	-.1087	.0000	.00	.30	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4698	.2155	.0000	.0000	.1744	-66.0498	-.2837	.0000	.00	.00	.003
2	.4261	.1034	.0000	.0000	.1522	-61.3531	-2.2515	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4261	.1034	.0000	.0000	.1522	-61.3531	-2.2515	.0000	.00	.00	.003
2	.3866	.0033	.0000	.0000	.1397	-58.5591	-3.3665	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3866	.0033	.0000	.0000	.1397	-58.5591	-3.3665	.0000	.00	.00	003
2	.3526	-.0934	.0000	.0000	1336	-57.2077	-3.8955	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3526	-.0934	.0000	.0000	.1336	-57.2077	-3.8955	.0000	.00	.00	.003
2	3312	- 1675	.0000	0000	1322	-57.0176	-3.9776	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3312	-.1675	.0000	.0000	.1322	-57.0176	-3.9776	.0000	.00	.00	.003
2	.3090	-.2728	.0000	.0000	.1341	-57.8460	-3.6775	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3090	-.2728	.0000	.0000	.1341	-57.8460	-3.6775	.0000	.00	.00	.003
2	.2963	-.3915	.0000	.0000	.1402	-60.0602	-2.8285	.0000	.00	.00	.003

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.2963	-.3915	.0000	.0000	.1402	-60.0602	-2.8285	.0000	.00	.00	.003
2	.2970	-.5314	.0000	.0000	.1505	-64.0676	-1.1991	.0000	.00	.00	.003

```
PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN 1PF75(11)
42.000,    7,    22,    22,    1,    20,    1
21.000
1,   2.550,   0.000,   0.300,   3250000.0,   0.20
2,   0.800,   0.000,   0.300,   3250000.0,   0.20
3,   0.800,   0.000,   0.500,   3250000.0,   0.20
4,   0.600,   0.000,   0.500,   3250000.0,   0.20
5,   0.000,   4.400,   0.600,   3250000.0,   0.20
6,   0.800,   0.000,   0.400,   3250000.0,   0.20
7,   0.600,   0.000,   0.400,   3250000.0,   0.20
1,   1,   2,   1,   1,   0.000,   0.000,   0.000
2,   2,   3,   2,   1,   0.000,   0.000,   3.875
3,   3,   4,   2,   1,   0.000,   0.000,   3.875
4,   4,   6,   3,   1,   0.000,   0.000,   4.550
5,   6,   8,   3,   1,   0.000,   0.000,   4.550
6,   8,  10,   3,   1,   0.000,   0.000,   0.000
7,  10,  12,   4,   1,   0.000,   0.000,   0.000
8,  12,  14,   3,   1,   0.000,   0.000,   0.000
9,  14,  16,   3,   1,   0.000,   0.000,   0.000
10, 16,  18,   3,   1,   0.000,   0.000,   0.000
11, 18,  20,   2,   1,   0.000,   0.000,   0.000
12, 20,  21,   2,   1,   0.000,   0.000,   0.000
13, 21,  22,   1,   1,   0.000,   0.000,   0.000
14,  4,   5,   5,   1,   0.000,   0.000,   0.000
15, 18,  19,   5,   1,   0.000,   0.000,   0.000
16,  5,   7,   6,   1,   0.000,   0.000,   0.000
17,  7,   9,   6,   1,   0.000,   0.000,   0.000
18,  9,  11,   6,   1,   0.000,   0.000,   0.000
19, 11,  13,   7,   1,   0.000,   0.000,   0.000
20, 13,  15,   6,   1,   0.000,   0.000,   0.000
21, 15,  17,   6,   1,   0.000,   0.000,   0.000
22, 17,  19,   6,   1,   0.000,   0.000,   0.000
8
2,   0.000,   0.680,   21.000,   30.000
3,   0.000,   0.680,   21.000,   30.000
4,   0.000,   0.810,   21.000,   30.000
5,   0.000,   0.810,   21.000,   30.000
8,   0.000,   0.000,   21.000,   30.000
9,   0.000,   0.000,   21.000,   30.000
10,  0.000,   0.000,   21.000,   30.000
11,  0.000,   0.000,   21.000,   30.000
1,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
2,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
3,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
4,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
5,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
6,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
7,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
8,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
9,   0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
10,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
11,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
12,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
13,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
14,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
15,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
16,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
17,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
18,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
19,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
20,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
21,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
22,  0.000,   0.000,   0.000,   0.000,   0, 0, 0, 0
```

3, 0.000, 0.000, 0.000, 0.000 21.000, 0.000

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN IPF7

HOZ =	42.000
NUMERO DE TIPOS DE PLACA =	7
NUMERO DE ELEMENTOS =	22
NUMERO DE JUNTAS =	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO =	1
MAXIMO NUMERO DE ARMONICOS =	20

CMCB TR3
IPF75
1 TREN TIPO2

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	3.875
3	3	4	2	1	.000	.000	3.875
4	4	6	3	1	.000	.000	4.550
5	6	8	3	1	.000	.000	4.550
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE	CARGA H	CARGA-V	COLOCACION	ANCHO DE CARGA

2	.000	.680	21.000	30.000
3	.000	.680	21.000	30.000
4	.000	.810	21.000	30.000
5	.000	.810	21.000	30.000
8	.000	.000	21.000	30.000
9	.000	.000	21.000	30.000
10	.000	.000	21.000	30.000
11	.000	.000	21.000	30.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH	VERTICAL /IV	ROTACIONAL /IM	LONGITUDINAL/IS
1	.000 0	.000 0	.000 0	.000 0
2	.000 0	.000 0	.000 0	.000 0
3	.000 0	.000 0	.000 0	.000 0
4	.000 0	.000 0	.000 0	.000 0
5	.000 0	.000 0	.000 0	.000 0
6	.000 0	.000 0	.000 0	.000 0
7	.000 0	.000 0	.000 0	.000 0
8	.000 0	.000 0	.000 0	.000 0
9	.000 0	.000 0	.000 0	.000 0
10	.000 0	.000 0	.000 0	.000 0
11	.000 0	.000 0	.000 0	.000 0
12	.000 0	.000 0	.000 0	.000 0
13	.000 0	.000 0	.000 0	.000 0
14	.000 0	.000 0	.000 0	.000 0
15	.000 0	.000 0	.000 0	.000 0
16	.000 0	.000 0	.000 0	.000 0
17	.000 0	.000 0	.000 0	.000 0
18	.000 0	.000 0	.000 0	.000 0
19	.000 0	.000 0	.000 0	.000 0
20	.000 0	.000 0	.000 0	.000 0
21	.000 0	.000 0	.000 0	.000 0
22	.000 0	.000 0	.000 0	.000 0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0132	.8118	.0005	.0000
2	.0109	.6756	.0005	.0000
3	.0102	.6345	.0005	.0000
4	.0093	.6079	.0001	.0000
5	.0079	.6050	.0000	.0000
6	.0084	.5966	.0002	.0000
7	.0092	.5957	.0002	.0000
8	.0076	.5788	.0003	.0000
9	.0104	.5756	.0003	.0000
10	.0068	.5551	.0003	.0000
11	.0115	.5494	.0003	.0000
12	.0063	.5355	.0003	.0000
13	.0123	.5286	.0003	.0000
14	.0056	.5104	.0003	.0000
15	.0133	.5029	.0003	.0000
16	.0049	.4897	.0002	.0000
17	.0142	.4840	.0002	.0000
18	.0043	.4776	.0001	.0000
19	.0152	.4765	.0000	.0000
20	.0035	.4713	.0001	.0000
21	.0027	.4653	.0001	.0000
22	.0006	.4488	.0001	.0000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.2489	.0000	.0000	.0000	-.0052	39.9796	.0000	.0000	.00	-.01	.00
2	.2296	.0159	.0000	.0000	.0193	42.9325	-.5640	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.2296	.0159	.0000	.0000	.0193	42.9325	-.5640	.0000	.00	-.01	.00
2	-.0630	-1.4372	.0000	.0000	3.6178	44.3301	-.9769	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-.0630	-1.4372	.0000	.0000	3.6178	44.3301	-.9769	.0000	.00	-.01	.00
2	-.9242	-5.7659	.0000	.0000	7.1816	45.9400	-1.4950	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.2956	1.1779	.0000	.0000	-5.7031	76.2484	-4.0829	.0000	.00	-.01	.00
2	1.8530	4.0896	.0000	.0000	-1.5109	74.1947	-2.8027	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.8530	4.0896	.0000	.0000	-1.5109	74.1947	-2.8027	.0000	.00	-.01	.00
2	1.7347	3.6288	.0000	.0000	2.7167	72.4982	-1.7033	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.7347	3.6288	.0000	.0000	2.7167	72.4982	-1.7033	.0000	.00	-.01	.00

2	1.2782	1.4688	.0000	.0000	2.7311	71.1972	-.8045	.0000	.00	-.01	.006

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.2782	1.4688	.0000	.0000	2.7311	71.1972	-.8045	.0000	.00	-.01	.006
2	.9330	-.1538	.0000	.0000	2.7345	70.4911	.2663	.0000	.00	.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9330	-.1538	.0000	.0000	2.7345	70.4911	-.2663	.0000	.00	.01	.005
2	.4719	-2.3197	.0000	.0000	2.7385	69.9190	.2658	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4719	-2.3197	.0000	.0000	2.7385	69.9190	.2658	.0000	.00	-.01	.005
2	.0136	-4.4932	.0000	.0000	2.7451	69.7790	.5814	.0000	.00	.00	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0136	-4.4932	.0000	.0000	2.7451	69.7790	.5814	.0000	.00	.00	.005
2	-.4388	-6.6806	.0000	.0000	2.7553	70.0820	.6749	.0000	.00	.00	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1926	-.0062	.0000	.0000	.0020	41.5969	-1.8564	.0000	.00	.00	.005
2	.1907	-.0059	.0000	.0000	.0013	40.4579	-1.2133	.0000	.00	.00	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1907	-.0059	.0000	.0000	.0013	40.4579	-1.2133	.0000	.00	.00	.005
2	.1889	.0052	.0000	.0000	.0007	39.5863	-.7057	.0000	.00	.00	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.1889	-.0052	.0000	.0000	.0007	39.5863	-.7057	.0000	.00	.00	.00
2	.1849	.0000	.0000	.0000	-.0014	38.6234	.0000	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.3538	-6.9438	.0000	.0000	-2.6108	95.0528	12.8743	.0000	.00	.61	.00
2	.8915	4.5086	.0000	.0000	-2.5995	-150.9577	1.6969	.0000	.00	.60	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.3130	-6.6744	.0000	.0000	-2.5483	84.4886	2.7610	.0000	.00	.48	.00
2	.9038	4.4661	.0000	.0000	-2.5350	-133.2246	-1.6859	.0000	.00	.48	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.4484	4.5086	.0000	.0000	1.6929	-100.3476	2.5859	.0000	.00	-.01	.00
2	1.1720	3.1652	.0000	.0000	1.6820	-97.1724	1.0719	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.1720	3.1652	.0000	.0000	1.6820	-97.1724	1.0719	.0000	.00	-.01	.00
2	.8921	1.8344	.0000	.0000	1.6743	-94.4813	-.1980	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8921	1.8344	.0000	.0000	1.6743	-94.4813	-.1980	.0000	.00	.01	.00
2	.6102	.5113	.0000	.0000	1.6700	-92.3009	-1.2112	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.6102	.5113	.0000	.0000	1.6700	92.3009	1.2112	.0000	.00	.01	.00
2	.3985	-.4789	.0000	.0000	1.6689	-91.0158	-1.7956	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3985	-.4789	.0000	.0000	1.6689	-91.0158	-1.7956	.0000	.00	-.01	.005
2	.1174	-1.8004	.0000	.0000	1.6705	-89.7890	-2.3319	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1174	-1.8004	.0000	.0000	1.6705	-89.7890	-2.3319	.0000	.00	-.01	.005
2	-.1610	-3.1279	.0000	.0000	1.6754	-89.1409	2.5798	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.1610	-3.1279	.0000	.0000	1.6754	-89.1409	-2.5798	.0000	.00	-.01	.005
2	-.4349	-4.4661	.0000	.0000	1.6837	-89.0971	-2.5275	.0000	.00	-.02	.005

```
PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TRENEX IPF75(II)
42.000,    7,    22,    22,    1,    20,    1
21.000
1,   2.550,   0.000,   0.300,   3250000.0,   0.20
2,   0.800,   0.000,   0.300,   3250000.0,   0.20
3,   0.800,   0.000,   0.500,   3250000.0,   0.20
4,   0.600,   0.000,   0.500,   3250000.0,   0.20
5,   0.000,   4.400,   0.600,   3250000.0,   0.20
6,   0.800,   0.000,   0.400,   3250000.0,   0.20
7,   0.600,   0.000,   0.400,   3250000.0,   0.20
1,   1,   2,   1,   1,   0.000,   0.000,   0.000
2,   2,   3,   2,   1,   0.000,   0.000,   3.875
3,   3,   4,   2,   1,   0.000,   0.000,   3.875
4,   4,   6,   3,   1,   0.000,   0.000,   4.550
5,   6,   8,   3,   1,   0.000,   0.000,   4.550
6,   8,  10,   3,   1,   0.000,   0.000,   0.000
7,  10,  12,   4,   1,   0.000,   0.000,   0.000
8,  12,  14,   3,   1,   0.000,   0.000,   3.875
9,  14,  16,   3,   1,   0.000,   0.000,   3.875
10, 16,  18,   3,   1,   0.000,   0.000,   4.550
11, 18,  20,   2,   1,   0.000,   0.000,   4.550
12, 20,  21,   2,   1,   0.000,   0.000,   0.000
13, 21,  22,   1,   1,   0.000,   0.000,   0.000
14,  4,   5,   5,   1,   0.000,   0.000,   0.000
15, 18,  19,   5,   1,   0.000,   0.000,   0.000
16,  5,   7,   6,   1,   0.000,   0.000,   0.000
17,  7,   9,   6,   1,   0.000,   0.000,   0.000
18,  9,  11,   6,   1,   0.000,   0.000,   0.000
19, 11,  13,   7,   1,   0.000,   0.000,   0.000
20, 13,  15,   6,   1,   0.000,   0.000,   0.000
21, 15,  17,   6,   1,   0.000,   0.000,   0.000
22, 17,  19,   6,   1,   0.000,   0.000,   0.000
8
2,   0.000,   0.680,   21.000,   30.000
3,   0.000,   0.680,   21.000,   30.000
4,   0.000,   0.810,   21.000,   30.000
5,   0.000,   0.810,   21.000,   30.000
8,   0.000,   0.680,   21.000,   30.000
9,   0.000,   0.680,   21.000,   30.000
10,  0.000,   0.810,   21.000,   30.000
11,  0.000,   0.810,   21.000,   30.000
1,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
2,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
3,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
4,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
5,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
6,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
7,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
8,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
9,   0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
10,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
11,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
12,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
13,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
14,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
15,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
16,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
17,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
18,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
19,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
20,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
21,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
22,  0.000,  0.000,  0.000,  0.000,  0, 0, 0, 0
```

3, 0.000, 0.000, 0.000, 0.000 21.000, 0.000

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TRENEX IP

CINCBTR 4
IPF 7T
2 TRANS, TIPO 2

LUZ	=	42.000
NUMERO DE TIPOS DE PLACA	=	7
NUMERO DE ELEMENTOS	=	22
NUMERO DE JUNTAS	=	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	1
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	3.875
3	3	4	2	1	.000	.000	3.875
4	4	6	3	1	.000	.000	4.550
5	6	8	3	1	.000	.000	4.550
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	3.875
9	14	16	3	1	.000	.000	3.875
10	16	18	3	1	.000	.000	4.550
11	18	20	2	1	.000	.000	4.550
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	6	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

1

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE	CARGA-H	CARGA-V	COLOCACION	ANCHO DE CARGA

2	.000	.680	21.000	30.000
3	.000	.680	21.000	30.000
4	.000	.810	21.000	30.000
5	.000	.810	21.000	30.000
8	.000	.680	21.000	30.000
9	.000	.680	21.000	30.000
10	.000	.810	21.000	30.000
11	.000	.810	21.000	30.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0158	1.2640	.0005	.0000
2	.0115	1.1491	.0004	.0000
3	.0100	1.1154	.0004	.0000
4	.0085	1.0965	.0000	.0000
5	-.0100	1.0923	.0001	.0000
6	.0068	1.0994	-.0001	.0000
7	-.0077	1.0867	.0001	.0000
8	.0053	1.1045	.0000	.0000
9	-.0056	1.0806	.0001	.0000
10	.0039	1.1065	.0000	.0000
11	-.0036	1.0748	.0001	.0000
12	.0028	1.1048	.0001	.0000
13	-.0020	1.0712	.0001	.0000
14	.0014	1.0971	.0001	.0000
15	.0000	1.0678	.0000	.0000
16	-.0001	1.0844	.0002	.0000
17	.0021	1.0669	.0000	.0000
18	.0016	1.0729	.0001	.0000
19	.0042	1.0690	-.0001	.0000
20	-.0032	1.0693	.0000	.0000
21	-.0047	1.0676	.0000	.0000
22	-.0090	1.0666	.0000	.0000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4400	.0000	.0000	.0000	-.0043	78.2808	.0000	.0000	.00	-.02	.011
2	.4237	.0135	.0000	.0000	.0179	82.6115	-1.2593	.0000	.00	-.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4237	.0135	.0000	.0000	.0179	82.6115	-1.2593	.0000	.00	-.01	.011
2	.1324	-1.4391	.0000	.0000	3.6156	85.0038	-2.1729	.0000	.00	-.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1324	-1.4391	.0000	.0000	3.6156	85.0038	-2.1729	.0000	.00	-.01	.011
2	-.7273	-5.7669	.0000	.0000	7.1786	87.8734	-3.3256	.0000	.00	-.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.6647	-6.5389	.0000	.0000	-9.6574	146.9132	-3.2552	.0000	.00	-.01	.011
2	1.8627	-.4758	.0000	.0000	-5.4570	144.4014	-1.8922	.0000	.00	-.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.8627	-.4758	.0000	.0000	-5.4570	144.4014	-1.8922	.0000	.00	-.01	.011
2	2.3893	2.2034	.0000	.0000	-1.2222	142.6861	-.9305	.0000	.00	-.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.3893	2.2034	.0000	.0000	-1.2222	142.6861	-.9305	.0000	.00	-.01	.011

2	2.5779	3.1754	.0000	.0000	-1.1981	141.7966	-.3852	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.5779	3.1754	.0000	.0000	-1.1981	141.7966	.3852	.0000	.00	.00	.011
2	2.7143	3.8953	.0000	.0000	1.1781	141.6760	-.2514	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.7143	3.8953	.0000	.0000	-1.1781	141.6760	-.2514	.0000	.00	.00	.011
2	2.6075	3.4005	.0000	.0000	2.4346	142.2450	-.4404	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.6075	3.4005	.0000	.0000	2.4346	142.2450	-.4404	.0000	.00	.00	.011
2	1.9311	.0032	.0000	.0000	6.0499	143.6439	-1.0485	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.9311	.0032	.0000	.0000	6.0499	143.6439	-1.0485	.0000	.00	.00	.011
2	.6339	-6.5322	.0000	.0000	10.2549	145.8466	-2.0633	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0835	-1.6782	.0000	.0000	-4.2025	87.0817	-3.3693	.0000	.00	.00	.011
2	.4191	.0096	.0000	.0000	-.0061	84.4530	2.2022	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4191	.0096	.0000	.0000	-.0061	84.4530	-2.2022	.0000	.00	.00	.011
2	.4207	.0095	.0000	.0000	.0013	82.3091	-1.2772	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4207	.0095	.0000	.0000	.0013	82.3091	-1.2772	.0000	.00	.00	.011
2	.4235	.0000	.0000	.0000	.0012	78.8106	.0000	.0000	.00	.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1779	.7720	.0000	.0000	.0584	180.4432	16.8306	.0000	.00	1.10	.00
2	.0791	.5576	.0000	.0000	.0588	-285.1156	.2853	.0000	.00	1.09	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.9739	-4.8540	.0000	.0000	-1.2996	178.4020	14.4545	.0000	.00	1.07	.000
2	.1878	.8936	.0000	.0000	-1.3112	-282.8555	-.2631	.0000	.00	1.07	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.1243	.5576	.0000	.0000	.2820	-190.1291	-.0698	.0000	.00	.01	.011
2	1.0768	.3362	.0000	.0000	.2783	-186.8075	-1.8170	.0000	.00	.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.0768	.3362	.0000	.0000	.2783	-186.8075	-1.8170	.0000	.00	.01	.011
2	1.0296	.1180	.0000	.0000	.2748	-184.5668	-3.0233	.0000	.00	.01	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.0296	.1180	.0000	.0000	.2748	-184.5668	-3.0233	.0000	.00	.01	.011
2	.9830	-.0977	.0000	.0000	.2717	-183.4113	-3.6866	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9830	-.0977	.0000	.0000	.2717	-183.4113	-3.6866	.0000	.00	.00	.011
2	.9486	-.2582	.0000	.0000	.2696	-183.2590	-3.8268	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9486	-.2582	.0000	.0000	.2696	-183.2590	-3.8268	.0000	.00	.00	.011
2	.9036	-.4708	.0000	.0000	.2672	-184.0108	-3.5361	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9036	-.4708	.0000	.0000	.2672	-184.0108	-3.5361	.0000	.00	.00	.011
2	.8597	-.6824	.0000	.0000	.2652	-185.8565	-2.6984	.0000	.00	.00	.011

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.8597	-.6824	.0000	.0000	.2652	185.8565	-2.6984	.0000	.00	.00	.011
2	.8171	-.8936	.0000	.0000	.2636	-188.7978	-1.3128	.0000	.00	.00	.011

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PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN UIC
42.00,  7, 22, 22,  1,  20,  1
21.00
1,    2.550,    0.000,    0.300,    3250000.,  0.20
2,    0.800,    0.000,    0.300,    3250000.,  0.20
3,    0.800,    0.000,    0.500,    3250000.,  0.20
4,    0.600,    0.000,    0.500,    3250000.,  0.20
5,    0.800,    4.400,    0.600,    3250000.,  0.20
6,    0.800,    0.000,    0.400,    3250000.,  0.20
7,    0.600,    0.000,    0.400,    3250000.,  0.20
1,   1,   2,   1,   1,   0.000,   0.000,   0.000
2,   2,   3,   2,   1,   0.000,   0.000,   3.800
3,   3,   4,   2,   1,   0.000,   0.000,   3.800
4,   4,   6,   3,   1,   0.000,   0.000,   3.270
5,   6,   8,   3,   1,   0.000,   0.000,   3.270
6,   8,  10,   1,   1,   0.000,   0.000,   0.000
7,  10,  12,   4,   1,   0.000,   0.000,   0.000
8,  12,  14,   3,   1,   0.000,   0.000,   0.000
9,  14,  16,   3,   1,   0.000,   0.000,   0.000
10  16,  18,   3,   1,   0.000,   0.000,   0.000
11  18,  20,   2,   1,   0.000,   0.000,   0.000
12  20,  21,   2,   1,   0.000,   0.000,   0.000
13  21,  22,   1,   1,   0.000,   0.000,   0.000
14   4,   5,   5,   1,   0.000,   0.000,   0.000
15  18,  19,   5,   1,   0.000,   0.000,   0.000
16   5,   7,   6,   1,   0.000,   0.000,   0.000
17   7,   9,   6,   1,   0.000,   0.000,   0.000
18   9,  11,   6,   1,   0.000,   0.000,   0.000
19  11,  13,   7,   1,   0.000,   0.000,   0.000
20  13,  15,   6,   1,   0.000,   0.000,   0.000
21  15,  17,   6,   1,   0.000,   0.000,   0.000
22  17,  19,   6,   1,   0.000,   0.000,   0.000
8
2,   0.000,  2.830,  21.000,   6.400,
3,   0.000,  2.830,  21.000,   6.400,
4,   0.000,  2.640,  21.000,   6.400,
5,   0.000,  2.640,  21.000,   6.400,
8,   0.000,  0.000,  21.000,   6.400,
9,   0.000,  0.000,  21.000,   6.400,
10,  0.000,  0.000,  21.000,   6.400,
11,  0.000,  0.000,  21.000,   6.400,
1,   0.,   0.,   0.,   0.,   0,   0,   0,   0
2,   0.,   0.,   0.,   0.,   0,   0,   0,   0
3,   0.,   0.,   0.,   0.,   0,   0,   0,   0
4,   0.,   0.,   0.,   0.,   0,   0,   0,   0
5,   0.,   0.,   0.,   0.,   0,   0,   0,   0
6,   0.,   0.,   0.,   0.,   0,   0,   0,   0
7,   0.,   0.,   0.,   0.,   0,   0,   0,   0
8,   0.,   0.,   0.,   0.,   0,   0,   0,   0
9,   0.,   0.,   0.,   0.,   0,   0,   0,   0
10,  0.,   0.,   0.,   0.,   0,   0,   0,   0
11,  0.,   0.,   0.,   0.,   0,   0,   0,   0
12,  0.,   0.,   0.,   0.,   0,   0,   0,   0
13,  0.,   0.,   0.,   0.,   0,   0,   0,   0
14,  0.,   0.,   0.,   0.,   0,   0,   0,   0
15,  0.,   0.,   0.,   0.,   0,   0,   0,   0
16,  0.,   0.,   0.,   0.,   0,   0,   0,   0
17,  0.,   0.,   0.,   0.,   0,   0,   0,   0
18,  0.,   0.,   0.,   0.,   0,   0,   0,   0
19,  0.,   0.,   0.,   0.,   0,   0,   0,   0
20,  0.,   0.,   0.,   0.,   0,   0,   0,   0
21,  0.,   0.,   0.,   0.,   0,   0,   0,   0
22,  0.,   0.,   0.,   0.,   0,   0,   0,   0
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3, 0., 0., 0., 0., 21., 0.

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN UIC

LUZ	=	42.000
NUMERO DE TIPOS DE PLACA	=	7
NUMERO DE ELEMENTOS	=	22
NUMERO DE JUNTAS	=	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	1
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	3.800
3	3	4	2	1	.000	.000	3.800
4	4	6	3	1	.000	.000	3.270
5	6	8	3	1	.000	.000	3.270
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE	CARGA-H	CARGA-V	COLOCACION	ANCHO DE CARGA

2	.000	2.830	21.000	6.400
3	.000	2.830	21.000	6.400
4	.000	2.640	21.000	6.400
5	.000	2.640	21.000	6.400
8	.000	.000	21.000	6.400
9	.000	.000	21.000	6.400
10	.000	.000	21.000	6.400
11	.000	.000	21.000	6.400

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

1

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0121	.7674	.0006	.0000
2	.0101	.6112	.0006	.0000
3	.0094	.5605	.0006	.0000
4	.0086	.5269	.0001	.0000
5	.0066	.5236	.0000	.0000
6	.0078	.5155	.0002	.0000
7	.0078	.5158	.0002	.0000
8	.0070	.4991	.0002	.0000
9	.0089	.4979	.0003	.0000
10	.0063	.4775	.0003	.0000
11	.0098	.4742	.0003	.0000
12	.0059	.4599	.0003	.0000
13	.0105	.4553	.0003	.0000
14	.0053	.4374	.0003	.0000
15	.0113	.4318	.0003	.0000
16	.0047	.4190	.0002	.0000
17	.0121	.4144	.0002	.0000
18	.0041	.4082	.0001	.0000
19	.0129	.4073	.0000	.0000
20	.0034	.4027	.0001	.0000
21	.0028	.3975	.0001	.0000
22	.0010	.3834	.0000	.0000

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.5120	.0000	.0000	.0000	.0421	34.8500	.0000	.0000	.00	.01	.008
2	.4112	.3610	.0000	.0000	-.1013	38.1229	-.6615	.0000	.00	-.01	.006

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4112	.3610	.0000	.0000	-.1013	38.1229	-.6615	.0000	.00	.01	.006
2	-.0642	-1.6152	.0000	.0000	5.2214	39.7876	-1.2005	.0000	.00	-.01	.006

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0642	-1.6152	.0000	.0000	5.2214	39.7876	-1.2005	.0000	.00	-.01	.006
2	-1.3587	-7.9038	.0000	.0000	10.5687	41.7933	-1.9254	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9427	-.4280	.0000	.0000	-7.0131	69.3805	-4.5846	.0000	.00	-.01	.005
2	1.6733	3.2895	.0000	.0000	-2.2512	66.4980	-3.0041	.0000	.00	-.01	.005

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.6733	3.2895	.0000	.0000	-2.2512	66.4980	-3.0041	.0000	.00	-.01	.005
2	1.6534	3.1951	.0000	.0000	2.4786	64.2050	-1.7347	.0000	.00	.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.6534	3.1951	.0000	.0000	2.4786	64.2050	-1.7347	.0000	.00	-.01	.005

2	1.2344	1.2349	.0000	.0000	2.4714	62.4876	-.7598	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.2344	1.2349	.0000	.0000	2.4714	62.4876	.7598	.0000	.00	.01	.005
2	.9043	-.2087	.0000	.0000	2.4558	61.5477	-.2012	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.9043	-.2087	.0000	.0000	2.4558	61.5477	.2012	.0000	.00	-.01	.005
2	.4557	-2.1115	.0000	.0000	2.4461	60.7258	.3344	.0000	.00	.01	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4557	-2.1115	.0000	.0000	2.4461	60.7258	.3344	.0000	.00	-.01	.004
2	.0105	-4.0184	.0000	.0000	2.4581	60.3722	.6447	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0105	-4.0184	.0000	.0000	2.4581	60.3722	.6447	.0000	.00	.00	.004
2	-.4196	-5.9638	.0000	.0000	2.4951	60.4723	.7368	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1625	-.0224	.0000	.0000	.0047	35.8823	-1.5634	.0000	.00	.00	.004
2	.1596	-.0157	.0000	.0000	-.0033	34.8284	-1.0112	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1596	-.0157	.0000	.0000	-.0033	34.8284	-1.0112	.0000	.00	.00	.004
2	.1576	-.0109	.0000	.0000	-.0025	34.0209	-.5821	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.1576	-.0109	.0000	.0000	-.0025	34.0209	-.5821	.0000	.00	.00	.00
2	.1530	.0000	.0000	.0000	-.0020	33.0206	.0000	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.4666	-7.4759	.0000	.0000	-2.7093	87.8686	17.5590	.0000	.00	.53	.0
2	.8673	4.1991	.0000	.0000	-2.6562	-137.7227	1.5900	.0000	.00	.52	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.1753	-5.9414	.0000	.0000	-2.3423	72.8937	2.5189	.0000	.00	.41	.00
2	.8533	4.0530	.0000	.0000	-2.2794	-113.9163	-1.5617	.0000	.00	.41	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.3616	4.1991	.0000	.0000	1.5901	-91.4958	2.6566	.0000	.00	-.01	.00
2	1.1027	2.9450	.0000	.0000	1.5636	-87.0917	.9006	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.1027	2.9450	.0000	.0000	1.5636	-87.0917	.9006	.0000	.00	-.01	.00
2	.8372	1.7186	.0000	.0000	1.5458	-83.5918	-.4129	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8372	1.7186	.0000	.0000	1.5458	-83.5918	.4129	.0000	.00	.01	.00
2	.5687	.5085	.0000	.0000	1.5358	-80.8569	-1.3619	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.5687	.5085	.0000	.0000	1.5358	-80.8569	-1.3619	.0000	.00	-.01	.00
2	.3671	-.3945	.0000	.0000	1.5331	-79.2519	-1.8636	.0000	.00	.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3671	-.3945	.0000	.0000	1.5331	-79.2519	-1.8636	.0000	.00	-.01	.005
2	.1003	-1.6002	.0000	.0000	1.5357	-77.6572	-2.2763	.0000	.00	-.01	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1003	-1.6002	.0000	.0000	1.5357	-77.6572	-2.2763	.0000	.00	-.01	.004
2	-.1619	-2.8163	.0000	.0000	1.5453	-76.6474	-2.4120	.0000	.00	.01	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.1619	-2.8163	.0000	.0000	1.5453	-76.6474	-2.4120	.0000	.00	.01	.004
2	-.4163	-4.0530	.0000	.0000	1.5624	-76.1923	-2.2818	.0000	.00	-.01	.004

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PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TREN UIC
42.00,  7, 22, 22,  1,  20,  1
21.00
1,    2.550,    0.000,   0.300,   3250000.,  0.20
2,    0.800,    0.000,   0.300,   3250000.,  0.20
3,    0.800,    0.000,   0.500,   3250000.,  0.20
4,    0.600,    0.000,   0.500,   3250000.,  0.20
5,    0.000,    4.400,   0.600,   3250000.,  0.20
6,    0.800,    0.000,   0.400,   3250000.,  0.20
7,    0.600,    0.000,   0.400,   3250000.,  0.20
1,  1,  2,  1,  1,  0.000,   0.000,   0.000
2,  2,  3,  2,  1,  0.000,   0.000,   3.800
3,  3,  4,  2,  1,  0.000,   0.000,   3.800
4,  4,  6,  3,  1,  0.000,   0.000,   3.270
5,  6,  8,  3,  1,  0.000,   0.000,   3.270
6,  8, 10,  3,  1,  0.000,   0.000,   0.000
7, 10, 12,  4,  1,  0.000,   0.000,   0.000
8, 12, 14,  3,  1,  0.000,   0.000,   3.800
9, 14, 16,  3,  1,  0.000,   0.000,   3.800
10 16, 18,  3,  1,  0.000,   0.000,   3.270
11 18, 20,  2,  1,  0.000,   0.000,   3.270
12 20, 21,  2,  1,  0.000,   0.000,   0.000
13 21, 22,  1,  1,  0.000,   0.000,   0.000
14  4,  5,  5,  1,  0.000,   0.000,   0.000
15 18, 19,  5,  1,  0.000,   0.000,   0.000
16  5,  7,  6,  1,  0.000,   0.000,   0.000
17  7,  9,  6,  1,  0.000,   0.000,   0.000
18  9, 11,  6,  1,  0.000,   0.000,   0.000
19 11, 13,  7,  1,  0.000,   0.000,   0.000
20 13, 15,  6,  1,  0.000,   0.000,   0.000
21 15, 17,  6,  1,  0.000,   0.000,   0.000
22 17, 19,  6,  1,  0.000,   0.000,   0.000
8
2,  0.000,  2.830,  21.000,  6.400,
3,  0.000,  2.830,  21.000,  6.400,
4,  0.000,  2.640,  21.000,  6.400,
5,  0.000,  2.640,  21.000,  6.400,
8,  0.000,  2.830,  21.000,  6.400,
9,  0.000,  2.830,  21.000,  6.400,
10, 0.000,  2.640,  21.000,  6.400,
11, 0.000,  2.640,  21.000,  6.400,
1,   0.,   0.,   0.,   0.,   0,   0,   0,   0
2,   0.,   0.,   0.,   0.,   0,   0,   0,   0
3,   0.,   0.,   0.,   0.,   0,   0,   0,   0
4,   0.,   0.,   0.,   0.,   0,   0,   0,   0
5,   0.,   0.,   0.,   0.,   0,   0,   0,   0
6,   0.,   0.,   0.,   0.,   0,   0,   0,   0
7,   0.,   0.,   0.,   0.,   0,   0,   0,   0
8,   0.,   0.,   0.,   0.,   0,   0,   0,   0
9,   0.,   0.,   0.,   0.,   0,   0,   0,   0
10,  0.,   0.,   0.,   0.,   0,   0,   0,   0
11,  0.,   0.,   0.,   0.,   0,   0,   0,   0
12,  0.,   0.,   0.,   0.,   0,   0,   0,   0
13,  0.,   0.,   0.,   0.,   0,   0,   0,   0
14,  0.,   0.,   0.,   0.,   0,   0,   0,   0
15,  0.,   0.,   0.,   0.,   0,   0,   0,   0
16,  0.,   0.,   0.,   0.,   0,   0,   0,   0
17,  0.,   0.,   0.,   0.,   0,   0,   0,   0
18,  0.,   0.,   0.,   0.,   0,   0,   0,   0
19,  0.,   0.,   0.,   0.,   0,   0,   0,   0
20,  0.,   0.,   0.,   0.,   0,   0,   0,   0
21,  0.,   0.,   0.,   0.,   0,   0,   0,   0
22,  0.,   0.,   0.,   0.,   0,   0,   0,   0
```

3., 0., 0., 0., 0., 21., 0.

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TREN UIC

NUMERO DE TIPOS DE PLACA	=	7
NUMERO DE ELEMENTOS	=	22
NUMERO DE JUNTAS	=	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO	=	1
MAXIMO NUMERO DE ARMONICOS	=	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA Y IGUAL A

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	3.800
3	3	4	2	1	.000	.000	3.800
4	4	6	3	1	.000	.000	3.270
5	6	8	3	1	.000	.000	3.270
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	3.800
9	14	16	3	1	.000	.000	3.800
10	16	18	3	1	.000	.000	3.270
11	18	20	2	1	.000	.000	3.270
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

1

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE CARGA-H CARGA-V COLOCACION ANCHO DE CARGA

2	.000	2.830	21.000	6.400
3	.000	2.830	21.000	6.400
4	.000	2.640	21.000	6.400
5	.000	2.640	21.000	6.400
8	.000	2.830	21.000	6.400
9	.000	2.830	21.000	6.400
10	.000	2.640	21.000	6.400
11	.000	2.640	21.000	6.400

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	.000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	.000	0	.000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0149	1.1525	.0005	.0000
2	.0112	1.0171	.0005	.0000
3	.0099	.9738	.0005	.0000
4	.0084	.9482	.0000	.0000
5	-.0096	.9437	.0001	.0000
6	.0070	.9514	-.0001	.0000
7	-.0076	.9381	.0001	.0000
8	.0057	.9579	-.0001	.0000
9	-.0058	.9315	.0001	.0000
10	.0044	.9613	.0000	.0000
11	-.0041	.9249	.0001	.0000
12	.0035	.9600	.0001	.0000
13	-.0028	.9205	.0001	.0000
14	.0023	.9512	.0002	.0000
15	-.0011	.9162	.0000	.0000
16	.0011	.9352	.0002	.0000
17	.0007	.9144	.0000	.0000
18	-.0002	.9202	.0001	.0000
19	.0025	.9162	.0000	.0000
20	-.0017	.9145	.0000	.0000
21	.0031	.9109	.0000	.0000
22	.0068	.9035	.0000	.0000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.6582	.0000	.0000	.0000	-.0388	67.5265	.0000	.0000	.00	-.01	.01
2	.5638	.3367	.0000	.0000	-.0917	72.3353	-1.2500	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.5638	.3367	.0000	.0000	-.0917	72.3353	-1.2500	.0000	.00	-.01	.01
2	.0916	-1.6539	.0000	.0000	5.2351	74.9864	-2.2266	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0916	-1.6539	.0000	.0000	5.2351	74.9864	-2.2266	.0000	.00	-.01	.01
2	-1.1972	-7.9639	.0000	.0000	10.5883	78.2362	-3.5192	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.1717	-8.2993	.0000	.0000	-11.5432	130.8571	-3.5482	.0000	.00	-.01	.00
2	1.6994	-1.0741	.0000	.0000	-6.7021	127.5422	-1.7911	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.6994	-1.0741	.0000	.0000	-6.7021	127.5422	1.7911	.0000	.00	-.01	.01
2	2.5026	2.2723	.0000	.0000	-1.9651	125.3056	-.5738	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	2.5026	2.2723	.0000	.0000	-1.9651	125.3056	-.5738	.0000	.00	-.01	.01

2	2.8984	3.7843	.0000	.0000	-2.0234	124.1358	.1217	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	2.8984	3.7843	.0000	.0000	2.0234	124.1358	.1217	.0000	.00	.00	.010
2	3.1510	5.0136	.0000	.0000	-2.0910	123.9401	.3159	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3.1510	5.0136	.0000	.0000	-2.0910	123.9401	.3159	.0000	.00	.00	.010
2	3.0012	4.6806	.0000	.0000	-3.1090	124.5845	.1408	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	3.0012	4.6806	.0000	.0000	3.1090	124.5845	.1408	.0000	.00	.00	.010
2	1.9533	.2142	.0000	.0000	8.3961	126.2837	-.5476	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.9533	.2142	.0000	.0000	8.3961	126.2837	-.5476	.0000	.00	.00	.009
2	.1101	-8.3085	.0000	.0000	15.2094	129.0380	-1.7635	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0012	-1.9197	.0000	.0000	-4.7370	76.9260	-3.5423	.0000	.00	.00	.009
2	.3694	-.0012	.0000	.0000	-.0255	74.0899	-2.2625	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3694	-.0012	.0000	.0000	-.0255	74.0899	-2.2625	.0000	.00	.00	.009
2	.3732	.0061	.0000	.0000	.0025	71.8328	-1.2836	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.3732	.0061	.0000	.0000	-.0025	71.8328	-1.2836	.0000	.00	.00	.00
2	.3753	.0000	.0000	.0000	-.0002	68.2382	.0000	.0000	.00	.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.0941	.3354	.0000	.0000	.0252	162.3113	22.1561	.0000	.00	.25	.00
2	.1233	.7413	.0000	.0000	-.1281	-253.3263	.3739	.0000	.00	.94	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-1.2766	-6.3889	.0000	.0000	-1.9552	158.8742	18.0264	.0000	.00	.92	.000
2	.2183	1.1037	.0000	.0000	-1.6002	-249.4633	-.3333	.0000	.00	.92	.000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.0779	.7413	.0000	.0000	.3647	-168.9147	.0968	.0000	.00	.01	.009
2	1.0122	.4621	.0000	.0000	.3543	-164.5606	-2.0537	.0000	.00	.01	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.0122	.4621	.0000	.0000	.3543	-164.5606	-2.0537	.0000	.00	.01	.009
2	.9474	.1907	.0000	.0000	.3468	-161.7042	-3.4831	.0000	.00	.01	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9474	.1907	.0000	.0000	.3468	-161.7042	-3.4831	.0000	.00	.01	.009
2	.8843	-.0767	.0000	.0000	.3421	-160.2210	-4.2675	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.8843	-.0767	.0000	.0000	.3421	160.2210	4.2675	.0000	.00	.00	.009
2	.8386	-.2766	.0000	.0000	.3403	-159.9732	-4.4549	.0000	00	00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.8386	-.2766	.0000	.0000	.3403	-159.9732	-4.4549	.0000	.00	.00	.009
2	.7806	-.5449	.0000	.0000	.3401	-160.7902	-4.1740	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.7806	-.5449	.0000	.0000	.3401	-160.7902	4.1740	.0000	.00	.00	.009
2	.7271	-.8190	.0000	.0000	.3429	-162.9618	3.2616	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.7271	-.8190	.0000	.0000	.3429	-162.9618	-3.2616	.0000	.00	.00	.009
2	.6799	-1.1037	.0000	.0000	.3492	-166.5952	-1.6538	.0000	.00	.00	.009

```
PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN SW2
42.00,  7, 22, 22,  1,  20,  1
21.00
1,    2.550,    0.000,    0.300,    3250000.,  0.20
2,    0.800,    0.000,    0.300,    3250000.,  0.20
3,    0.800,    0.000,    0.500,    3250000.,  0.20
4,    0.600,    0.000,    0.500,    3250000.,  0.20
5,    0.000,    4.400,    0.600,    3250000.,  0.20
6,    0.800,    0.000,    0.400,    3250000.,  0.20
7,    0.600,    0.000,    0.400,    3250000.,  0.20
1,  1,  2,  1,  1,   0.000,   0.000,   0.000
2,  2,  3,  2,  1,   0.000,   0.000,   0.000
3,  3,  4,  2,  1,   0.000,   0.000,   0.000
4,  4,  6,  3,  1,   0.000,   0.000,   0.000
5,  6,  8,  3,  1,   0.000,   0.000,   0.000
6,  8, 10,  3,  1,   0.000,   0.000,   0.000
7, 10, 12,  4,  1,   0.000,   0.000,   0.000
8, 12, 14,  3,  1,   0.000,   0.000,   0.000
9, 14, 16,  5,  1,   0.000,   0.000,   0.000
10 16, 18,  3,  1,   0.000,   0.000,   0.000
11 18, 20,  2,  1,   0.000,   0.000,   0.000
12 20, 21,  2,  1,   0.000,   0.000,   0.000
13 21, 22,  1,  1,   0.000,   0.000,   0.000
14  4,  5,  5,  1,   0.000,   0.000,   0.000
15 18, 19,  5,  1,   0.000,   0.000,   0.000
16  5,  7,  6,  1,   0.000,   0.000,   0.000
17  7,  9,  6,  1,   0.000,   0.000,   0.000
18  9, 11,  6,  1,   0.000,   0.000,   0.000
19 11, 13,  7,  1,   0.000,   0.000,   0.000
20 13, 15,  6,  1,   0.000,   0.000,   0.000
21 15, 17,  6,  1,   0.000,   0.000,   0.000
22 17, 19,  6,  1,   0.000,   0.000,   0.000
8
2,   0.000,  4.520,  21.000,  25.000,
3,   0.000,  4.520,  21.000,  25.000,
4,   0.000,  6.050,  21.000,  25.000,
5,   0.000,  6.050,  21.000,  25.000,
8,   0.000,  0.000,  21.000,  25.000,
9,   0.000,  0.000,  21.000,  25.000,
10,  0.000,  0.000,  21.000,  25.000,
11,  0.000,  0.000,  21.000,  25.000,
1,   0.,   0.,   0.,   0.,   0,  0,  0,  0
2,   0.,   0.,   0.,   0.,   0,  0,  0,  0
3,   0.,   0.,   0.,   0.,   0,  0,  0,  0
4,   0.,   0.,   0.,   0.,   0,  0,  0,  0
5,   0.,   0.,   0.,   0.,   0,  0,  0,  0
6,   0.,   0.,   0.,   0.,   0,  0,  0,  0
7,   0.,   0.,   0.,   0.,   0,  0,  0,  0
8,   0.,   0.,   0.,   0.,   0,  0,  0,  0
9,   0.,   0.,   0.,   0.,   0,  0,  0,  0
10,  0.,   0.,   0.,   0.,   0,  0,  0,  0
11,  0.,   0.,   0.,   0.,   0,  0,  0,  0
12,  0.,   0.,   0.,   0.,   0,  0,  0,  0
13,  0.,   0.,   0.,   0.,   0,  0,  0,  0
14,  0.,   0.,   0.,   0.,   0,  0,  0,  0
15,  0.,   0.,   0.,   0.,   0,  0,  0,  0
16,  0.,   0.,   0.,   0.,   0,  0,  0,  0
17,  0.,   0.,   0.,   0.,   0,  0,  0,  0
18,  0.,   0.,   0.,   0.,   0,  0,  0,  0
19,  0.,   0.,   0.,   0.,   0,  0,  0,  0
20,  0.,   0.,   0.,   0.,   0,  0,  0,  0
21,  0.,   0.,   0.,   0.,   0,  0,  0,  0
22,  0.,   0.,   0.,   0.,   0,  0,  0,  0
```

3, 0., 0., 0., 0., 21., 0.

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 1 TREN SW2

U2 ... =	42.000
NUMERO DE TIPOS DE PLACA ... =	7
NUMERO DE ELEMENTOS ... =	22
NUMERO DE JUNTAS ... =	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO ... =	1
MAXIMO NUMERO DE ARMONICOS ... =	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.500	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	2	1	.000	.000	.000
4	4	6	3	1	.000	.000	.000
5	6	8	3	1	.000	.000	.000
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

1

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE CARGA-H CARGA-V COLOCACION ANCHO DE CARGA

2	.000	4.520	21.000	25.000
3	.000	4.520	21.000	25.000
4	.000	6.050	21.000	25.000
5	.000	6.050	21.000	25.000
8	.000	.000	21.000	25.000
9	.000	.000	21.000	25.000
10	.000	.000	21.000	25.000
11	.000	.000	21.000	25.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH		VERTICAL /IV		ROTACIONAL /IM		LONGITUDINAL/IS	
1	000	0	.000	0	.000	0	.000	0
2	.000	0	.000	0	.000	0	.000	0
3	.000	0	.000	0	.000	0	.000	0
4	.000	0	.000	0	.000	0	.000	0
5	.000	0	.000	0	.000	0	.000	0
6	.000	0	.000	0	.000	0	.000	0
7	.000	0	.000	0	.000	0	.000	0
8	.000	0	.000	0	000	0	000	0
9	.000	0	.000	0	.000	0	.000	0
10	.000	0	.000	0	.000	0	.000	0
11	.000	0	.000	0	.000	0	.000	0
12	.000	0	.000	0	.000	0	.000	0
13	.000	0	.000	0	.000	0	.000	0
14	.000	0	.000	0	.000	0	.000	0
15	.000	0	.000	0	.000	0	.000	0
16	.000	0	.000	0	.000	0	.000	0
17	.000	0	.000	0	.000	0	.000	0
18	.000	0	.000	0	.000	0	.000	0
19	.000	0	.000	0	.000	0	.000	0
20	.000	0	.000	0	.000	0	.000	0
21	.000	0	.000	0	.000	0	.000	0
22	.000	0	.000	0	.000	0	.000	0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F.LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0112	.7273	.0005	.0000
2	.0091	.5995	.0005	.0000
3	.0084	.5607	.0004	.0000
4	.0076	.5361	.0001	.0000
5	.0092	.5332	.0000	.0000
6	.0067	.5270	.0001	.0000
7	.0104	.5248	.0002	.0000
8	.0060	.5116	.0002	.0000
9	.0115	.5064	.0003	.0000
10	.0053	.4900	.0003	.0000
11	.0125	.4822	.0003	.0000
12	.0048	.4718	.0003	.0000
13	.0132	.4631	.0003	.0000
14	.0042	.4480	.0003	.0000
15	.0141	.4396	.0003	.0000
16	.0036	.4285	.0002	.0000
17	.0149	.4224	.0002	.0000
18	.0030	.4170	.0001	.0000
19	.0157	.4160	.0000	.0000
20	.0023	.4111	.0001	.0000
21	.0016	4056	.0001	.0000
22	-.0002	.3901	.0001	.0000

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	.2550	.0000	.0000	.0000	-.0115	36.5116	.0000	.0000	.00	-.01	.0
2	.2161	.0309	.0000	.0000	.0376	39.3424	-.6919	.0000	.00	-.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	.2161	.0309	.0000	.0000	.0376	39.3424	-.6919	.0000	.00	-.01	.0
2	-.0761	-1.4120	.0000	.0000	3.5777	40.7908	-1.1915	.0000	.00	-.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	-.0761	-1.4120	.0000	.0000	3.5777	40.7908	-1.1915	.0000	.00	-.01	.0
2	-.9211	-5.6825	.0000	.0000	7.0573	42.4739	-1.8083	.0000	.00	-.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	1.0935	.4815	.0000	.0000	-6.6999	70.5576	-4.1753	.0000	.00	-.01	.0
2	1.7651	4.0179	.0000	.0000	-2.0408	68.0991	-2.8193	.0000	.00	-.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	1.7651	4.0179	.0000	.0000	-2.0408	68.0991	-2.8193	.0000	.00	-.01	.0
2	1.6852	3.7872	.0000	.0000	2.6867	66.0167	-1.6591	.0000	.00	-.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(c
1	1.6852	3.7872	.0000	.0000	2.6867	66.0167	-1.6591	.0000	.00	-.01	.0

2	1.2284	1.6456	.0000	.0000	2.7196	64.3651	-.7220	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.2284	1.6456	.0000	.0000	2.7196	64.3651	-.7220	.0000	.00	-.01	.005
2	.8801	.0323	.0000	.0000	2.7283	63.4171	-.1677	.0000	.00	.00	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8801	.0323	.0000	.0000	2.7283	63.4171	.1677	.0000	.00	.00	.005
2	.4133	2.1242	.0000	.0000	2.7372	62.5435	.3737	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4133	-2.1242	.0000	.0000	2.7372	62.5435	.3737	.0000	.00	.00	.004
2	-.0503	-4.2939	.0000	.0000	2.7497	62.1178	.6894	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.0503	-4.2939	.0000	.0000	2.7497	62.1178	.6894	.0000	.00	.00	.004
2	-.5055	-6.4867	.0000	.0000	2.7678	62.1418	.7794	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1699	-.0058	.0000	.0000	.0027	36.8570	-1.6725	.0000	.00	.00	.004
2	.1680	-.0061	.0000	.0000	.0018	35.6646	-1.0839	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1680	-.0061	.0000	.0000	.0018	35.6646	-1.0839	.0000	.00	.00	.004
2	.1663	-.0057	.0000	.0000	.0009	34.7270	-.6255	.0000	.00	.00	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.1663	-.0057	.0000	.0000	.0009	34.7270	-.6255	.0000	.00	.00	.00
2	.1618	.0000	.0000	.0000	-.0017	33.3944	.0000	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.2085	-6.1641	.0000	.0000	2.3928	88.4203	13.7455	.0000	.00	.54	.00
2	.8756	4.2099	.0000	.0000	-2.3679	-141.1509	1.6034	.0000	.00	.53	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	-1.2872	-6.4809	.0000	.0000	-2.4664	74.9374	2.7717	.0000	.00	.42	.00
2	.8973	4.2058	.0000	.0000	-2.4483	-116.2688	-1.5916	.0000	.00	.42	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.3603	4.2099	.0000	.0000	1.6019	-93.8418	2.3629	.0000	.00	-.01	.005
2	1.0990	2.9420	.0000	.0000	1.5848	-89.7903	.8082	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	1.0990	2.9420	.0000	.0000	1.5848	-89.7903	.8082	.0000	.00	-.01	.005
2	.8317	1.6940	.0000	.0000	1.5729	-86.3189	-.4525	.0000	.00	-.01	.005

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8317	1.6940	.0000	.0000	1.5729	-86.3189	-.4525	.0000	.00	-.01	.00
2	.5612	.4581	.0000	.0000	1.5665	-83.4314	-1.4184	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.5612	.4581	.0000	.0000	1.5665	-83.4314	-1.4184	.0000	.00	-.01	.00
2	.3577	-.4657	.0000	.0000	1.5653	-81.6488	-1.9504	.0000	.00	-.01	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3577	-.4657	.0000	.0000	1.5653	-81.6488	-1.9504	.0000	.00	-.01	.005
2	.0880	-1.6998	.0000	.0000	1.5686	-79.7815	-2.4049	.0000	.00	-.01	.004

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0880	-1.6998	.0000	.0000	1.5686	-79.7815	-2.4049	.0000	.00	-.01	.004
2	.1777	2.9438	.0000	.0000	1.5774	-78.4953	-2.5706	.0000	.00	-.01	.004

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.1777	-2.9438	.0000	.0000	1.5774	-78.4953	-2.5706	.0000	.00	-.01	.004
2	-.4366	-4.2058	.0000	.0000	1.5918	-77.7901	-2.4488	.0000	.00	-.02	.004

```
PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TREN SW2
42.00,  7,  22,  22,  1,  20,  1
21.00
1,    2.550,    0.000,    0.300,    3250000.,  0.20
2,    0.800,    0.000,    0.300,    3250000.,  0.20
3,    0.800,    0.000,    0.500,    3250000.,  0.20
4,    0.800,    0.000,    0.500,    3250000.,  0.20
5,    0.300,    4.400,    0.600,    3250000.,  0.20
6,    0.800,    0.000,    0.400,    3250000.,  0.20
7,    0.600,    0.000,    0.400,    3250000.,  0.20
1,  1,  2,  1,  1,  0.000,  0.000,  0.000
2,  2,  3,  2,  1,  0.000,  0.000,  0.000
3,  3,  4,  2,  1,  0.000,  0.000,  0.000
4,  4,  6,  3,  1,  0.000,  0.000,  0.000
5,  6,  8,  3,  1,  0.000,  0.000,  0.000
6,  8,  10,  3,  1,  0.000,  0.000,  0.000
7,  10,  12,  4,  1,  0.000,  0.000,  0.000
8,  12,  14,  3,  1,  0.000,  0.000,  0.000
9,  14,  16,  3,  1,  0.000,  0.000,  0.000
10  16,  18,  3,  1,  0.000,  0.000,  0.000
11  18,  20,  2,  1,  0.000,  0.000,  0.000
12  20,  21,  2,  1,  0.000,  0.000,  0.000
13  21,  22,  1,  1,  0.000,  0.000,  0.000
14  4,  5,  5,  1,  0.000,  0.000,  0.000
15  18,  19,  5,  1,  0.000,  0.000,  0.000
16  5,  7,  6,  1,  0.000,  0.000,  0.000
17  7,  9,  6,  1,  0.000,  0.000,  0.000
18  9,  11,  6,  1,  0.000,  0.000,  0.000
19  11,  13,  7,  1,  0.000,  0.000,  0.000
20  13,  15,  6,  1,  0.000,  0.000,  0.000
21  15,  17,  6,  1,  0.000,  0.000,  0.000
22  17,  19,  6,  1,  0.000,  0.000,  0.000
8
2,  0.000,  4.520,  21.000,  25.000,
3,  0.000,  4.520,  21.000,  25.000,
4,  0.000,  6.050,  21.000,  25.000,
5,  0.000,  6.050,  21.000,  25.000,
8,  0.000,  4.520,  21.000,  25.000,
9,  0.000,  4.520,  21.000,  25.000,
10,  0.000,  6.050,  21.000,  25.000,
11,  0.000,  6.050,  21.000,  25.000,
1,  0.,  0.,  0.,  0.,  0,  0,  0,  0
2,  0.,  0.,  0.,  0.,  0,  0,  0,  0
3,  0.,  0.,  0.,  0.,  0,  0,  0,  0
4,  0.,  0.,  0.,  0.,  0,  0,  0,  0
5,  0.,  0.,  0.,  0.,  0,  0,  0,  0
6,  0.,  0.,  0.,  0.,  0,  0,  0,  0
7,  0.,  0.,  0.,  0.,  0,  0,  0,  0
8,  0.,  0.,  0.,  0.,  0,  0,  0,  0
9,  0.,  0.,  0.,  0.,  0,  0,  0,  0
10,  0.,  0.,  0.,  0.,  0,  0,  0,  0
11,  0.,  0.,  0.,  0.,  0,  0,  0,  0
12,  0.,  0.,  0.,  0.,  0,  0,  0,  0
13  0.,  0.,  0.,  0.,  0,  0,  0,  0
14,  0.,  0.,  0.,  0.,  0,  0,  0,  0
15,  0.,  0.,  0.,  0.,  0,  0,  0,  0
16,  0.,  0.,  0.,  0.,  0,  0,  0,  0
17,  0.,  0.,  0.,  0.,  0,  0,  0,  0
18,  0.,  0.,  0.,  0.,  0,  0,  0,  0
19,  0.,  0.,  0.,  0.,  0,  0,  0,  0
20,  0.,  0.,  0.,  0.,  0,  0,  0,  0
21,  0.,  0.,  0.,  0.,  0,  0,  0,  0
22,  0.,  0.,  0.,  0.,  0,  0,  0,  0
1
```

3, 0., 0., 0., 0., 21., 0.

1

PROGRAMA DE CALCULO DE LAMINA PLEGADA

PROYECTO : PUENTE SOBRE EL RIO CINCA. FLEX TRANS. 2 TREN SW2

LUZ ..... =	42.000
NUMERO DE TIPOS DE PLACA ..... =	7
NUMERO DE ELEMENTOS ..... =	22
NUMERO DE JUNTAS ..... =	22
NUMERO DE SECCIONES TRANVERSALES DE CALCULO .... =	1
MAXIMO NUMERO DE ARMONICOS ..... =	20

NOTA : CALCULO DE DESPLAZAMIENTOS PARA LAS SERIES DE FOURIER PARES

VALORES EN SECCIONES TRANSVERSALES PARA X IGUAL A :

SECCION 1 X = 21.000

T. PLACA	PROY./X	PROY./Y	ESPESOR	M.ELASTICIDAD	POISSON
1	2.550	.000	.300	3250000.0	.20
2	.800	.000	.300	3250000.0	.20
3	.800	.000	.500	3250000.0	.20
4	.600	.000	.500	3250000.0	.20
5	.000	4.400	.600	3250000.0	.20
6	.800	.000	.400	3250000.0	.20
7	.600	.000	.400	3250000.0	.20

ELE	I	J	PL	NSEC	LON	UNIF HL	UNIF VL
1	1	2	1	1	.000	.000	.000
2	2	3	2	1	.000	.000	.000
3	3	4	2	1	.000	.000	.000
4	4	6	3	1	.000	.000	.000
5	6	8	3	1	.000	.000	.000
6	8	10	3	1	.000	.000	.000
7	10	12	4	1	.000	.000	.000
8	12	14	3	1	.000	.000	.000
9	14	16	3	1	.000	.000	.000
10	16	18	3	1	.000	.000	.000
11	18	20	2	1	.000	.000	.000
12	20	21	2	1	.000	.000	.000
13	21	22	1	1	.000	.000	.000
14	4	5	5	1	.000	.000	.000
15	18	19	5	1	.000	.000	.000
16	5	7	6	1	.000	.000	.000
17	7	9	6	1	.000	.000	.000
18	9	11	6	1	.000	.000	.000
19	11	13	7	1	.000	.000	.000
20	13	15	6	1	.000	.000	.000
21	15	17	6	1	.000	.000	.000
22	17	19	6	1	.000	.000	.000

NUMERO DE LAS CARGAS PARCIALES DE SUPERFICIE = 8

ELE	CARGA H	CARGA V	COLOCACION	ANCHO DE CARGA

2	.000	4.520	21.000	25.000
3	.000	4.520	21.000	25.000
4	.000	6.050	21.000	25.000
5	.000	6.050	21.000	25.000
8	.000	4.520	21.000	25.000
9	.000	4.520	21.000	25.000
10	.000	6.050	21.000	25.000
11	.000	6.050	21.000	25.000

CARGAS INICIALES O DESPLAZAMIENTOS EN JUNTAS

JUNTA	HORIZONTAL /IH	VERTICAL /IV	ROTACIONAL /IM	LONGITUDINAL/IS
1	.000 0	.000 0	.000 0	.000 0
2	.000 0	.000 0	.000 0	.000 0
3	.000 0	.000 0	.000 0	.000 0
4	.000 0	.000 0	.000 0	.000 0
5	.000 0	.000 0	.000 0	.000 0
6	.000 0	.000 0	.000 0	.000 0
7	.000 0	.000 0	.000 0	.000 0
8	.000 0	.000 0	.000 0	.000 0
9	.000 0	.000 0	.000 0	.000 0
10	.000 0	.000 0	.000 0	.000 0
11	.000 0	.000 0	.000 0	.000 0
12	.000 0	.000 0	.000 0	.000 0
13	.000 0	.000 0	.000 0	.000 0
14	.000 0	.000 0	.000 0	.000 0
15	.000 0	.000 0	.000 0	.000 0
16	.000 0	.000 0	.000 0	.000 0
17	.000 0	.000 0	.000 0	.000 0
18	.000 0	.000 0	.000 0	.000 0
19	.000 0	.000 0	.000 0	.000 0
20	.000 0	.000 0	.000 0	.000 0
21	.000 0	.000 0	.000 0	.000 0
22	.000 0	.000 0	.000 0	.000 0

NUMERO DE CARGAS CONCENTRADAS EN JUNTA = 1

JUNTA	CARGA-H	CARGA-V	MOMENTO	F LONG.	COLOCACION	ANCHO DE CARGA
3	.000	.000	.000	.000	21.000	.000

1

DESPLAZAMIENTOS FINALES DE JUNTA

SECCION A 21.000 m

JUNTA	DH (cm)	DV (cm)	RO (ra)	DL (cm)
1	.0137	1.1181	.0004	.0000
2	.0099	1.0106	.0004	.0000
3	.0085	.9789	.0004	.0000
4	.0070	.9618	.0000	.0000
5	.0062	.9578	.0001	.0000
6	.0055	.9664	-.0001	.0000
7	-.0062	.9526	.0001	.0000
8	.0042	.9729	.0001	.0000
9	-.0043	.9473	.0001	.0000
10	.0029	.9759	.0000	.0000
11	-.0025	.9425	.0001	.0000
12	.0020	.9747	.0000	.0000
13	-.0012	.9395	.0000	.0000
14	.0007	.9673	.0001	.0000
15	.0006	.9371	.0000	.0000
16	-.0006	.9547	.0002	.0000
17	.0025	.9369	.0000	.0000
18	-.0020	.9433	.0001	.0000
19	.0044	.9395	-.0001	.0000
20	-.0035	.9402	.0000	.0000
21	-.0049	.9391	.0000	.0000
22	.0087	.9397	.0000	.0000

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 1 ENTRE JUNTAS 1/ 2

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.4193	.0000	.0000	.0000	.0094	69.7303	.0000	.0000	.00	-.01	.01
2	.3858	.0243	.0000	.0000	.0362	74.2251	-1.3155	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 2 ENTRE JUNTAS 2/ 3

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.3858	.0243	.0000	.0000	.0362	74.2251	-1.3155	.0000	.00	-.01	.01
2	.0956	-1.4185	.0000	.0000	3.5750	76.7147	-2.2724	.0000	.00	-.01	.01

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 3 ENTRE JUNTAS 3/ 4

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0956	-1.4185	.0000	.0000	3.5750	76.7147	-2.2724	.0000	.00	-.01	.01
2	-.7477	-5.6876	.0000	.0000	7.0531	79.6939	-3.4767	.0000	.00	-.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 4 ENTRE JUNTAS 4/ 6

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.4056	-6.9965	.0000	.0000	-10.5772	133.3304	-3.2587	.0000	.00	-.01	.01
2	1.7071	-.3754	.0000	.0000	-5.9027	130.6713	-1.8318	.0000	.00	-.01	.01

1

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 5 ENTRE JUNTAS 6/ 8

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.7071	-.3754	.0000	.0000	-5.9027	130.6713	-1.8318	.0000	.00	-.01	.01
2	2.2629	2.4591	.0000	.0000	-1.1617	128.8374	-.8266	.0000	.00	.00	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 6 ENTRE JUNTAS 8/ 10

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.2629	2.4591	.0000	.0000	-1.1617	128.8374	-.8266	.0000	.00	.00	.01

2	2.4409	3.3693	.0000	.0000	-1.1105	127.8827	-.2706	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 7 ENTRE JUNTAS 10/ 12

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.4409	3.3693	.0000	.0000	1.1105	127.8827	.2706	.0000	.00	.00	.010
2	2.5640	4.0329	.0000	.0000	-1.0715	127.7510	.1510	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 8 ENTRE JUNTAS 12/ 14

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.5640	4.0329	.0000	.0000	-1.0715	127.7510	.1510	.0000	.00	.00	.010
2	2.4418	3.4741	.0000	.0000	2.4958	128.3546	.3882	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 9 ENTRE JUNTAS 14/ 16

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	2.4418	3.4741	.0000	.0000	2.4958	128.3546	-.3882	.0000	.00	.00	.010
2	1.7619	.0412	.0000	.0000	6.0692	129.8385	-1.0755	.0000	.00	.00	.010

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 10 ENTRE JUNTAS 16/ 18

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.7619	.0412	.0000	.0000	6.0692	129.8385	-1.0755	.0000	.00	.00	.010
2	.4294	-6.7106	.0000	.0000	10.7489	132.1497	-2.1874	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 11 ENTRE JUNTAS 18/ 20

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.0058	-1.8844	.0000	.0000	-4.6774	78.8592	-3.4655	.0000	.00	.00	.009
2	.3790	.0025	.0000	.0000	-.0175	76.0939	-2.2648	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 12 ENTRE JUNTAS 20/ 21

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3790	.0025	.0000	.0000	-.0175	76.0939	-2.2648	.0000	.00	.00	.009
2	.3823	.0068	.0000	.0000	-.0018	73.8206	1.3113	.0000	.00	.00	.009

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 13 ENTRE JUNTAS 21/ 22

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.3823	.0068	.0000	.0000	-.0018	73.8206	-1.3113	.0000	.00	.00	.0
2	.3856	.0000	.0000	.0000	.0006	70.0065	.0000	.0000	.00	.01	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 14 ENTRE JUNTAS 4/ 5

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.2851	1.3089	.0000	.0000	.2030	164.3032	17.6235	.0000	.00	.96	.0
2	.0570	.4259	.0000	.0000	.2106	-258.6222	.2439	.0000	.00	.96	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 15 ENTRE JUNTAS 18/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	-.9732	-4.8262	.0000	.0000	-1.2675	162.1890	15.4215	.0000	.00	.94	.0
2	.1757	.7941	.0000	.0000	-1.2861	-255.8637	-.2197	.0000	.00	.94	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 16 ENTRE JUNTAS 5/ 7

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	1.0163	.4259	.0000	.0000	.2408	-172.4915	-.2211	.0000	.00	.01	.01
2	.9753	.2380	.0000	.0000	.2362	-168.8948	-2.0567	.0000	.00	.01	.01

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 17 ENTRE JUNTAS 7/ 9

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9753	.2380	.0000	.0000	.2362	-168.8948	-2.0567	.0000	.00	.01	.01
2	.9346	.0540	.0000	.0000	.2321	-166.4589	-3.3106	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 18 ENTRE JUNTAS 9/ 11

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.9346	.0540	.0000	.0000	.2321	-166.4589	-3.3106	.0000	.00	.00	.00
2	.8944	-.1270	.0000	.0000	.2287	-165.1882	-3.9805	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 19 ENTRE JUNTAS 11/ 13

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra)
1	.8944	-.1270	.0000	.0000	.2287	-165.1882	-3.9805	.0000	.00	.00	.00
2	.8649	-.2613	.0000	.0000	.2264	-165.0007	-4.0991	.0000	.00	.00	.00

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 20 ENTRE JUNTAS 13/ 15

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8649	-.2613	.0000	.0000	.2264	-165.0007	-4.0991	.0000	.00	.00	.00
2	.8267	-.4392	.0000	.0000	.2240	-165.7715	-3.7458	.0000	.00	.00	.0

FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 21 ENTRE JUNTAS 15/ 17

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.8267	.4392	.0000	.0000	.2240	-165.7715	-3.7458	.0000	.00	.00	.00
2	.7898	.6165	.0000	.0000	.2222	-167.7074	-2.8090	.0000	.00	.00	.00

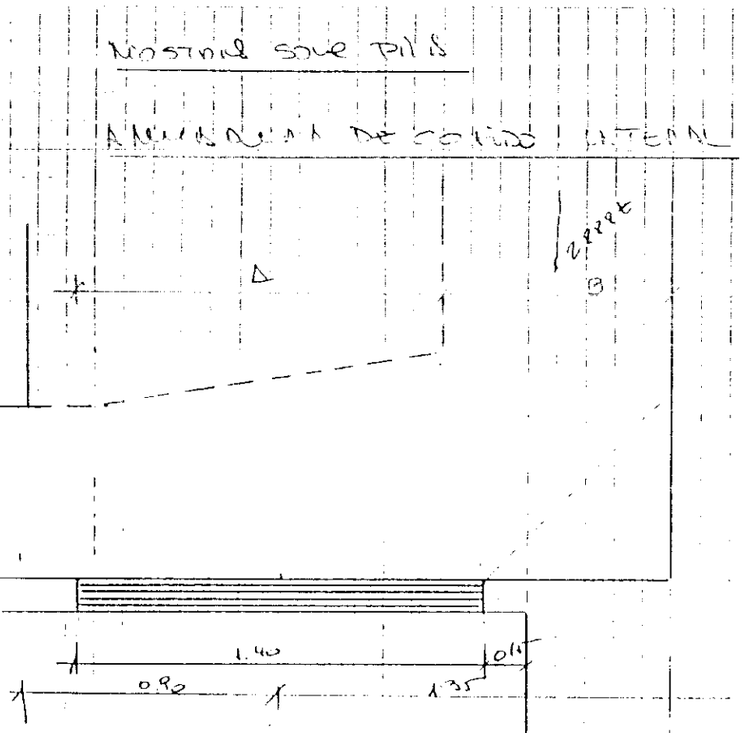
FUERZAS INTERNAS POR UNIDAD DE LONGITUD Y DESPLAZAMIENTOS INTERNOS EN ELEMENTO 22 ENTRE JUNTAS 17/ 19

SECCION A 21.000 m

P.	MX (t/m/m)	MY (t/m/m)	MXY(t/m/m)	QX (t/m)	QY (t/m)	NX (t/m)	NY (t/m)	NXY (t/m)	U(cm)	V(cm)	W(ra
1	.7898	.6165	.0000	.0000	.2222	-167.7074	-2.8090	.0000	.00	.00	.00
2	.7547	-.7941	.0000	.0000	.2211	-170.8047	-1.2908	.0000	.00	.00	.00

2.6.2.- Mamparos sobre pilas

Nostra sola pila



B=0.80

B' = 0.60

b = 2.25 - 0.80 = 1.45

b' = 2.25 - 0.60 = 1.65

Q = 2888 × 1.45 / (1.45 + 0.80) = 1861

Q' = 2502 × 1.65 / (1.65 + 0.60) = 1834

Il carico sulla base (0.60 × 0.80) della pila

è pari a:

Q = 1861 × 1.6 = 2978 tm

$\tau_b = \frac{2978}{1.80 \times 3.20} = 193\ t/m^2$

Tensione tangenziale

$\tau_b = \frac{193}{\Delta \tau_b} = 16.2\ kg/cm^2$

Tensione nel tirante

$H = 1624$

$H' = 1624 \times 1.6 = 2598\ t$

$\tau = \left(4.81 - 1.81 \frac{6.00 - 4.80}{\sqrt{2 \times 4.80^2 + 6.0^2}}\right) \times \frac{2598}{4.8^2 \times 6.0} = 85\ t/m^2$

Si ha una pompa tale che

$\tau = 85 \times \frac{2.40 - 0.40}{2.40} \times \frac{1}{3.2} = 22\ t/m^2$

$\sigma = \frac{22}{4.2} = 5.2\ kg/cm^2$

ANILLO DE CABEZA SUPERIOR E INFERIOR



$f_H = \frac{2888 \times 10^5}{240} = 1763$

$f'_H = 1763 \times 1.6 = 2021$

En cara de la presa

$w = \frac{2021 \times 1.15}{51 \times 3.2 \times 20} = 11 \text{ cm}^2/\text{m}^2$

ANILLO DE CUELGUE

$Q = 1861$ t

$D = 1861 \times 1.6 = 2978$

$\sigma = \frac{2978}{427} = 108 \text{ cm}^2/\text{ml}$

$\omega = \frac{108}{27} = 271 \text{ cm}^2/\text{ml}$

Se dispone $e\,\phi 25/10 + 1\,\phi 20/10$ (Doble malla y 2 ud $\phi 25$ en la base de la presa

$\%$

$\omega_1 = 2 \times 10 \times 4.91 + 1 \times 3.14 \times 10 + 2 \times 11 \times 4.91 = 237 \text{ cm}^2/\text{ml}$

RADIALES DE APOYO

$N = 2888$ t

$N_{SD} = 0.3 \times 2888 \times 1.6 \left(\frac{2.5 \times 140}{2 \pi} \right) \times \frac{1.15}{5.1} = 118 \text{ cm}^2$

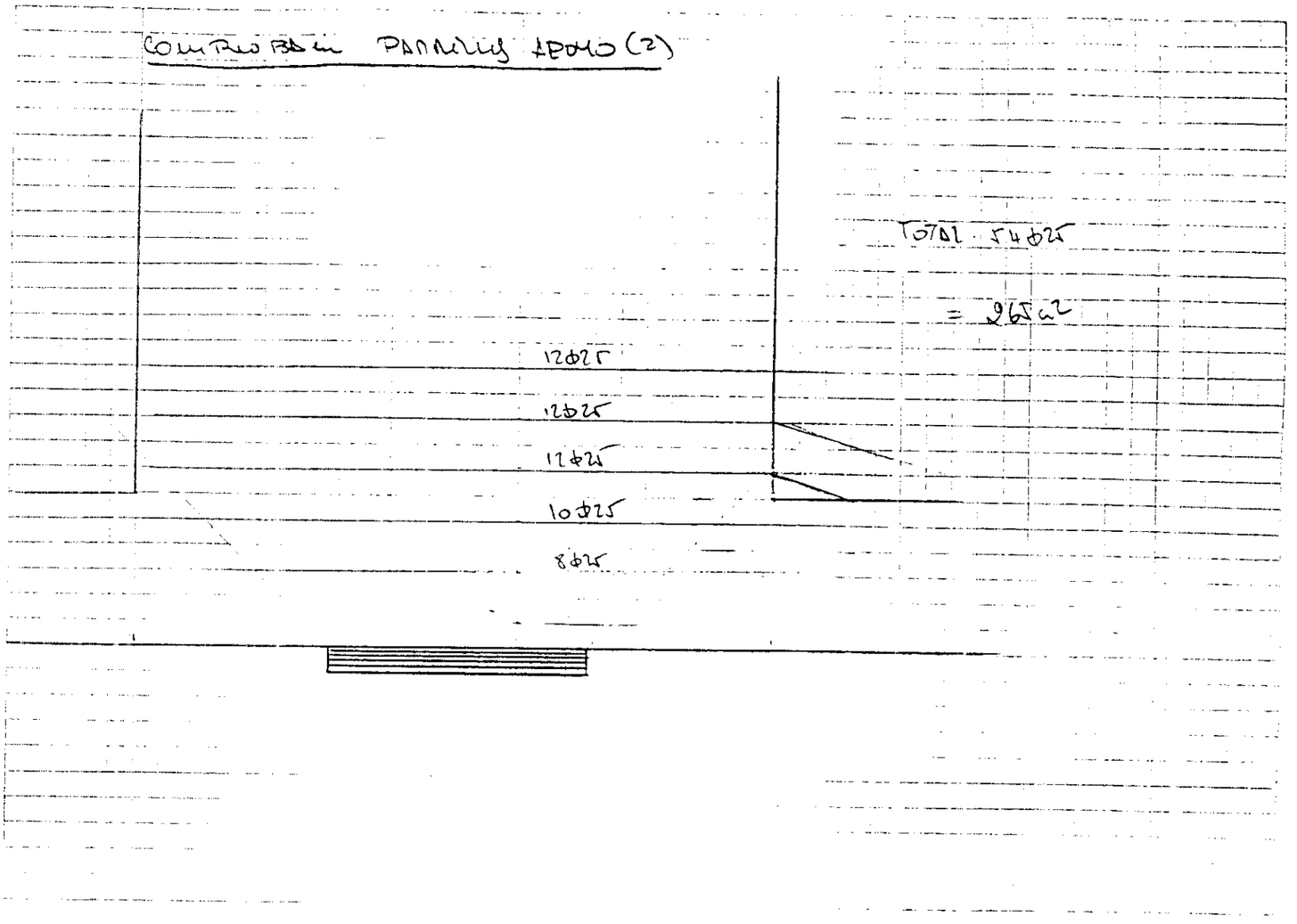
Se disponen $(2 \times 11 + 1 \times 9)\,\phi 25 = 152 \text{ cm}^2$

PROYECTO: _____ HOJA _____ DE _____

EJECUTANTE: _____ FECHA _____

intecsa

COMPROBACIÓN PANTALLA TIPO 1 (2)



2.6.3.- Mamparo sobre estribo 2

intecsa

PROYECTO:

EJECUTANTE:

HOJA ___ DE ___

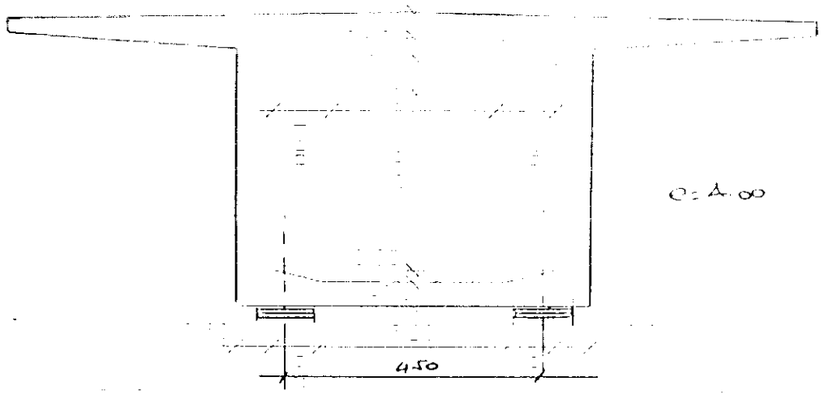
FECHA ___

NUDO SOBRE ESTRIBO 2

Qmax = 1133 kg/m²

Vt = 2155 kg/m²

Mmax = 3240 kg·m



ARMADURA DE CORTE POR ESFUERZO CORTANTE AL ESTRIBO

$$\omega = \frac{3240 \times 1.6}{40 \times (480+410) \times 2} \times \frac{1}{42} = 113 \text{ cm}^2/\text{m}^2$$

ARMADURA POR TORSIÓN

Vt = 2155 kg

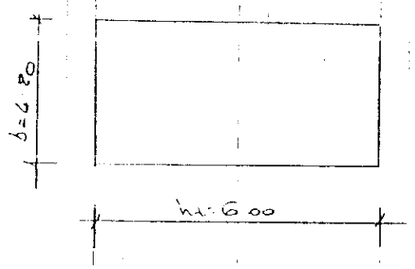
Mt = 2155 x 1.6 = 3448 kg·m

La tensión cortante máxima por torsión se produce en el centro del nudo, a partir de los cuales se supone

En virtud de esta tensión cortante de fu y longitud

$$z = \left(4.81 - 1.81 \frac{6m - 4.80}{12 \times 4.8^2 + 6.0^2}\right) \frac{3448}{4.8^2 \times 6.00} = 118 \text{ t/m}$$

La [illegible] resistente

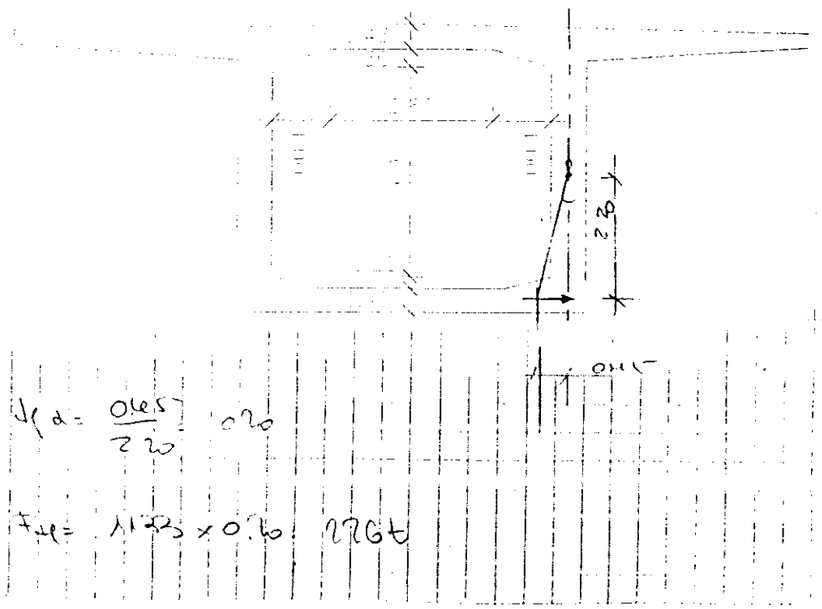


Toda la suspensión se tie-

ne

$$z = 118 \times \frac{2.40 - 0.10}{2.40} \times \frac{1}{400} \times \frac{1}{4.2} = 5.6 \text{ cm}^2/\text{m}^2$$

ARMADURA CABEZA SUSPENSIÓN ESUSPENSIÓN.



$$A_s = \frac{[illegible]}{220} \cdot 220$$

$$F_u = 1125 \times 0.6 = 2926$$

intecsa INTERNACIONAL DE INGENIERIA Y ESTUDIOS TECNICOS S.A

PROYECTO:

EJECUTANTE:

HOJA ___ DE ___

FECHA: ___

ω = 226 x 1.6 x 1.15 / 5.1 = 81 a2 tal e mitad fierro

ω = 81 / 4.00 x 2.20 = 92.0 a2/m2

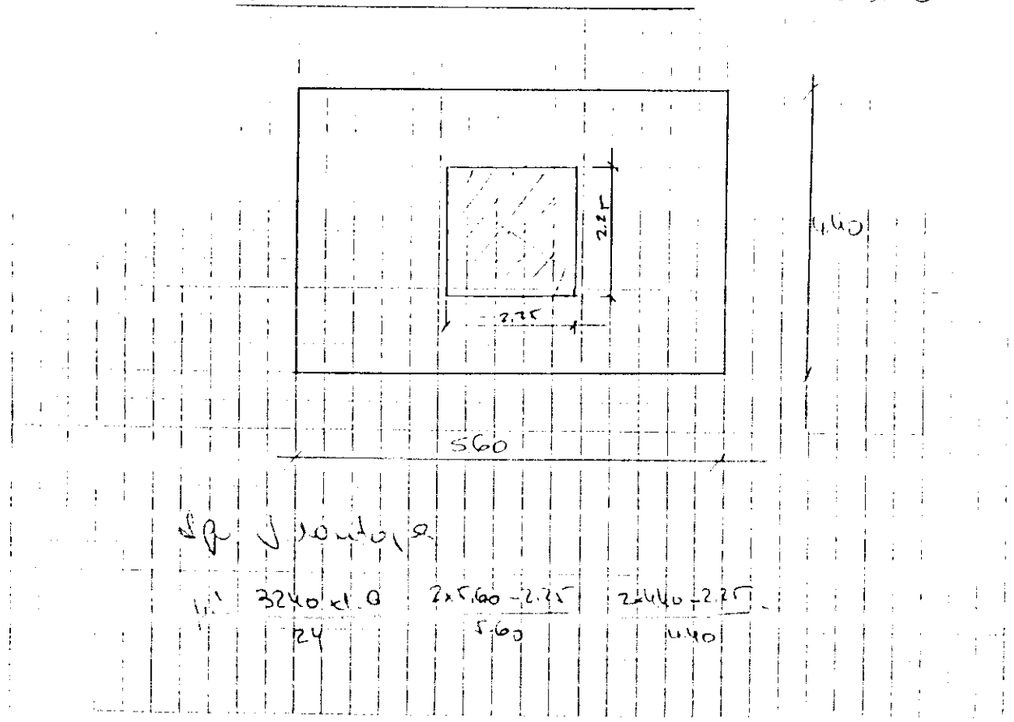
DIAGRAMA TOTAL DE ESFUERZOS

DIAGRAMAS VERTICALES

ω = 1.13 + 5.6 + 92.0 = 32.1 a2/m2

Ø20/30/30 (0.1)

COLUMNA FLEXION DE PLACA N = 3240 t



Ag = 3240 x 1.0 / 24 = 2 x 5.60 - 2.25 / 5.60 = 2.2440 - 2.25 / 1.40

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FECHA: ___

= 216 x 1.60 x 1.48 = 511 mt/ml

ω = 511 x 1.15 / 5.1 x 8.50 = 329 a2/m2 Ø25/15

PARALELA DE LUCIANO DE PUENTE(1.00)

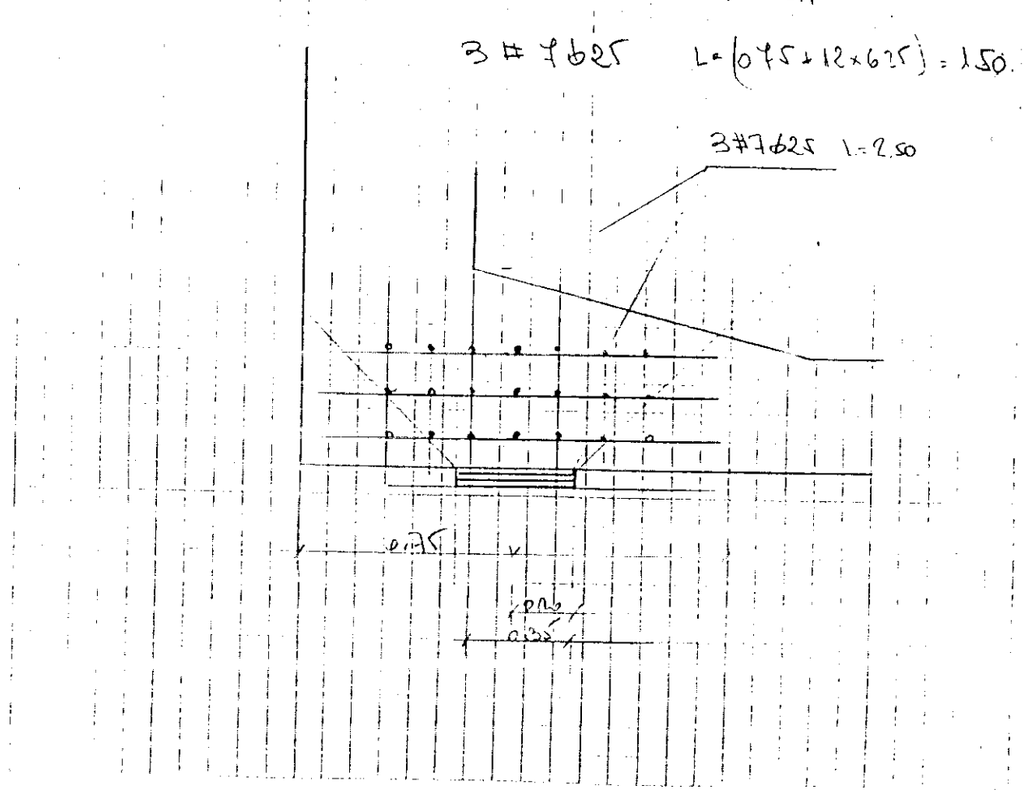
(LA MITAD DEL ESTRIBO)

PANELES DE APOYOS

Q = 1133 (200 x 400)

ω = 1133 x 1.6 x 0.3 (1.80 - 0.40 / 1.50) x 1.15 / 5.1 = 89 a2.

3 # 7Ø25 L = (0.75 + 12 x 0.25) = 1.50



ANCLAJE DE CUELGUE

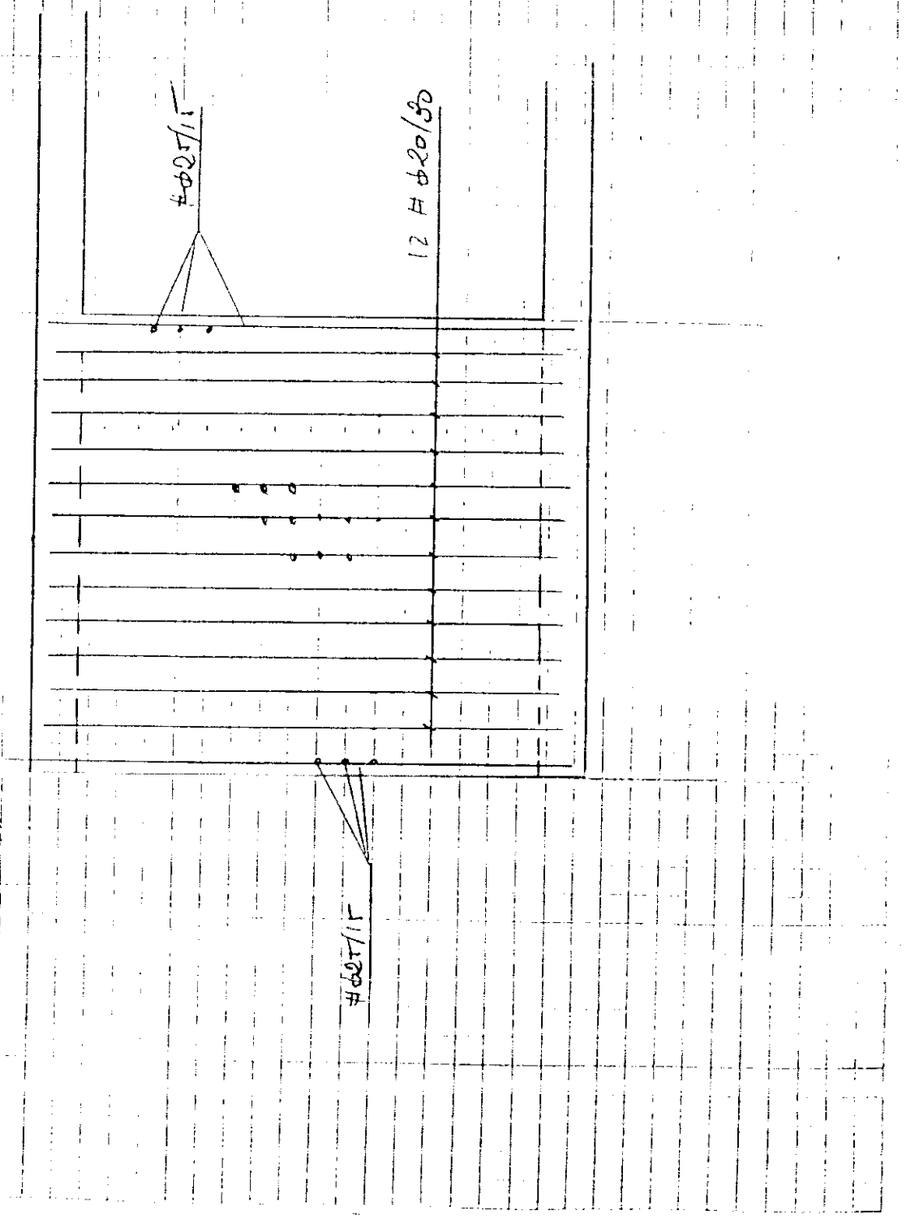
$N = 1133 \times \frac{0.85}{0.95} = 414$

$\sigma = \frac{414 \times 1.6}{51} = 12.9 \text{ kg/cm}^2$ total

$\omega = \frac{12.9}{4.0} = 3.16$

Long cinta $\phi 20/12.5$ $2 \times 3.14 \times 8 = 50.24$ m²

Pues se incrementa un 10% por los anclajes que trae la sección



2.6.4.- Mamparo sobre estribo 1

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FECHA

EJECUTANTE:

MOSTRAR SOBRE ESTRIBO 1

ES EL MISMO DIMENSIONAMIENTO DEL ESTRIBO 2

CON UN ANCHO DE CORTE DE 0.40

$W_T = 5164.920 = 14.82 \text{ Tn/m2}$ Ø16/30/30

TAMBIEN LLEVA EL ANCLAJE CON PLACA DE ACERO DE PRETENSADO



2.7.- ARMADURAS EN ANCLAJES

- Armaduras en anclajes

- Cables con bucle

Tracción tras el anclaje. Pretensado = 1100 cm²

$Z = 0,3 \gamma \left(1 - \frac{\sigma}{\sigma_p}\right)$

Para cables 12 - 19 y 22 Ø 0,6" para $\sigma_p = 0,5$, en sección de losa

$Z_{12} = 0,3 \cdot 240 \left(1 - \frac{0,25}{0,5}\right)$ = 36 t → 18 cm²

$Z_{19} = 0,3 \cdot 380 \left(1 - \frac{0,32}{0,5}\right)$ = 41 t → 20 cm²

$Z_{22} = 0,3 \cdot 480 \left(1 - \frac{0,38}{0,5}\right)$ = 36 t → 18 cm²

Se colocan 3 pb. de 4 b16.

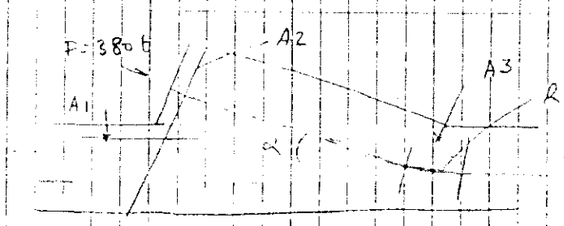
En la dirección longitudinal, en cabeza superior

$Z_{12} = 0,3 \cdot 2110 \left(1 - \frac{0,25}{1,05}\right)$ = 453 t → 3×4 b20

$Z_{19} = 0,3 \cdot 380 \left(1 - \frac{0,32}{1,05}\right)$ = 80 t → 3×4 Ø20

$Z_{22} = 0,3 \cdot 480 \left(1 - \frac{0,38}{1,05}\right)$ = 92 t → 3×4 b20

Tracción en anclajes en losa superior e inferior



$A_1 = \frac{0,44 \times 380}{2,8} = 54 \text{ cm}^2$ → 2×6 b20 para anclaje (2,4 m, 0,8)

$A_2 = \frac{380}{8} \cdot \frac{1}{2,4} = 20 \text{ cm}^2$ (4 Ø20 + 4 b16)

$A_3 = \frac{380}{8} \times \frac{1,6}{4,4} = 18 \text{ cm}^2$ en losa (10 cercos b12)

A lo largo de la pieza se colocan cercos y horquillas

b12 cada 15 cm

Armadura comba

$N = 0,3 \cdot 480 \left(1 - \frac{0,32}{0,6}\right) = 53 \text{ t}$ (2×4 Ø 20)

2.8.- APOYOS

2.8.1.- Características de los apoyos

CARACTERISTICAS DE APOYOS

	APARATOS DE APOYO				APOYOS GUIADOS	LONGITUD DE CHAPA	
	REACCION VERTICAL (tn)	GIRO (rdn)	DESPLAZAMIENTO acortamiento(mm)	DESPLAZAMIENTO alargamiento(mm)	REACCION HORIZONTAL (tn)	L1 (d1+B/2+150)mm	L2 (d2+B/2+150)mm
ESTRIBO 2	1200	0.005	0	0	100	850	850
PILA 13	2600	0.005	33.9	7.2	250	900	860
PILA 12	2600	0.005	75.2	15.9	250	940	880
PILA 11	2600	0.005	115.0	24.6	250	980	880
PILA 10	2600	0.005	153.8	33.3	250	1020	900
PILA 9	2600	0.005	192.1	42.0	250	1060	900
PILA 8	2600	0.005	229.8	50.7	250	1080	920
PILA 7	2600	0.005	267.0	59.4	250	1120	920
PILA 6	2600	0.005	303.8	68.1	250	1160	920
PILA 5	2600	0.005	341.7	76.8	250	1200	940
PILA 4	3000	0.005	380.8	85.5	320	1240	940
PILA 3	3000	0.005	431.0	96.0	320	1300	960
PILA 2	3000	0.005	480.4	105.5	320	1340	960
PILA 1	3000	0.005	530.2	117.0	320	1400	980
ESTRIBO1	1200	0.005	559.3	124.5	120	1420	980

GIROS EN APOYOS

	GIROS EN APOYOS (rdn x 1000)						GIRO (rdn)	GIRO (rdn)
APOYOS	NPP	NCP	PRET.	SCMAX	SCMIN	TEMP.	MAXIMO(+)	MINIMO(-)
ESTRIBO 1	0.4183	0.1604	-0.3209	0.5042	-0.2807	-0.1719	0.0008	-0.0002
1	0.1662	0.0630	-0.2750	0.5329	-0.4068	0.0573	0.0005	-0.0005
2	-0.0573	-0.0229	0.0573	0.5730	-0.6245	-0.0172	0.0006	-0.0007
3	0.0688	0.0286	-0.0458	0.6131	-0.5901	0.0000	0.0007	-0.0005
4	-0.2177	-0.0802	0.2693	0.4354	-0.5558	0.0000	0.0004	-0.0006
5	0.0630	0.0229	-0.0917	0.4354	-0.3839	0.0000	0.0004	-0.0004
6	-0.0115	-0.0057	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
7	-0.0115	0.0000	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
8	-0.0115	0.0000	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
9	-0.0115	0.0000	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
10	-0.0115	0.0000	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
11	-0.0115	0.0000	0.0000	0.4354	-0.3839	0.0000	0.0004	-0.0004
12	-0.0115	0.0000	0.0516	0.3495	-0.3495	0.0172	0.0004	-0.0003
13	0.0286	0.0000	0.0115	0.2693	-0.2922	-0.0516	0.0003	-0.0003
ESTRIBO 2	-0.4469	-0.1432	0.7391	0.1375	-0.3380	0.1604	0.0004	-0.0002

2.8.2.- Estudio mesetas de apoyos

Estudios locales

- Muestras de apoyo

En pilas la reacción transversal máxima es la siguiente:

	Sin sismo	Con sismo transversal	Nuevas hipótesis
Pilas 1 a 4	250	306	3000
Pilas 5 a 13	700	246	2000

En los apoyos guiados la fuerza transversal es la misma reacción horizontal transversal y en los deslizantes el 5% de la carga vertical máxima.

En apoyos guiados de Pilas 1 a 4

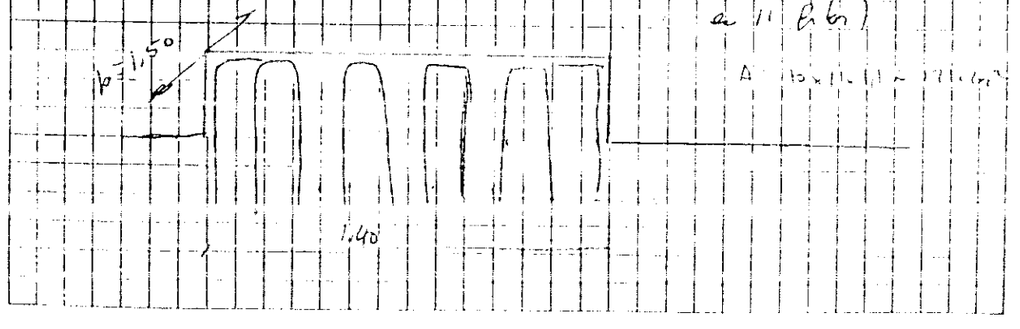
$$Hd = 1.6 \times \sqrt{750^2 + 150^2} = 466$$

Con sismo

$$Hd = 250 \times 1.28 + 56 < 430 \text{ kg}$$

$$A = \frac{466}{41.2} = 11.3 \text{ cm}^2$$ (como en cada pilar en el de pilas)

$$A = 15 \times 11.31 = 170 \text{ cm}^2$$



Resistencia de cálculo del hormigón. Pilas 57 a 73 - 25 N/mm²

$$P_{Rd} = 0,8 \cdot f_{cd} \cdot \frac{\varepsilon_1}{\gamma_V}$$

$$P_{Rd} = \frac{\alpha \cdot \eta_a \cdot \pi \cdot d^2 \sqrt{f_{cd} \cdot E_{cm}}}{\gamma_V}$$

con $\alpha = \left(\frac{h}{d} + 1\right) 0.2 \neq 1$ para $\frac{h}{d} \sim 4 \rightarrow \alpha = 1$

$\gamma_V = 1,25$

Con hormigón de 350 kg/cm² de cem.

Para ϕ = 19 mm

$$P_{Rd} = 0,8 \cdot 1,15 \cdot \frac{2,8^{11}}{1,25} = 8.2 \text{ kg/perno}$$

En apoyos guiados

$$F_d = 1.6 \sqrt{750^2 + (3000 \times 0,05)^2} = 466 \text{ kg}$$

$$N = \frac{466}{8,2} = 57 \text{ pernos} \quad \text{Se colocan } 9 \times 9 \text{ pernos}$$

separación 15 cm

Se colocan las mismas hipótesis en los apoyos deslizantes.

En cuanto a pernos de pilar en q

$H_d = 1.6 \sqrt{100^2 + 130^2} = 380$ kn

$N_{pernos} = \frac{384}{9,12} = 46$ (7x7 pernos con 2 de cada)

Se colocan los pernos de los anclajes laterales

La separación será de 6 diámetros entre ejes de los chapas

se comprueba en base en una superficie de 1,20 x 1,70

Sentido longitudinal a la vía:

$P_L = 2 \cdot 0,85 \cdot L \cdot a = 1,70\ La$

Sentido transversal a la vía:

$P_t = 2 \cdot 0,75 \cdot L \cdot a = 1,5\ La$

Acción longitudinal FL ① Solución longitudinal

Acción transversal FT ② Solución longitudinal

$H_{T1} = \frac{1,5}{1,41} \cdot FT = 0,53\ FT$

$H_{T2} = \frac{1,5}{3,2} FT = 0,47\ FT$

$H_{L1} = 0,47\ FL$

$H_{L2} = 0,53\ FL$

Solución ① transversal

$\sigma = 0,47 \frac{FL}{2aLr_2}$

$\tau_1 = \frac{0,47\ FL}{2aL\sqrt{2}}$

$\tau_2 = \frac{0,53\ FT}{2aL}$

$\frac{1}{aL} \sqrt{\frac{0,47^2}{8} FL^2 + 1,8 \left(\frac{0,47^2}{8} FL^2 + \frac{0,53^2}{4} FT^2 \right)} < 3,6$

$aL > 44\ cm^2 \rightarrow a > 3,6$ mm

Con la soldadura para la otra dirección

$\sigma = \frac{0,47\ FT}{2aLr_2}$

$\tau_1 = \frac{0,47\ FT}{2aLr_2}$ $\quad aL > 39\ cm^2$

$\tau_2 = \frac{0,53\ FL}{2aL}$ $\quad a \geq 3,2$ mm

Se toma $a = 4$ mm en todos los casos.

2.9.- GEOMETRÍA Y LONGITUD DE DOVELAS

Estimación de longitudes de Dovelas

Estimación de deformaciones diferidas

Se supone un entorno ambiental con una humedad del 75%

Características de la sección

$A = 13,4\ m^2$

$U = 2\,(3,7 + 4,4 + 4,0 + 4,8) = 53,8\ m$

$e = 1,5 \cdot \frac{2 \cdot 13,4}{53,8} = 0,75\ m$

- Retracción: Se toma

$\varepsilon_t = \beta_t \cdot \varepsilon_{01} \cdot \varepsilon_{02} = \beta_t \cdot 32 \cdot 0,75 \cdot 10^{-5}$

$\varepsilon_t = \beta_t \cdot 24 \cdot 10^{-5}$

Para β_t se toman valores en función de t de acuerdo con el cuadro adjunto

t	100	200	300	400
β	0,10	0,15	0,20	0,25

Fluencia

En el plan de obra se prevé un ritmo de una Dovela (unos 18 m) por semana que supone un plazo del orden de las 50 semanas. Dado que en cada Dovela sólo se tesan en cada fase un tercio de los cables resistentes se supone una edad del hormigón al tesar los cables de 3 semanas, es decir 20 días.

Los tesados de los cables de siguiente fase se producen con hormigones con edades comprendidas entre un año y unos 2 meses.

De acuerdo con ello se han estimado los siguientes coeficientes de fluencia para el pretensado

1) Cables de funicularidad

$\Psi_t = \beta_a(\infty) + \Psi_{01} \cdot \Psi_{02} \cdot (\beta_t - \beta_d) + 0,4\,\beta'_{t-\tau}$

$\beta_a(\infty) = 0,8\,(1 - 0,65) \simeq 0,28$

$\Psi_{01} = 2,6$

$\Psi_{02} = 0,79$

Los valores de β_t se toman según la EP 93 según valores que figuran en la tabla adjunta

VARIACION DE LA FUNCION FLUENCIA

E(cm)	T(dias)	F1	F2	Bt
75	20	0.562	1.000	0.222
75	40	0.562	1.000	0.288
75	60	0.562	1.000	0.336
75	80	0.562	1.000	0.374
75	100	0.562	1.000	0.405
75	120	0.562	1.000	0.430
75	140	0.562	1.000	0.452
75	160	0.562	1.000	0.472
75	180	0.562	1.000	0.489
75	200	0.562	1.000	0.505
75	220	0.562	1.000	0.519
75	240	0.562	1.000	0.532
75	260	0.562	1.000	0.544
75	280	0.562	1.000	0.555
75	320	0.562	1.000	0.575
75	360	0.562	1.000	0.592
75	400	0.562	0.999	0.607
75	500	0.562	0.999	0.640
75	600	0.562	0.998	0.665
75	700	0.562	0.997	0.687
75	800	0.562	0.995	0.705
75	900	0.562	0.993	0.721
75	1000	0.562	0.990	0.735
75	2000	0.562	0.926	0.826
75	3000	0.562	0.787	0.883
75	4000	0.562	0.610	0.924
75	5000	0.562	0.444	0.953
75	10000	0.562	0.091	0.995
75	20000	0.562	0.012	1.000

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$\varphi_t = 0,28 + 2,129 (\beta_t - \beta_0) + 0,14 =$

$\varphi_t = 0,68 + 2,58 (\beta_t - \beta_0)$

Dada la aplicación con la que estoy β'_t frente a β_t y la influencia pequeña de los tesados prácticamente como valor β_{10}

b) Cables de segunda fase

En este caso se toma un valor medio

$\beta_a(j) = 0,8 (1 - 0,9) = 0,08$

Se supone que el pretensado de cada tendón en cada viga en la edad T_i que figura en el cuadro adjunto, por lo que el valor de $\beta_t - \beta_i$ será para cada caso, a tiempo infinito

$\beta_t - \beta_i = 1 - \beta_i$

$\varphi_i = 0,08 + 2,58 (1 - \beta_i) + 0,14$

$\varphi_i = 0,28 + 2,58 (1 - \beta_i)$

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- Acortamiento elástico

Se toma el valor $S = \frac{\sigma_{cp}}{E_c}$

De acuerdo con ello se incluyen en los cuadros adjuntos la deformaciones que se producen en el tablero sobre cada pila, considerando fijo el apoyo en el estribo 2

Relación de datos

D11: Acortamiento elástico y diferido del tablero desde la puesta en tensión de los cables de primera fase hasta la finalización del tablero.

D12: Acortamiento diferido del tablero desde su terminación hasta tiempo infinito producido por los cables de primera fase.

D21: Acortamiento elástico del tablero producido por los cables de segunda fase.

D22: Acortamiento diferido del tablero pruducido por los cables de segunda fase.

R1: Retracción producida desde el hormigonado de cada vano hasta la finalización del tablero.

R2 Retracción producida desde la finalización del tablero hasta tiempo infinito.

DEFORMACIONES ELASTICAS Y POR FLUENCIA : PRETENSADO DE 1ª FASE

VANO	LUZ	AXILES FASE 1		Ti	Tj	Bj-Bi	1.00-Bj	D11(MM)	SUMA(D11)	D12(MM)	SUMA(D12)
		C. CONTINUOS	C. DISCONTINUOS								
14	48	6720	2850	20	40	0.066	0.712	16.1	16.1	16.0	16.0
13	58	6720	1780	20	60	0.114	0.664	18.4	34.5	16.0	32.0
12	58	6240	1780	20	80	0.152	0.636	18.3	52.8	14.5	46.4
11	58	6240	1780	20	100	0.183	0.595	19.0	71.7	13.5	59.9
10	58	6240	1780	20	120	0.208	0.570	19.5	91.3	13.0	72.9
9	58	6240	1780	20	140	0.230	0.548	20.0	111.3	12.5	85.3
8	58	6240	1780	20	160	0.250	0.528	20.5	131.8	12.0	97.3
7	58	6240	1780	20	180	0.267	0.511	20.9	152.6	11.6	109.0
6	58	7320	1780	20	200	0.283	0.495	24.1	176.7	12.8	121.7
5	56	8760	1450	20	220	0.297	0.481	27.4	204.1	13.9	135.6
4	70	9760	2185	20	240	0.310	0.468	39.3	243.4	19.1	154.8
3	70	9760	2280	20	280	0.333	0.445	40.5	283.9	18.3	173.1
2	70	10560	2280	20	320	0.353	0.425	44.1	328.0	18.7	191.7
1	50	10560	1710	20	360	0.370	0.408	30.6	358.6	12.2	204.0

DEFORMACIONES ELASTICAS Y POR FLUENCIA: PRETENSADO DE 2ª FASE

VANO	LUZ	N(FASE 2)	Tj	1.00-Bj	D21(MM)	SUMA(D21)	D22(MM)	SUMA(D22)	SUMA dif.
14	48	0	400	0.393	0.0	0.0	0.0	0.0	16.0
13	58	2280	360	0.408	2.5	2.5	3.8	3.8	38.3
12	58	2280	320	0.425	2.5	5.0	3.9	7.8	59.2
11	58	2280	280	0.445	2.5	7.5	4.1	11.9	79.3
10	58	2280	240	0.468	2.5	10.0	4.2	16.1	99.0
9	58	2280	220	0.481	2.5	12.5	4.3	20.4	118.3
8	58	2280	200	0.495	2.5	15.0	4.4	24.8	137.2
7	58	2280	180	0.511	2.5	17.5	4.5	29.3	155.8
6	58	2280	160	0.528	2.5	20.0	4.6	33.9	175.7
5	58	2280	140	0.548	2.5	22.5	4.7	38.7	196.8
4	70	2660	120	0.570	3.5	26.1	6.9	45.5	226.3
3	70	2660	100	0.595	3.5	29.6	7.1	52.6	255.3
2	70	2660	80	0.626	3.5	33.1	7.4	60.0	284.9
1	50	0	60	0.664	0.0	33.1	0.0	60.0	297.1

DEFORMACIONES ELASTICAS Y POR FLUENCIA: PRETENSADO DE 2ª FASE

VANO	LUZ	N(FASE 2)	Tj	1.00-Bj	D21(MM)	SUMA(D21)	D22(MM)	SUMA(D22)
14	48	0	400	0.393	0.0	0.0	0.0	0.0
13	58	2280	360	0.408	2.5	2.5	3.8	3.8
12	58	2280	320	0.425	2.5	5.0	3.9	7.8
11	58	2280	280	0.445	2.5	7.5	4.1	11.9
10	58	2280	240	0.468	2.5	10.0	4.2	16.1
9	58	2280	220	0.481	2.5	12.5	4.3	20.4
8	58	2280	200	0.495	2.5	15.0	4.4	24.8
7	58	2280	180	0.511	2.5	17.5	4.5	29.3
6	58	2280	160	0.528	2.5	20.0	4.6	33.9
5	58	2280	140	0.548	2.5	22.5	4.7	38.7
4	70	2660	120	0.570	3.5	26.1	6.9	45.5
3	70	2660	100	0.595	3.5	29.6	7.1	52.6
2	70	2660	80	0.626	3.5	33.1	7.4	60.0
1	50	0	60	0.664	0.0	33.1	0.0	60.0

DEFORMACIONES POR RETRACCION Y TEMPERATURA

VANO	LUZ	T (fin obra)	Bt	B(infinito)	RETRAC.(1)	SUMA (R1)	RETRAC.(2)	SUMA (R2)	TEMP (MM)	SUMA TEMP (MM)	SUMA(R2+TEMP)
14	48	40	0.07	1.00	0.8	0.8	10.7	10.7	7.2	7.2	17.9
13	58	60	0.08	1.00	1.1	1.9	12.8	23.5	8.7	15.9	39.4
12	58	80	0.09	1.00	1.3	3.2	12.7	36.2	8.7	24.6	60.8
11	58	100	0.10	1.00	1.4	4.6	12.5	48.7	8.7	33.3	82.0
10	58	120	0.11	1.00	1.5	6.1	12.4	61.1	8.7	42.0	103.1
9	58	140	0.12	1.00	1.7	7.8	12.2	73.4	8.7	50.7	124.1
8	58	160	0.13	1.00	1.8	9.6	12.1	85.5	8.7	59.4	144.9
7	58	180	0.14	1.00	1.9	11.5	12.0	97.4	8.7	68.1	165.5
6	58	200	0.15	1.00	2.1	13.6	11.8	109.3	8.7	76.8	186.1
5	58	220	0.16	1.00	2.2	15.8	11.7	121.0	8.7	85.5	206.5
4	70	240	0.18	1.00	3.0	18.9	13.8	134.7	10.5	96.0	230.7
3	70	280	0.20	1.00	3.4	22.2	13.4	148.2	10.5	106.5	254.7
2	70	320	0.21	1.00	3.5	25.8	13.3	161.4	10.5	117.0	278.4
1	50	360	0.22	1.00	2.6	28.4	9.4	170.8	7.5	124.5	295.3

Resumen de deformaciones

	Reducción de deformación (mm)	Tiempo final de obra (mm)
Pretensado Fase 1ª	359	204
Pretensado Fase 2ª	33	60
Retracción	28	171
Total	420	435

Temperatura ± 124,5

Incremento de longitud por variación lineal diferencial

$$\Delta l = 835\,(1-\cos(0{,}02)) = 0{,}167 \text{ m}$$

Se propone construir una longitud l

$$l = 830 + 2{,}20 + 2{,}50 + (0{,}42 + 0{,}17 + 0{,}175 + 0{,}31)$$

$$l = 830 + 2{,}20 + 2{,}5 + 0{,}75 = 835{,}45 \text{ m}$$

De acuerdo con ello se proponen las siguientes longitudes

Dovelas	l (teórica)	l (real)	Δ
1	2,5 + 2,25 = 8,75	8,75	
2 a 15	17.500	17.520	0,020 × 14 = 0,28
16	18.017	18.020	= 0,003
17 a 44	19.333	19.350	0,0167 × 28 = 0,467
45	19 + 2,2 = 21.200	21,20	
	854,200	855,45	0,750

CARACTERISTICAS DE APOYOS

	APARATOS DE APOYO				APOYOS GUIADOS	LONGITUD TOTAL
	REACCION	GIRO	DESPLAZAMIENTO		REACCION	CHAPA
	VERTICAL (tn)	(rdn)	acortamiento(mm)	alargamiento(mm)	HORIZONTAL (tn)	(d1+d2+100)mm
ESTRIBO 2	1200	0.012	0	0	100	0
PILA 13	2600	0.012	33.9	7.2	250	141
PILA 12	2600	0.012	75.2	15.9	250	191
PILA 11	2600	0.012	115.0	24.6	250	240
PILA 10	2600	0.012	153.8	33.3	250	287
PILA 9	2600	0.012	192.1	42.0	250	334
PILA 8	2600	0.012	229.8	50.7	250	380
PILA 7	2600	0.012	267.0	59.4	250	426
PILA 6	2600	0.012	303.8	68.1	250	472
PILA 5	2600	0.012	341.7	76.8	250	519
PILA 4	3000	0.015	380.8	85.5	320	566
PILA 3	3000	0.015	431.0	96.0	320	627
PILA 2	3000	0.015	480.4	106.5	320	687
PILA 1	3000	0.015	530.2	117.0	320	747
ESTRIBO 1	1200	0.015	559.3	124.5	120	784

Rozamiento

Cable tesa $\mu = 0,21$

$K/\mu = 0,006$

Con $\alpha = 0$; $\lambda \simeq 30$ m

$\Delta P_1 = 0,21(0,006 \times 30) \simeq 0,04 = 4\%$

Penetración de cuñas

$\Delta P_2 = \frac{L}{59.000} \times 70000 \simeq 2$ Kg/mm²

Retracción

$\Delta P_0 \simeq 24 \cdot 10^{-5} \cdot 2 \cdot 10^5 \simeq 4,8$ Kg/mm²

Fluencia

Cable 1ª fase $P_f = 0,68 \cdot P_i \cdot \delta (1 - 0,2 \alpha) = 2,68$

Vanos 1 a 2 $\Delta P = 5,8 \cdot 2,68 = 15,5$ Kg/mm²

Vanos 3 a 5 $\Delta P = 5,4 \cdot 2,68 = 14,5$ Kg/mm²

Vanos 6 a 14 $\Delta P = 3,6 \cdot 2,68 = 9,6$ Kg/mm²

Cable 2ª fase $P_f = 0,48 \cdot 2,98 (1 - 0,1) = 1,17$

Vanos 1 - 2 $\Delta P = 5,8 \cdot 2,2 = 12,8$ Kg/mm²

Vanos 3 a 5 $\Delta P = 5,4 \cdot 2,2 = 11,9$ Kg/mm²

Vanos 6 a 14 $\Delta P = 3,6 \cdot 1,17 = 6,4$ Kg/mm²

Retracción

$\Delta P_0 = 0,04 \cdot \left[190 \times 0,75 - 2 \left(4,8 + 6,4 \right) \right] = 4,8$ Kg/mm²

Procediendo con el resto de hipótesis de la misma forma siguiente

Cable 1ª fase

Vanos 1 a 2 $f_f = 142,5 - 2,9 - 5,7 - 2 - 4,8 - 15,5 - 4,8 = 106,8 = 0,75\ f_i$

Vanos 3 a 5 $f_f = 108$ Kg/mm² $\rightarrow = 0,757\ f_i$

Vanos 6 a 14 $f_f = 113,8$ Kg/mm² $\simeq 0,80\ f_i$

Se toma un valor medio de pérdidas del 24%

Cable de 2ª fase

Vanos 1 a 2 $f_f = 142,5 - 2,9 - 5,7 - 2 - 6,8 - 10,5 - 4,8 - 11,2 = 0,785\ P_i$

Vanos 3 a 5 $f_f = 112,9$ Kg/mm² $\rightarrow 0,79\ P_i$

Vanos 6 a 14 $f_f = 117$ Kg/mm² $\rightarrow 0,82\ P_i$

Se toma un valor medio de pérdidas del 21%

2.10.- CONTROL DE DEFORMACIONES

Cálculo de estructuras

1. Frecuencia propia

Se calculan los periodos propios de la viga trabajando con un valor del módulo de elasticidad $E = 355000$ K/cm²

Los ratios de frecuencias adimensionales f_{min}, f_{max} y los obtenidos para la viga de 68 y 70 m se indican en el cuadro adjunto

Vano (m)	f (Hz)	f_{min}	f_{max}
68	2.62	2.10	4.60
70	1.78	1.70	3.80

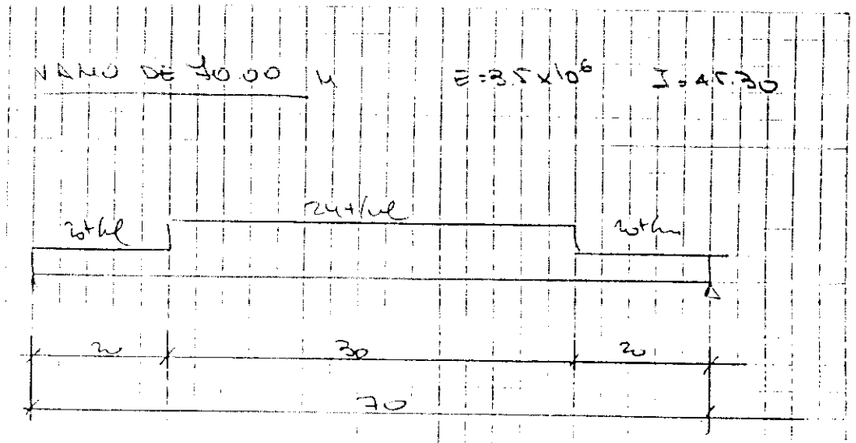
Como puede comprobarse la frecuencia obtenida se halla dentro del rango exigido

2. Giro y movimiento vertical de la viga

Los giros producidos en extremos por la carga Real se han supuesto con

$\vartheta_1 = 0.37 \cdot 10^{-3}$ rad en extremo 1 (< 1.0 rad)

$\vartheta_2 = 0.40 \cdot 10^{-3}$ rad en extremo 2



COMO ISOSTATICA

$$f_1 = \frac{4 \times 35 \times 30}{6 \times 70} \frac{70 \cdot 35}{EJ} \left(-(70-35)^2 + 35\left(70 + 35 - \frac{32}{4 \cdot 35}\right)\right).$$

$$= \frac{350}{EJ}\left(-1225 + 3450\right) = \frac{478750}{EJ}$$

$$f_2 = \frac{5 \times 20 \times 70^4}{384 \times EJ} = \frac{6252600}{EJ}$$

$$f_T = f_1 + f_2 = \frac{7033350}{EJ} = 0.0445 \text{ m}$$

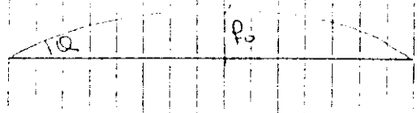
$$\varphi_1 = \frac{4 \times 35 \times 35 \times 35}{6\, EJ\, 70}\left(70 + 35 + \frac{35^2}{4 \times 35}\right) = \frac{34300}{EJ}$$

$$\varphi_2 = \frac{20 \times 70^3}{48\, EJ} = \frac{143000}{EJ}$$

$$\varphi_T = \varphi_1 + \varphi_2 = \frac{177300}{EJ} = 0.00411 \text{ rad}$$

DEL CALCULO COMO VIGA CONTINUA

$\varphi = 0.00128/1000 \times \frac{180}{\pi} = 0.000733$



$2 f_0 = 35 \times (0.0011 - 0.000733) = 0.01245$

f_0 0.02569

$f_{TOTAL} = 0.0445 - 0.025 = 0.019$ m

Limite $\frac{10 \times 11}{1000} = 0.032$ m (válido)

VANO DE 58.00 m

ESQUEMATICA

$f_1 = \frac{4 \times 29 \times 30}{6 \times 58} \frac{58^2 - 29}{EJ} \left(-\left(58 - 29\right)^2 + 29\left(58^2 + 29 - \frac{30^2}{4 \times 29}\right) \right)$

$= \frac{290}{EJ} (-841 + 3248) = \frac{622530}{EJ}$

$f_2 = \frac{1 \times 20 \times 58^4}{384 EJ} = \frac{2950000}{EJ}$

$f_T = f_1 - f_2 = \frac{3372530}{EJ} = 0.0213$ m

$\phi_1 = \frac{4 \times 29 \times 30 \times 29}{6 \times 58 EJ} \left(58 + 29 - \frac{30^2}{4 \times 29} \right) = \frac{23000}{EJ}$

$\phi_2 = \frac{20 \times 58^3}{48 EJ} = \frac{81300}{EJ}$

$\phi_T = \phi_1 + \phi_2 = \frac{104300}{EJ}$ 0.0006 rad

Del cálculo rotura viga cortina

$\psi = 0.0072/1000 \times \frac{18v}{m} = 0.000447$

$\varepsilon_{fo} = 29 \times (0.0006 - 0.000447) = 0.0044$

$f_o = 0.0022$

$f_{total} = 0.0213 - 0.0022 = 0.019$ m

Junta $\frac{58 \times 1,1}{2400} = 0.026$ m (válido)

3 Deformación (bóveda)

El giro de giro vertical que se produce por la acción de bóveda, vertical, y gradiente transversal de temperatura

Cálculo 1

$\alpha = (0,33 + 0,12)\ 10^{-3} = 0,45\ 10^{-3}$ rad

Cálculo 2

$\alpha = (0,11 + 0,09)\ 10^{-3} = 0,20\ 10^{-3}$

Giro uniforme según ejemplo 66 0,0015 rad

La máxima flecha horizontal se produce en los vanos 3

$f = 25.6 + \frac{5 \cdot (0,286 + 2,22)\ 75^4}{384 \cdot 3,335 \cdot 10^6 \cdot 1,24} \cdot 10^3$ mm

$f = 25,6 + 1,9 = 27,5$ mm

La mayor parte de la flecha (bóveda) de la cimentación

Tomando una bóveda $L = 50 + 3 \times 70 + 58 = 318$ m

$R = \frac{318^2}{8 \cdot 0,0275} = 460000 \Rightarrow 17500$

La tensión flecha horizontal viene (viento 3)

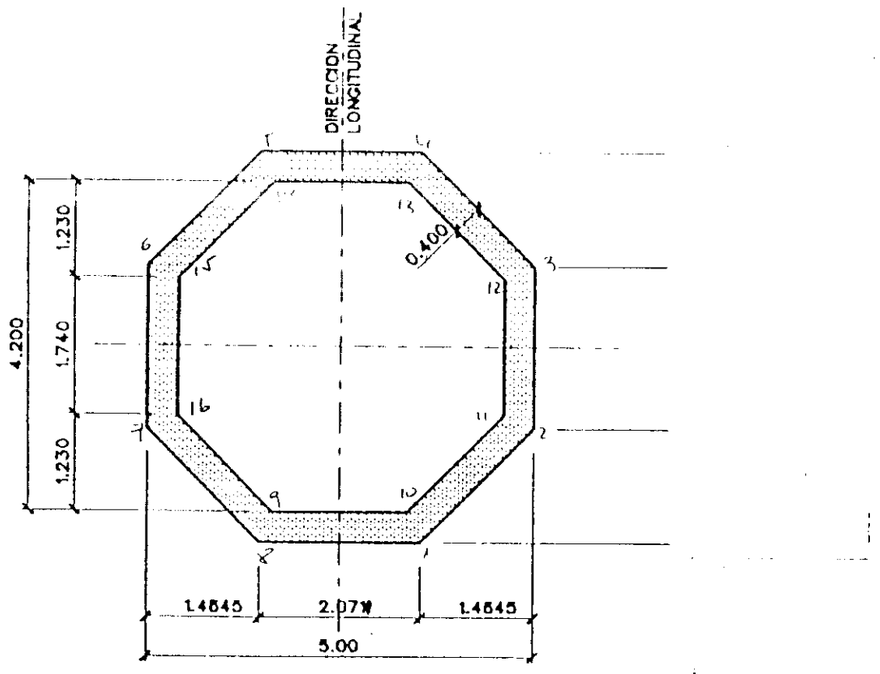
$$f = 25,6 + \frac{5\,(0,186 + 3,22) \cdot 70^4}{384 \cdot 3,35 \cdot 10^6 \cdot 12^4} \cdot 10^3 \text{ (mm)}$$

$$f = 25,6 + 1,9 = 27,5 \text{ mm}$$

Teniendo en cuenta longitud $l = (58 + 3 \times 10 + 50) = 318$ m

$$l = \left(\frac{318}{2}\right)^2 \frac{1}{2 \cdot 0,027} = 460.000 \gg 17.500$$

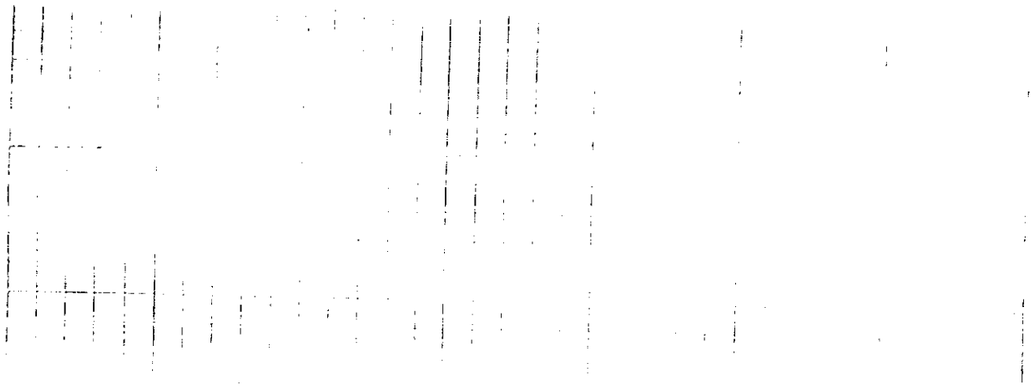
DIMENSIONES GEOMETRICAS DE LA SECCION.



CALCULO DE CARACTERISTICAS MECANICAS SECCION DE PILA

BASE SUPERIOR	BASE INFERIOR	ALTURA	D.A B.SUP.
.000	2.929	1.465	.000
2.929	2.929	2.071	1.465
2.929	.000	1.465	3.536
2.071	2.071	5.000	.000
.000	-2.460	1.230	.400
-2.460	-2.460	1.740	1.630
-2.460	.000	1.230	3.370
-1.740	-1.740	4.200	.400

AREA (M2)	INERCIA (M4)	V.SUP (M)	V.INF (M)	CANTO (M)	W.SUP (M-3)	W.INF (M-3)	C. EQ. N
6.096	17.1760	2.500	2.500	5.000	.146	.146	1.0



Alcanos de petróleo en forma de fuel y alquitranes

Diseño de soportes en estribos

Área $1,1 \times 1,1 \times 2 = 2,42\ m^2$ Separación 4,50 m

$I_x = I_y = 2 \cdot 2,25^2 \cdot 1,1^2 = 12,05\ m^4$

$I_z = \frac{2}{12} 1,1^3 = 0,2218\ m^4$

Centro de cortantes

$$Z_q = \frac{\sum I_{zi} \cdot d_i}{I_z}$$

$I_y = 124,66\ m^4$

Cajón

Tabla superior $I_y = \frac{1}{12} 6^3 \cdot 0,42 = 7,56$

$d_i = 0,23$

$I_y \cdot d_i = 1,74$

Tabla inferior $I = \frac{1}{12} 6^3 \cdot 0,4 = 7,2$

$d_i = (4,93 - 0,70) = 4,23$

$I_y \cdot d_i = 34,06$

Almas $I_y = \left[\frac{0,4^3}{12} \cdot 4 + 0,6 \cdot 4 \cdot 2,9^2\right] 2 = 35,13$

$d_i = 2,40$

$I_z \cdot d_z = 84,30$

Volados $I_z \cdot \left[\frac{1}{12} \cdot 2 \cdot 3,85^3 \times 0,35 + \right.$

$\left. + 0,35\ 3,85 \times (3 + 1,93)^2\right] 2 = 73,2$

$d_i = 0,18$

$I_y \cdot d_i = 13,18$

$$\frac{\sum I_y \cdot d_i}{I_y} = \frac{133,08}{123,09} = 1,08$$

Fuerza centrífuga Renfe

$$F = \frac{200^2}{127} \cdot \frac{1^2}{11.000} = 0,286 \text{ t/m} \rightarrow \text{vía}$$

brazo a c e c

$$z = 1,8 + 0,7 + 1,08 = 3,58$$

$$m_t = -3,6 \times 0,286 = -1,02 \text{ mt/m}$$

Carga vertical excentrica apoyada 0,30 m al exterior

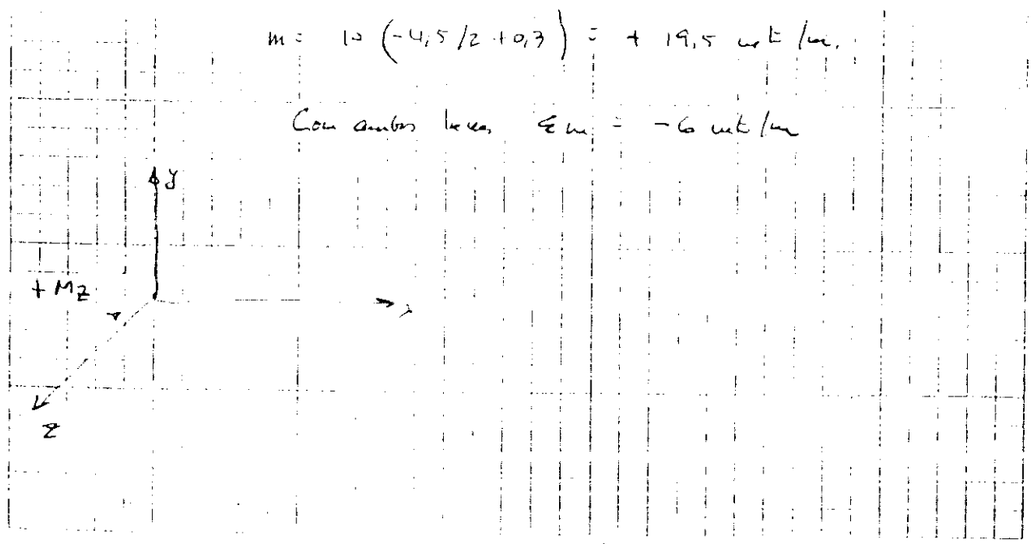
$$N = 10 t \times \varphi = 11,7 \text{ t/m}$$

$$m = -10 \times \left(\frac{4,5}{2} + 0,3\right) = -25,5 \text{ mt/m}$$

Segunda carga excentrica 30cm al exterior

$$m = 10 \left(-4,5/2 + 0,3\right) = +19,5 \text{ mt/m}$$

Con ambas luces $\varepsilon_m = -6$ mt/m



Acción de frenado transversal

- Peso $1,66 \cdot 0 = 1328 \cdot 1,25 = 33,2$ t/m

Para tener en cuenta la posible distribución irregular en 3 vías

$$P = 33,2 \times 1,03 = 34,2 \text{ t/m}$$

Distancia entre c de g y c de esfuerzos verticales

$$d = 1,95 - 1,08 = 0,87 \text{ m}$$

$$F_t = 34,2 \cdot 0,064 = 2,19 \text{ t/m}$$

$$m_t = 2,19 \times 0,87 = 1,90 \text{ mt/m}$$

Carga permanente

Distancia c de g a c e c.

$$z = 0,30 + 1,08 = 1,38$$

$$F_t = 13,1 \times 0,064 = 0,838 \text{ t/m}$$

$$m_t = -0,838 \times 1,38 = -1,16 \text{ mt/m}$$

La sección de ambos lados

$$F_t = 3,03 \text{ t/m}$$

$$m_t = +2,74 \text{ mt/m}$$

Peso de la vía $= 10 \text{ t/m} \times 0,3 = 3 \text{ t/m}$

$$f_t = 3 \times 0,064 = 0,192 \text{ t/m}$$

$$m_t = 0,192 \left(1,8 + 0,7 + 1,08\right) = -0,69 \text{ mt/m}$$

Tracción en Pilas $4 \times 4,8 \times 2,5 \times 2,5 \times 0,064 / 3,85 = 2 \text{ t/m}$ $(P = 120 t)$

En estribos $4 \times 4,8 \times 2,5 \times 4 \times 0,064 / 3,85 = 3,2 \text{ t/m}$ $(P = 192 t)$

Ejemplo de viento

En viento $h = 1,9 + 0,7 + 2,1 = 4,9$ m

$f_0 = 1,6 \cdot 0,2 = 1,52$ t

brazo a c d e e.

$$Z = \frac{0,7 \cdot 0,35 + 2 \times 1 \times 0,5 - 4,9 \cdot 2,45}{0,7 + 2,1 + 4,9} + 2,4 =$$

$Z = -1,45 + 1,08 = -0,37$

$M_t = 1,52 \times 0,37 = 0,56$

Un lado $= 3,5 \times$

$f = 3,5 \times 0,2 = 0,7$

brazo a c e c

$Z = 1,8 + 0,7 + 1,0,8 = 3,58$

$M_t = -0,7 \times 3,58 = -2,50$ mt

Para las vigas son los valores de 1 viga $\times 1,20$

$P = 0,84$ t/m

$M_t = -3,0$ mt/m

Efecto lateral

Se toman un valor de 10 kg por una, con simultaneidad en ambos

Se analiza el modelo en el que la causa es la acción del trabajo sobre pilas a efecto de sismo transversal de pilas.

Los valores de las acciones que se toman son

$F_2 = -70$ kg

$M_6 = -70 \cdot d = -55,6$ mt/m

$d = 0,7 + 1,08 + 1,78$ m

Solicitud Torsional de Temperatura

$\varphi = \frac{3 \times 10^{-5}}{6}$

$\mu = E \cdot \varphi = 3,35 \times 10^6 \times 124,66 \times \frac{3 \times 10^{-5}}{6} = 10,88$

M = Momento de calculo + 2088 mt

RELACION DE DATOS

Altura.	Altura de la pila (m)
NPP:	Axil de peso propio del tablero y riostras de apoyo.(tn)
NCP:	Axil de carga permanente.(tn)
NSCMAX	Axil producido por la sobrecarga máxima de RENFE con impacto.(tn)
SCMED	Axil máximo producido por una vía cargada de RENFE con impacto (tn)
MT1TREN	Momento transversal en base de pila. Un tren excéntrico ripado 30 cm con fuerza centrífuga y efecto lazo. (mtn)
MV1TREN	Momento transversal en base de pila por viento sobre tablero y sobre un tren (200kg/m2)
MT2TREN	Momento transversal en base de pila. Dos trenes ripados 30 cm fuerza centrífuga y efecto lazo.
MV2TREN	Momento transversal en base de pila por viento sobre tablero y sobre 2 trenes (200 kg/m2)
FV1TREN	Cortante en base de pila de viento (un tren, tablero y pila)(tn)
FV2TREN	Cortante en base de pila de viento (dos trenes, tablero y pila)
FC1TREN	Cortante en base de pila. Centrífuga y lazo de un tren.
FC2TREN	Cortante en base de pila. Centrífuga y lazo de dos trenes.
MTS1T	Momento transversal de sismo en base de pila. Incluye el efecto sísmico sobre la masa de un tren casi-permanente (30% del máximo).
FTS1T	Cortante en base de pila de sismo con un tren.
MTS2T	Momento transversal de sismo en base de pila. Incluye el efecto sísmico sobre la masa de 2 trenes casi-permanentes (30% del máximo)
FTS2T	Cortante en la base de pila de sismo con 2 trenes.

Los coeficientes de mayoración tomados son 1.44 cuando actúan sobrecargas de explotación y viento, y 1.28 cuando actua el sismo, acción que no se mayora.

Los momentos longitudinales en base de pila son los producidos por una fuerza horizontal en cabeza de valor igual al 5% de las cargas permanentes.

Las acciones en cimentación no están mayoradas e incluyen el peso de la zapata.

ESFUERZOS EN BASE DE PILAS

PILA	ALTURA	NPP	NCP	NSCMAX	NSCMED	MT1TREN	MV1TREN	T2TRENE	MV2TRENE	FV1TREN	FV2TRENES	FC1TREN	FC2TRENES
1	19.10	2331	876	1320	660	1444	2762	1194	2940	135.0	142.0	7.1	36.6
2	19.10	2465	929	1420	710	2415	4117	1803	4389	193.0	204.0	35.2	10.0
3	20.30	2479	934	1425	712	2290	3951	1722	4211	172.0	182.0	23.4	50.8
4	19.30	2263	849	1336	668	2252	3690	1644	3934	175.0	186.0	26.1	50.1
5	18.30	1981	737	1218	609	2083	3217	1479	3431	148.0	156.0	23.4	45.2
6	16.70	2063	770	1218	609	1986	2930	1389	3127	143.0	151.0	21.0	44.4
7	14.50	2037	759	1203	602	2004	2718	1350	2904	145.0	153.0	23.4	46.7
8	13.10	2037	759	1203	602	2094	2664	1366	2849	153.0	162.0	31.3	52.0
9	14.50	2037	759	1203	602	1778	2388	1206	2552	130.0	137.0	13.2	40.2
10	12.60	2037	759	1203	602	2000	2494	1300	2668	150.0	159.0	27.9	50.5
11	11.50	2037	759	1203	602	1935	2288	1230	2450	145.0	153.0	25.0	49.0
12	10.90	2037	759	1203	602	1829	2112	1159	2262	142.0	150.0	26.8	49.0
13	10.10	2080	776	1169	585	1432	1728	956	1850	128.0	135.0	14.3	29.3

ESFUERZOS EN BASE DE PILAS

	SISMO CON 1 TREN		SISMO CON 2 TRENES	
PILA	MTS1T	FTS1T	MTS2T	FTS1T
1	4581	203	4470	211
2	6903	301	6676	306
3	6610	265	6398	272
4	6206	256	5983	261
5	5444	228	5226	233
6	4985	222	4770	227
7	4668	226	4436	231
8	4610	242	4356	246
9	4104	201	3899	207
10	4325	237	4080	242
11	3992	228	3728	233
12	3697	225	3464	229
13	3011	200	2838	206

ESFUERZOS MAYORADOS EN BASE DE PILAS

	ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS		
	AXILES	MAXIMOS	2 TRENES	TORSORES	MAXIMOS	1 TREN	SISMO CON	AXILES	MAXIMOS	SISMO CON	M. TRANS.	MAXIMOS
PILA	N_D	MT_D	ML_D	N_D	MT_D	ML_D	ND	MTD	MLD	ND	MTD	MLD
1	6931	5953	4410	5981	6057	4410	4631	4470	3920	4378	4581	3920
2	7345	8916	4667	6322	9406	4667	4928	6676	4149	4655	6903	4149
3	7405	8544	4988	6378	8987	4988	4973	6398	4434	4700	6610	4434
4	6822	8032	4324	5860	8556	4324	4573	5983	3844	4317	6206	3844
5	6063	7070	3581	5186	7632	3581	4043	5226	3183	3809	5444	3183
6	6194	6503	3406	5317	7079.0	3406	4209	4770	3028	3975	4985	3028
7	6072	6126	2919	5206	6800	2919	4175	4436	2595	3944	4668	2595
8	6042	6070	2637	5176	6852	2637	4194	4356	2344	3964	4610	2344
9	6072	5412	2919	5206	5999	2919	4214	3899	2595	3983	4104	2595
10	6031	5714	2537	5165	6471	2537	4233	4080	2255	4002	4325	2255
11	6007	5299	2315	5142	6081	2315	4252	3728	2058	4021	3992	2058
12	5994	4926	2194	5129	5675	2194	4271	3464	1950	4040	3697	1950
13	6014	4041	2077	5173	4550	2077	4354	2838	1846	4130	3011	1846

TENSIONES EN CIMENTACION SIN SISMO

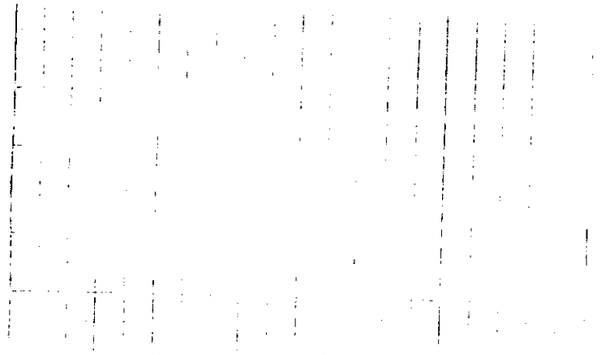
	ZAPATA			CARGAS EN CIMENTACIÓN CON		MAXIMOS	TENSIONES EN CIMENTACION				CARGAS EN CIMENTACION CON	M. TRANS	MAXIMO	TENSIONES EN CIMENTACION			
PILA	LONG	ANCHO	CANTO	N	MT	ML	S1	S2	S3	S4	N	M1	ML	S1	S2	S3	S4
1	10.0	12.5	2.7	5657	4616	3495	79.8	46.2	44.3	10.8	4154	4259	3495	68.4	32.8	33.7	0.1
2	10.2	14.0	3.2	6243	6877	3784	79.9	48.8	38.7	7.5	4391	6603	3784	66.2	35.0	26.5	-4.7
3	10.2	14.0	3.2	6285	6678	4010	80.6	47.5	40.5	7.5	4430	6303	4010	66.5	33.4	28.6	-4.4
4	10.2	14.0	3.2	5880	6334	3501	74.6	45.8	36.6	7.7	4070	6005	3501	60.9	32.1	24.9	-3.9
5	10.0	12.0	2.5	4961	5413	2827	78.0	49.8	32.9	4.6	3602	5367	2827	56.5	38.2	21.8	-6.5
6	10.0	12.0	2.5	5052	5005	2720	76.5	49.3	34.8	7.6	3693	4987	2720	65.1	31.9	23.6	-3.6
7	10.0	12.0	2.5	4967	4753	2377	73.1	49.3	33.5	9.7	3616	4789	2377	62.0	38.2	22.1	-1.7
8	10.0	12.0	2.5	4946	4750	2181	71.9	50.1	32.3	10.5	3595	4832	2181	61.0	39.2	20.7	-1.1
9	10.0	11.0	2.5	4904	4201	2377	78.4	52.4	36.7	10.8	3616	4220	2377	66.8	40.8	24.9	-1.0
10	10.0	11.0	2.5	4876	4492	2111	78.1	55.1	33.6	10.5	3587	4565	2111	66.8	43.7	21.5	-1.5
11	10.0	11.0	2.5	4859	4185	1957	75.6	54.2	34.1	12.7	3571	4291	1957	64.4	43.1	21.9	0.5
12	10.0	11.0	2.5	4850	3919	1873	73.7	53.3	34.9	14.4	3562	4009	1873	62.5	42.0	22.7	2.3
13	10.0	11.0	2.5	4864	3217	1799	70.0	50.4	38.1	18.5	3593	3217	1799	59.4	38.8	26.5	6.9

TENSIONES EN CIMENTACION CON SISMO

				CARGAS EN CIMENTACION			TENSIONES EN CIMENTACION				CARGAS EN CIMENTACION			TENSIONES EN CIMENTACION			
				SISMO	AXILES	MAXIMOS	SISMO	AXILES	MAXIMOS		SISMO	M. TRANS	MAXIMOS	SISMO	M.TRANS	MAXIMOS	
PILA	LONG	ANCHO	CANTO	AXIL	M. TRANS	M. LONG	S1	S2	S3	S4	AXIL	M.TRANS.	M. LONG	S1	S2	S3	S4
1	10.0	12.5	2.7	4208	5211	3414	70.1	37.3	30.0	-2.7	4439	5091	3414	71.4	38.7	32.4	-0.4
2	10.2	14.0	3.2	4708	7734	3697	71.4	40.9	25.0	-5.5	4957	7505	3697	72.5	42.0	27.4	-3.0
3	10.2	14.0	3.2	4728	7239	3919	71.0	38.7	27.5	-4.8	4978	7041	3919	72.1	39.8	29.9	-2.4
4	10.2	14.0	3.2	4416	6807	3419	65.4	37.3	24.6	-3.6	4651	6597	3419	66.5	38.3	26.9	-1.3
5	10.0	12.0	2.5	3616	5819	2758	68.2	40.6	19.7	-7.9	3830	5611	2758	69.1	41.5	22.3	-5.3
6	10.0	12.0	2.5	3724	5358	2650	66.6	40.1	22.0	-4.5	3938	5156	2650	67.5	41.0	24.6	-1.9
7	10.0	12.0	2.5	3724	5048	2346	63.8	40.3	21.7	-1.7	3938	4826	2346	64.7	41.2	24.4	1.0
8	10.0	12.0	2.5	3724	5022	2153	62.7	41.2	20.9	-0.7	3938	4776	2153	63.5	41.9	23.7	2.1
9	10.0	11.0	2.5	3661	4460	2346	68.2	42.6	24.0	-1.6	3875	4256	2346	69.1	43.5	26.9	1.3
10	10.0	11.0	2.5	3661	4740	2084	68.2	45.4	21.1	-1.6	3875	4502	2084	68.9	46.2	24.3	1.5
11	10.0	11.0	2.5	3661	4384	1932	65.6	44.5	22.1	1.0	3875	4150	1932	66.3	45.3	25.2	4.1
12	10.0	11.0	2.5	3661	4128	1849	63.8	43.7	22.9	2.7	3875	3894	1849	64.6	44.4	26.0	5.8
13	10.0	11.0	2.5	3673	3594	1751	60.8	41.7	25.1	6.0	3878	3394	1751	61.6	42.5	28.0	8.9

REACCIONES EN APOYOS

APOYOS	NPP	NCP	PRET.	SCMAX	SCMIN	D. APOYOS	1 TREN M.T. MAX	2 TRENES MT (A.MAX)	REACCIONES UN TREN N. MAX	N. MIN	REACCIONES DOS TRENES N. MAX.	N. MIN
STRIBO 1	778	232	78	474	-113	4.50	2155	1541	1141	37	1123	439
PILA 1	2331	876	-60	1320	-124	3.30	1685	847	2414	1032	2490	1977
PILA 2	2465	929	-15	1420	-114	3.30	2253	1219	2727	978	2769	2030
PILA 3	2479	934	-31	1425	-113	3.30	2396	1321	2773	937	2804	2003
PILA 4	2263	849	0	1336	-126	3.30	2354	1335	2603	811	2629	1819
PILA 5	1981	737	0	1218	-157	3.30	2267	1316	2350	633	2367	1569
PILA 6	2063	770	0	1218	-106	3.30	2241	1302	2400	711	2420	1631
PILA 7	2037	759	0	1203	-124	3.30	2315	1373	2400	665	2416	1583
PILA 8	2037	759	0	1203	-124	3.30	2344	1400	2409	657	2424	1575
PILA 9	2037	759	0	1203	-124	3.30	2134	1214	2345	720	2367	1632
PILA 10	2037	759	0	1203	-124	3.30	2247	1311	2380	686	2397	1602
PILA 11	2037	759	0	1203	-124	3.30	2254	1326	2382	684	2401	1598
PILA 12	2037	759	0	1203	-124	3.30	2085	1216	2331	735	2368	1631
PILA 13	2080	776	-63	1169	-124	3.30	1720	984	2210	844	2279	1683
STRIBO 2	792	237	56	448	-78	4.50	1483	960	984	193	980	553



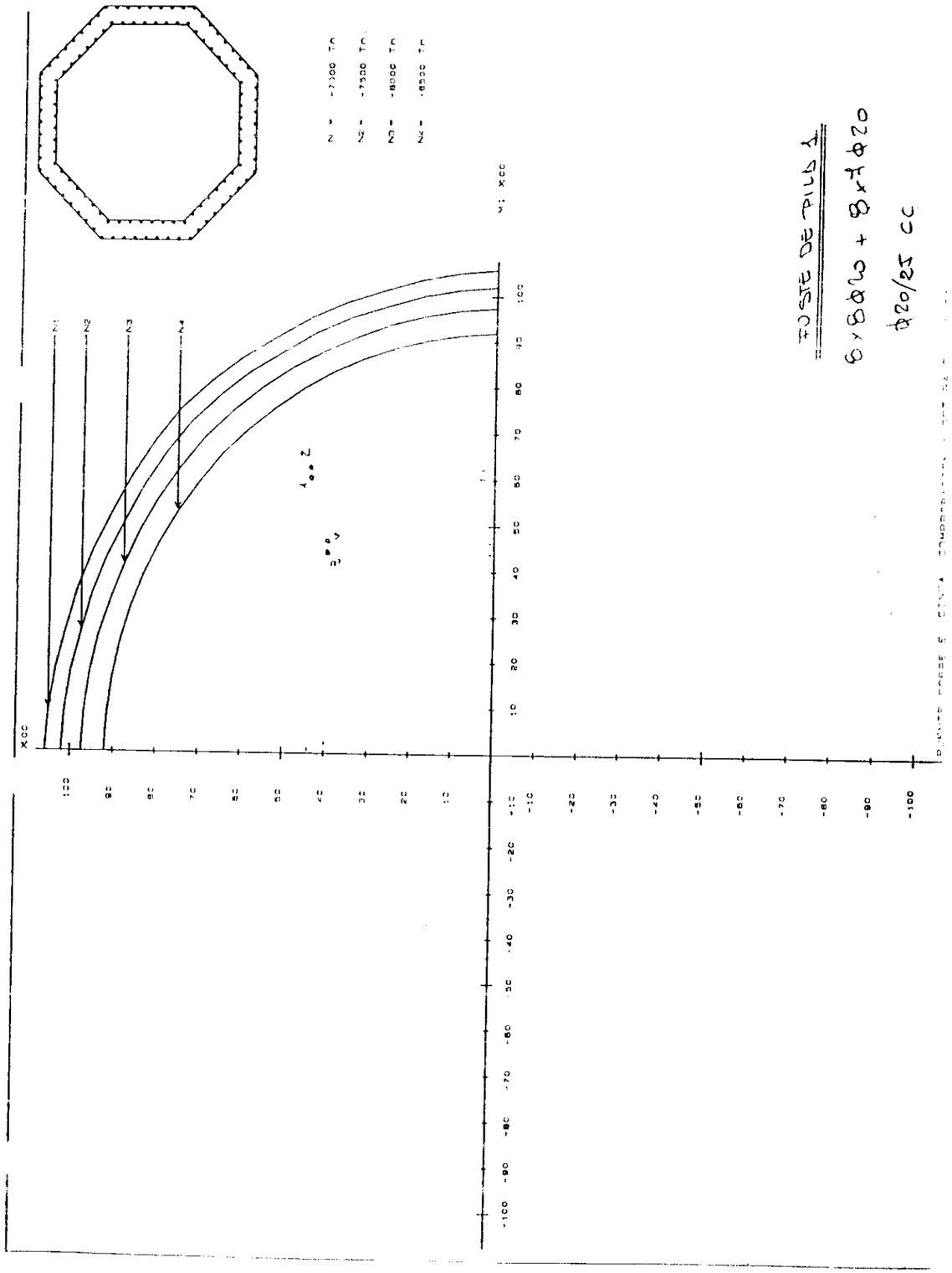
LAS ARMADURAS DE LAS PILAS SE HAN VERIFICADO A PARTIR DE LOS ABACOS DE FLEXION CALCULADOS PARA LA SECCION TIPICA DE HORMIGON Y LAS SIGUIENTES CUANTIAS DE ARMADURA

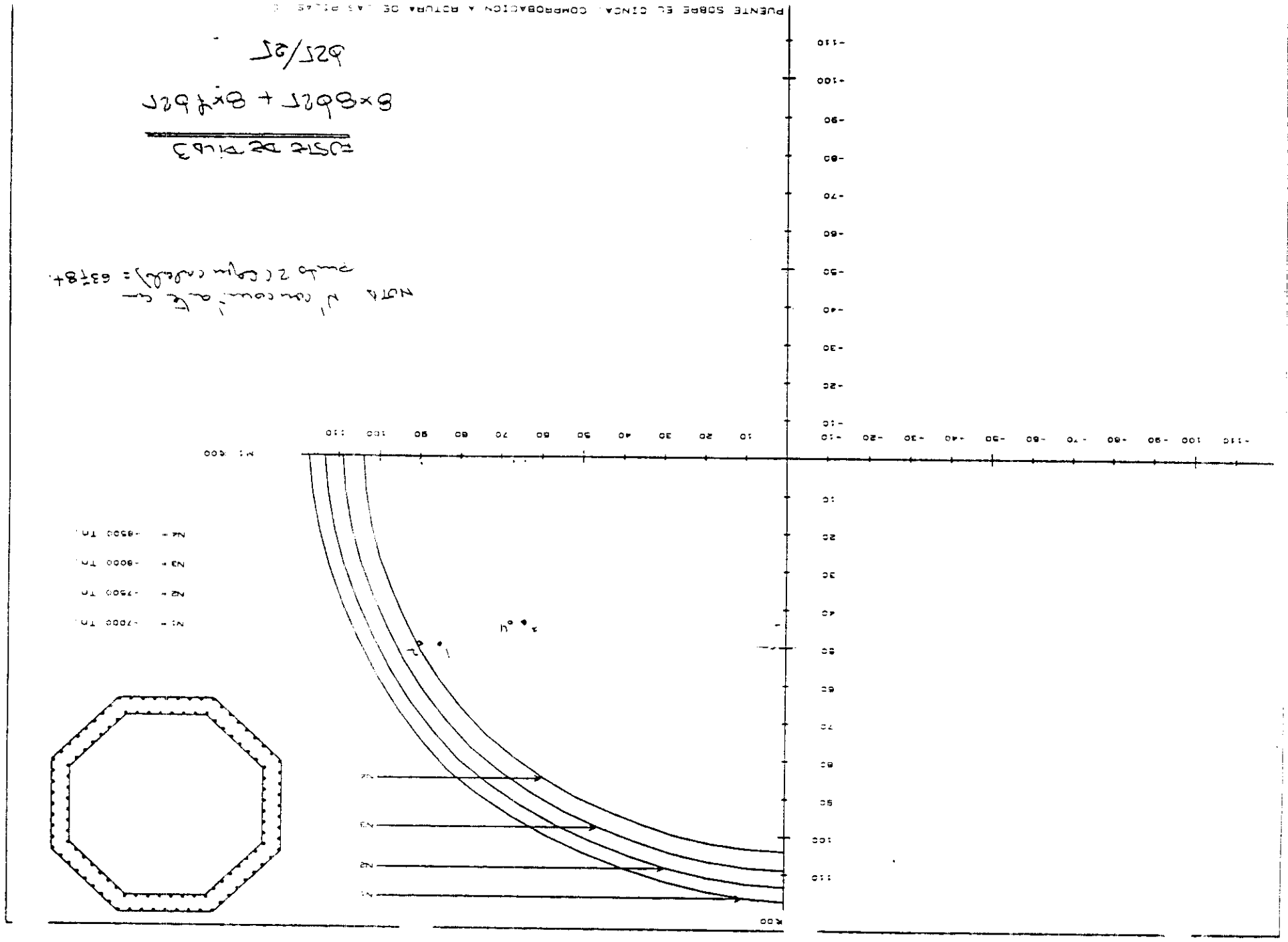
1 ⟶ Φ20/25 c/c ⟶ ρ = 0006

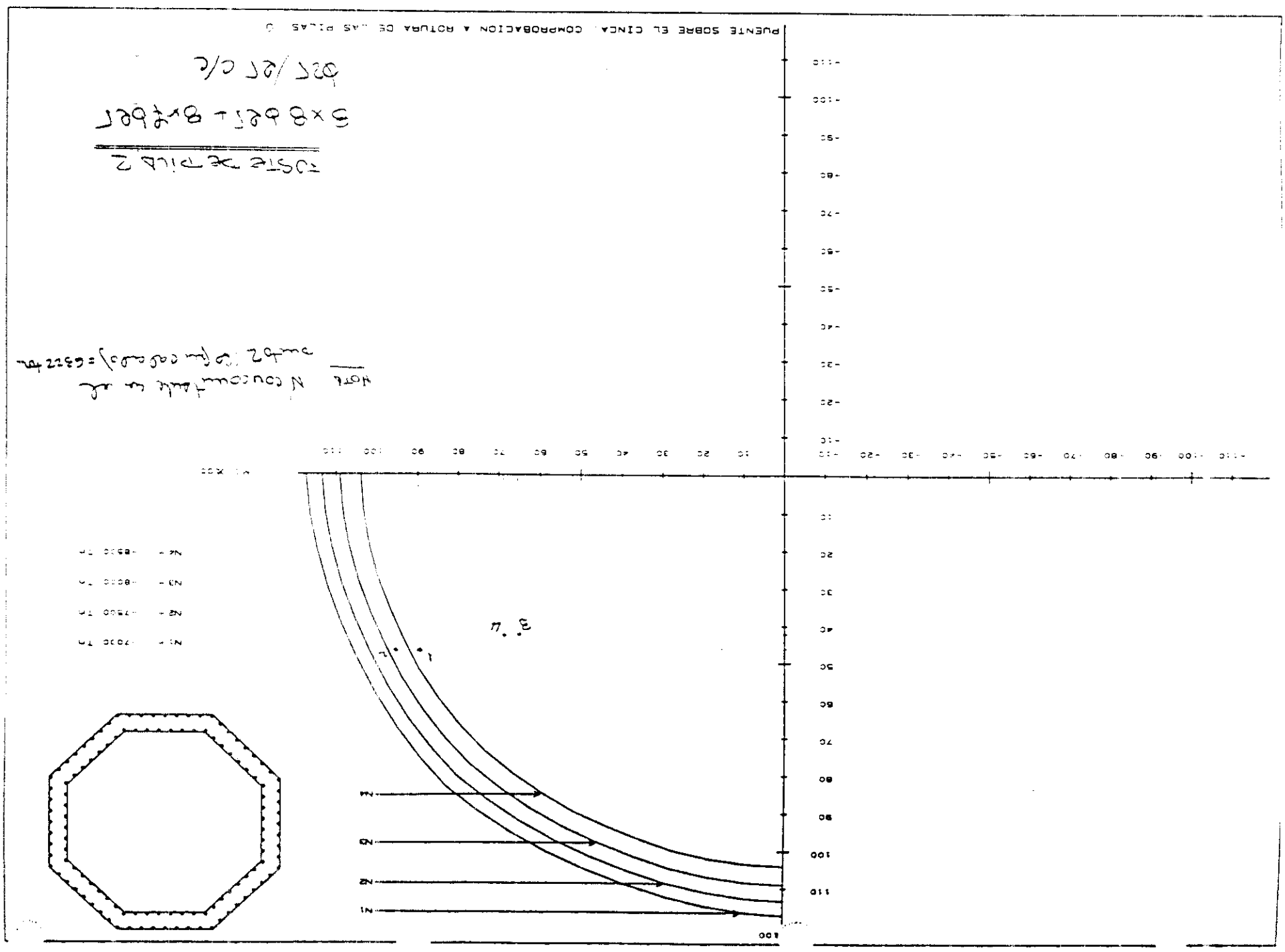
2 ⟶ Φ25/25 c/c ⟶ ρ = 0009

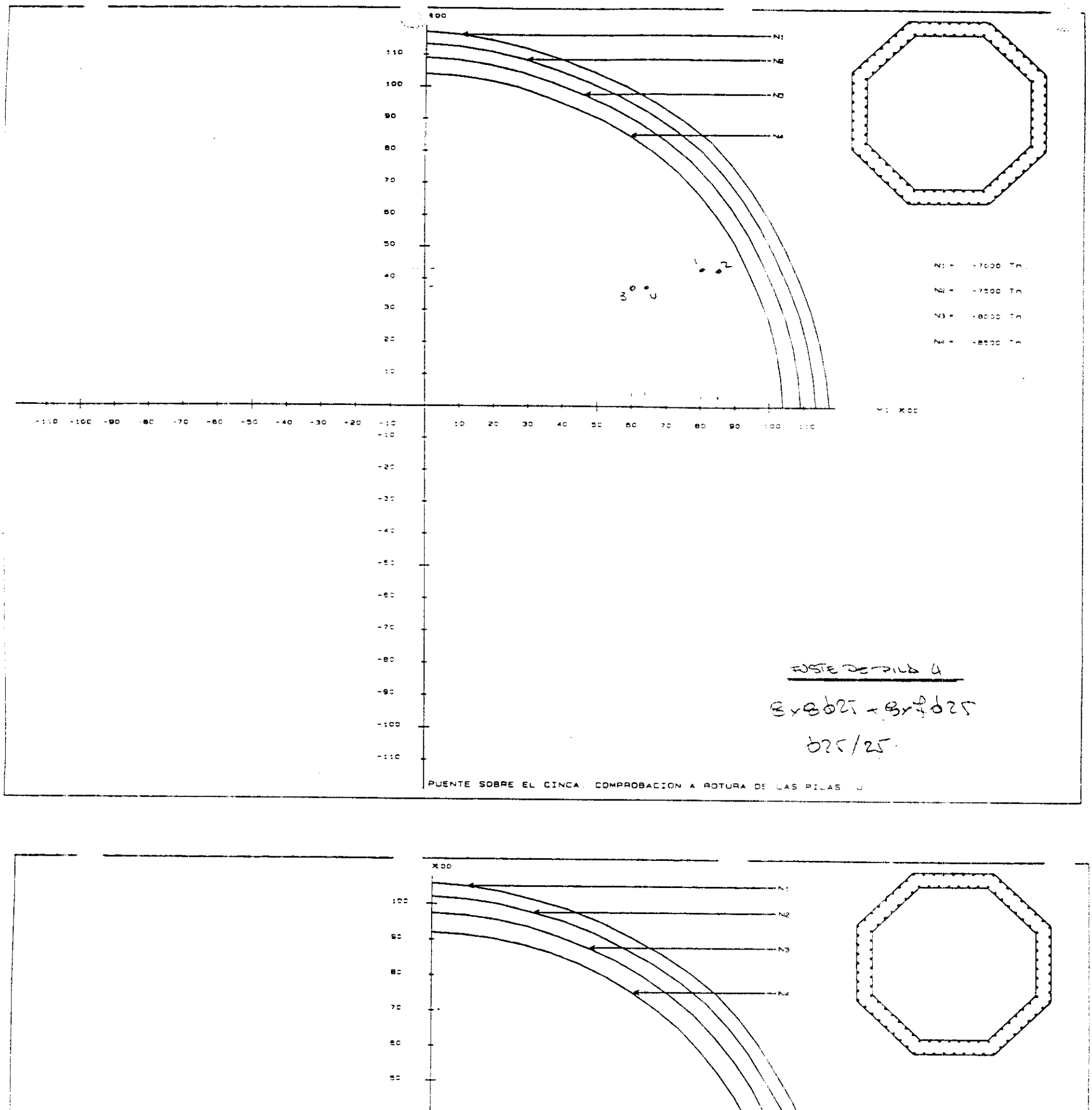
NOTA:

LOS ABACOS, ASI COMO LOS LISTADOS COMO DOMINIOS SE ADJUNTAN EN ANEJO APARTE.




PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS
N1 = -7000 Tn.
N2 = -7500 Tn.
N3 = -8000 Tn.
N4 = -8500 Tn.
N1
N2
N3
N4
ε. u
1 ‰
2 ‰
3 ‰
3.5 ‰

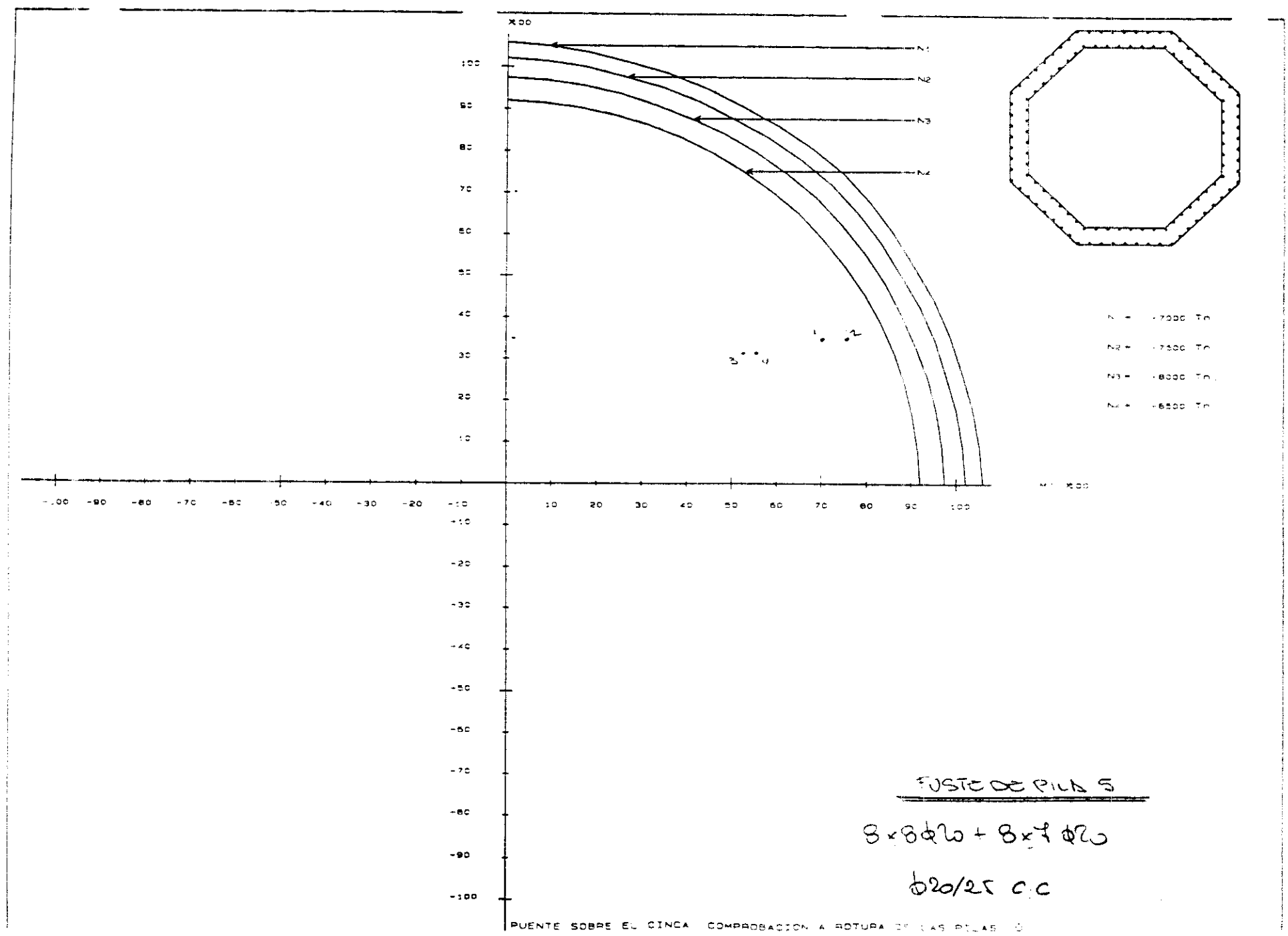

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS
N1 = -7000 Tn.
N2 = -7500 Tn.
N3 = -8000 Tn.
N4 = -8500 Tn.
N1
N2
N3
N4
ε. u
1 ‰
2 ‰
3 ‰
3.5 ‰



FUSTE DE PILA 4

8×8ϕ25 + 8×4ϕ25

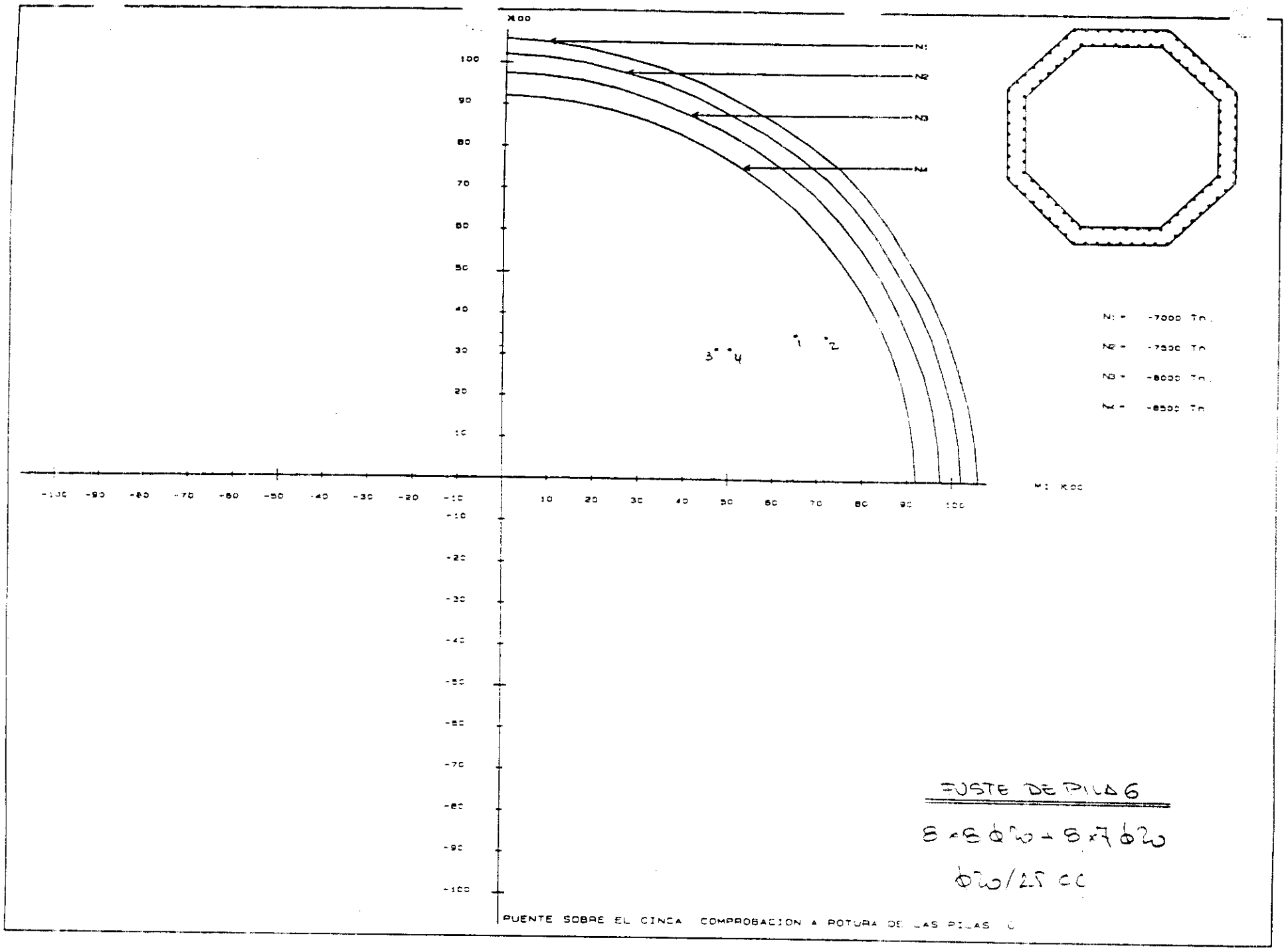
ϕ25/25.



FUSTE DE PILA 5

8×8ϕ20 + 8×4 ϕ20

ϕ20/25 c.c

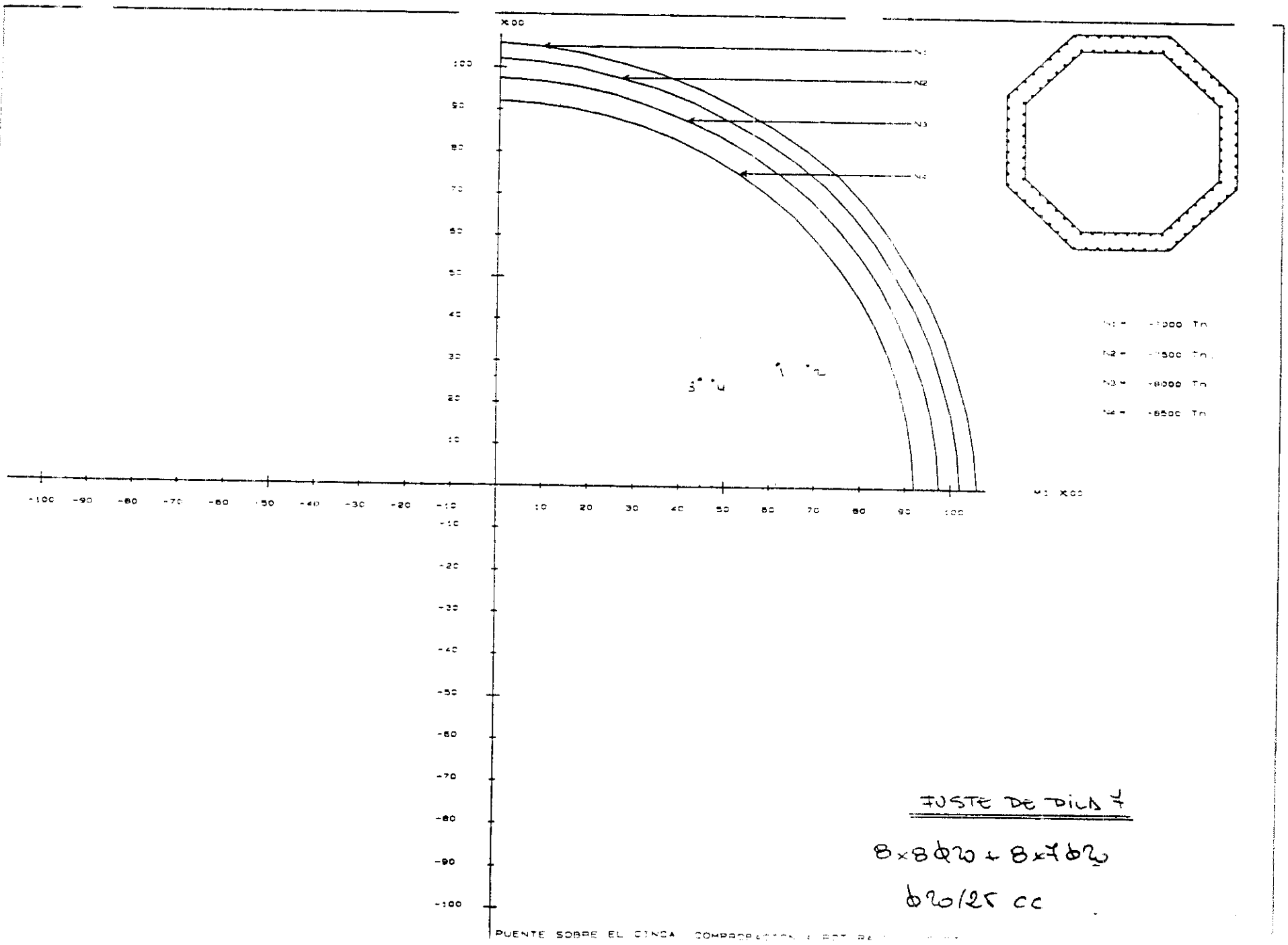


FUSTE DE PILA 6

8 - 8 ϕ 20 + 8 x 7 ϕ 20

ϕ 20/25 cc

PUENTE SOBRE EL CINCA COMPROBACION A ROTURA DE LAS PILAS

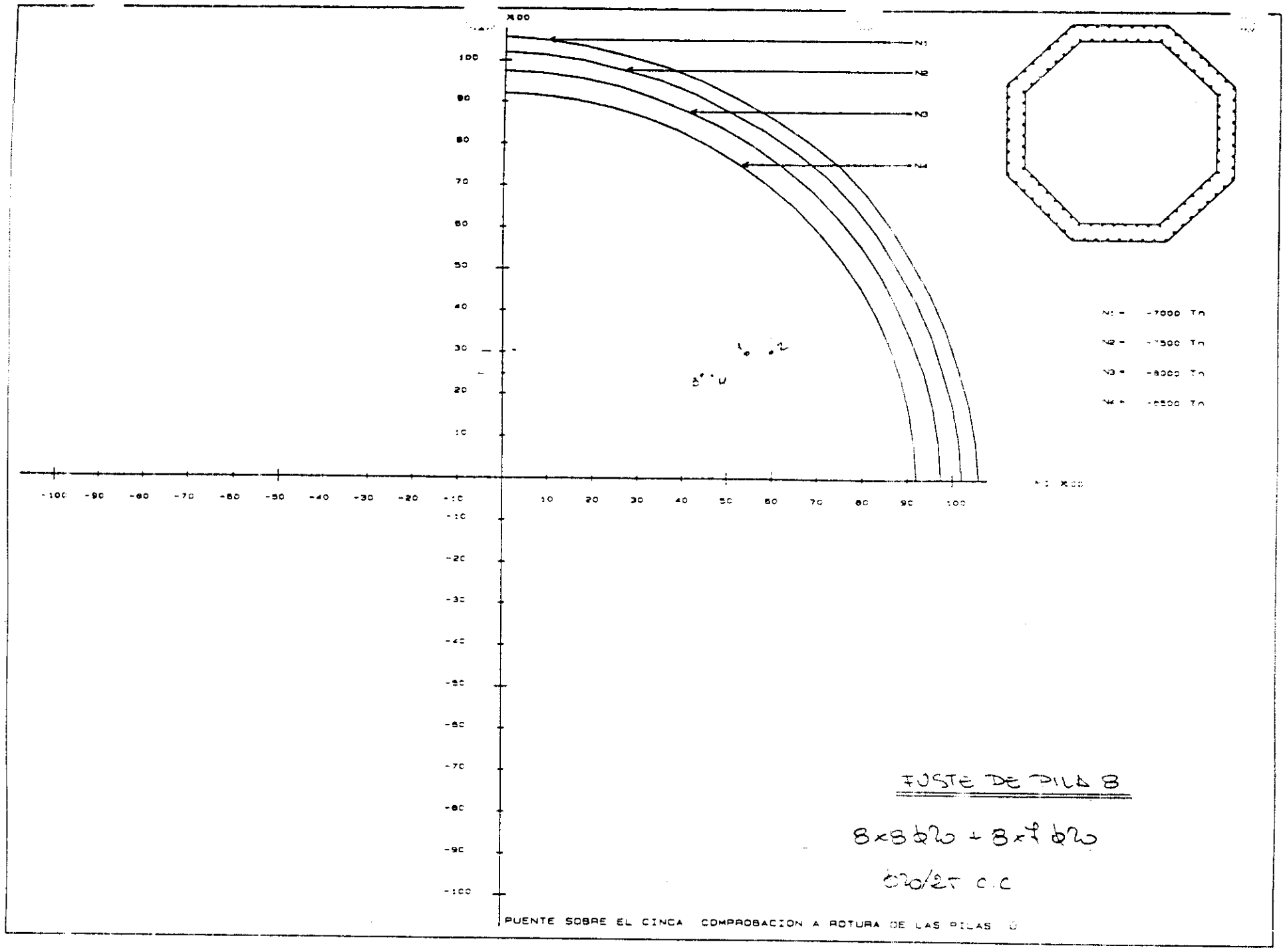


FUSTE DE PILA 7

8 x 8 ϕ 20 + 8 x 7 ϕ 20

ϕ 20/25 cc

PUENTE SOBRE EL CINCA COMPROBACION A ROTURA DE LAS PILAS

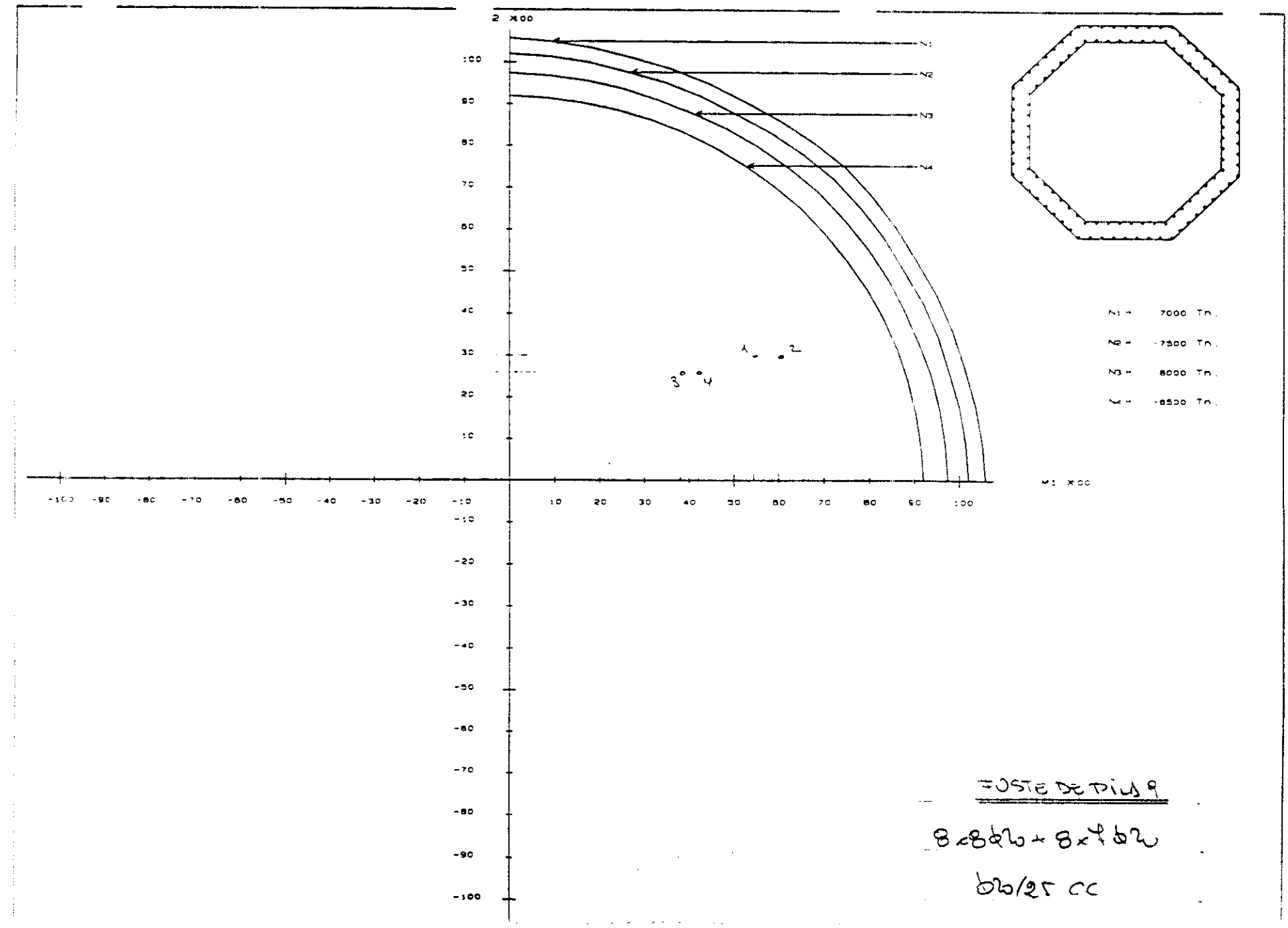


FUSTE DE PILA 8

8×8 ϕ20 + 8×4 ϕ20

ϕ20/25 C.C

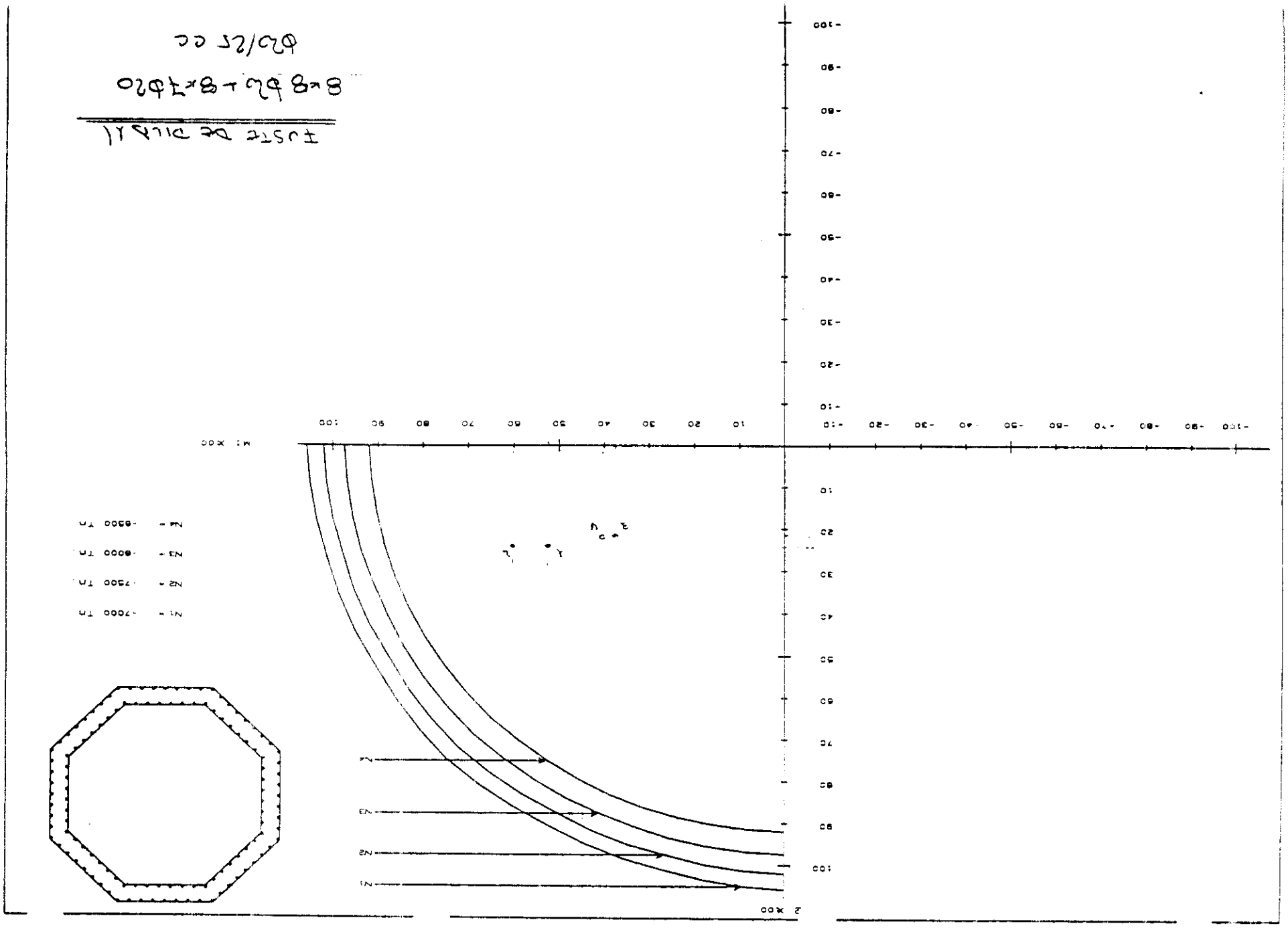
PUENTE SOBRE EL CINCA COMPROBACION A ROTURA DE LAS PILAS 8



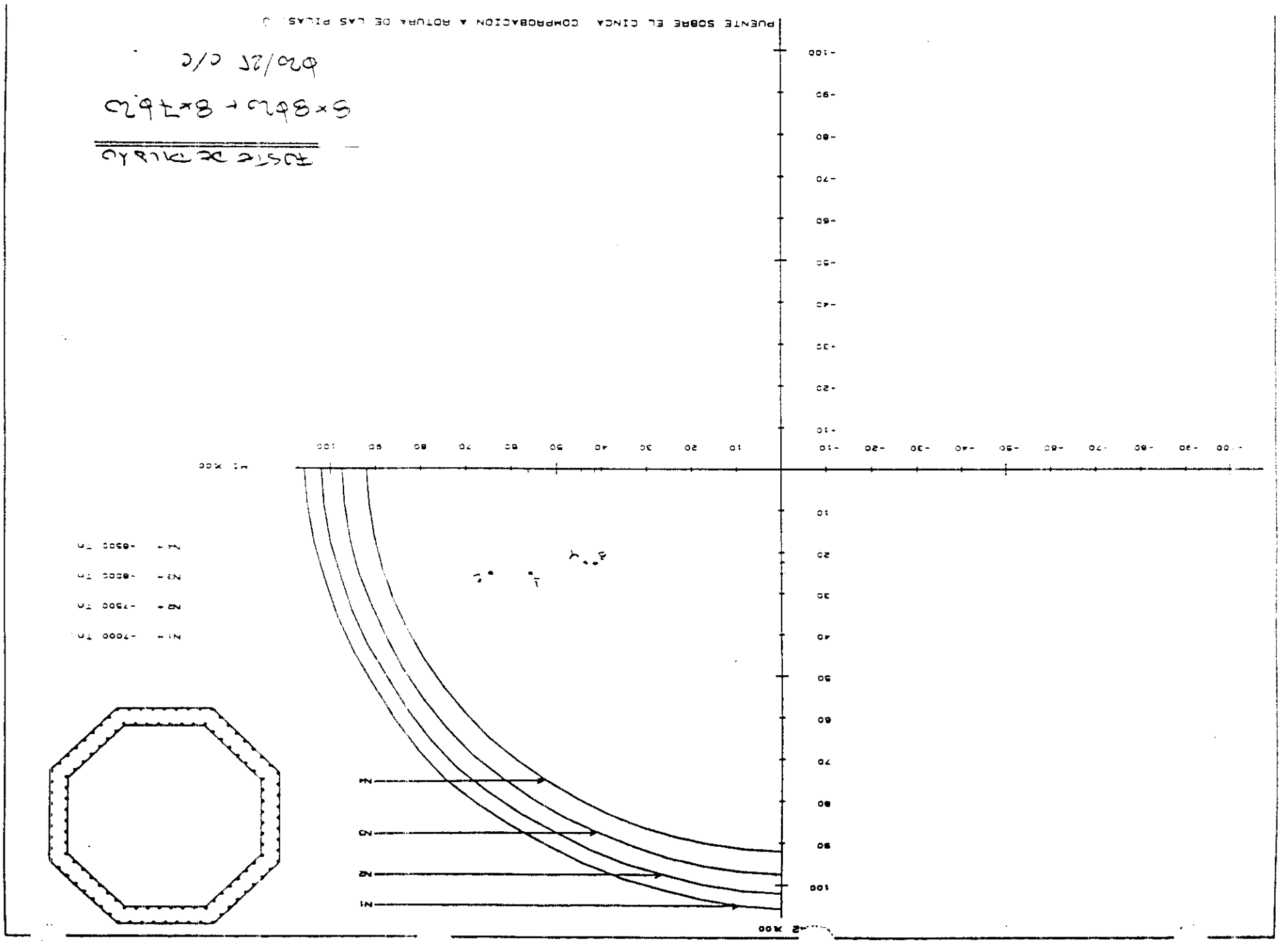
FUSTE DE PILA 9

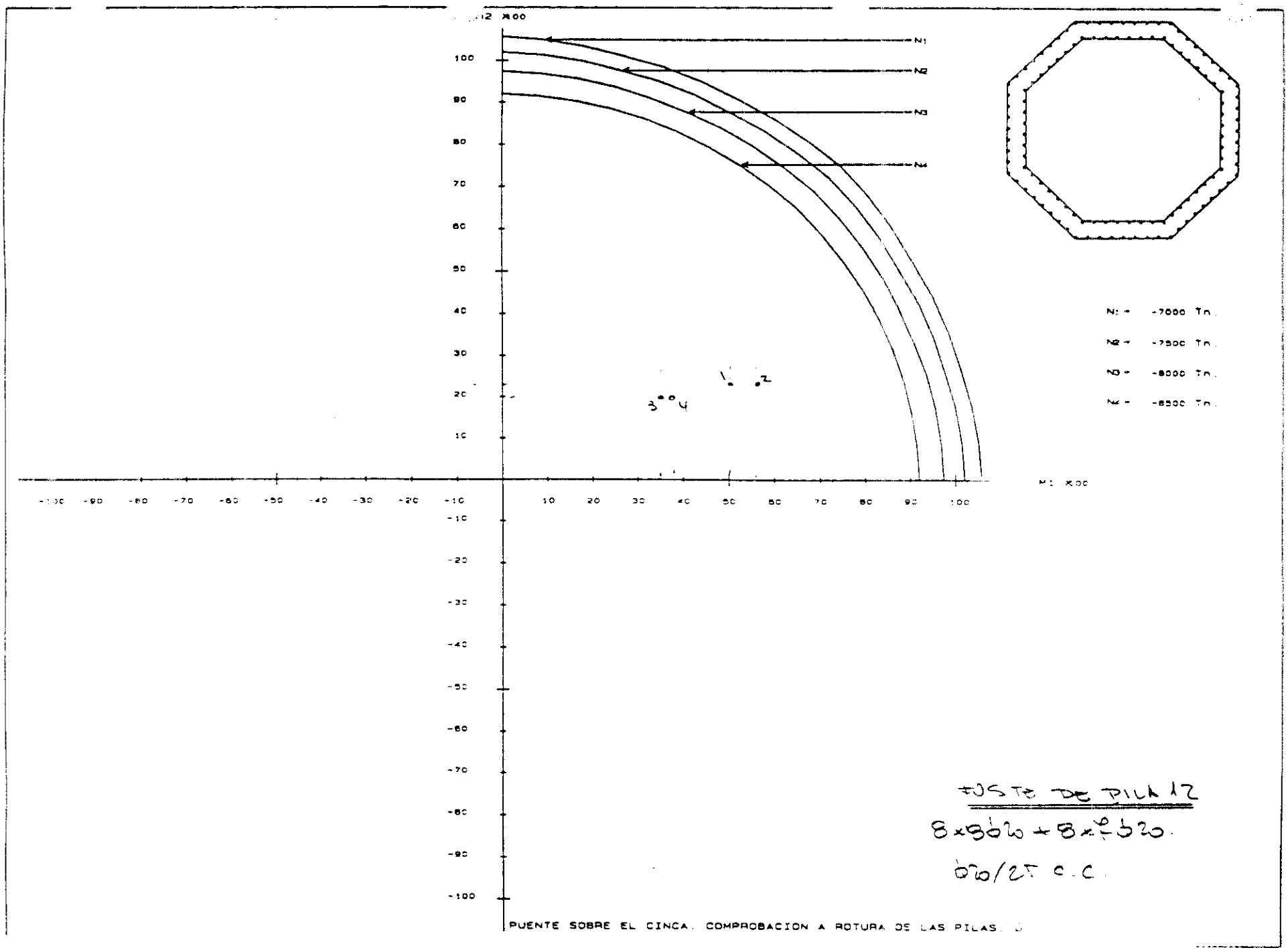
8×8 ϕ20 + 8×4 ϕ20

ϕ20/25 CC



PUENTE SOBRE EL CINCA COMPROBACION A ROTURA DE LAS PILAS.



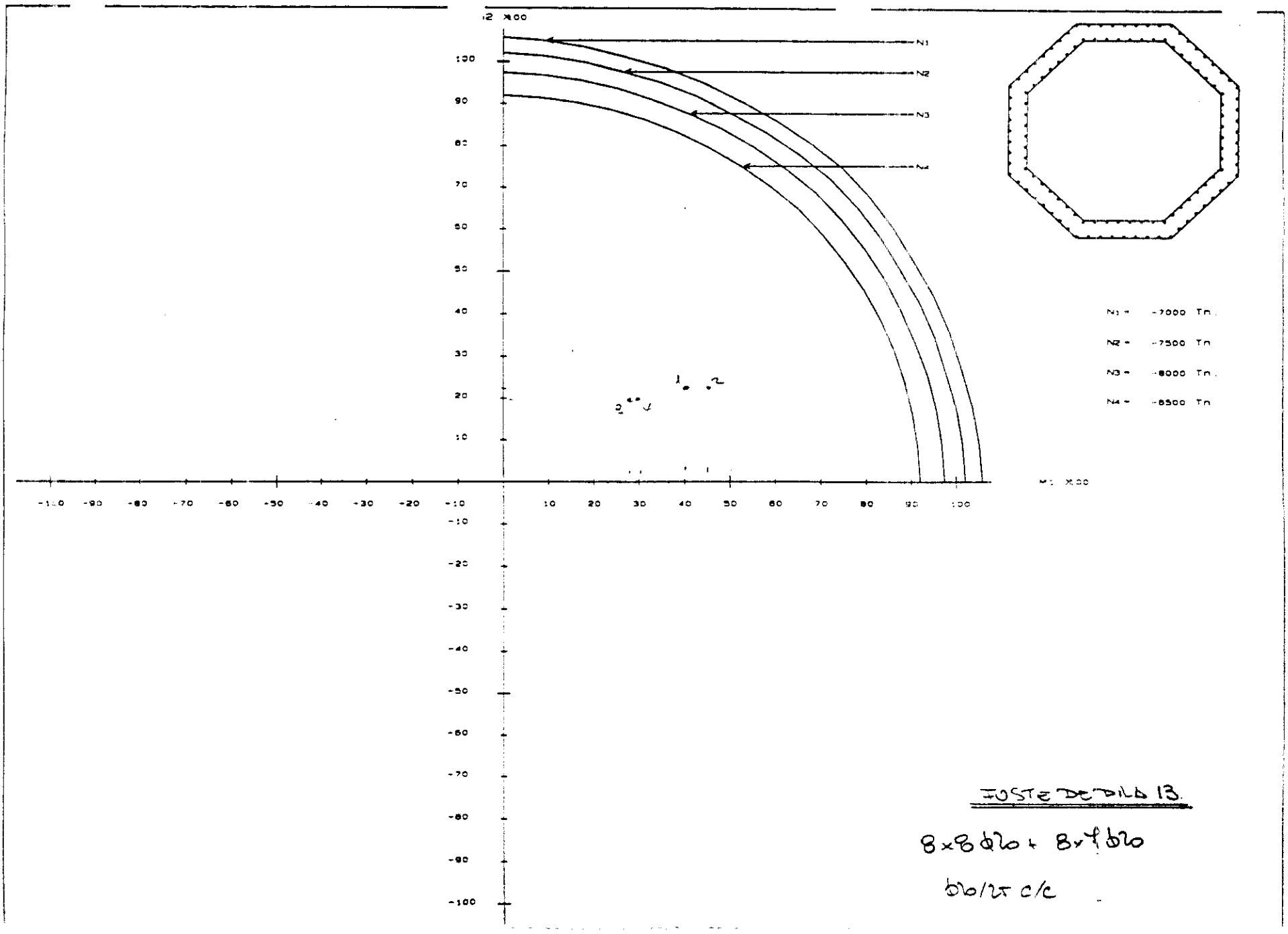


AJUSTE DE PILA 12

8 x 8 ⌀20 + 8 x ⌀20.

⌀6/25 c.c.

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS.



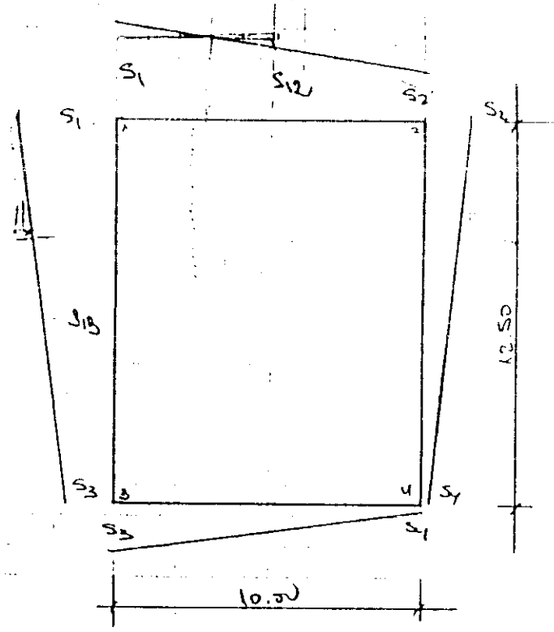
AJUSTE DE PILA 13.

8 x 8 ⌀20 + 8 x ⌀20

⌀6/25 c/c

SOPATTA DE PILA 4

Dimensioni 10.00 × 12.50 × 2.00



$\sigma_1 = 79.0 - 6.25 = 72.7\ t/m^2$

$\sigma_2 = 45.7 - 6.25 = 39.5\ t/m^2$

$\sigma_3 = 43.8 - 6.25 = 37.5\ t/m^2$

$\sigma_4 = 10.5 - 6.25 = 4.31\ t/m^2$

$S_{12} = 0.5(72.7 + 39.5) = 56.1\ t/m^2$

$S_{13} = 0.5(72.7 + 37.5) = 55.1\ t/m^2$

ANCHONA 1-3 $\quad U = 0.5(12.50 - 5.00) + 0.15 \times 5.00 = 4.50$

$M_{13} = 56.1 \times \frac{4.50^2}{2} + 0.75(72.7 - 56.1) \times \frac{4.50^2}{2} = 694\ mt$

$M'_{13} = 1.6 \times 694 = 1110\ mt$

$U_c = \frac{2500}{1.5} \times 100 \times 2.60 = 4333$

$U_s = 4333\left(1 - \sqrt{1 - \frac{2 \times 1110}{2.6 \times 4333}}\right) = 450\ t$

$\omega = 450 \times 1.15 / 5.1 = 102.2\ cm^2/ml$ $\quad$ 2 c Φ32/25

$\omega_s = 0.30 \times 102 = 30.6$ $\quad$ 1 c Φ25/16

ANCHONA 1-2 $\quad U = 0.5(10.00 + 5.00) + 0.15 \times 5 = 8.25$

$M_{12} = 56.1 \times \frac{8.25^2}{2} + 0.75(72.7 - 56.1) \times \frac{8.25^2}{2} = 360\ mt$

M'_{12} 360 × 1.6 = 577

$U_s = 4333\left(1 - \sqrt{1 - \frac{2 \times 577}{2.6 \times 4333}}\right) = 928\ t$

$\omega = 928 \times 1.15 / 5.1 = 51.4\ cm^2$ $\quad$ 1 c Φ32/15

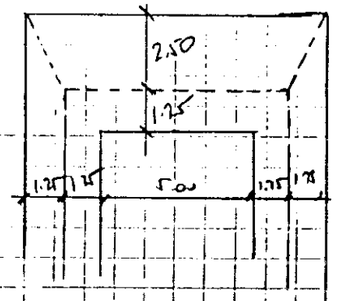
$\omega_s = 0.30 \times 51.4 = 15.4\ cm^2/ml$ $\quad$ 1 c Φ25/30

CENTRO $\quad U = (12.50 - 5.00) \times 0.5 - 1.35 = 2.40$

$\sigma = 56.1 + 0.75(72.7 - 56.1) = 68.55\ t/m^2$

$Q = 68.55 \times \frac{10 \times 12.50}{2} \times 2.40 = 1439\ t$

$Q' = 1439 \times 1.6 = 2303\ t$



SEZIONE ATT

$V_{Rd2} = 2 b_z d_2 f_{cd} = 2 \times 1.50 \times 2.160 \times 5\sqrt{\frac{250}{1.5}}$

$= 2514\ t > 2303$

Si deve armare minimo

$\omega_m = 0.02 \times \frac{2500}{1.5} \times 100 \times \frac{1}{4} = 99\ cm^2/m^2$

2 ADINTAS DE PILAS 2-3 y 4

Dimensiones 10.20 x 14.00 x 3.20

$S_1 = 80.6 - 8.0 - 72.6$ t/m2

$S_2 = 47.5 - 8.0 - 39.5$ t/m2

$S_3 = 41.5 - 8.0 = 32.5$ t/m2

$S_4 = 7.5 - 8.0 = -0.5$ t/m2

$S_{12} = 0.5\,(72.6+39.5) = 56.05$ t/m2

$S_{13} = 0.5\,(72.6+32.5) = 52.55$ t/m2

Alineación 1-3 $Q = 0.5(14.00-5.00)\times 0.15\times 5 = 5.25$

$M_{13} = 56.05 \times \frac{5.25^2}{2} + 0.5(72.6-56.05)\times\frac{5.25^2}{2} = 94.3$ mt

$M'_{13} = 1.6 \times 94.3 = 150.9$ mt

$A_c = \frac{2500}{1.5}\times 3.10 = 5167$ t

$U_3 = 5167\left(1-\sqrt{1-\frac{2\times 150.9}{3.1\times 5167}}\right) = 512$ t

$\omega = 512\times 1.15/S_1 = 11.5$ cm2/m — 2c ϕ32/14

$\omega_2 = 0.3\times 11.5 = 3.4$ cm2/m — 1c ϕ25/14

Alineación 1-2 $Q = (10.2-5.00)\times 0.5+0.75 = 3.35$

$M_{12} = 52.55\times\frac{3.35^2}{2} + (72.6+52.55)\times 0.15\times\frac{3.35^2}{2} = 31.9$ t

$M'_{12} = 31.9\times 1.6 = 60.6$ mt

$U_3 = 5167\left(1-\sqrt{1-\frac{2\times 60.6}{3.1\times 5167}}\right) = 19$ t

$\omega = 1.15\times 45.0 = 45.0$ cm2/m — 1c ϕ32/17

$\omega_2 = 45.0\times 0.3 = 13.5$ cm/m — 1c ϕ25/36

Contiene $Q = (14.00-5.00)\times 0.5 - 1.60 = 2.90$ m

$Q = 56.05+0.75(72.6-56.05) = 68.46$ t/m2

$Q = 68.46\times\frac{10.20+8.20}{2}\times 2.90 = 182.6$ t

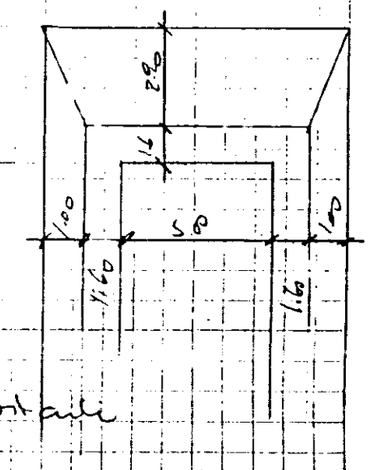
$Q' = 1.6\times 182.6 = 292.1$ t

$U_{82} = 2\times 8.20\times 3.1\times\sqrt{\frac{250}{1.5}} =$

$= 328.1 > Q'$.

No se necesita armadura a cortante

Se pone $\omega_m = 0.02\times\frac{2500}{4.5}\times 10.0\times\frac{1}{4.2} = 9.9$ cm2/m2



ZAPATAS DE MUROS 5-6-7 y 8

Datos 1000 x 1200 x 2.10

$q_1 = 71.9 - 6.25 = 71.64 t/m^2$

$q_2 = 49.7 - 6.25 = 43.5 t/m^2$

$q_3 = 32.8 - 6.25 = 26.6 t/m^2$

$q_4 = 4.6 - 6.25 = -1.6 t/m^2$

$q_{12} = 0.5 (71.6 - 43.5) = 57.55 t/m^2$

$q_{13} = 0.5 (71.6 + 26.6) = 49.1 t/m^2$

ANCHO 1.3 $U = (12.00 - 5.00) \times 0.5 \times 0.75 = 4.25$

$M = 57.55 \times \frac{4.25^2}{2} + 0.75 (71.6 - 57.55) \times \frac{4.25^2}{2} = 614$

$M' = 1.6 \times 614 = 983 mt$

$d_2 = 40.00 \left(1 - \sqrt{1 - \frac{2 \times 983}{24 \times 4000}}\right) = 43.3 cm$

$\omega = 43.3 \times 1.15 / 5.1 = 97.7 cm^2/m$ 7 c Ø32/16

$\omega_2 = 0.3 \times 43.3 = 29.3 cm^2/m$ 1 c Ø32/16

ANCHO 1.2 $U = 3.25 m$

$M = 49.1 \times \frac{3.25^2}{2} + 0.75 (71.6 - 49.1) \times \frac{3.25^2}{2} = 848 mt$

$M' = 1.6 \times 848 = 1357 mt$

$d_2 = 40.00 \left(1 - \sqrt{1 - \frac{2 \times 1357}{2.4 \times 4000}}\right) = 43.9 cm$

$\omega = 43.9 \times 1.15 / 5.1 = 53.4 cm^2/m$ 1 c Ø32/15

$\omega_2 = 0.3 \times 53.4 = 16.02 cm^2/m$ 1 c Ø25/30

PORTICO $U = (12.00 - 5.00) \times 0.5 - 1.25 = 2.25$

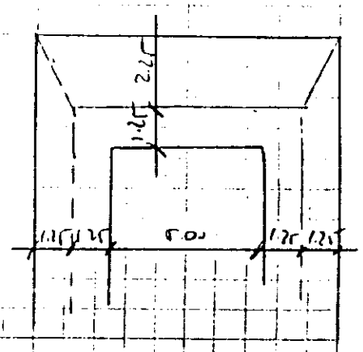
$G = 57.55 + 0.75 (71.6 - 57.55) = 68.08 t/m^2$

$Q = 68.08 \times \frac{10 + 7.50}{2} \times 2.25 = 1340 t$

$Q' = 1340 \times 1.6 = 2144 t$

$U_{\phi 2} = 2 \times \pi 50 \times 2.4 \times 5 \sqrt{\frac{250}{1.5}} =$

$= 2323 t > Q'$



No se necesita anodo a contacto

Diseño $\omega_{min} = 0.2 \times \frac{250}{1.5} \times 100 \times \frac{1}{4.7} = 1.9 cm^2/m^2$

SOLAIO 9-10-11-12 e 13

Dimensioni 10.00 x 11.00 x 2.50

$g_1 = 79.9 - 6.25 = 73.6\ t/m^2$

$g_2 = 53.0 - 6.25 = 46.8\ t/m^2$

$g_3 = 38.3 - 6.25 = 32.0\ t/m^2$

$g_4 = 11.4 - 6.25 = 5.2\ t/m^2$

$g_{12} = 0.5\,(73.6 + 46.8) = 60.2\ t/m^2$

$g_{13} = 0.5\,(73.6 + 32.0) = 52.8\ t/m^2$

Striscia 1.3 $\quad U = (11.00 - 5.00) \times 0.5 + 0.75 = 3.75$

$M_{13} = 60.2 \times \frac{3.75^2}{2} + 0.75\,(73.6 - 60.2) \times \frac{3.75^2}{2} = 494\ mt$

$M'_{13} = 1.6 \times 494 = 790\ mt$

$U_S = 4000\left(1 - \sqrt{1 - \frac{2 \times 790}{2.4 \times 4000}}\right) = 343\ t$

$w = 343 \times 1.15 / s_1 = 77\ cm^2/ml$ $\quad$ 2 ϕ 32/20

$w_S = 77 \times 0.3 = 23.1\ cm^2/l$ $\quad$ 1 ϕ 25/21

Striscia 1.2 $\quad U = 3.25$

$M = 52.8 \times \frac{3.25^2}{2} + 0.75\,(73.6 - 52.8) \times \frac{3.25^2}{2} = 361\ mt$

$M' = 361 \times 1.6 = 578\ mt$

$U_S = 4000\left(1 - \sqrt{1 - \frac{2 \times 578}{2.4 \times 4000}}\right) = 248\ t$

$w = 248 \times 1.15 / s_1 = 56\ cm^2/ml$ $\quad$ 1 ϕ 32/14.4

$w_S = 56 \times 0.3 = 16.8\ cm^2/l$ $\quad$ 1 ϕ 25/30

Contorno $\quad U = (11 - 5) \times 0.5 - 1.25 = 1.75$

$\bar{G} = 60.2 + 0.75\,(73.6 - 60.2) = 70.25\ t/...$

$Q = 70.25 \times \frac{10.00 + 7.50}{2} \times 1.75 = 1075$

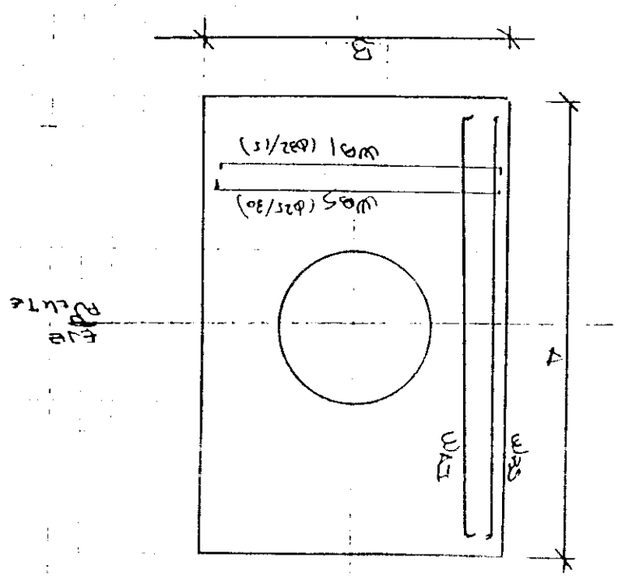
$Q' = 1075 \times 1.6 = 1721\ t$

$U_{Q2} = 2 \times 1.50 \times 2.4 \times 5 \sqrt{\frac{250}{1.5}} = 2323\ t > Q'$

Non si rendono annodi a contatto, le

distanze

$w_{min} = 0.02 \times \frac{2500}{1.5} \times 1.00 \times \frac{1}{4.2} = 7.9\ cm^2/m$

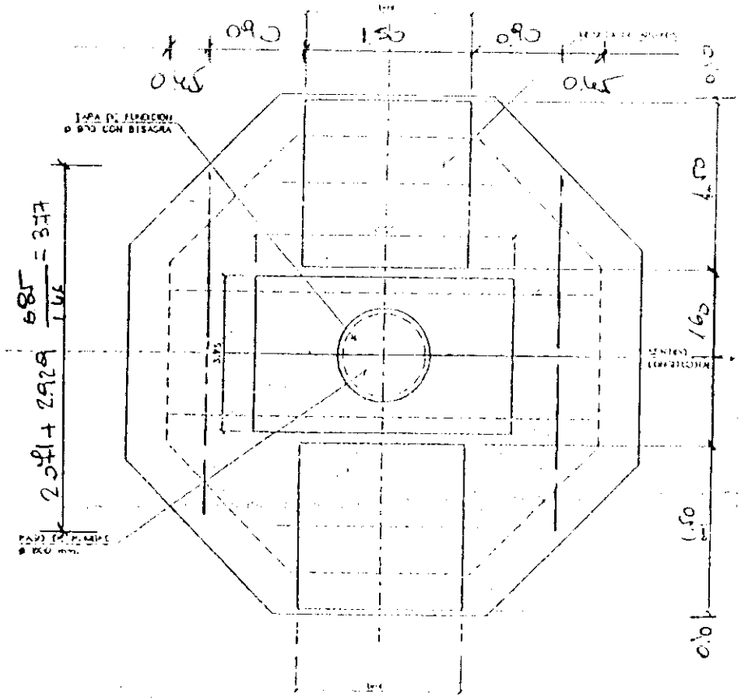


	B	A	H	w_{A3}	w_{A2}	w_{B2}
A	10.00	A2.50	9.40	2c.b32/1r	Ac.b2r/1r	Ac.b32/1r	Ac.b2r/30
B-3-4	10.20	M.00	3.20	Qc.b32/1r	Ac.b2r/1r	Ac.b32/1r	Ac.b2r/30
J-L+8	A0.00	12.00	2.50	2c.b32/1r	Ac.b2r/1r	Ac.b32/1r	Ac.b2r/30
9-10.11 12 13	10.00	A4.00	8.50	2c.b32/1r	Ac.b2r/1s	1 c.b 82/1r	1c.b 2r/30

Concrete Works

$\phi 12/\text{ur}/60 = 2 \times 1.12 \times \frac{1}{0\text{m}} \times \frac{}{0.60} \quad 83.2/\text{m}^2$

DISEÑO DE CABEZAL DE PILA



SOBRE EL CABEZAL DE APOYO DE 1.30 x 1.50 SE APOYAN LAS VIGAS DE 45° HASTA LA LINEA NEUTRA (h/2 = 0.90)

LA CARGA DE REPARTICION ACTUA EN TODOS LOS LADOS DEL OCTOGONO

$$S = 2.0 \times 3 + 2 \times \frac{1.30 + 3.37}{2} \times 0.61 - \frac{1.10 \times 0.4^2}{4} = 15.04\ m^2$$

$$q_u \leq 2 \times \frac{2773}{15.04} \times 2.75 = 373\ t/m^2$$

Adoptando la placa superior a un circulo de igual area

$$S = 300 \times 7.0 t/l + 2 \times 1.46\ \frac{7.0 t/l + 5.00}{2} = 10.35 + 10.32 = 20.67\ t/m^2$$

$$S = \pi \frac{D^2}{4} = 20.67 \qquad D = 5.13\ m$$

Segun KALMANOK (PCC)

$$\frac{r}{a} = \frac{0.50}{2.57} = 0.20 \qquad K = 0.265$$

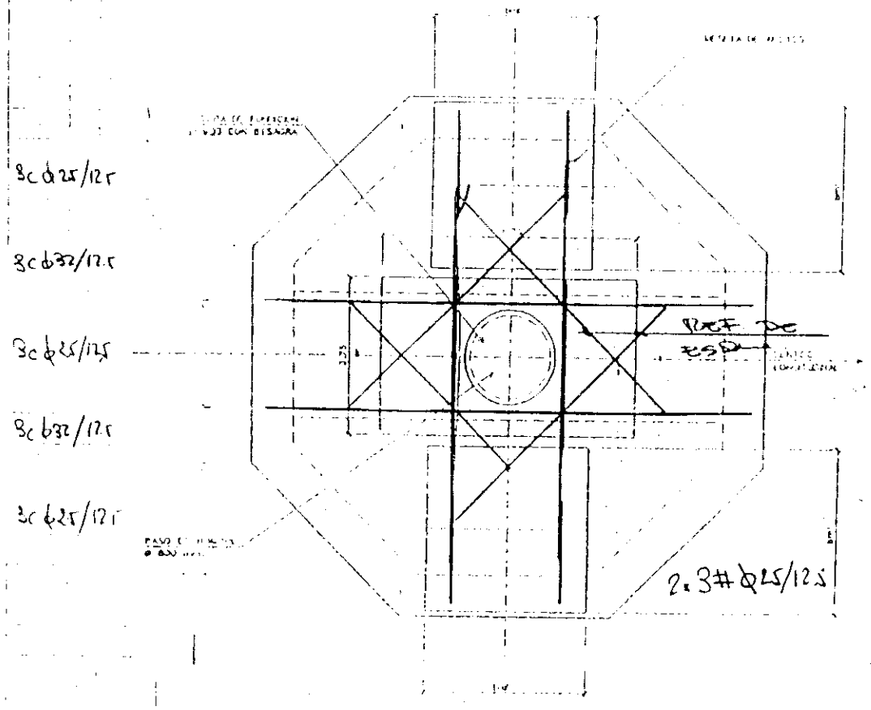
$$M = 0.265 \times 373 \times \left(\frac{5.13}{2} - 0.20\right)^2 = 552\ mt$$

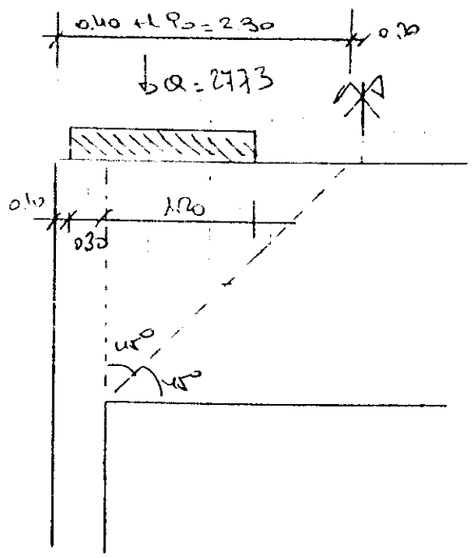
$$M' = 552 \times 1.6 = 885\ mt$$

$$U_0 = \frac{3500}{1.5} \times 1.90 = 4433\ t$$

$$U_s = 4433\left(1 - \sqrt{1 - \frac{2 \times 885}{19 \times 4433}}\right) = 493\ t/l$$

$$w = 493 \times 1.15 / S_1 = 111\ cm^2/ml \quad 3\ \text{ramas } \varnothing 25/12.5$$





$$Q_1 = \frac{27.73 \times 1.00}{1.50} = 22.18 \text{ ton}$$

CONSIDERANDO LAS ZONAS AFECTADAS DEL MONICA

DE $(1.50 + 0.95 + 0.95) \times 1.9 \longrightarrow 6.46 \text{ m}^2$

$Q_1 = 22.18 + 6.46 \times 2.5 \times 2.5 = 22.58 \text{ t}$

$Q'_1 = 1.6 \times 22.58 = 36.12 \text{ ton}$

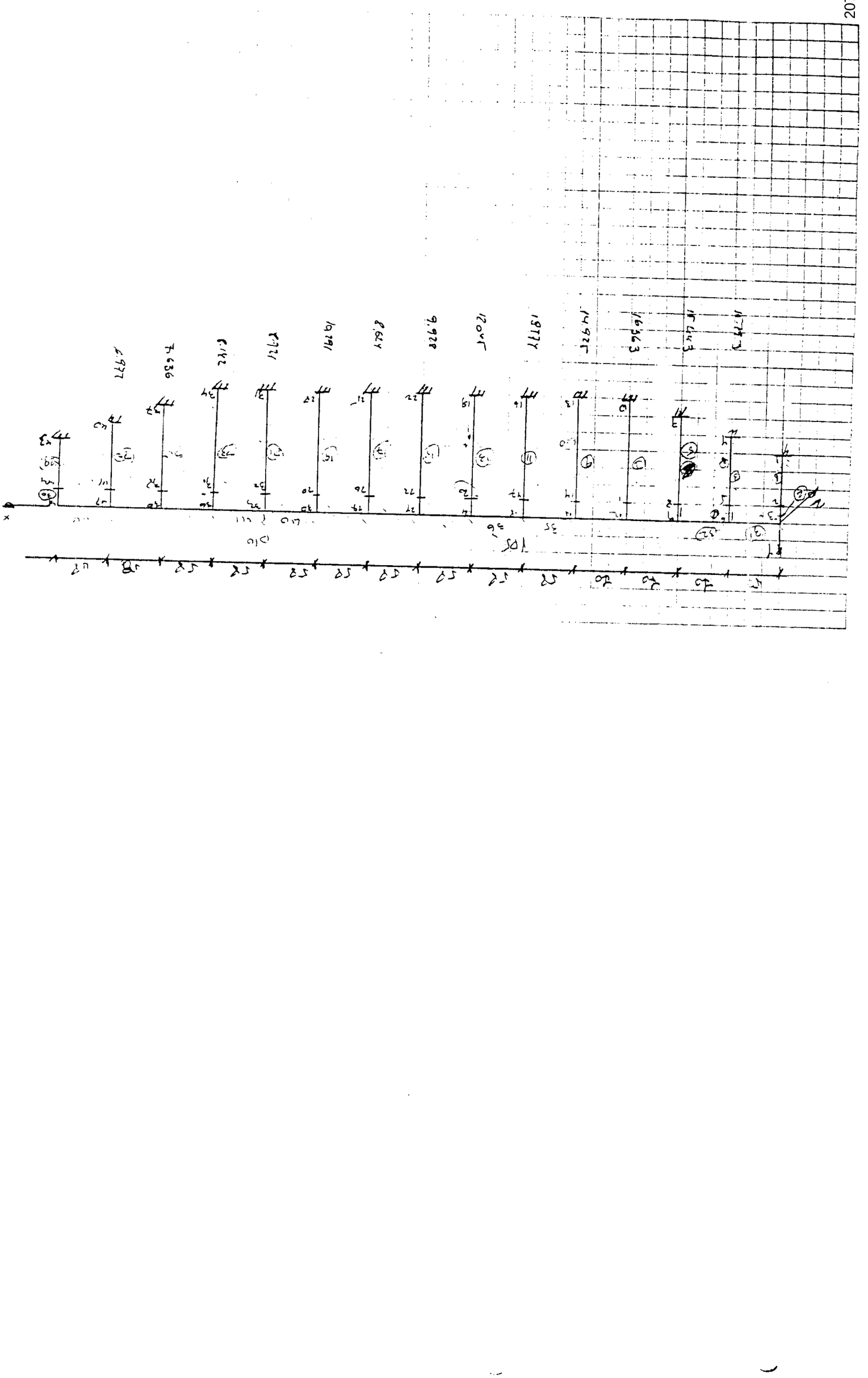
El agotamiento del suelo es

$U = 0.30 \times \frac{3500}{1.5} \times 6.46 = 45.22 \text{ t} > Q_1$

PARA EL CALCULO DE ANCLAJE A CORTANTE se descuentan las cargas de la zona a 45° en la que se distribuye anchura unitaria $\sigma_t = 1.97 \text{ m}^2/\text{m}^2$

equivale a 4 bars d 16 /m²

(Modelo Interrogativo)



1) TABLERO NO TIGODADO

EFECTOS CARGAS EXCENTRICAS, FUERZAS CENTRIFUGAS, VIENTO Y SISMO.

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    FEB 20, 1997        *
*          Time=    13:20:32            *
*                                       *
*****************************************
```

```
1. STAAD SPACE FRAME. PUENTE SOBRE EL CINCA. PILAS CON MUELLES CIMENTACION
2. * FICHERO(CINCAP11) TABLERO NO FISURADO POR TORSION.
3. UNIT METER MTON
4. JOINT COORDINATES
5. * ALINEACION TABLERO
6.   1    0.000  -4.000  0.000
7.   4   50.000 -23.450  0.000
8.   7  120.000 -23.450  0.000
9.  10  190.000 -24.650  0.000
10. 13  260.000 -23.650  0.000
11. 16  318.000 -22.650  0.000
12. 19  376.000 -21.050  0.000
13. 22  434.000 -18.850  0.000
14. 25  492.000 -17.450  0.000
15. 28  550.000 -18.850  0.000
16. 31  608.000 -16.950  0.000
17. 34  668.000 -15.850  0.000
18. 37  726.000 -15.250  0.000
19. 40  782.000 -14.450  0.000
20. 43  830.000  -4.000  0.000
21.  2    0.000  -3.850  0.000
22.  5   50.000  -3.850  0.000
23.  8  120.000  -3.850  0.000
24. 11  190.000  -3.850  0.000
25. 14  260.000  -3.850  0.000
26. 17  318.000  -3.850  0.000
27. 20  376.000  -3.850  0.000
28. 23  434.000  -3.850  0.000
29. 26  492.000  -3.850  0.000
30. 29  550.000  -3.850  0.000
31. 32  608.000  -3.850  0.000
32. 35  668.000  -3.850  0.000
33. 38  726.000  -3.850  0.000
34. 41  782.000  -3.850  0.000
35. 44  830.000  -3.850  0.000
36.  3    0.000   0.000  0.000
37.  6   50.000   0.000  0.000
38.  9  120.000   0.000  0.000
39. 12  190.000   0.000  0.000
40. 15  260.000   0.000  0.000
41. 18  318.000   0.000  0.000
42. 21  376.000   0.000  0.000
43. 24  434.000   0.000  0.000
44. 27  492.000   0.000  0.000
45. 30  550.000   0.000  0.000
46. 33  608.000   0.000  0.000
47. 36  668.000   0.000  0.000
```



```
* FICHERO(CINCAP11) TABLERO NO FISURADO POR TORSION.
48.  39  726.000   0.000  0.000
49.  42  782.000   0.000  0.000
50.  45  830.000   0.000  0.000
51. MEMBER INCIDENCES
52.   1    1    2
53. R 14   2    3
54.   2    2    3
55. R 14   2    3
56.  31    3    6
57.  R     13   1    3
58. MEMBER PROPERTY
59. * ESTRIBOS (APOYOS)
60.   1  29            PR AX  2.420 IX  12.2500 IY  12.2500 IZ  0.2218
61. * TRAVIESAS
62.   2  4  6  8 10 12 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
63.  14 16 18 20 22 24 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
64.  26 28 30          PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
65. *FUSTES DE PILA
66.   3  5  7  9 11 13 PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
67.  15 17 19 21 23    PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
68.  25 27             PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
69.  *TABLERO
70.  31 TO 44          PR AX 13.280 IX  56.0000 IY 124.6600 IZ 44.1200
71. MEMBER RELEASE
72. 1 3 5 7 9 11 13 15 17 19 21 23 25 27 END FY  MX MZ
73. 29                                   END MX  MZ
74. CONSTANTS
75. E        3350000.   ALL  BUT 1 29
76. E  120000  1  29
77. POISSON   0.2  ALL  BUT 1 29
78. POISSON  299   1  29
79. SUPPORTS
80. 1  43 FIXED BUT KMX 5100000.
81. *1  43 FIXED
82. 4 7 10 13 16 19 22 25 28 31 34 37 40  FIXED BUT KMX 2550000.
83. *4 7 10 13 16 19 22 25 28 31 34 37 40 FIXED
84. LOADING 1 SISMO SOBRE TABLERO EN VACIO.
85. MEMBER LOAD
86. * PILAS
87. 3  5  7  9 11 13 15 17 19 21 23 25 27       UNI  GZ -0.975
88. * TABLERO Y CARGA PERMANENTE
89. 31 TO 44                                    UNI  GZ  -3.03
90. 2                                       30  UNI  GZ  -3.200
91.   4  6  8 10 12 14 16 18 20 22 24 26 28     UNI  GZ  -2.000
92. 31 TO 44                                    UMOM GX   0.740
93. LOADING 2 SISMO POR SOBRECARGAS RENFE EN TABLERO E1 A P5 (318)
94. MEMBER LOAD
95. 31 TO 35              UNI  GZ  -0.384
96. 31 TO 35              UMOM GX  -1.380
97. LOADING 3 SISMO POR SOBRECARGAS RENFE EN TABLERO P5 A P10 (290)
98. MEMBER LOAD
99. 36 TO 40              UNI  GZ  -0.384
100. 36 TO 40             UMOM GX  -1.380
101. LOADING 4 SISMO POR SOBRECARGAS RENFE EN TABLERO E1 A P5 (280)
102. MEMBER LOAD
103. 41 TO 44             UNI  GZ  -0.384
104. 41 TO 44             UMOM GX  -1.380
105. LOADIND 5 TREN RENFE EXCENTRICO EXTERIOR CON IMPACTO Y F. CEN RIFUGA
106. MEMBER LOAD
107. 31 TO 44             UNI  GY -11.70
```

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* FICHERO(CINCAPI1) TABLERO NO FISURADO POR TORSION.
108. 31 TO 44                UMOM  GX -26.52
109. 31 TO 44                UNI   GZ -0.286
110. LOADIND 6 DOS TRENES RENFE EXCENTRICOS CON IMPACTO Y F. CENTRIFUGA
111. MEMBER LOAD
112. 31 TO 44                UNI   GY -23.40
113. 31 TO 44                UMOM  GX  -8.04
114. 31 TO 44                UNI   GZ -0.572
115. LOADIND 7 VIENTO TRANSVERSAL SOBRE TABLERO Y UN TREN
116. MEMBER LOAD
117. 3 5 7 9 11 13 15 17 19 21 23 25 27  UNI  GZ  -1.04
118. 31 TO 44                            UNI  GZ  -2.22
119. 31 TO 44                            UMOM GX  -1.94
120. LOADIND 8 VIENTO TRANSVERSAL SOBRE TABLERO Y DOS TRENES
121. MEMBER LOAD
122. 3 5 7 9 11 13 15 17 19 21 23 25 27  UNI  GZ  -1.04
123. 31 TO 44                            UNI  GZ  -2.36
124. 31 TO 44                            UMOM GX  -2.44
125. LOADING COMBINATION  9 MOMENTOS TRANVERSALES MAXIMOS SERVICIO
126. 5 1.00 7 1.00
127. LOADING COMBINATION 10 AXILES MAXIMOS SERVICIO
128. 6 1.00 8 1.00
129. LOADING COMBINATION 11 SISMO CON MOMENTOS TRANVERSALES MAXIMOS
130. 1 1.00 2 1.00 3 1.00 4 1.00 5 0.30
131. LOADING COMBINATION 12 SISMO CON AXILES MAXIMOS
132. 1 1.00 2 1.00 3 1.00 4 1.00  6 0.30
133. 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 =    45/   44/   15
ORIGINAL/FINAL BAND-WIDTH =   15/    3
TOTAL PRIMARY LOAD CASES  =    8, TOTAL DEGREES OF FREEDOM =   195
SIZE OF STIFFNESS MATRIX =    3705 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.16 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX.          13:20:36
++ PROCESSING GLOBAL STIFFNESS MATRIX.           13:20:36
++ PROCESSING TRIANGULAR FACTORIZATION.          13:20:36
++ CALCULATING JOINT DISPLACEMENTS.              13:20:36
++ CALCULATING MEMBER  FORCES.                   13:20:36

134. LOAD LIST ALL
135. PRINT REAC ALL
```



```
* FICHERO(CINCAPI1) TABLERO NO FISURADO POR TORSION.
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SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	0.00	93.17	1037.93	0.00	0.00
	2	0.00	0.00	10.63	188.64	0.00	0.00
	3	0.00	0.00	0.00	0.30	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	207.85	18.14	1277.54	0.00	0.00
	6	0.00	415.69	18.23	548.32	0.00	0.00
	7	0.00	0.00	59.81	841.82	0.00	0.00
	8	0.00	0.00	63.68	910.57	0.00	0.00
	9	0.00	207.85	77.95	2119.37	0.00	0.00
	10	0.00	415.69	81.91	1458.89	0.00	0.00
	11	0.00	62.35	109.24	1610.14	0.00	0.00
	12	0.00	124.71	109.26	1391.37	0.00	0.00
43	1	0.00	0.00	76.23	542.15	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	-0.01	0.68	0.00	0.00
	4	0.00	0.00	8.34	115.22	0.00	0.00
	5	0.00	214.82	10.98	983.94	0.00	0.00
	6	0.00	429.63	13.53	383.36	0.00	0.00
	7	0.00	0.00	47.12	461.42	0.00	0.00
	8	0.00	0.00	50.16	503.56	0.00	0.00
	9	0.00	214.82	58.10	1445.36	0.00	0.00
	10	0.00	429.63	63.68	886.93	0.00	0.00
	11	0.00	64.44	87.86	953.23	0.00	0.00
	12	0.00	128.89	88.62	773.05	0.00	0.00
4	1	0.00	0.00	183.84	3695.15	0.00	0.00
	2	0.00	0.00	19.36	488.62	0.00	0.00
	3	0.00	0.00	-0.01	0.44	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	777.40	-1.38	1323.73	0.00	0.00
	6	0.00	1554.80	25.12	953.73	0.00	0.00
	7	0.00	0.00	134.60	2761.96	0.00	0.00
	8	0.00	0.00	141.66	2940.14	0.00	0.00
	9	0.00	777.40	133.22	4085.69	0.00	0.00
	10	0.00	1554.80	166.78	3893.88	0.00	0.00
	11	0.00	233.22	202.78	4581.32	0.00	0.00
	12	0.00	466.44	210.73	4470.32	0.00	0.00
7	1	0.00	0.00	262.53	5475.46	0.00	0.00
	2	0.00	0.00	30.19	745.95	0.00	0.00
	3	0.00	0.00	-0.15	0.35	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	827.81	28.45	2271.55	0.00	0.00
	6	0.00	1655.61	46.18	1514.44	0.00	0.00
	7	0.00	0.00	193.38	4117.15	0.00	0.00
	8	0.00	0.00	204.33	4389.03	0.00	0.00
	9	0.00	827.81	221.83	6388.71	0.00	0.00
	10	0.00	1655.61	250.51	5903.47	0.00	0.00
	11	0.00	248.34	301.11	6903.22	0.00	0.00
	12	0.00	496.68	306.43	6676.09	0.00	0.00
10	1	0.00	0.00	234.13	5253.60	0.00	0.00
	2	0.00	0.00	26.60	709.84	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	3	0.00	0.00	-0.55	2.91	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	830.91	17.02	2150.22	0.00	0.00
	6	0.00	1661.83	38.25	1441.86	0.00	0.00
	7	0.00	0.00	172.49	3951.01	0.00	0.00
	8	0.00	0.00	181.99	4210.67	0.00	0.00
	9	0.00	830.91	189.51	6101.23	0.00	0.00
	10	0.00	1661.83	220.24	5652.53	0.00	0.00
	11	0.00	249.27	265.28	6610.42	0.00	0.00
	12	0.00	498.55	271.65	6397.91	0.00	0.00
13	1	0.00	0.00	224.68	4900.53	0.00	0.00
	2	0.00	0.00	23.76	602.79	0.00	0.00
	3	0.00	0.00	1.33	66.54	0.00	0.00
	4	0.00	0.00	0.00	0.03	0.00	0.00
	5	0.00	755.29	19.90	2119.01	0.00	0.00
	6	0.00	1510.59	37.66	1377.47	0.00	0.00
	7	0.00	0.00	165.50	3689.72	0.00	0.00
	8	0.00	0.00	174.65	3933.55	0.00	0.00
	9	0.00	755.29	185.41	5808.72	0.00	0.00
	10	0.00	1510.59	212.32	5311.03	0.00	0.00
	11	0.00	226.59	255.74	6205.58	0.00	0.00
	12	0.00	453.18	261.07	5983.12	0.00	0.00
16	1	0.00	0.00	200.91	4268.65	0.00	0.00
	2	0.00	0.00	11.65	315.32	0.00	0.00
	3	0.00	0.00	10.57	271.98	0.00	0.00
	4	0.00	0.00	0.00	0.12	0.00	0.00
	5	0.00	656.03	17.44	1959.19	0.00	0.00
	6	0.00	1312.06	33.51	1232.24	0.00	0.00
	7	0.00	0.00	147.78	3217.29	0.00	0.00
	8	0.00	0.00	155.89	3431.27	0.00	0.00
	9	0.00	656.03	165.22	5176.48	0.00	0.00
	10	0.00	1312.06	189.20	4663.50	0.00	0.00
	11	0.00	196.81	228.37	5443.83	0.00	0.00
	12	0.00	393.62	233.13	5225.74	0.00	0.00
19	1	0.00	0.00	196.07	3885.16	0.00	0.00
	2	0.00	0.00	1.12	70.00	0.00	0.00
	3	0.00	0.00	20.58	470.06	0.00	0.00
	4	0.00	0.00	-0.01	0.37	0.00	0.00
	5	0.00	684.42	14.75	1865.62	0.00	0.00
	6	0.00	1368.83	31.98	1148.69	0.00	0.00
	7	0.00	0.00	143.53	2930.44	0.00	0.00
	8	0.00	0.00	151.43	3127.30	0.00	0.00
	9	0.00	684.42	158.28	4796.06	0.00	0.00
	10	0.00	1368.83	183.41	4275.79	0.00	0.00
	11	0.00	205.33	222.18	4985.28	0.00	0.00
	12	0.00	410.65	227.35	4770.15	0.00	0.00
22	1	0.00	0.00	198.85	3590.86	0.00	0.00
	2	0.00	0.00	-0.93	3.62	0.00	0.00
	3	0.00	0.00	23.37	506.54	0.00	0.00
	4	0.00	0.00	-0.09	0.73	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	5	0.00	676.74	16.58	1886.39	0.00	0.00
	6	0.00	1353.47	33.28	1114.52	0.00	0.00
	7	0.00	0.00	144.92	2717.62	0.00	0.00
	8	0.00	0.00	153.07	2903.70	0.00	0.00
	9	0.00	676.74	161.50	4604.01	0.00	0.00
	10	0.00	1353.47	186.35	4018.22	0.00	0.00
	11	0.00	203.02	226.17	4667.67	0.00	0.00
	12	0.00	406.04	231.18	4436.11	0.00	0.00
25	1	0.00	0.00	210.42	3508.60	0.00	0.00
	2	0.00	0.00	-0.26	0.41	0.00	0.00
	3	0.00	0.00	24.86	503.68	0.00	0.00
	4	0.00	0.00	-0.36	4.09	0.00	0.00
	5	0.00	680.43	24.15	1977.49	0.00	0.00
	6	0.00	1360.85	37.55	1132.35	0.00	0.00
	7	0.00	0.00	153.30	2664.18	0.00	0.00
	8	0.00	0.00	162.14	2849.26	0.00	0.00
	9	0.00	680.43	177.45	4641.67	0.00	0.00
	10	0.00	1360.85	199.69	3981.61	0.00	0.00
	11	0.00	204.13	241.91	4610.02	0.00	0.00
	12	0.00	408.26	245.93	4356.48	0.00	0.00
28	1	0.00	0.00	179.22	3154.83	0.00	0.00
	2	0.00	0.00	-0.01	0.69	0.00	0.00
	3	0.00	0.00	19.34	414.91	0.00	0.00
	4	0.00	0.00	0.26	33.84	0.00	0.00
	5	0.00	674.18	6.82	1666.47	0.00	0.00
	6	0.00	1348.37	27.36	982.10	0.00	0.00
	7	0.00	0.00	130.11	2388.35	0.00	0.00
	8	0.00	0.00	137.25	2552.05	0.00	0.00
	9	0.00	674.18	136.93	4054.82	0.00	0.00
	10	0.00	1348.37	164.62	3534.15	0.00	0.00
	11	0.00	202.25	200.86	4104.21	0.00	0.00
	12	0.00	404.51	207.02	3898.90	0.00	0.00
31	1	0.00	0.00	207.02	3280.94	0.00	0.00
	2	0.00	0.00	0.00	0.28	0.00	0.00
	3	0.00	0.00	12.65	254.13	0.00	0.00
	4	0.00	0.00	11.09	223.72	0.00	0.00
	5	0.00	692.85	20.72	1886.54	0.00	0.00
	6	0.00	1385.69	36.09	1071.48	0.00	0.00
	7	0.00	0.00	150.47	2494.47	0.00	0.00
	8	0.00	0.00	159.13	2668.60	0.00	0.00
	9	0.00	692.85	171.19	4381.01	0.00	0.00
	10	0.00	1385.69	195.22	3740.09	0.00	0.00
	11	0.00	207.85	236.98	4325.03	0.00	0.00
	12	0.00	415.71	241.59	4080.51	0.00	0.00
34	1	0.00	0.00	200.25	3000.80	0.00	0.00
	2	0.00	0.00	0.00	0.04	0.00	0.00
	3	0.00	0.00	-0.01	34.86	0.00	0.00
	4	0.00	0.00	22.97	409.01	0.00	0.00
	5	0.00	697.28	17.86	1825.01	0.00	0.00
	6	0.00	1394.55	34.37	1012.06	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	7	0.00	0.00	145.94	2288.37	0.00	0.00
	8	0.00	0.00	153.40	2450.03	0.00	0.00
	9	0.00	697.28	162.89	4113.37	0.00	0.00
	10	0.00	1394.55	187.78	3462.08	0.00	0.00
	11	0.00	209.18	228.57	3992.21	0.00	0.00
	12	0.00	418.37	233.52	3748.33	0.00	0.00
37	1	0.00	0.00	196.19	2769.03	0.00	0.00
	2	0.00	0.00	0.00	0.01	0.00	0.00
	3	0.00	0.00	-0.59	1.96	0.00	0.00
	4	0.00	0.00	23.20	409.71	0.00	0.00
	5	0.00	659.40	19.44	1723.03	0.00	0.00
	6	0.00	1318.81	34.28	945.73	0.00	0.00
	7	0.00	0.00	141.95	2112.15	0.00	0.00
	8	0.00	0.00	150.19	2262.06	0.00	0.00
	9	0.00	659.40	161.39	3835.18	0.00	0.00
	10	0.00	1318.81	184.47	3207.79	0.00	0.00
	11	0.00	197.82	224.62	3697.61	0.00	0.00
	12	0.00	395.64	229.07	3464.42	0.00	0.00
40	1	0.00	0.00	177.48	2278.70	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	-0.03	1.56	0.00	0.00
	4	0.00	0.00	19.85	332.31	0.00	0.00
	5	0.00	675.60	6.50	1330.10	0.00	0.00
	6	0.00	1351.21	27.58	751.21	0.00	0.00
	7	0.00	0.00	127.35	1728.36	0.00	0.00
	8	0.00	0.00	134.58	1849.95	0.00	0.00
	9	0.00	675.60	133.85	3058.46	0.00	0.00
	10	0.00	1351.21	162.16	2601.16	0.00	0.00
	11	0.00	202.68	199.25	3011.61	0.00	0.00
	12	0.00	405.36	205.57	2837.94	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

136. PRINT MEMBER FORCES ALL

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	1	1	0.00	0.00	93.17	0.00	-1037.93	0.00
		2	0.00	0.00	-93.17	0.00	1023.95	0.00
	2	1	0.00	0.00	10.63	0.00	-188.64	0.00
		2	0.00	0.00	-10.63	0.00	187.05	0.00
	3	1	0.00	0.00	0.00	0.00	-0.30	0.00
		2	0.00	0.00	0.00	0.00	0.30	0.00
	4	1	0.00	0.00	0.00	0.00	0.00	0.00
		2	0.00	0.00	0.00	0.00	0.00	0.00
	5	1	207.85	0.00	18.14	0.00	-1277.54	0.00
		2	-207.85	0.00	-18.14	0.00	1274.82	0.00
	6	1	415.69	0.00	18.23	0.00	-548.32	0.00
		2	-415.69	0.00	-18.23	0.00	545.59	0.00
	7	1	0.00	0.00	59.81	0.00	-841.82	0.00
		2	0.00	0.00	-59.81	0.00	832.85	0.00
	8	1	0.00	0.00	63.68	0.00	-910.57	0.00
		2	0.00	0.00	-63.68	0.00	901.02	0.00
	9	1	207.85	0.00	77.95	0.00	-2119.37	0.00
		2	-207.85	0.00	-77.95	0.00	2107.67	0.00
	10	1	415.69	0.00	81.91	0.00	-1458.89	0.00
		2	-415.69	0.00	-81.91	0.00	1446.61	0.00
	11	1	62.35	0.00	109.24	0.00	-1610.14	0.00
		2	-62.35	0.00	-109.24	0.00	1593.75	0.00
	12	1	124.71	0.00	109.26	0.00	-1391.37	0.00
		2	-124.71	0.00	-109.26	0.00	1374.98	0.00
3	1	4	0.00	0.00	183.84	0.00	-3695.15	0.00
		5	0.00	0.00	-164.73	0.00	279.16	0.00
	2	4	0.00	0.00	19.36	0.00	-488.62	0.00
		5	0.00	0.00	-19.36	0.00	109.16	0.00
	3	4	0.00	0.00	-0.01	0.00	-0.44	0.00
		5	0.00	0.00	0.01	0.00	0.61	0.00
	4	4	0.00	0.00	0.00	0.00	0.00	0.00
		5	0.00	0.00	0.00	0.00	0.00	0.00
	5	4	777.40	0.00	-1.38	0.00	-1323.73	0.00
		5	-777.40	0.00	1.38	0.00	1350.74	0.00
	6	4	1554.80	0.00	25.12	0.00	-953.73	0.00
		5	-1554.80	0.00	-25.12	0.00	461.42	0.00
	7	4	0.00	0.00	134.60	0.00	-2761.96	0.00
		5	0.00	0.00	-114.22	0.00	323.55	0.00
	8	4	0.00	0.00	141.66	0.00	-2940.14	0.00
		5	0.00	0.00	-121.27	0.00	363.41	0.00
	9	4	777.40	0.00	133.22	0.00	-4085.69	0.00
		5	-777.40	0.00	-112.84	0.00	1674.29	0.00
	10	4	1554.80	0.00	166.78	0.00	-3893.88	0.00
		5	-1554.80	0.00	-146.39	0.00	824.83	0.00
	11	4	233.22	0.00	202.78	0.00	-4581.32	0.00
		5	-233.22	0.00	-183.67	0.00	794.16	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM Z
	12	4	466.44	0.00	210.73	0.00	4470.32	0.00
		5	-466.44	0.00	-191.62	0.00	527.36	0.00
5	1	7	0.00	0.00	262.53	0.00	-5475.46	0.00
		8	0.00	0.00	-243.42	0.00	517.08	0.00
	2	7	0.00	0.00	30.19	0.00	-745.95	0.00
		8	0.00	0.00	-30.19	0.00	154.26	0.00
	3	7	0.00	0.00	-0.15	0.00	-0.35	0.00
		8	0.00	0.00	0.15	0.00	3.23	0.00
	4	7	0.00	0.00	0.00	0.00	0.00	0.00
		8	0.00	0.00	0.00	0.00	0.00	0.00
	5	7	827.81	0.00	28.45	0.00	-2271.55	0.00
		8	-827.81	0.00	-28.45	0.00	1713.90	0.00
	6	7	1655.61	0.00	46.18	0.00	-1514.44	0.00
		8	-1655.61	0.00	-46.18	0.00	609.41	0.00
	7	7	0.00	0.00	193.38	0.00	-4117.15	0.00
		8	0.00	0.00	-173.00	0.00	526.65	0.00
	8	7	0.00	0.00	204.33	0.00	-4389.03	0.00
		8	0.00	0.00	-183.95	0.00	583.87	0.00
	9	7	827.81	0.00	221.83	0.00	-6388.71	0.00
		8	-827.81	0.00	-201.45	0.00	2240.55	0.00
	10	7	1655.61	0.00	250.51	0.00	-5903.47	0.00
		8	-1655.61	0.00	-230.12	0.00	1193.28	0.00
	11	7	248.34	0.00	301.11	0.00	-6903.22	0.00
		8	-248.34	0.00	-282.00	0.00	1188.74	0.00
	12	7	496.68	0.00	306.43	0.00	-6676.09	0.00
		8	-496.68	0.00	-287.32	0.00	857.40	0.00
7	1	10	0.00	0.00	234.13	0.00	-5252.60	0.00
		11	0.00	0.00	-213.85	0.00	593.67	0.00
	2	10	0.00	0.00	26.60	0.00	-709.84	0.00
		11	0.00	0.00	-26.60	0.00	156.57	0.00
	3	10	0.00	0.00	-0.55	0.00	-2.91	0.00
		11	0.00	0.00	0.55	0.00	14.30	0.00
	4	10	0.00	0.00	0.00	0.00	0.00	0.00
		11	0.00	0.00	0.00	0.00	0.01	0.00
	5	10	830.91	0.00	17.02	0.00	-2150.22	0.00
		11	-830.91	0.00	-17.02	0.00	1796.28	0.00
	6	10	1661.83	0.00	38.25	0.00	-1441.86	0.00
		11	-1661.83	0.00	-38.25	0.00	646.34	0.00
	7	10	0.00	0.00	172.49	0.00	-3951.01	0.00
		11	0.00	0.00	-150.86	0.00	588.15	0.00
	8	10	0.00	0.00	181.99	0.00	-4210.67	0.00
		11	0.00	0.00	-160.36	0.00	650.25	0.00
	9	10	830.91	0.00	189.51	0.00	-6101.23	0.00
		11	-830.91	0.00	-167.88	0.00	2384.43	0.00
	10	10	1661.83	0.00	220.24	0.00	-5652.53	0.00
		11	-1661.83	0.00	-198.60	0.00	1296.59	0.00
	11	10	249.27	0.00	265.28	0.00	-6610.42	0.00
		11	-249.27	0.00	-245.00	0.00	1303.43	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	10	498.55	0.00	271.65	0.00	-6397.91	0.00
		11	-498.55	0.00	251.37	0.00	958.45	0.00
9	1	13	0.00	0.00	224.68	0.00	-4900.53	0.00
		14	0.00	0.00	-205.37	0.00	643.01	0.00
	2	13	0.00	0.00	23.76	0.00	-602.79	0.00
		14	0.00	0.00	-23.76	0.00	132.33	0.00
	3	13	0.00	0.00	1.33	0.00	-66.54	0.00
		14	0.00	0.00	-1.33	0.00	40.14	0.00
	4	13	0.00	0.00	0.00	0.00	-0.03	0.00
		14	0.00	0.00	0.00	0.00	0.04	0.00
	5	13	755.29	0.00	19.90	0.00	-2119.01	0.00
		14	-755.29	0.00	-19.90	0.00	1724.92	0.00
	6	13	1510.59	0.00	37.66	0.00	-1377.47	0.00
		14	-1510.59	0.00	-37.66	0.00	631.74	0.00
	7	13	0.00	0.00	165.50	0.00	-3689.72	0.00
		14	0.00	0.00	-144.91	0.00	616.61	0.00
	8	13	0.00	0.00	174.65	0.00	-3933.55	0.00
		14	0.00	0.00	-154.06	0.00	679.31	0.00
	9	13	755.29	0.00	185.41	0.00	-5808.72	0.00
		14	-755.29	0.00	-164.81	0.00	2341.52	0.00
	10	13	1510.59	0.00	212.32	0.00	-5311.03	0.00
		14	-1510.59	0.00	-191.72	0.00	1311.05	0.00
	11	13	226.59	0.00	255.74	0.00	-6205.58	0.00
		14	-226.59	0.00	-236.44	0.00	1333.00	0.00
	12	13	453.18	0.00	261.07	0.00	-5983.12	0.00
		14	-453.18	0.00	-241.77	0.00	1005.05	0.00
11	1	16	0.00	0.00	200.91	0.00	-4268.65	0.00
		17	0.00	0.00	-182.58	0.00	663.81	0.00
	2	16	0.00	0.00	11.65	0.00	-315.32	0.00
		17	0.00	0.00	-11.65	0.00	96.31	0.00
	3	16	0.00	0.00	10.57	0.00	-271.98	0.00
		17	0.00	0.00	-10.57	0.00	73.18	0.00
	4	16	0.00	0.00	0.00	0.00	-0.12	0.00
		17	0.00	0.00	0.00	0.00	0.13	0.00
	5	16	656.03	0.00	17.44	0.00	-1959.19	0.00
		17	-656.03	0.00	-17.44	0.00	1631.39	0.00
	6	16	1312.06	0.00	33.31	0.00	-1232.24	0.00
		17	-1312.06	0.00	-33.31	0.00	605.97	0.00
	7	16	0.00	0.00	147.78	0.00	-3217.29	0.00
		17	0.00	0.00	-128.23	0.00	622.74	0.00
	8	16	0.00	0.00	155.89	0.00	-3431.27	0.00
		17	0.00	0.00	-136.33	0.00	684.39	0.00
	9	16	656.03	0.00	165.22	0.00	-5176.48	0.00
		17	-656.03	0.00	-145.67	0.00	2254.13	0.00
	10	16	1312.06	0.00	189.20	0.00	-4663.50	0.00
		17	1312.06	0.00	169.65	0.00	1290.36	0.00
	11	16	196.81	0.00	228.37	0.00	-5443.83	0.00
		17	-196.81	0.00	-210.04	0.00	1322.85	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	16	393.62	0.00	233.13	0.00	-5225.74	0.00
		17	-393.62	0.00	-214.80	0.00	1015.22	0.00
13	1	19	0.00	0.00	196.07	0.00	-3885.16	0.00
		20	0.00	0.00	-179.30	0.00	656.99	0.00
	2	19	0.00	0.00	1.12	0.00	-70.00	0.00
		20	0.00	0.00	-1.12	0.00	50.80	0.00
	3	19	0.00	0.00	20.58	0.00	-470.06	0.00
		20	0.00	0.00	-20.58	0.00	116.14	0.00
	4	19	0.00	0.00	-0.01	0.00	-0.37	0.00
		20	0.00	0.00	0.01	0.00	0.47	0.00
	5	19	684.42	0.00	14.75	0.00	-1865.62	0.00
		20	-684.42	0.00	-14.75	0.00	1611.89	0.00
	6	19	1368.83	0.00	31.98	0.00	-1148.49	0.00
		20	-1368.83	0.00	-31.98	0.00	598.49	0.00
	7	19	0.00	0.00	143.53	0.00	-2930.44	0.00
		20	0.00	0.00	-125.64	0.00	615.61	0.00
	8	19	0.00	0.00	151.43	0.00	-3127.30	0.00
		20	0.00	0.00	-133.55	0.00	676.46	0.00
	9	19	684.42	0.00	158.28	0.00	-4796.06	0.00
		20	-684.42	0.00	-140.39	0.00	2227.49	0.00
	10	19	1368.83	0.00	183.41	0.00	-4275.79	0.00
		20	-1368.83	0.00	-165.52	0.00	1274.94	0.00
	11	19	205.33	0.00	222.18	0.00	-4985.28	0.00
		20	-205.33	0.00	-205.41	0.00	1307.96	0.00
	12	19	410.65	0.00	227.35	0.00	-4770.15	0.00
		20	-410.65	0.00	-210.58	0.00	1003.94	0.00
15	1	22	0.00	0.00	198.85	0.00	-3590.86	0.00
		23	0.00	0.00	-184.22	0.00	717.87	0.00
	2	22	0.00	0.00	-0.93	0.00	-5.62	0.00
		23	0.00	0.00	0.93	0.00	17.49	0.00
	3	22	0.00	0.00	23.37	0.00	-506.54	0.00
		23	0.00	0.00	-23.37	0.00	156.03	0.00
	4	22	0.00	0.00	-0.09	0.00	-0.73	0.00
		23	0.00	0.00	0.09	0.00	2.06	0.00
	5	22	676.74	0.00	16.58	0.00	-1886.39	0.00
		23	-676.74	0.00	-16.58	0.00	1637.63	0.00
	6	22	1353.47	0.00	33.28	0.00	-1114.52	0.00
		23	-1353.47	0.00	-33.28	0.00	615.28	0.00
	7	22	0.00	0.00	144.92	0.00	-2717.62	0.00
		23	0.00	0.00	-129.32	0.00	660.88	0.00
	8	22	0.00	0.00	153.07	0.00	-2903.70	0.00
		23	0.00	0.00	-137.47	0.00	724.71	0.00
	9	22	676.74	0.00	161.50	0.00	-4604.01	0.00
		23	-676.74	0.00	-145.90	0.00	2298.51	0.00
	10	22	1353.47	0.00	186.35	0.00	4018.22	0.00
		23	-1353.47	0.00	-170.75	0.00	1339.99	0.00
	11	22	203.02	0.00	226.17	0.00	-4867.67	0.00
		23	-203.02	0.00	211.55	0.00	1484.74	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	22	406.04	0.00	231.18	0.00	-4436.11	0.00
		23	-406.04	0.00	-216.56	0.00	1078.03	0.00
17	1	25	0.00	0.00	210.42	0.00	-3508.60	0.00
		26	0.00	0.00	-197.16	0.00	737.10	0.00
	2	25	0.00	0.00	-0.26	0.00	-0.41	0.00
		26	0.00	0.00	0.26	0.00	3.89	0.00
	3	25	0.00	0.00	24.86	0.00	-503.68	0.00
		26	0.00	0.00	24.86	0.00	165.61	0.00
	4	25	0.00	0.00	-0.36	0.00	-4.09	0.00
		26	0.00	0.00	0.36	0.00	8.92	0.00
	5	25	680.43	0.00	24.15	0.00	-1977.49	0.00
		26	-680.43	0.00	-24.15	0.00	1649.12	0.00
	6	25	1360.85	0.00	37.55	0.00	-1132.35	0.00
		26	-1360.85	0.00	-37.55	0.00	621.71	0.00
	7	25	0.00	0.00	153.30	0.00	-2664.18	0.00
		26	0.00	0.00	-139.16	0.00	675.41	0.00
	8	25	0.00	0.00	162.14	0.00	-2849.26	0.00
		26	0.00	0.00	-148.00	0.00	740.28	0.00
	9	25	680.43	0.00	177.45	0.00	-4641.67	0.00
		26	-680.43	0.00	-163.31	0.00	2324.53	0.00
	10	25	1360.85	0.00	199.69	0.00	-3981.61	0.00
		26	-1360.85	0.00	-185.55	0.00	1361.99	0.00
	11	25	204.13	0.00	241.91	0.00	-4610.02	0.00
		26	-204.13	0.00	-228.65	0.00	1410.25	0.00
	12	25	408.26	0.00	245.93	0.00	-4356.48	0.00
		26	-408.26	0.00	-232.67	0.00	1102.03	0.00
19	1	28	0.00	0.00	179.22	0.00	-3154.83	0.00
		29	0.00	0.00	-164.59	0.00	576.27	0.00
	2	28	0.00	0.00	-0.01	0.00	-0.69	0.00
		29	0.00	0.00	0.01	0.00	0.80	0.00
	3	28	0.00	0.00	19.34	0.00	-414.91	0.00
		29	0.00	0.00	-19.34	0.00	124.74	0.00
	4	28	0.00	0.00	0.26	0.00	-33.84	0.00
		29	0.00	0.00	-0.26	0.00	29.99	0.00
	5	28	674.18	0.00	6.82	0.00	1666.47	0.00
		29	-674.18	0.00	-6.82	0.00	1564.14	0.00
	6	28	1348.37	0.00	27.36	0.00	-982.10	0.00
		29	-1348.37	0.00	-27.36	0.00	571.66	0.00
	7	28	0.00	0.00	130.11	0.00	-2388.35	0.00
		29	0.00	0.00	-114.51	0.00	553.71	0.00
	8	28	0.00	0.00	137.25	0.00	-2552.05	0.00
		29	0.00	0.00	-121.65	0.00	610.23	0.00
	9	28	674.18	0.00	136.93	0.00	-4054.82	0.00
		29	-674.18	0.00	-121.33	0.00	2117.85	0.00
	10	28	1348.37	0.00	164.62	0.00	-3534.15	0.00
		29	-1348.37	0.00	-149.02	0.00	1181.89	0.00
	11	28	202.25	0.00	200.86	0.00	-4104.21	0.00
		29	-202.25	0.00	-186.23	0.00	1201.03	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM Y	MOM-Z
	12	28	404.51	0.00	207.02	0.00	3898.90	0.00
		29	404.51	0.00	-192.39	0.00	903.29	0.00
21	1	31	0.00	0.00	207.02	0.00	-3280.94	0.00
		32	0.00	0.00	-194.24	0.00	652.68	0.00
	2	31	0.00	0.00	0.00	0.00	-0.28	0.00
		32	0.00	0.00	0.00	0.00	0.23	0.00
	3	31	0.00	0.00	12.65	0.00	-254.13	0.00
		32	0.00	0.00	12.65	0.00	88.35	0.00
	4	31	0.00	0.00	11.09	0.00	-223.72	0.00
		32	0.00	0.00	-11.09	0.00	78.42	0.00
	5	31	692.85	0.00	20.72	0.00	-1886.54	0.00
		32	-692.85	0.00	-20.72	0.00	1615.07	0.00
	6	31	1385.69	0.00	36.09	0.00	1071.48	0.00
		32	-1385.69	0.00	-36.09	0.00	598.70	0.00
	7	31	0.00	0.00	150.47	0.00	-2494.47	0.00
		32	0.00	0.00	-136.85	0.00	612.53	0.00
	8	31	0.00	0.00	159.13	0.00	-2668.60	0.00
		32	0.00	0.00	-145.51	0.00	673.23	0.00
	9	31	692.85	0.00	171.19	0.00	-4381.01	0.00
		32	-692.85	0.00	-157.57	0.00	2227.60	0.00
	10	31	1385.69	0.00	195.22	0.00	-3740.09	0.00
		32	-1385.69	0.00	-181.60	0.00	1271.93	0.00
	11	31	207.85	0.00	236.98	0.00	-4325.03	0.00
		32	-207.85	0.00	-224.21	0.00	1304.20	0.00
	12	31	415.71	0.00	241.59	0.00	-4080.51	0.00
		32	-415.71	0.00	-228.82	0.00	999.28	0.00
23	1	34	0.00	0.00	200.25	0.00	-3000.80	0.00
		35	0.00	0.00	-188.55	0.00	667.95	0.00
	2	34	0.00	0.00	0.00	0.00	-0.04	0.00
		35	0.00	0.00	0.00	0.00	0.06	0.00
	3	34	0.00	0.00	-0.01	0.00	-34.86	0.00
		35	0.00	0.00	0.01	0.00	35.04	0.00
	4	34	0.00	0.00	22.97	0.00	-409.01	0.00
		35	0.00	0.00	-22.97	0.00	133.35	0.00
	5	34	697.28	0.00	17.86	0.00	-1825.01	0.00
		35	-697.28	0.00	-17.86	0.00	1610.73	0.00
	6	34	1394.55	0.00	34.37	0.00	-1012.06	0.00
		35	-1394.55	0.00	-34.37	0.00	599.60	0.00
	7	34	0.00	0.00	145.04	0.00	-2288.37	0.00
		35	0.00	0.00	-132.56	0.00	622.83	0.00
	8	34	0.00	0.00	153.40	0.00	-2450.03	0.00
		35	0.00	0.00	-140.92	0.00	684.06	0.00
	9	34	697.28	0.00	162.89	0.00	-4113.37	0.00
		35	-697.28	0.00	-150.41	0.00	2253.56	0.00
	10	34	1394.55	0.00	187.78	0.00	-3462.08	0.00
		35	-1394.55	0.00	-175.30	0.00	1283.65	0.00
	11	34	209.18	0.00	228.57	0.00	-3992.22	0.00
		35	-209.18	0.00	-216.87	0.00	1319.62	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	34	418.37	0.00	233.52	0.00	-3748.33	0.00
		35	-418.37	0.00	-221.82	0.00	1016.28	0.00
25	1	37	0.00	0.00	196.19	0.00	-2769.03	0.00
		38	0.00	0.00	-185.07	0.00	595.84	0.00
	2	37	0.00	0.00	0.00	0.00	-0.01	0.00
		38	0.00	0.00	0.00	0.00	0.01	0.00
	3	37	0.00	0.00	-0.59	0.00	-1.96	0.00
		38	0.00	0.00	0.59	0.00	8.73	0.00
	4	37	0.00	0.00	23.20	0.00	-409.71	0.00
		38	0.00	0.00	-23.20	0.00	145.27	0.00
	5	37	659.40	0.00	19.44	0.00	-1723.03	0.00
		38	-659.40	0.00	-19.44	0.00	1501.40	0.00
	6	37	1318.81	0.00	34.28	0.00	-945.73	0.00
		38	-1318.81	0.00	-34.28	0.00	554.95	0.00
	7	37	0.00	0.00	141.95	0.00	-2112.15	0.00
		38	0.00	0.00	-130.10	0.00	561.47	0.00
	8	37	0.00	0.00	150.19	0.00	-2262.06	0.00
		38	0.00	0.00	-138.34	0.00	617.45	0.00
	9	37	659.40	0.00	161.39	0.00	-3835.18	0.00
		38	-659.40	0.00	-149.54	0.00	2062.87	0.00
	10	37	1318.81	0.00	184.47	0.00	-3207.79	0.00
		38	-1318.81	0.00	-172.62	0.00	1172.40	0.00
	11	37	197.82	0.00	224.62	0.00	-3697.61	0.00
		38	-197.82	0.00	-213.51	0.00	1200.27	0.00
	12	37	395.64	0.00	229.07	0.00	-3464.42	0.00
		38	-395.64	0.00	-217.96	0.00	916.34	0.00
27	1	40	0.00	0.00	177.48	0.00	-2278.70	0.00
		41	0.00	0.00	-167.14	0.00	452.19	0.00
	2	40	0.00	0.00	0.00	0.00	0.00	0.00
		41	0.00	0.00	0.00	0.00	0.00	0.00
	3	40	0.00	0.00	-0.03	0.00	-1.56	0.00
		41	0.00	0.00	0.03	0.00	1.86	0.00
	4	40	0.00	0.00	19.85	0.00	-332.31	0.00
		41	0.00	0.00	19.85	0.00	121.95	0.00
	5	40	675.60	0.00	6.50	0.00	-1330.10	0.00
		41	-675.60	0.00	-6.50	0.00	1261.19	0.00
	6	40	1351.21	0.00	27.58	0.00	-751.21	0.00
		41	-1351.21	0.00	-27.58	0.00	458.84	0.00
	7	40	0.00	0.00	127.35	0.00	-1728.36	0.00
		41	0.00	0.00	-116.33	0.00	436.87	0.00
	8	40	0.00	0.00	134.58	0.00	-1849.95	0.00
		41	0.00	0.00	-123.55	0.00	481.87	0.00
	9	40	675.60	0.00	133.85	0.00	-3058.46	0.00
		41	-675.60	0.00	122.83	0.00	1698.06	0.00
	10	40	1351.21	0.00	162.16	0.00	-2601.16	0.00
		41	-1351.21	0.00	151.13	0.00	940.71	0.00
	11	40	202.68	0.00	199.25	0.00	-3011.61	0.00
		41	-202.68	0.00	-188.91	0.00	954.36	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	40	405.36	0.00	205.57	0.00	2837.94	0.00
		41	-405.36	0.00	-195.24	0.00	713.66	0.00
29	1	43	0.00	0.00	76.23	0.00	-542.15	0.00
		44	0.00	0.00	-76.23	0.00	530.71	0.00
	2	43	0.00	0.00	0.00	0.00	0.00	0.00
		44	0.00	0.00	0.00	0.00	0.00	0.00
	3	43	0.00	0.00	-0.01	0.00	-0.68	0.00
		44	0.00	0.00	0.01	0.00	0.68	0.00
	4	43	0.00	0.00	8.34	0.00	-115.22	0.00
		44	0.00	0.00	-8.34	0.00	113.97	0.00
	5	43	214.82	0.00	10.98	0.00	-983.94	0.00
		44	-214.82	0.00	-10.98	0.00	982.30	0.00
	6	43	429.63	0.00	13.53	0.00	-383.36	0.00
		44	-429.63	0.00	-13.53	0.00	381.33	0.00
	7	43	0.00	0.00	47.12	0.00	-461.42	0.00
		44	0.00	0.00	-47.12	0.00	454.35	0.00
	8	43	0.00	0.00	50.16	0.00	-503.56	0.00
		44	0.00	0.00	-50.16	0.00	496.04	0.00
	9	43	214.82	0.00	58.10	0.00	-1445.36	0.00
		44	-214.82	0.00	-58.10	0.00	1436.65	0.00
	10	43	429.63	0.00	63.68	0.00	-886.93	0.00
		44	-429.63	0.00	-63.68	0.00	877.37	0.00
	11	43	64.44	0.00	87.86	0.00	-953.23	0.00
		44	-64.44	0.00	-87.86	0.00	940.05	0.00
	12	43	128.89	0.00	88.62	0.00	-773.05	0.00
		44	-128.89	0.00	-88.62	0.00	759.76	0.00
2	1	2	0.00	0.00	93.17	0.00	-1023.95	0.00
		3	0.00	0.00	-80.85	0.00	688.97	0.00
	2	2	0.00	0.00	10.62	0.00	-187.05	0.00
		3	0.00	0.00	-10.62	0.00	146.14	0.00
	3	2	0.00	0.00	0.00	0.00	-0.30	0.00
		3	0.00	0.00	0.00	0.00	0.31	0.00
	4	2	0.00	0.00	0.00	0.00	0.00	0.00
		3	0.00	0.00	0.00	0.00	0.00	0.00
	5	2	207.85	0.00	18.15	0.00	-1274.82	0.00
		3	-207.85	0.00	-18.15	0.00	1204.96	0.00
	6	2	415.69	0.00	18.23	0.00	-545.59	0.01
		3	-415.69	0.00	-18.23	0.00	475.41	0.00
	7	2	0.00	0.00	59.81	0.00	-832.85	0.00
		3	0.00	0.00	-59.81	0.00	602.59	0.00
	8	2	0.00	0.00	63.68	0.00	-901.02	0.00
		3	0.00	0.00	-63.68	0.00	655.85	0.00
	9	2	207.85	0.00	77.95	0.00	-2107.67	0.00
		3	-207.85	0.00	-77.95	0.00	1807.55	0.00
	10	2	415.69	0.00	81.91	0.00	-1446.61	0.01
		3	-415.69	0.00	-81.91	0.00	1131.26	0.00
	11	2	62.35	0.00	109.24	0.00	-1593.75	0.00
		3	-62.35	0.00	-96.92	0.00	1196.91	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	2	124.71	0.00	109.26	0.00	-1374.98	0.00
		3	-124.71	0.00	-96.94	0.00	978.05	0.00
4	1	5	0.00	0.00	164.73	0.00	-279.17	0.00
		6	0.00	0.00	-157.03	0.00	-340.23	0.00
	2	5	0.00	0.00	19.36	0.00	-109.16	0.00
		6	0.00	0.00	-19.36	0.00	34.62	0.00
	3	5	0.00	0.00	-0.01	0.00	-0.61	0.00
		6	0.00	0.00	0.01	0.00	0.65	0.00
	4	5	0.00	0.00	0.00	0.00	0.00	0.00
		6	0.00	0.00	0.00	0.00	0.00	0.00
	5	5	777.40	0.00	-1.38	0.00	-1350.74	0.00
		6	-777.40	0.00	1.38	0.00	1356.04	0.00
	6	5	1554.81	0.00	25.12	0.00	-461.41	0.00
		6	-1554.81	0.00	-25.12	0.00	364.71	0.01
	7	5	0.00	0.00	114.21	0.00	-323.55	0.00
		6	0.00	0.00	-114.21	0.00	-116.18	0.00
	8	5	0.00	0.00	121.27	0.00	-363.41	0.00
		6	0.00	0.00	-121.27	0.00	-103.48	0.00
	9	5	777.40	0.00	112.84	0.00	-1674.29	0.00
		6	-777.40	0.00	-112.84	0.00	1239.85	0.00
	10	5	1554.81	0.00	146.39	0.00	-824.82	0.00
		6	-1554.81	0.00	-146.39	0.00	261.23	0.01
	11	5	233.22	0.00	183.67	0.00	-794.17	0.00
		6	-233.22	0.00	-175.97	0.00	101.85	0.00
	12	5	466.44	0.00	191.62	0.00	-527.37	0.00
		6	-466.44	0.00	-183.92	0.00	-195.54	0.00
6	1	8	0.00	0.00	243.42	0.00	-517.09	0.00
		9	0.00	0.00	-235.72	0.00	-405.28	0.00
	2	8	0.00	0.00	30.19	0.00	-154.26	0.00
		9	0.00	0.00	-30.19	0.00	38.04	0.00
	3	8	0.00	0.00	-0.15	0.00	-3.23	0.00
		9	0.00	0.00	0.15	0.00	3.80	0.00
	4	8	0.00	0.00	0.00	0.00	0.00	0.00
		9	0.00	0.00	0.00	0.00	0.00	0.00
	5	8	827.81	0.00	28.45	0.00	-1713.90	0.00
		9	-827.81	0.00	-28.45	0.00	1604.36	0.00
	6	8	1655.62	0.00	46.17	0.00	-609.40	0.00
		9	-1655.62	0.00	-46.17	0.00	431.63	0.00
	7	8	0.00	0.00	172.99	0.00	-526.64	0.00
		9	0.00	0.00	-172.99	0.00	-139.38	0.00
	8	8	0.00	0.00	183.95	0.00	-583.88	0.00
		9	0.00	0.00	-183.95	0.00	-124.34	0.00
	9	8	827.81	0.00	201.44	0.00	-2240.54	0.00
		9	827.81	0.00	-201.44	0.00	1464.98	0.00
	10	8	1655.62	0.00	230.12	0.00	-1193.28	0.00
		9	1655.62	0.00	-230.12	0.00	307.30	0.00
	11	8	248.34	0.00	281.99	0.00	-1188.75	0.00
		9	-248.34	0.00	-274.29	0.00	117.87	0.00

MEMBER END FORCES STRUCTURE TYPE - SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM Z
	12	8	496.68	0.00	287.31	0.00	-857.40	0.00
		9	-496.68	0.00	-279.61	0.00	-233.95	0.00
8	1	11	0.00	0.00	213.85	0.00	-593.67	0.00
		12	0.00	0.00	-206.15	0.00	-214.82	0.00
	2	11	0.00	0.00	26.60	0.00	-156.57	0.00
		12	0.00	0.00	-26.60	0.00	54.16	0.00
	3	11	0.00	0.00	0.55	0.00	14.30	0.00
		12	0.00	0.00	0.55	0.00	16.41	0.00
	4	11	0.00	0.00	0.00	0.00	-0.01	0.00
		12	0.00	0.00	0.00	0.00	0.01	0.00
	5	11	830.91	0.00	17.02	0.00	-1796.28	0.00
		12	-830.91	0.00	-17.02	0.00	1750.76	0.00
	6	11	1661.83	0.00	38.25	0.00	-646.35	0.00
		12	-1661.83	0.00	-38.25	0.00	499.09	-0.01
	7	11	0.00	0.00	150.86	0.00	-588.15	0.00
		12	0.00	0.00	-150.86	0.00	7.35	0.00
	8	11	0.00	0.00	160.36	0.00	-650.25	0.00
		12	0.00	0.00	-160.36	0.00	32.86	0.00
	9	11	830.91	0.00	167.87	0.00	-2384.43	0.00
		12	-830.91	0.00	-167.87	0.00	1738.11	0.00
	10	11	1661.83	0.00	198.61	0.00	-1296.60	0.00
		12	-1661.83	0.00	-198.61	0.00	531.95	-0.01
	11	11	249.27	0.00	245.00	0.00	-1503.44	0.00
		12	-249.27	0.00	-237.30	0.00	374.99	0.00
	12	11	498.55	0.00	251.37	0.00	-958.46	0.00
		12	-498.55	0.00	-243.67	0.00	5.49	0.00
10	1	14	0.00	0.00	205.37	0.00	-643.00	0.00
		15	0.00	0.00	-197.67	0.00	-132.84	0.00
	2	14	0.00	0.00	23.76	0.00	-152.33	0.00
		15	0.00	0.00	-23.76	0.00	40.85	0.00
	3	14	0.00	0.00	1.33	0.00	40.14	0.00
		15	0.00	0.00	-1.33	0.00	35.01	0.00
	4	14	0.00	0.00	0.00	0.00	-0.04	0.00
		15	0.00	0.00	0.00	0.00	0.04	0.00
	5	14	755.29	0.00	19.90	0.00	-1724.91	0.00
		15	-755.29	0.00	-19.90	0.00	1648.29	0.00
	6	14	1510.59	0.00	37.66	0.00	-641.76	0.00
		15	-1510.59	0.00	-37.66	0.00	486.74	0.00
	7	14	0.00	0.00	144.91	0.00	-616.61	0.00
		15	0.00	0.00	-144.91	0.00	58.70	0.00
	8	14	0.00	0.00	154.06	0.00	-679.31	0.00
		15	0.00	0.00	-154.06	0.00	86.19	0.00
	9	14	755.29	0.00	164.81	0.00	2341.53	0.00
		15	-755.29	0.00	-164.81	0.00	1706.99	0.00
	10	14	1510.59	0.00	191.72	0.00	-1311.05	0.00
		15	-1510.59	0.00	-191.72	0.00	572.92	0.00
	11	14	226.59	0.00	236.43	0.00	-1332.99	0.00
		15	226.59	0.00	-228.73	0.00	437.55	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	14	453.18	0.00	241.76	0.00	-1005.04	0.00
		15	453.18	0.00	-234.06	0.00	89.08	0.00
12	1	17	0.00	0.00	182.58	0.00	-663.82	0.00
		18	0.00	0.00	-174.88	0.00	-24.31	0.00
	2	17	0.00	0.00	11.65	0.00	-96.31	0.00
		18	0.00	0.00	-11.65	0.00	51.46	0.00
	3	17	0.00	0.00	10.57	0.00	-73.18	0.00
		18	0.00	0.00	-10.57	0.00	32.46	0.00
	4	17	0.00	0.00	0.00	0.00	-0.13	0.00
		18	0.00	0.00	0.00	0.00	0.13	0.00
	5	17	656.03	0.00	17.44	0.00	-1631.39	0.00
		18	-656.03	0.00	-17.44	0.00	1564.27	0.00
	6	17	1312.06	0.00	33.31	0.00	-605.98	0.00
		18	-1312.06	0.00	-33.31	0.00	477.72	0.01
	7	17	0.00	0.00	128.23	0.00	-622.73	0.00
		18	0.00	0.00	-128.23	0.00	129.05	0.00
	8	17	0.00	0.00	136.34	0.00	-684.39	0.00
		18	0.00	0.00	-136.34	0.00	159.51	0.00
	9	17	656.03	0.00	145.66	0.00	-2254.12	0.00
		18	-656.03	0.00	-145.66	0.00	1693.32	0.00
	10	17	1312.06	0.00	169.65	0.00	-1290.37	0.00
		18	-1312.06	0.00	-169.65	0.00	637.22	0.01
	11	17	196.81	0.00	210.04	0.00	-1322.85	0.00
		18	-196.81	0.00	-202.34	0.00	529.02	0.00
	12	17	393.62	0.00	214.80	0.00	-1015.23	0.00
		18	-393.62	0.00	-207.10	0.00	203.06	0.00
14	1	20	0.00	0.00	179.30	0.00	-657.00	0.00
		21	0.00	0.00	-171.60	0.00	-18.49	0.00
	2	20	0.00	0.00	1.12	0.00	-50.80	0.00
		21	0.00	0.00	-1.12	0.00	46.50	0.00
	3	20	0.00	0.00	20.58	0.00	-116.14	0.00
		21	0.00	0.00	-20.58	0.00	36.92	0.00
	4	20	0.00	0.00	-0.01	0.00	-0.47	0.00
		21	0.00	0.00	0.01	0.00	0.49	0.00
	5	20	684.42	0.00	14.75	0.00	-1611.88	0.00
		21	-684.42	0.00	-14.75	0.00	1555.10	0.00
	6	20	1368.83	0.00	31.98	0.00	-598.49	0.00
		21	-1368.83	0.00	-31.98	0.00	475.38	0.00
	7	20	0.00	0.00	125.64	0.00	-615.60	0.00
		21	0.00	0.00	-125.64	0.00	131.90	0.00
	8	20	0.00	0.00	133.55	0.00	-676.46	0.00
		21	0.00	0.00	-133.55	0.00	162.30	0.00
	9	20	684.42	0.00	140.39	0.00	-2227.48	0.00
		21	-684.42	0.00	-140.39	0.00	1687.00	0.00
	10	20	1368.83	0.00	165.53	0.00	-1274.95	0.00
		21	1368.83	0.00	-165.53	0.00	637.68	0.00
	11	20	205.33	0.00	205.41	0.00	-1307.96	0.00
		21	-205.33	0.00	-197.71	0.00	531.94	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	20	410.65	0.00	210.58	0.00	-1003.95	0.00
		21	-410.65	0.00	-202.88	0.00	208.02	0.00
16	1	23	0.00	0.00	184.22	0.00	-717.86	0.00
		24	0.00	0.00	-176.52	0.00	23.44	0.00
	2	23	0.00	0.00	-0.93	0.00	-17.49	0.00
		24	0.00	0.00	0.93	0.00	21.05	0.00
	3	23	0.00	0.00	23.37	0.00	-156.03	0.00
		24	0.00	0.00	-23.37	0.00	66.06	0.00
	4	23	0.00	0.00	0.09	0.00	-2.06	0.00
		24	0.00	0.00	0.09	0.00	2.40	0.00
	5	23	676.74	0.00	16.59	0.00	-1637.63	0.00
		24	-676.74	0.00	-16.59	0.00	1573.78	0.00
	6	23	1353.47	0.00	33.28	0.00	-615.28	0.00
		24	-1353.47	0.00	-33.28	0.00	487.14	0.00
	7	23	0.00	0.00	129.31	0.00	-660.87	0.00
		24	0.00	0.00	-129.31	0.00	163.02	0.00
	8	23	0.00	0.00	137.46	0.00	-724.71	0.00
		24	0.00	0.00	-137.46	0.00	195.47	0.00
	9	23	676.74	0.00	145.90	0.00	-2298.50	0.00
		24	-676.74	0.00	-145.90	0.00	1736.80	0.00
	10	23	1353.47	0.00	170.74	0.00	-1339.99	0.00
		24	-1353.47	0.00	-170.74	0.00	682.61	0.00
	11	23	203.02	0.00	211.55	0.00	-1384.73	0.00
		24	-203.02	0.00	-203.85	0.00	585.10	0.00
	12	23	406.04	0.00	216.56	0.00	-1078.03	0.00
		24	-406.04	0.00	-208.86	0.00	259.11	0.00
18	1	26	0.00	0.00	197.16	0.00	-737.09	0.00
		27	0.00	0.00	-189.46	0.00	-7.13	0.00
	2	26	0.00	0.00	-0.26	0.00	-3.89	0.00
		27	0.00	0.00	0.26	0.00	4.88	0.00
	3	26	0.00	0.00	24.86	0.00	-165.61	0.00
		27	0.00	0.00	-24.86	0.00	69.91	0.00
	4	26	0.00	0.00	-0.36	0.00	-8.92	0.00
		27	0.00	0.00	0.36	0.00	10.29	0.00
	5	26	680.43	0.00	24.15	0.00	1649.12	0.00
		27	-680.43	0.00	-24.15	0.00	1556.15	0.00
	6	26	1360.85	0.00	37.55	0.00	-621.71	0.00
		27	-1360.85	0.00	-37.55	0.00	477.16	0.00
	7	26	0.00	0.00	139.16	0.00	-675.41	0.00
		27	0.00	0.00	-139.16	0.00	139.65	0.00
	8	26	0.00	0.00	148.00	0.00	-740.28	0.00
		27	0.00	0.00	-148.00	0.00	170.48	0.00
	9	26	680.43	0.00	163.31	0.00	-2324.53	0.00
		27	-680.43	0.00	163.31	0.00	1695.80	0.00
	10	26	1360.85	0.00	185.55	0.00	1361.99	0.00
		27	-1360.85	0.00	-185.55	0.00	647.63	0.00
	11	26	204.13	0.00	228.65	0.00	-1419.25	0.00
		27	-204.13	0.00	-220.95	0.00	544.78	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	26	408.26	0.00	232.67	0.00	-1102.03	0.00
		27	-408.26	0.00	-224.97	0.00	221.09	0.00
20	1	29	0.00	0.00	164.59	0.00	-576.26	0.00
		30	0.00	0.00	-156.89	0.00	-42.58	0.00
	2	29	0.00	0.00	-0.01	0.00	-0.80	0.00
		30	0.00	0.00	0.01	0.00	0.82	0.00
	3	29	0.00	0.00	19.35	0.00	-124.74	0.00
		30	0.00	0.00	-19.35	0.00	50.26	0.00
	4	29	0.00	0.00	0.26	0.00	-29.99	0.00
		30	0.00	0.00	-0.26	0.00	29.00	0.00
	5	29	674.18	0.00	6.82	0.00	-1564.15	0.00
		30	-674.18	0.00	-6.82	0.00	1537.88	0.00
	6	29	1348.36	0.00	27.36	0.00	-571.66	0.00
		30	-1348.36	0.00	-27.36	0.00	466.31	0.00
	7	29	0.00	0.00	114.51	0.00	-553.71	0.00
		30	0.00	0.00	-114.51	0.00	112.85	0.00
	8	29	0.00	0.00	121.66	0.00	-610.24	0.00
		30	0.00	0.00	-121.66	0.00	141.86	0.00
	9	29	674.18	0.00	121.33	0.00	-2117.85	0.00
		30	-674.18	0.00	-121.33	0.00	1650.73	0.00
	10	29	1348.36	0.00	149.02	0.00	-1181.89	0.00
		30	-1348.36	0.00	-149.02	0.00	608.17	0.00
	11	29	202.25	0.00	186.23	0.00	-1201.03	0.00
		30	-202.25	0.00	-178.53	0.00	498.86	0.00
	12	29	404.51	0.00	192.39	0.00	-903.28	0.00
		30	-404.51	0.00	-184.69	0.00	177.39	0.00
22	1	32	0.00	0.00	194.24	0.00	-652.69	0.00
		33	0.00	0.00	-186.54	0.00	-80.34	0.00
	2	32	0.00	0.00	0.00	0.00	-0.23	0.00
		33	0.00	0.00	0.00	0.00	0.21	0.00
	3	32	0.00	0.00	12.65	0.00	-88.35	0.00
		33	0.00	0.00	-12.65	0.00	39.63	0.00
	4	32	0.00	0.00	11.09	0.00	-78.42	0.00
		33	0.00	0.00	-11.09	0.00	35.71	0.00
	5	32	692.85	0.00	20.72	0.00	-1615.07	0.00
		33	-692.85	0.00	-20.72	0.00	1535.30	0.00
	6	32	1385.69	0.00	36.09	0.00	-598.70	0.00
		33	-1385.69	0.00	-36.09	0.00	459.75	0.00
	7	32	0.00	0.00	136.85	0.00	-612.53	0.00
		33	0.00	0.00	-136.85	0.00	85.66	0.00
	8	32	0.00	0.00	145.51	0.00	-673.23	0.00
		33	0.00	0.00	-145.51	0.00	113.03	0.00
	9	32	692.85	0.00	157.57	0.00	-2227.60	0.00
		33	-692.85	0.00	-157.57	0.00	1620.96	0.00
	10	32	1385.69	0.00	181.60	0.00	-1271.93	0.00
		33	-1385.69	0.00	-181.60	0.00	572.77	0.00
	11	32	207.85	0.00	224.21	0.00	-1304.20	0.00
		33	-207.85	0.00	-216.51	0.00	455.80	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	32	415.71	0.00	228.82	0.00	-999.29	0.00
		33	-415.71	0.00	-221.12	0.00	133.14	0.00
24	1	35	0.00	0.00	188.55	0.00	-667.95	0.00
		36	0.00	0.00	-180.85	0.00	-43.16	0.00
	2	35	0.00	0.00	0.00	0.00	-0.06	0.00
		36	0.00	0.00	0.00	0.00	0.07	0.00
	3	35	0.00	0.00	-0.02	0.00	-35.04	0.00
		36	0.00	0.00	0.02	0.00	35.10	0.00
	4	35	0.00	0.00	22.97	0.00	133.35	0.00
		36	0.00	0.00	-22.97	0.00	44.91	0.00
	5	35	697.28	0.00	17.86	0.00	-1610.73	0.00
		36	-697.28	0.00	-17.86	0.00	1541.98	0.00
	6	35	1394.55	0.00	34.37	0.00	-599.60	0.00
		36	-1394.55	0.00	-34.37	0.00	467.26	0.00
	7	35	0.00	0.00	132.55	0.00	-622.82	0.00
		36	0.00	0.00	-132.55	0.00	112.49	0.00
	8	35	0.00	0.00	140.92	0.00	-684.06	0.00
		36	0.00	0.00	-140.92	0.00	141.50	0.00
	9	35	697.28	0.00	150.41	0.00	-2233.56	0.00
		36	-697.28	0.00	-150.41	0.00	1654.47	0.00
	10	35	1394.55	0.00	175.30	0.00	-1283.65	0.00
		36	-1394.55	0.00	-175.30	0.00	608.77	0.00
	11	35	209.18	0.00	216.86	0.00	-1319.62	0.00
		36	-209.18	0.00	-209.16	0.00	499.51	0.00
	12	35	418.37	0.00	221.82	0.00	-1016.28	0.00
		36	-418.37	0.00	-214.12	0.00	177.09	0.00
26	1	38	0.00	0.00	185.07	0.00	-595.84	0.00
		39	0.00	0.00	-177.37	0.00	-101.87	0.00
	2	38	0.00	0.00	0.00	0.00	-0.01	0.00
		39	0.00	0.00	0.00	0.00	0.02	0.00
	3	38	0.00	0.00	-0.59	0.00	-8.73	0.00
		39	0.00	0.00	0.59	0.00	11.02	0.00
	4	38	0.00	0.00	23.20	0.00	-145.27	0.00
		39	0.00	0.00	-23.20	0.00	55.96	0.00
	5	38	659.40	0.00	19.44	0.00	1501.40	0.00
		39	-659.40	0.00	-19.44	0.00	1426.56	0.00
	6	38	1318.81	0.00	34.28	0.00	-554.95	0.00
		39	-1318.81	0.00	-34.28	0.00	422.98	0.00
	7	38	0.00	0.00	130.10	0.00	-561.47	0.00
		39	0.00	0.00	-130.10	0.00	60.60	0.00
	8	38	0.00	0.00	138.34	0.00	-617.45	0.00
		39	0.00	0.00	-138.34	0.00	84.86	0.00
	9	38	659.40	0.00	149.54	0.00	2062.88	0.00
		39	-659.40	0.00	-149.54	0.00	1487.16	0.00
	10	38	1318.81	0.00	172.61	0.00	-1172.40	0.00
		39	-1318.81	0.00	-172.61	0.00	507.83	0.00
	11	38	197.82	0.00	213.51	0.00	-1200.27	0.00
		39	-197.82	0.00	-205.81	0.00	393.09	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	38	395.64	0.00	217.96	0.00	-916.34	0.00
		39	-395.64	0.00	-210.26	0.00	92.02	0.00
28	1	41	0.00	0.00	167.14	0.00	-452.19	0.00
		42	0.00	0.00	-159.44	0.00	-176.49	0.00
	2	41	0.00	0.00	0.00	0.00	0.00	0.00
		42	0.00	0.00	0.00	0.00	0.00	0.00
	3	41	0.00	0.00	-0.03	0.00	-1.86	0.00
		42	0.00	0.00	0.03	0.00	1.97	0.00
	4	41	0.00	0.00	19.85	0.00	-121.95	0.00
		42	0.00	0.00	-19.85	0.00	45.54	0.00
	5	41	675.60	0.00	6.50	0.00	-1261.19	0.00
		42	-675.60	0.00	-6.50	0.00	1236.15	0.00
	6	41	1351.21	0.00	27.58	0.00	-458.84	0.00
		42	-1351.21	0.00	-27.58	0.00	352.66	0.00
	7	41	0.00	0.00	116.33	0.00	-436.87	0.00
		42	0.00	0.00	-116.33	0.00	-10.98	0.00
	8	41	0.00	0.00	123.55	0.00	-481.87	0.00
		42	0.00	0.00	-123.55	0.00	6.19	0.00
	9	41	675.60	0.00	122.83	0.00	-1698.06	0.00
		42	-675.60	0.00	-122.83	0.00	1225.17	0.00
	10	41	1351.21	0.00	151.13	0.00	-940.71	0.00
		42	-1351.21	0.00	-151.13	0.00	358.85	0.00
	11	41	202.68	0.00	188.91	0.00	-954.36	0.00
		42	-202.68	0.00	-181.21	0.00	241.87	0.00
	12	41	405.36	0.00	195.24	0.00	-713.65	0.00
		42	-405.36	0.00	-187.54	0.00	-23.18	0.00
30	1	44	0.00	0.00	76.23	0.00	-530.71	0.00
		45	0.00	0.00	-63.91	0.00	260.93	0.00
	2	44	0.00	0.00	0.00	0.00	0.00	0.00
		45	0.00	0.00	0.00	0.00	0.00	0.00
	3	44	0.00	0.00	-0.01	0.00	-0.68	0.00
		45	0.00	0.00	0.01	0.00	0.71	0.00
	4	44	0.00	0.00	8.34	0.00	-113.97	0.00
		45	0.00	0.00	-8.34	0.00	81.88	0.00
	5	44	214.82	0.00	10.98	0.00	-982.30	0.00
		45	-214.82	0.00	-10.98	0.00	940.02	0.00
	6	44	429.63	0.00	13.53	0.00	-381.33	0.00
		45	-429.63	0.00	-13.53	0.00	329.26	0.00
	7	44	0.00	0.00	47.12	0.00	-454.35	0.00
		45	0.00	0.00	-47.12	0.00	272.93	0.00
	8	44	0.00	0.00	50.16	0.00	-496.04	0.00
		45	0.00	0.00	-50.16	0.00	302.93	0.00
	9	44	214.82	0.00	58.10	0.00	-1436.65	0.00
		45	-214.82	0.00	-58.10	0.00	1212.95	0.00
	10	44	429.63	0.00	63.68	0.00	-877.37	0.00
		45	-429.63	0.00	-63.68	0.00	632.19	0.00
	11	44	64.44	0.00	87.85	0.00	-940.05	0.00
		45	-64.44	0.00	-75.53	0.00	625.53	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	44	128.89	0.00	88.62	0.00	759.76	0.00
		45	-128.89	0.00	-76.30	0.00	442.30	0.00
31	1	3	0.00	0.00	80.85	688.97	0.00	0.00
		6	0.00	0.00	70.65	-725.97	-254.90	0.00
	2	3	0.00	0.00	10.62	146.14	0.00	0.00
		6	0.00	0.00	8.58	-77.14	-51.24	0.00
	3	3	0.00	0.00	0.00	0.31	0.00	0.00
		6	0.00	0.00	0.00	-0.31	0.05	0.00
	4	3	0.00	0.00	0.00	0.00	0.00	0.00
		6	0.00	0.00	0.00	0.00	0.00	0.00
	5	3	0.00	207.85	18.15	1204.96	0.00	0.00
		6	0.00	377.15	-3.85	121.04	-549.80	-4232.67
	6	3	0.00	415.69	18.23	475.41	0.00	0.00
		6	0.00	754.31	10.37	-73.41	-196.37	-8465.34
	7	3	0.00	0.00	59.81	602.59	0.00	0.00
		6	0.00	0.00	51.19	-505.59	-215.43	0.00
	8	3	0.00	0.00	63.68	655.85	0.00	0.00
		6	0.00	0.00	54.32	-533.85	-234.03	0.00
	9	3	0.00	207.85	77.95	1807.55	0.00	0.00
		6	0.00	377.15	47.35	-384.55	-765.23	-4232.67
	10	3	0.00	415.69	81.91	1131.26	0.00	0.00
		6	0.00	754.31	64.69	-607.26	-430.39	-8465.34
	11	3	0.00	62.35	96.92	1196.91	0.00	0.00
		6	0.00	113.15	78.07	-767.11	-471.02	-1269.80
	12	3	0.00	124.71	96.94	978.05	0.00	0.00
		6	0.00	226.29	82.34	-825.45	-364.99	-2539.60
32	1	6	0.00	0.00	86.38	385.75	254.90	0.00
		9	0.00	0.00	125.72	-437.55	1122.16	0.00
	2	6	0.00	0.00	10.78	111.77	51.24	0.00
		9	0.00	0.00	16.10	-15.17	134.62	0.00
	3	6	0.00	0.00	-0.01	0.96	-0.05	0.00
		9	0.00	0.00	0.01	-0.96	0.76	0.00
	4	6	0.00	0.00	0.00	0.00	0.00	0.00
		9	0.00	0.00	0.00	0.00	0.00	0.00
	5	6	0.00	400.25	2.47	1235.00	549.80	4232.67
		9	0.00	418.75	17.55	621.40	-21.86	-4880.25
	6	6	0.00	800.50	14.75	438.12	196.36	8465.34
		9	0.00	837.50	25.29	124.68	172.85	-9760.50
	7	6	0.00	0.00	63.03	389.40	215.43	0.00
		9	0.00	0.00	92.37	-253.60	811.80	0.00
	8	6	0.00	0.00	66.95	430.36	234.03	0.00
		9	0.00	0.00	98.25	-259.56	861.17	0.00
	9	6	0.00	400.25	65.49	1624.40	765.23	4232.67
		9	0.00	418.75	109.93	367.80	789.94	-4880.25
	10	6	0.00	800.50	81.70	868.48	430.39	8465.34
		9	0.00	837.50	123.54	-134.88	1034.02	-9760.50
	11	6	0.00	120.67	97.89	888.97	471.02	1269.80
		9	0.00	125.63	147.09	-267.25	1250.98	-1464.07

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	6	0.00	240.15	101.58	629.91	364.99	2539.60
		9	0.00	251.25	149.42	-416.27	1309.39	-2928.15
33	1	9	0.00	0.00	110.00	32.27	-1122.16	0.00
		12	0.00	0.00	102.10	-84.07	845.56	0.00
	2	9	0.00	0.00	14.09	53.20	-134.62	0.00
		12	0.00	0.00	12.79	43.40	88.91	0.00
	3	9	0.00	0.00	-0.16	4.76	-0.76	0.00
		12	0.00	0.00	0.16	-4.76	11.76	0.00
	4	9	0.00	0.00	0.00	0.00	0.00	0.00
		12	0.00	0.00	0.00	0.00	0.01	0.00
	5	9	0.00	409.06	10.90	982.96	21.86	4880.25
		12	0.00	409.94	9.12	873.44	-84.13	-4911.30
	6	9	0.00	818.11	20.88	306.96	-172.85	9760.50
		12	0.00	819.89	19.16	255.84	112.61	-9822.61
	7	9	0.00	0.00	80.62	114.22	-811.80	0.00
		12	0.00	0.00	74.78	21.58	607.24	0.00
	8	9	0.00	0.00	85.70	135.23	-861.17	0.00
		12	0.00	0.00	79.50	35.57	643.96	0.00
	9	9	0.00	409.06	91.52	1097.18	-789.94	4880.25
		12	0.00	409.94	83.90	895.02	523.11	-4911.30
	10	9	0.00	818.11	106.58	442.19	-1034.03	9760.50
		12	0.00	819.89	98.66	291.41	756.57	-9822.61
	11	9	0.00	122.72	127.21	385.12	-1250.98	1464.07
		12	0.00	122.98	117.78	216.60	921.00	-1473.39
	12	9	0.00	245.43	130.20	182.32	-1309.39	2928.15
		12	0.00	245.97	120.79	31.32	980.02	-2946.78
34	1	12	0.00	0.00	104.05	-130.75	-845.56	0.00
		15	0.00	0.00	108.05	78.95	985.68	0.00
	2	12	0.00	0.00	13.81	10.77	-88.91	0.00
		15	0.00	0.00	13.07	85.83	62.84	0.00
	3	12	0.00	0.00	-0.70	21.16	-11.76	0.00
		15	0.00	0.00	0.70	-21.16	61.09	0.00
	4	12	0.00	0.00	0.00	0.02	-0.01	0.00
		15	0.00	0.00	0.00	-0.02	0.03	0.00
	5	12	0.00	420.97	7.90	857.32	84.13	4911.30
		15	0.00	398.03	12.12	999.08	63.84	-4108.45
	6	12	0.00	841.94	19.09	243.25	112.61	9822.61
		15	0.00	796.06	20.95	319.55	177.97	-8216.89
	7	12	0.00	0.00	76.08	-14.24	-607.24	0.00
		15	0.00	0.00	79.32	150.04	720.48	0.00
	8	12	0.00	0.00	80.86	-2.70	-643.96	0.00
		15	0.00	0.00	84.34	173.50	765.68	0.00
	9	12	0.00	420.97	83.98	843.08	-523.11	4911.30
		15	0.00	398.03	91.44	1149.12	784.32	-4108.45
	10	12	0.00	841.94	99.95	240.55	-756.58	9822.61
		15	0.00	796.06	105.29	493.05	943.65	-8216.89
	11	12	0.00	126.29	119.52	158.39	-921.00	1473.39
		15	0.00	119.41	125.46	443.33	1128.80	-1232.53

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	12	0.00	252.58	122.88	-25.83	-980.02	2946.78
		15	0.00	238.82	128.11	339.47	1163.04	2465.07
35	1	15	0.00	0.00	89.62	-211.80	-985.69	0.00
		18	0.00	0.00	86.12	168.88	884.09	0.00
	2	15	0.00	0.00	10.69	-44.98	-62.84	0.00
		18	0.00	0.00	11.58	125.02	88.54	0.00
	3	15	0.00	0.00	0.63	56.17	-61.09	0.00
		18	0.00	0.00	-0.63	-56.17	24.66	0.00
	4	15	0.00	0.00	0.00	0.06	-0.03	0.00
		18	0.00	0.00	0.00	-0.06	0.08	0.00
	5	15	0.00	357.26	7.78	649.21	-63.84	4108.45
		18	0.00	321.34	8.81	888.95	95.67	-3066.60
	6	15	0.00	714.53	16.71	167.19	-177.97	8216.89
		18	0.00	642.67	16.47	299.13	170.92	-6133.19
	7	15	0.00	0.00	65.59	-91.34	-720.48	0.00
		18	0.00	0.00	63.17	203.86	650.09	0.00
	8	15	0.00	0.00	69.72	-87.32	-765.68	0.00
		18	0.00	0.00	67.16	228.84	691.38	0.00
	9	15	0.00	357.26	73.37	557.87	-784.32	4108.45
		18	0.00	321.34	71.97	1092.81	743.76	-3066.60
	10	15	0.00	714.53	86.43	79.87	-943.65	8216.89
		18	0.00	642.67	83.63	527.97	862.30	-6133.19
	11	15	0.00	107.18	103.28	-5.79	-1128.80	1232.53
		18	0.00	96.40	99.71	504.36	1025.47	-919.98
	12	15	0.00	214.36	105.95	-150.39	-1163.04	2465.07
		18	0.00	192.80	102.01	327.41	1048.64	-1839.96
36	1	18	0.00	0.00	88.76	-193.18	-884.09	0.00
		21	0.00	0.00	86.98	150.26	832.29	0.00
	2	18	0.00	0.00	0.07	-73.56	-88.54	0.00
		21	0.00	0.00	-0.07	73.56	84.45	0.00
	3	18	0.00	0.00	11.20	88.63	-24.66	0.00
		21	0.00	0.00	11.07	8.59	20.78	0.00
	4	18	0.00	0.00	0.00	0.18	-0.08	0.00
		21	0.00	0.00	0.00	0.18	0.14	0.00
	5	18	0.00	334.69	8.63	675.32	-93.68	3066.60
		21	0.00	343.91	7.96	862.84	74.32	-3333.73
	6	18	0.00	669.39	16.85	170.59	178.92	6133.19
		21	0.00	687.81	16.33	287.73	155.99	-6667.46
	7	18	0.00	0.00	65.07	-74.82	-650.09	0.00
		21	0.00	0.00	63.69	187.34	610.31	0.00
	8	18	0.00	0.00	69.18	-69.34	-691.38	0.00
		21	0.00	0.00	67.70	210.86	648.73	0.00
	9	18	0.00	334.69	73.69	600.50	-743.76	3066.60
		21	0.00	343.91	71.65	1050.18	684.63	3333.73
	10	18	0.00	669.39	86.02	109.25	862.30	6133.19
		21	0.00	687.81	84.06	498.59	884.12	6667.46
	11	18	0.00	100.41	102.62	24.67	1025.47	919.98
		21	0.00	103.17	100.36	473.90	959.96	-1000.12

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	18	0.00	200.82	105.09	-124.34	-1048.64	1839.96
		21	0.00	206.34	102.88	301.36	984.46	-2000.24
37	1	21	0.00	0.00	84.62	-168.75	-832.29	0.00
		24	0.00	0.00	91.12	125.83	1020.64	0.00
	2	21	0.00	0.00	1.19	-27.06	-84.45	0.00
		24	0.00	0.00	-1.19	27.06	15.62	0.00
	3	21	0.00	0.00	9.51	45.51	-20.78	0.00
		24	0.00	0.00	12.76	34.53	115.21	0.00
	4	21	0.00	0.00	-0.01	0.67	-0.14	0.00
		24	0.00	0.00	0.01	-0.67	0.52	0.00
	5	21	0.00	340.51	6.79	692.25	-74.33	3333.73
		24	0.00	338.09	9.80	845.91	161.46	-3263.49
	6	21	0.00	681.02	15.65	187.65	-155.99	6667.46
		24	0.00	676.18	17.53	278.67	210.60	-6526.97
	7	21	0.00	0.00	61.95	-55.45	-610.31	0.00
		24	0.00	0.00	66.81	167.97	751.52	0.00
	8	21	0.00	0.00	65.84	-48.56	-648.73	0.00
		24	0.00	0.00	71.04	190.08	799.40	0.00
	9	21	0.00	340.51	68.74	636.80	-684.63	3333.73
		24	0.00	338.09	76.61	1013.88	912.98	-3263.49
	10	21	0.00	681.02	81.49	139.09	-804.72	6667.46
		24	0.00	676.18	88.57	468.75	1010.00	-6526.97
	11	21	0.00	102.15	97.35	58.05	-959.96	1000.12
		24	0.00	101.43	105.64	440.52	1200.43	-979.05
	12	21	0.00	204.31	100.00	-93.33	-984.46	2000.24
		24	0.00	202.85	107.96	270.35	1215.17	-1958.09
38	1	24	0.00	0.00	85.40	-102.39	-1020.63	0.00
		27	0.00	0.00	90.34	59.47	1163.72	0.00
	2	24	0.00	0.00	0.26	-6.01	-15.62	0.00
		27	0.00	0.00	-0.26	6.01	0.44	0.00
	3	24	0.00	0.00	10.60	31.53	-115.21	0.00
		27	0.00	0.00	11.67	48.51	146.09	0.00
	4	24	0.00	0.00	-0.10	3.07	-0.52	0.00
		27	0.00	0.00	0.10	-3.07	6.05	0.00
	5	24	0.00	338.65	6.79	727.87	-161.47	3263.49
		27	0.00	339.95	9.80	810.29	248.84	-3301.30
	6	24	0.00	677.30	15.75	208.47	-210.60	6526.97
		27	0.00	679.90	17.42	257.85	259.03	-6602.59
	7	24	0.00	0.00	62.50	-4.95	-751.52	0.00
		27	0.00	0.00	66.26	117.47	860.48	0.00
	8	24	0.00	0.00	66.43	5.39	-799.40	0.00
		27	0.00	0.00	70.45	136.13	916.10	0.00
	9	24	0.00	338.65	69.29	722.92	-912.99	3263.49
		27	0.00	339.95	76.06	927.76	1109.32	-3301.30
	10	24	0.00	677.30	82.18	213.86	-1010.00	6526.97
		27	0.00	679.90	87.87	393.98	1175.13	-6602.59
	11	24	0.00	101.59	98.21	144.57	-1200.43	979.05
		27	0.00	101.99	104.78	354.00	1390.55	-990.39

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	24	0.00	203.19	100.90	-11.25	-1215.17	1958.09
		27	0.00	203.97	107.07	188.26	1394.01	1980.78
39	1	27	0.00	0.00	99.12	-66.60	-1163.72	0.00
		30	0.00	0.00	76.62	23.68	511.24	0.00
	2	27	0.00	0.00	0.01	-1.13	-0.44	0.00
		30	0.00	0.00	-0.01	1.13	0.11	0.00
	3	27	0.00	0.00	13.19	21.40	-146.09	0.00
		30	0.00	0.00	9.08	58.64	26.97	0.00
	4	27	0.00	0.00	-0.45	13.36	-6.05	0.00
		30	0.00	0.00	0.45	-13.36	32.18	0.00
	5	27	0.00	340.47	14.34	745.87	-248.84	3301.30
		30	0.00	338.13	2.24	792.29	-102.12	-3233.20
	6	27	0.00	680.95	20.12	219.31	-259.03	6602.59
		30	0.00	676.25	13.05	247.01	53.95	-6466.41
	7	27	0.00	0.00	72.90	22.17	-860.48	0.00
		30	0.00	0.00	55.86	90.35	366.21	0.00
	8	27	0.00	0.00	77.55	34.35	-916.10	0.00
		30	0.00	0.00	59.33	107.17	387.84	0.00
	9	27	0.00	340.47	87.25	768.05	-1109.32	3301.30
		30	0.00	338.13	58.10	882.64	264.10	-3233.20
	10	27	0.00	680.95	97.67	253.66	-1175.13	6602.59
		30	0.00	676.25	72.38	354.18	441.79	-6466.41
	11	27	0.00	102.14	116.17	190.79	-1390.96	990.39
		30	0.00	101.44	86.82	307.78	539.87	-969.96
	12	27	0.00	204.28	117.90	32.82	-1394.01	1980.78
		30	0.00	202.88	90.06	144.20	586.69	-1939.92
40	1	30	0.00	0.00	80.27	-66.27	-511.24	0.00
		33	0.00	0.00	95.47	23.35	951.97	0.00
	2	30	0.00	0.00	0.00	-0.31	-0.11	0.00
		33	0.00	0.00	0.00	0.31	0.19	0.00
	3	30	0.00	0.00	10.26	-8.38	-26.97	0.00
		33	0.00	0.00	12.01	88.42	77.63	0.00
	4	30	0.00	0.00	-0.19	42.36	-32.18	0.00
		33	0.00	0.00	0.19	-42.36	43.43	0.00
	5	30	0.00	336.06	4.58	745.59	102.12	3233.20
		33	0.00	342.54	12.01	792.57	113.37	-3421.33
	6	30	0.00	672.11	14.31	219.30	-53.95	6466.41
		33	0.00	685.09	18.87	247.02	186.02	-6842.65
	7	30	0.00	0.00	58.65	22.50	-366.21	0.00
		33	0.00	0.00	70.11	90.02	698.47	0.00
	8	30	0.00	0.00	62.32	34.69	-387.84	0.00
		33	0.00	0.00	74.56	106.83	742.67	0.00
	9	30	0.00	336.06	63.23	768.09	-264.10	3233.20
		33	0.00	342.54	82.12	882.58	811.84	-3421.33
	10	30	0.00	672.11	76.63	253.99	-441.79	6466.41
		33	0.00	685.09	93.42	353.85	928.70	-6842.65
	11	30	0.00	100.82	91.71	191.08	539.87	-969.96
		33	0.00	102.76	111.28	307.49	1107.22	-1026.40

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	30	0.00	201.63	94.63	33.19	-586.69	1939.92
		33	0.00	205.53	113.33	143.82	1129.02	-2052.80
41	1	33	0.00	0.00	91.08	-103.68	-951.97	0.00
		36	0.00	0.00	90.72	59.28	941.45	0.00
	2	33	0.00	0.00	0.00	-0.09	-0.19	0.00
		36	0.00	0.00	0.00	0.09	0.04	0.00
	3	33	0.00	0.00	0.65	-48.79	-77.63	0.00
		36	0.00	0.00	0.65	48.79	38.92	0.00
	4	33	0.00	0.00	10.90	78.07	-43.43	0.00
		36	0.00	0.00	12.14	4.73	80.72	0.00
	5	33	0.00	350.30	8.71	742.72	-113.37	3421.33
		36	0.00	351.70	8.45	848.48	105.38	-3463.17
	6	33	0.00	700.61	17.23	212.73	-186.02	6842.65
		36	0.00	703.40	17.09	269.67	182.09	-6926.34
	7	33	0.00	0.00	66.74	-4.35	-698.47	0.00
		36	0.00	0.00	66.46	120.75	690.12	0.00
	8	33	0.00	0.00	70.95	6.20	-742.67	0.00
		36	0.00	0.00	70.65	140.20	733.75	0.00
	9	33	0.00	350.30	75.45	738.37	-811.84	3421.33
		36	0.00	351.70	74.91	969.23	795.49	-3463.17
	10	33	0.00	700.61	88.17	218.93	-928.70	6842.65
		36	0.00	703.40	87.75	409.87	915.83	-6926.34
	11	33	0.00	105.09	105.24	148.32	-1107.22	1026.40
		36	0.00	105.51	104.75	367.44	1092.74	-1038.95
	12	33	0.00	210.18	107.79	-10.68	-1129.02	2052.80
		36	0.00	211.02	107.35	193.80	1115.76	-2077.90
42	1	36	0.00	0.00	90.13	-102.45	-941.45	0.00
		39	0.00	0.00	85.61	59.53	810.40	0.00
	2	36	0.00	0.00	0.00	-0.02	-0.04	0.00
		39	0.00	0.00	0.00	0.02	0.00	0.00
	3	36	0.00	0.00	0.63	-13.69	-38.92	0.00
		39	0.00	0.00	-0.63	13.69	2.37	0.00
	4	36	0.00	0.00	10.83	40.18	-80.72	0.00
		39	0.00	0.00	11.44	39.86	98.44	0.00
	5	36	0.00	345.58	9.41	693.51	-105.38	3463.17
		39	0.00	333.02	7.18	844.65	40.68	-3099.01
	6	36	0.00	691.16	17.28	197.59	-182.09	6926.34
		39	0.00	666.04	15.90	268.73	142.10	-6198.01
	7	36	0.00	0.00	66.09	-8.26	-690.12	0.00
		39	0.00	0.00	62.67	120.78	590.69	0.00
	8	36	0.00	0.00	70.27	1.30	-733.75	0.00
		39	0.00	0.00	66.61	140.22	627.45	0.00
	9	36	0.00	345.58	75.50	685.24	-795.49	3463.17
		39	0.00	333.02	69.84	965.44	631.37	-3099.01
	10	36	0.00	691.16	87.55	198.89	-915.83	6926.34
		39	0.00	666.04	82.51	408.95	769.55	-6198.01
	11	36	0.00	103.67	104.41	132.07	-1092.74	1038.95
		39	0.00	99.91	98.57	366.50	923.42	-929.70

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	36	0.00	207.35	106.77	-16.71	1115.76	2077.90
		39	0.00	199.81	101.19	193.72	953.85	-1859.40
43	1	39	0.00	0.00	91.76	-161.40	-810.40	0.00
		42	0.00	0.00	77.92	119.96	422.74	0.00
	2	39	0.00	0.00	0.00	0.00	0.00	0.00
		42	0.00	0.00	0.00	0.00	0.00	0.00
	3	39	0.00	0.00	0.04	-2.68	-2.37	0.00
		42	0.00	0.00	-0.04	2.68	0.36	0.00
	4	39	0.00	0.00	11.75	16.10	-98.44	0.00
		42	0.00	0.00	9.75	61.18	42.28	0.00
	5	39	0.00	326.38	12.26	581.90	-40.68	3099.01
		42	0.00	328.82	3.75	903.22	-197.57	-3167.26
	6	39	0.00	652.76	18.38	154.25	-142.10	6198.01
		42	0.00	657.64	13.65	295.99	9.69	-6334.51
	7	39	0.00	0.00	67.43	-60.18	-590.69	0.00
		42	0.00	0.00	56.89	168.82	295.54	0.00
	8	39	0.00	0.00	71.73	-55.36	-627.45	0.00
		42	0.00	0.00	60.43	192.00	311.11	0.00
	9	39	0.00	326.38	79.69	521.72	-631.37	3099.01
		42	0.00	328.82	60.64	1072.04	97.97	-3167.26
	10	39	0.00	652.76	90.11	98.89	-769.55	6198.01
		42	0.00	657.64	74.08	487.99	320.80	-6334.51
	11	39	0.00	97.91	107.23	26.59	-923.42	929.70
		42	0.00	98.65	88.76	454.79	406.11	-950.18
	12	39	0.00	195.83	109.07	-101.71	-953.85	1859.40
		42	0.00	197.29	91.73	272.62	468.29	-1900.35
44	1	42	0.00	0.00	81.53	-296.45	-422.74	0.00
		45	0.00	0.00	63.91	260.93	0.00	0.00
	2	42	0.00	0.00	0.00	0.00	0.00	0.00
		45	0.00	0.00	0.00	0.00	0.00	0.00
	3	42	0.00	0.00	0.01	-0.71	-0.36	0.00
		45	0.00	0.00	-0.01	0.71	0.00	0.00
	4	42	0.00	0.00	10.10	-15.64	-42.28	0.00
		45	0.00	0.00	8.34	81.88	0.00	0.00
	5	42	0.00	346.78	2.75	332.94	197.57	3167.26
		45	0.00	214.82	10.98	940.02	0.00	0.00
	6	42	0.00	693.57	13.93	56.66	-9.69	6334.51
		45	0.00	429.63	13.53	329.26	0.00	0.00
	7	42	0.00	0.00	59.44	-179.81	-295.54	0.00
		45	0.00	0.00	47.12	272.93	0.00	0.00
	8	42	0.00	0.00	63.12	-185.81	-311.11	0.00
		45	0.00	0.00	50.16	302.93	0.00	0.00
	9	42	0.00	346.78	62.19	153.13	-97.97	3167.26
		45	0.00	214.82	58.10	1212.95	0.00	0.00
	10	42	0.00	693.57	77.05	-129.15	-320.80	6334.51
		45	0.00	429.63	63.68	632.19	0.00	0.00
	11	42	0.00	104.04	92.46	-212.92	-406.11	950.18
		45	0.00	64.44	75.53	625.52	0.00	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	12	42	0.00	208.07	95.81	-295.80	-468.29	1900.35
		45	0.00	128.89	76.36	442.29	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

137. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4	1	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
7	1	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	2	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00005	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00005	0.00000	0.00000
10	1	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00005	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
13	1	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
16	1	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00004	0.00000	0.00000
19	1	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
22	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
25	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
28	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
31	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
34	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
37	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
40	1	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00001	0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	10	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	11	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
	12	0.00000	0.00000	0.00000	-0.00002	0.00000	0.00000
43	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	1	0.00000	0.00000	-0.00084	-0.00011	0.00026	0.00000
	2	0.00000	0.00000	-0.00015	-0.00002	0.00004	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.14875	-0.01074	-0.00104	-0.00013	0.00013	-0.00019
	6	-0.29750	-0.02147	-0.00045	-0.00006	0.00008	-0.00037
	7	0.00000	0.00000	-0.00069	-0.00009	0.00020	0.00000
	8	0.00000	0.00000	-0.00074	-0.00010	0.00021	0.00000
	9	-0.14875	-0.01074	-0.00173	-0.00022	0.00033	-0.00019
	10	-0.29750	-0.02147	-0.00119	-0.00015	0.00029	-0.00037
	11	-0.04462	-0.00322	-0.00131	-0.00017	0.00034	-0.00006
	12	-0.08925	-0.00644	-0.00113	-0.00015	0.00032	-0.00011

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
5	1	0.00000	0.00000	-0.89256	0.00069	0.00017	0.00000
	2	0.00000	0.00000	-0.12744	-0.00011	0.00002	0.00000
	3	0.00000	0.00000	-0.00017	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.10692	-0.07461	-0.46265	-0.00046	0.00009	-0.00008
	6	-0.21384	-0.14922	-0.27639	-0.00025	0.00005	-0.00016
	7	0.00000	0.00000	-0.67661	-0.00053	0.00013	0.00000
	8	0.00000	0.00000	-0.72309	-0.00057	0.00014	0.00000
	9	-0.10692	-0.07461	-1.13926	-0.00100	0.00022	-0.00008
	10	-0.21384	-0.14922	-0.99948	-0.00082	0.00019	-0.00016
	11	-0.03208	-0.02238	-1.15897	-0.00094	0.00022	-0.00002
	12	-0.06415	-0.04477	-1.10309	-0.00087	0.00021	-0.00005
8	1	0.00000	0.00000	-1.33912	-0.00105	0.00004	0.00000
	2	0.00000	0.00000	-0.19318	-0.00016	0.00001	0.00000
	3	0.00000	0.00000	-0.00044	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.06662	-0.07945	-0.72671	-0.00069	0.00003	0.00003
	6	-0.13323	-0.15890	-0.42516	-0.00037	0.00001	0.00005
	7	0.00000	0.00000	-1.01898	-0.00081	0.00003	0.00000
	8	0.00000	0.00000	-1.08950	-0.00087	0.00003	0.00000
	9	-0.06662	-0.07945	-1.74570	-0.00150	0.00005	0.00003
	10	-0.13323	-0.15890	-1.51467	-0.00124	0.00004	0.00005
	11	-0.01998	-0.02384	-1.75076	-0.00141	0.00005	0.00001
	12	-0.03997	-0.04767	-1.66029	-0.00132	0.00005	0.00002
11	1	0.00000	0.00000	-1.45243	-0.00108	-0.00001	0.00000
	2	0.00000	0.00000	-0.20764	-0.00016	0.00000	0.00000
	3	0.00000	0.00000	-0.00256	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.08818	-0.08463	-0.79463	-0.00073	0.00000	-0.00003
	6	-0.17636	-0.16926	-0.46290	-0.00039	0.00000	-0.00006
	7	0.00000	0.00000	-1.10611	-0.00083	-0.00001	0.00000
	8	0.00000	0.00000	-1.18267	-0.00089	-0.00001	0.00000
	9	-0.08818	-0.08463	-1.90074	-0.00156	-0.00001	-0.00003
	10	-0.17636	-0.16926	-1.64557	-0.00128	-0.00001	-0.00006
	11	-0.02645	-0.02539	-1.90102	-0.00146	-0.00001	-0.00001
	12	-0.05291	-0.05078	-1.80150	-0.00136	-0.00001	-0.00002
14	1	0.00000	0.00000	-1.24155	-0.00098	-0.00006	0.00000
	2	0.00000	0.00000	-0.16010	-0.00013	-0.00002	0.00000
	3	0.00000	0.00000	-0.02057	-0.00002	0.00001	0.00000
	4	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	5	-0.03938	-0.07323	-0.70584	-0.00068	0.00002	0.00010
	6	-0.07877	-0.14646	-0.40325	-0.00036	-0.00002	0.00019
	7	0.00000	0.00000	-0.94643	-0.00075	-0.00005	0.00000
	8	0.00000	0.00000	-1.01223	-0.00081	-0.00005	0.00000
	9	-0.03938	-0.07323	-1.65227	-0.00143	-0.00007	0.00010
	10	-0.07877	-0.14646	-1.41548	-0.00116	0.00007	0.00019
	11	0.01181	0.02197	-1.63398	-0.00133	-0.00008	0.00003
	12	-0.02363	-0.04394	-1.54320	-0.00123	0.00007	0.00006

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X ROTAN	Y-ROTAN	Z-ROTAN
17	1	0.00000	0.00000	-0.98808	-0.00083	-0.00005	0.00000
	2	0.00000	0.00000	-0.07848	-0.00007	-0.00002	0.00000
	3	0.00000	0.00000	-0.06668	-0.00006	0.00001	0.00000
	4	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	5	-0.08586	-0.06039	-0.59337	-0.00060	-0.00002	-0.00002
	6	-0.17172	-0.12079	-0.33019	-0.00031	-0.00001	-0.00005
	7	0.00000	0.00000	-0.75449	-0.00064	-0.00004	0.00000
	8	0.00000	0.00000	-0.80737	-0.00069	-0.00004	0.00000
	9	-0.08586	-0.06039	-1.34786	-0.00124	-0.00006	-0.00002
	10	-0.17172	-0.12079	-1.13756	-0.00099	-0.00005	-0.00005
	11	-0.02576	-0.01812	-1.31129	-0.00113	-0.00006	-0.00001
	12	-0.05152	-0.03624	-1.23233	-0.00105	-0.00006	-0.00001
20	1	0.00000	0.00000	-0.76171	-0.00070	-0.00005	0.00000
	2	0.00000	0.00000	-0.01717	-0.00002	-0.00001	0.00000
	3	0.00000	0.00000	-0.09605	-0.00009	0.00000	0.00000
	4	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	5	-0.07381	0.05764	-0.47982	-0.00053	-0.00002	0.00001
	6	-0.14762	-0.11529	-0.26164	-0.00027	-0.00001	0.00001
	7	0.00000	0.00000	-0.58289	-0.00054	-0.00004	0.00000
	8	0.00000	0.00000	-0.62416	-0.00058	-0.00004	0.00000
	9	-0.07381	-0.05764	-1.06271	-0.00107	-0.00006	0.00001
	10	-0.14762	-0.11529	-0.88580	-0.00085	-0.00005	0.00001
	11	-0.02214	-0.01729	-1.01898	-0.00097	-0.00006	0.00000
	12	-0.04429	-0.03459	-0.95353	-0.00089	-0.00006	0.00000
23	1	0.00000	0.00000	-0.54813	-0.00058	-0.00004	0.00000
	2	0.00000	0.00000	-0.00165	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.08139	-0.00009	0.00000	0.00000
	4	0.00000	0.00000	-0.00024	0.00000	0.00000	0.00000
	5	-0.07664	-0.04971	-0.37198	-0.00047	-0.00002	0.00000
	6	-0.15328	-0.09941	-0.19681	-0.00023	-0.00001	0.00000
	7	0.00000	0.00000	-0.42139	-0.00045	-0.00003	0.00000
	8	0.00000	0.00000	-0.45171	-0.00049	-0.00003	0.00000
	9	-0.07664	-0.04971	-0.79336	-0.00093	-0.00005	0.00000
	10	-0.15328	-0.09941	-0.64852	-0.00072	-0.00004	0.00000
	11	-0.02299	-0.01491	-0.74300	-0.00082	-0.00005	0.00000
	12	-0.04598	-0.02982	-0.69045	-0.00074	-0.00005	0.00000
26	1	0.00000	0.00000	-0.44568	-0.00052	0.00000	0.00000
	2	0.00000	0.00000	-0.00026	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.06753	-0.00008	0.00000	0.00000
	4	0.00000	0.00000	-0.00095	0.00000	0.00000	0.00000
	5	-0.07701	-0.04531	-0.31865	-0.00044	0.00000	0.00000
	6	0.15403	-0.09063	-0.16518	-0.00022	0.00000	0.00000
	7	0.00000	0.00000	-0.34387	-0.00041	0.00000	0.00000
	8	0.00000	0.00000	-0.36890	-0.00044	0.00000	0.00000
	9	-0.07701	-0.04531	-0.66252	-0.00085	0.00000	0.00000
	10	-0.15403	-0.09063	-0.53408	-0.00065	0.00000	0.00000
	11	-0.02310	-0.01359	-0.61001	-0.00074	0.00000	0.00000
	12	-0.04621	-0.02719	-0.56397	-0.00067	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X ROTAN	Y ROTAN	Z-ROTAN
29	1	0.00000	0.00000	-0.47759	-0.00050	0.00000	0.00000
	2	0.00000	0.00000	-0.00015	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.06647	-0.00007	0.00000	0.00000
	4	0.00000	0.00000	0.00671	-0.00001	0.00000	0.00000
	5	-0.07510	0.04952	0.33626	-0.00043	0.00000	0.00000
	6	-0.15021	-0.09904	-0.17535	-0.00021	0.00000	0.00001
	7	0.00000	0.00000	-0.36810	-0.00039	0.00000	0.00000
	8	0.00000	0.00000	-0.39480	-0.00042	0.00000	0.00000
	9	-0.07510	-0.04952	-0.70437	-0.00083	-0.00001	0.00000
	10	-0.15021	0.09904	-0.57016	-0.00065	-0.00001	0.00001
	11	-0.02253	-0.01486	-0.65180	-0.00071	-0.00001	0.00000
	12	-0.04506	-0.02971	-0.60352	-0.00065	-0.00001	0.00000
32	1	0.00000	0.00000	-0.38596	-0.00047	-0.00002	0.00000
	2	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.03193	-0.00004	-0.00001	0.00000
	4	0.00000	0.00000	-0.02815	-0.00004	0.00001	0.00000
	5	-0.08226	-0.04444	-0.28475	-0.00041	-0.00001	-0.00001
	6	-0.16452	-0.08889	-0.14589	-0.00020	-0.00001	-0.00003
	7	0.00000	0.00000	-0.29858	-0.00037	-0.00002	0.00000
	8	0.00000	0.00000	-0.32047	-0.00040	-0.00002	0.00000
	9	-0.08226	-0.04444	-0.58333	-0.00078	-0.00003	-0.00001
	10	-0.16452	-0.08889	-0.46636	-0.00059	-0.00002	-0.00003
	11	-0.02468	-0.01333	-0.53150	-0.00067	-0.00003	0.00000
	12	-0.04936	-0.02667	-0.48985	-0.00060	-0.00003	-0.00001
35	1	0.00000	0.00000	-0.30137	-0.00040	-0.00002	0.00000
	2	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00466	-0.00001	0.00000	0.00000
	4	0.00000	0.00000	-0.04304	-0.00006	0.00000	0.00000
	5	-0.07167	-0.04097	-0.23442	-0.00037	-0.00001	0.00001
	6	-0.14334	-0.08195	-0.11775	-0.00017	-0.00001	0.00003
	7	0.00000	0.00000	-0.23411	-0.00032	-0.00001	0.00000
	8	0.00000	0.00000	-0.25148	-0.00034	-0.00001	0.00000
	9	-0.07167	-0.04097	-0.46853	-0.00069	-0.00002	0.00001
	10	-0.14334	-0.08195	-0.36922	-0.00052	-0.00002	0.00003
	11	-0.02150	-0.01229	-0.41940	-0.00058	-0.00002	0.00000
	12	-0.04300	-0.02458	-0.38440	-0.00052	-0.00002	0.00001
38	1	0.00000	0.00000	-0.25131	-0.00035	-0.00001	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00049	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.03951	-0.00006	0.00000	0.00000
	5	0.07185	-0.03681	-0.19968	-0.00033	-0.00001	0.00001
	6	-0.14370	-0.07362	-0.09947	-0.00016	-0.00001	0.00002
	7	0.00000	0.00000	-0.19536	-0.00028	-0.00001	0.00000
	8	0.00000	0.00000	-0.20993	-0.00030	-0.00001	0.00000
	9	-0.07185	-0.03681	-0.39505	-0.00061	-0.00002	0.00001
	10	-0.14370	-0.07362	-0.30940	-0.00045	-0.00002	0.00002
	11	-0.02155	-0.01104	-0.35122	-0.00051	-0.00002	0.00000
	12	-0.04311	-0.02209	-0.32116	-0.00046	-0.00002	0.00001

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
41	1	0.00000	0.00000	-0.17868	-0.00027	-0.00004	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00017	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.02801	-0.00004	-0.00001	0.00000
	5	-0.08287	-0.03507	-0.13727	-0.00025	-0.00003	-0.00002
	6	-0.16574	-0.07014	-0.06928	-0.00012	-0.00001	-0.00003
	7	0.00000	0.00000	-0.13831	-0.00021	-0.00003	0.00000
	8	0.00000	0.00000	-0.14857	-0.00023	-0.00003	0.00000
	9	-0.08287	-0.03507	-0.27558	-0.00046	-0.00006	-0.00002
	10	-0.16574	-0.07014	-0.21785	-0.00034	-0.00004	-0.00003
	11	-0.02486	-0.01052	-0.24805	-0.00038	-0.00005	0.00000
	12	-0.04972	-0.02104	-0.22765	-0.00034	-0.00005	-0.00001
44	1	0.00000	0.00000	-0.00044	-0.00006	-0.00008	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00009	-0.00001	-0.00001	0.00000
	5	0.00000	-0.01110	-0.00080	-0.00010	-0.00005	0.00020
	6	0.00000	-0.02219	-0.00031	-0.00004	-0.00003	0.00040
	7	0.00000	0.00000	-0.00038	-0.00005	-0.00006	0.00000
	8	0.00000	0.00000	-0.00041	-0.00005	-0.00006	0.00000
	9	0.00000	-0.01110	-0.00118	-0.00015	-0.00011	0.00020
	10	0.00000	-0.02219	-0.00072	-0.00009	-0.00009	0.00040
	11	0.00000	-0.00333	-0.00078	-0.00010	-0.00010	0.00006
	12	0.00000	-0.00666	-0.00063	-0.00008	-0.00010	0.00012
3	1	0.00000	0.00000	-0.06843	-0.00023	0.00026	0.00000
	2	0.00000	0.00000	-0.01269	-0.00004	0.00004	0.00000
	3	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.07664	-0.01233	-0.08830	-0.00032	0.00013	-0.00019
	6	-0.15328	-0.02466	-0.03744	-0.00013	0.00008	-0.00037
	7	0.00000	0.00000	-0.05610	-0.00019	0.00020	0.00000
	8	0.00000	0.00000	-0.06073	-0.00021	0.00021	0.00000
	9	-0.07664	-0.01233	-0.14440	-0.00051	0.00033	-0.00019
	10	-0.15328	-0.02466	-0.09817	-0.00034	0.00029	-0.00037
	11	-0.02299	-0.00370	-0.10764	-0.00037	0.00034	-0.00006
	12	-0.04598	-0.00740	-0.09238	-0.00032	0.00032	-0.00011
6	1	0.00000	0.00000	1.16080	-0.00069	0.00017	0.00000
	2	0.00000	0.00000	-0.17032	-0.00012	0.00002	0.00000
	3	0.00000	0.00000	-0.00026	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.07664	-0.08057	-0.67981	-0.00066	0.00009	-0.00008
	6	-0.15328	-0.16114	-0.38385	-0.00031	0.00005	-0.00016
	7	0.00000	0.00000	-0.88685	-0.00055	0.00013	0.00000
	8	0.00000	0.00000	-0.94898	-0.00059	0.00014	0.00000
	9	-0.07664	-0.08057	-1.56666	-0.00121	0.00022	-0.00008
	10	-0.15328	-0.16114	-1.33282	-0.00090	0.00019	-0.00016
	11	-0.02299	-0.02417	1.53532	-0.00100	0.00022	-0.00002
	12	-0.04598	-0.04834	-1.44653	-0.00090	0.00021	-0.00005

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
9	1	0.00000	0.00000	-1.74827	0.00106	0.00004	0.00000
	2	0.00000	0.00000	-0.25745	-0.00017	0.00001	0.00000
	3	0.00000	0.00000	-0.00077	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.07664	-0.08579	-1.04153	-0.00094	0.00003	0.00003
	6	-0.15328	-0.17159	-0.58400	-0.00045	0.00001	0.00005
	7	0.00000	0.00000	-1.33860	-0.00084	0.00003	0.00000
	8	0.00000	0.00000	-1.43264	-0.00090	0.00003	0.00000
	9	-0.07664	-0.08579	-2.38013	-0.00177	0.00005	0.00003
	10	-0.15328	-0.17159	-2.01663	-0.00135	0.00004	0.00005
	11	0.02299	-0.02574	2.31895	-0.00151	0.00005	0.00001
	12	-0.04598	-0.05148	-2.18169	-0.00136	0.00005	0.00002
12	1	0.00000	0.00000	-1.87731	-0.00111	-0.00001	0.00000
	2	0.00000	0.00000	-0.27326	-0.00018	0.00000	0.00000
	3	0.00000	0.00000	-0.00419	-0.00001	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	-0.07664	-0.09100	-1.12517	-0.00099	0.00000	-0.00003
	6	-0.15328	-0.18199	-0.62892	-0.00047	0.00000	-0.00006
	7	0.00000	0.00000	-1.43834	-0.00088	-0.00001	0.00000
	8	0.00000	0.00000	-1.53939	-0.00094	-0.00001	0.00000
	9	-0.07664	-0.09100	-2.56351	-0.00187	-0.00001	-0.00003
	10	-0.15328	-0.18199	-2.16831	-0.00142	-0.00001	-0.00006
	11	-0.02299	-0.02730	-2.49232	-0.00159	-0.00001	-0.00001
	12	-0.04598	-0.05460	-2.34345	-0.00143	-0.00001	-0.00002
15	1	0.00000	0.00000	-1.62827	-0.00101	-0.00006	0.00000
	2	0.00000	0.00000	-0.21326	-0.00014	-0.00002	0.00000
	3	0.00000	0.00000	-0.02890	-0.00002	0.00001	0.00000
	4	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	5	-0.07664	-0.07902	-1.01418	-0.00092	-0.00002	0.00010
	6	-0.15328	-0.15803	-0.55649	-0.00044	-0.00002	0.00019
	7	0.00000	0.00000	-1.24910	-0.00080	-0.00005	0.00000
	8	0.00000	0.00000	-1.33730	-0.00087	-0.00005	0.00000
	9	-0.07664	-0.07902	-2.26328	-0.00173	-0.00007	0.00010
	10	-0.15328	-0.15803	-1.89379	-0.00130	-0.00007	0.00019
	11	-0.02299	-0.02371	-2.17471	-0.00146	-0.00008	0.00003
	12	-0.04598	-0.04741	-2.03740	-0.00131	-0.00007	0.00006
18	1	0.00000	0.00000	-1.31818	-0.00087	-0.00005	0.00000
	2	0.00000	0.00000	-0.10750	-0.00008	-0.00002	0.00000
	3	0.00000	0.00000	-0.09079	-0.00007	0.00001	0.00000
	4	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	5	-0.07664	-0.06542	-0.86993	-0.00084	-0.00002	-0.00002
	6	-0.15328	-0.13084	-0.46501	-0.00039	-0.00001	-0.00005
	7	0.00000	0.00000	1.01361	-0.00069	-0.00004	0.00000
	8	0.00000	0.00000	-1.08584	-0.00075	-0.00004	0.00000
	9	-0.07664	-0.06542	-1.88354	-0.00153	-0.00006	-0.00002
	10	-0.15328	-0.13084	-1.55084	0.00114	-0.00005	-0.00005
	11	-0.02299	-0.01963	-1.77751	-0.00127	-0.00006	-0.00001
	12	0.04598	0.03925	-1.65603	-0.00114	-0.00006	-0.00001

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
21	1	0.00000	0.00000	-1.04271	-0.00074	-0.00005	0.00000
	2	0.00000	0.00000	-0.02571	-0.00003	-0.00001	0.00000
	3	0.00000	0.00000	-0.13356	-0.00010	0.00000	0.00000
	4	0.00000	0.00000	-0.00017	0.00000	0.00000	0.00000
	5	-0.07664	-0.06289	-0.72995	-0.00077	-0.00002	0.00001
	6	-0.15328	-0.12578	-0.38098	-0.00035	-0.00001	0.00001
	7	0.00000	0.00000	-0.80458	-0.00060	-0.00004	0.00000
	8	0.00000	0.00000	-0.86263	-0.00064	-0.00004	0.00000
	9	-0.07664	-0.06289	-1.53453	-0.00136	-0.00006	0.00001
	10	-0.15328	0.12578	-1.24360	-0.00099	-0.00005	0.00001
	11	-0.02299	-0.01887	-1.42113	-0.00110	-0.00006	0.00000
	12	-0.04598	-0.03773	-1.31644	-0.00098	-0.00006	0.00000
24	1	0.00000	0.00000	-0.78568	-0.00064	-0.00004	0.00000
	2	0.00000	0.00000	-0.00325	-0.00001	0.00000	0.00000
	3	0.00000	0.00000	-0.11955	-0.00011	0.00000	0.00000
	4	0.00000	0.00000	-0.00044	0.00000	0.00000	0.00000
	5	-0.07664	-0.05489	-0.59956	-0.00071	-0.00002	0.00000
	6	-0.15328	-0.10978	-0.30277	-0.00031	-0.00001	0.00000
	7	0.00000	0.00000	-0.61015	-0.00051	-0.00003	0.00000
	8	0.00000	0.00000	-0.65502	-0.00056	-0.00003	0.00000
	9	-0.07664	-0.05489	-1.20971	-0.00122	-0.00005	0.00000
	10	-0.15328	-0.10978	-0.95779	-0.00087	-0.00004	0.00000
	11	-0.02299	-0.01647	-1.08878	-0.00096	-0.00005	0.00000
	12	-0.04598	-0.03294	-0.99975	-0.00084	-0.00005	0.00000
27	1	0.00000	0.00000	-0.66051	-0.00058	0.00000	0.00000
	2	0.00000	0.00000	-0.00057	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.10310	-0.00010	0.00000	0.00000
	4	0.00000	0.00000	-0.00182	0.00000	0.00000	0.00000
	5	-0.07664	-0.05053	-0.53468	-0.00068	0.00000	0.00000
	6	-0.15328	-0.10105	-0.26421	-0.00030	0.00000	0.00000
	7	0.00000	0.00000	-0.51545	-0.00047	0.00000	0.00000
	8	0.00000	0.00000	-0.55386	-0.00051	0.00000	0.00000
	9	-0.07664	-0.05053	-1.05014	-0.00115	0.00000	0.00000
	10	-0.15328	-0.10105	-0.81807	-0.00080	0.00000	0.00000
	11	-0.02299	-0.01516	-0.92640	-0.00088	0.00000	0.00000
	12	-0.04598	-0.03032	-0.84526	-0.00077	0.00000	0.00000
30	1	0.00000	0.00000	-0.68171	-0.00054	0.00000	0.00000
	2	0.00000	0.00000	-0.00025	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.09747	-0.00009	0.00000	0.00000
	4	0.00000	0.00000	-0.01084	-0.00001	0.00000	0.00000
	5	-0.07664	-0.05469	-0.54682	-0.00066	0.00000	0.00000
	6	-0.15328	-0.10937	-0.27110	-0.00029	0.00000	0.00001
	7	0.00000	0.00000	-0.53160	-0.00044	0.00000	0.00000
	8	0.00000	0.00000	-0.57112	-0.00048	0.00000	0.00000
	9	-0.07664	-0.05469	-1.07842	-0.00110	-0.00001	0.00000
	10	-0.15328	0.10937	-0.84223	-0.00077	-0.00001	0.00001
	11	-0.02299	-0.01641	-0.95432	-0.00084	-0.00001	0.00000
	12	-0.04598	0.03281	-0.87161	-0.00073	-0.00001	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
33	1	0.00000	0.00000	-0.57727	-0.00051	0.00002	0.00000
	2	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.04966	-0.00005	-0.00001	0.00000
	4	0.00000	0.00000	-0.04379	0.00004	0.00001	0.00000
	5	-0.07664	-0.04975	-0.48816	-0.00064	0.00001	0.00001
	6	-0.15328	-0.09951	-0.23755	-0.00028	-0.00001	-0.00003
	7	0.00000	0.00000	-0.45239	-0.00042	-0.00002	0.00000
	8	0.00000	0.00000	-0.48644	-0.00045	0.00002	0.00000
	9	-0.07664	-0.04975	-0.94056	-0.00106	-0.00003	-0.00001
	10	-0.15328	-0.09951	-0.72399	-0.00073	-0.00002	-0.00003
	11	-0.02299	-0.01493	-0.81724	-0.00086	0.00003	0.00000
	12	-0.04598	-0.02985	0.74206	-0.00069	-0.00003	-0.00001
36	1	0.00000	0.00000	-0.46776	-0.00045	-0.00002	0.00000
	2	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00855	-0.00001	0.00000	0.00000
	4	0.00000	0.00000	-0.06883	-0.00007	0.00000	0.00000
	5	-0.07664	-0.04632	-0.42212	-0.00060	-0.00001	0.00001
	6	-0.15328	-0.09263	-0.20085	-0.00025	-0.00001	0.00003
	7	0.00000	0.00000	-0.36883	-0.00037	-0.00001	0.00000
	8	0.00000	0.00000	-0.39700	-0.00040	-0.00001	0.00000
	9	-0.07664	-0.04632	-0.79095	-0.00097	-0.00002	0.00001
	10	-0.15328	-0.09263	-0.59785	-0.00066	-0.00002	0.00003
	11	-0.02299	-0.01389	-0.67179	-0.00071	-0.00002	0.00000
	12	-0.04598	-0.02779	-0.60541	-0.00061	-0.00002	0.00001
39	1	0.00000	0.00000	-0.39635	-0.00039	-0.00001	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00117	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.06503	-0.00007	0.00000	0.00000
	5	-0.07664	-0.04186	-0.36901	-0.00055	-0.00001	0.00001
	6	-0.15328	-0.08372	-0.17367	-0.00023	-0.00001	0.00002
	7	0.00000	0.00000	-0.31321	-0.00032	-0.00001	0.00000
	8	0.00000	0.00000	-0.33731	-0.00035	-0.00001	0.00000
	9	-0.07664	-0.04186	-0.68222	-0.00087	-0.00002	0.00001
	10	-0.15328	-0.08372	-0.51097	-0.00058	-0.00002	0.00002
	11	-0.02299	-0.01256	-0.57326	-0.00063	-0.00002	0.00000
	12	-0.04598	-0.02512	-0.51466	-0.00053	-0.00002	0.00001
42	1	0.00000	0.00000	-0.28768	-0.00029	-0.00004	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00035	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.04773	-0.00006	-0.00001	0.00000
	5	-0.07664	-0.04024	-0.28815	-0.00043	-0.00005	-0.00002
	6	-0.15328	-0.08049	-0.12616	-0.00018	-0.00001	-0.00003
	7	0.00000	0.00000	-0.22710	-0.00024	-0.00003	0.00000
	8	0.00000	0.00000	-0.24460	0.00026	-0.00003	0.00000
	9	-0.07664	-0.04024	-0.49525	-0.00067	-0.00006	-0.00002
	10	-0.15328	-0.08049	-0.37076	-0.00044	-0.00004	-0.00003
	11	-0.02299	-0.01207	-0.41621	-0.00047	-0.00005	0.00000
	12	-0.04598	-0.02415	-0.37361	-0.00040	0.00005	-0.00001

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
45	1	0.00000	0.00000	-0.03460	-0.00011	-0.00008	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00767	-0.00003	-0.00001	0.00000
	5	-0.07664	-0.01274	-0.06814	-0.00025	-0.00005	0.00020
	6	-0.15328	-0.02548	-0.02615	-0.00009	-0.00003	0.00040
	7	0.00000	0.00000	-0.03012	-0.00010	-0.00006	0.00000
	8	0.00000	0.00000	-0.03293	-0.00011	-0.00006	0.00000
	9	-0.07664	-0.01274	-0.09826	-0.00035	-0.00011	0.00020
	10	-0.15328	-0.02548	-0.05908	-0.00020	-0.00009	0.00040
	11	-0.02299	-0.00382	-0.06276	-0.00021	-0.00010	0.00006
	12	-0.04598	-0.00765	-0.05016	-0.00017	-0.00010	0.00012

********** END OF LATEST ANALYSIS RESULT **********

138. FINISH

********** END OF STAAD-III **********

**** DATE= FEB 20,1997 TIME= 13:20:39 ****

****
* 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 *
****

2) ד"ר שלום לוי _____

ד"ר משה כהן

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    FEB 20, 1997        *
*          Time=    13:19:49            *
*                                       *
*****************************************
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```
1. STAAD SPACE FRAME. PUENTE SOBRE EL CINCA. PILAS CON MUELLES CIMENTACION
2. * FICHERO(CINCAPI2) TABLERO NO FISURADO POR TORSION.EFECTO LAZO.
3. UNIT METER MTON
4. JOINT COORDINATES
5. * ALINEACION TABLERO
6.   1    0.000  -4.000  0.000
7.   4   50.000 -23.450  0.000
8.   7  120.000 -23.450  0.000
9.  10  190.000 -24.650  0.000
10. 13  260.000 -23.650  0.000
11. 16  318.000 -22.650  0.000
12. 19  376.000 -21.050  0.000
13. 22  434.000 -18.850  0.000
14. 25  492.000 -17.450  0.000
15. 28  550.000 -18.850  0.000
16. 31  608.000 -16.950  0.000
17. 34  668.000 -15.850  0.000
18. 37  726.000 -15.250  0.000
19. 40  782.000 -14.450  0.000
20. 43  830.000  -4.000  0.000
21.  2    0.000  -3.850  0.000
22.  5   50.000  -3.850  0.000
23.  8  120.000  -3.850  0.000
24. 11  190.000  -3.850  0.000
25. 14  260.000  -3.850  0.000
26. 17  318.000  -3.850  0.000
27. 20  376.000  -3.850  0.000
28. 23  434.000  -3.850  0.000
29. 26  492.000  -3.850  0.000
30. 29  550.000  -3.850  0.000
31. 32  608.000  -3.850  0.000
32. 35  668.000  -3.850  0.000
33. 38  726.000  -3.850  0.000
34. 41  782.000  -3.850  0.000
35. 44  830.000  -3.850  0.000
36.  3    0.000   0.000  0.000
37.  6   50.000   0.000  0.000
38.  9  120.000   0.000  0.000
39. 12  190.000   0.000  0.000
40. 15  260.000   0.000  0.000
41. 18  318.000   0.000  0.000
42. 21  376.000   0.000  0.000
43. 24  434.000   0.000  0.000
44. 27  492.000   0.000  0.000
45. 30  550.000   0.000  0.000
46. 33  608.000   0.000  0.000
47. 36  668.000   0.000  0.000
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```
* FICHERO(CINCAPI2) TABLERO NO FISURADO POR TORSION.EFEC
48.  39  726.000   0.000  0.000
49.  42  782.000   0.000  0.000
50.  45  830.000   0.000  0.000
51. MEMBER INCIDENCES
52.    1    1    2
53. R 14    2    3
54.   2    2    3
55. R 14    2    3
56.  31    3    6
57. R      13    1    3
58. MEMBER PROPERTY
59. * ESTRIBOS (APOYOS)
60.   1 29           PR AX  2.420 IX  12.2500 IY  12.2500 IZ  0.2218
61. * TRAVIESAS
62.   2  4  6  8 10 12 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
63.  14 16 18 20 22 24 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
64.  26 28 30          PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
65. *FUSTES DE PILA
66.   3  5  7  9 11 13 PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
67.  15 17 19 21 23    PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
68.  25 27             PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
69.  *TABLERO
70.  31 TO 44          PR AX 13.280 IX  56.0000 IY 124.6600 IZ 44.1200
71. MEMBER RELEASE
72. 1 3 5 7 9 11 13 15 17 19 21 23 25 27 END FY  MX MZ
73. 29                                   END MX  MZ
74. CONSTANTS
75. E        3350000.   ALL  BUT 1 29
76. E  120000  1  29
77. POISSON   0.2  ALL  BUT 1 29
78. POISSON  299   1  29
79. SUPPORTS
80. 1  43 FIXED BUT KMX 5100000.
81. *1  43 FIXED
82. 4 7 10 13 16 19 22 25 28 31 34 37 40  FIXED BUT KMX 2550000.
83. *4 7 10 13 16 19 22 25 28 31 34 37 40 FIXED
84. LOADING 1 CARGA SOBRE SECCION EN ESTRIBO
85. JOINT LOAD
86. 3 FZ  -20.
87. 3 MX  -35.6
88. LOADING 2 CARGA SECCION EN PILA 1
89. JOINT LOAD
90. 6 FZ  -20.
91. 6 MX  -35.6
92. LOADING 3 CARGA SECCION EN PILA 2
93. JOINT LOAD
94. 9 FZ  -20.
95. 9 MX  -35.6
96. LOADING 4 CARGA SECCION EN PILA 3
97. JOINT LOAD
98. 12 FZ  -20.
99. 12 MX  -35.6
100. LOADING 5 CARGA SECCION EN PILA 4
101. JOINT LOAD
102. 15 FZ  -20.
103. 15 MX  -35.6
104. LOADING 6 CARGA SECCION EN PILA 5
105. JOINT LOAD
106. 18 FZ  -20.
107. 18 MX  -35.6
```

108. LOADING 7 CARGA SECCION EN PILA 6
109. JOINT LOAD
110. 21 FZ -20.
111. 21 MX -35.6
112. LOADING 8 CARGA SECCION EN PILA 7
113. JOINT LOAD
114. 24 FZ -20.
115. 24 MX -35.6
116. LOADING 9 CARGA SECCION EN PILA 8
117. JOINT LOAD
118. 27 FZ -20
119. 27 MX -35.6
120. LOADING 10 CARGA SECCION EN PILA 9
121. JOINT LOAD
122. 30 FZ -20.
123. 30 MX -35.6
124. LOADING 11 CARGA SECCION EN PILA 10
125. JOINT LOAD
126. 33 FZ -20.
127. 33 MX -35.6
128. LOADING 12 CARGA SECCION EN PILA 11
129. JOINT LOAD
130. 36 FZ -20.
131. 36 MX -35.6
132. LOADING 13 CARGA SECCION EN PILA 12
133. JOINT LOAD
134. 39 FZ -20.
135. 39 MX -35.6
136. LOADING 14 CARGA SECCION EN PILA 13
137. JOINT LOAD
138. 42 FZ -20.
139. 42 MX -35.6
140. LOADING 15 CARGA SECCION EN ESTRIBO 2
141. JOINT LOAD
142. 45 FZ -20.
143. 45 MX -35.6
144. 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 = 45/ 44/ 15
ORIGINAL/FINAL BAND-WIDTH = 15/ 3
TOTAL PRIMARY LOAD CASES = 15, TOTAL DEGREES OF FREEDOM = 195
SIZE OF STIFFNESS MATRIX = 3705 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.16 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 13:19:53
++ PROCESSING GLOBAL STIFFNESS MATRIX. 13:19:53
++ PROCESSING TRIANGULAR FACTORIZATION. 13:19:53
++ CALCULATING JOINT DISPLACEMENTS. 13:19:54
++ CALCULATING MEMBER FORCES. 13:19:54

145. LOAD LIST ALL
146. PRINT REAC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	0.00	20.10	97.03	0.00	0.00
	2	0.00	0.00	4.45	62.90	0.00	0.00
	3	0.00	0.00	1.15	23.87	0.00	0.00
	4	0.00	0.00	-0.39	5.59	0.00	0.00
	5	0.00	0.00	-0.03	1.10	0.00	0.00
	6	0.00	0.00	0.00	0.30	0.00	0.00
	7	0.00	0.00	0.00	0.08	0.00	0.00
	8	0.00	0.00	0.00	0.02	0.00	0.00
	9	0.00	0.00	0.00	0.00	0.00	0.00
	10	0.00	0.00	0.00	0.00	0.00	0.00
	11	0.00	0.00	0.00	0.00	0.00	0.00
	12	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
43	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00
	8	0.00	0.00	0.00	0.01	0.00	0.00
	9	0.00	0.00	0.00	0.05	0.00	0.00
	10	0.00	0.00	0.00	0.18	0.00	0.00
	11	0.00	0.00	0.01	0.60	0.00	0.00
	12	0.00	0.00	-0.11	2.29	0.00	0.00
	13	0.00	0.00	-1.05	9.84	0.00	0.00
	14	0.00	0.00	2.22	37.51	0.00	0.00
	15	0.00	0.00	19.98	95.02	0.00	0.00
4	1	0.00	0.00	-0.21	9.46	0.00	0.00
	2	0.00	0.00	11.53	239.31	0.00	0.00
	3	0.00	0.00	4.35	106.95	0.00	0.00
	4	0.00	0.00	-0.37	7.48	0.00	0.00
	5	0.00	0.00	-0.25	-1.18	0.00	0.00
	6	0.00	0.00	-0.03	0.10	0.00	0.00
	7	0.00	0.00	0.00	0.19	0.00	0.00
	8	0.00	0.00	0.00	0.05	0.00	0.00
	9	0.00	0.00	0.00	0.00	0.00	0.00
	10	0.00	0.00	0.00	0.00	0.00	0.00
	11	0.00	0.00	0.00	0.00	0.00	0.00
	12	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
7	1	0.00		0.13	5.95	0.00	0.00
	2	0.00		4.60	109.15	0.00	0.00
	3	0.00		13.57	288.74	0.00	0.00
	4	0.00		4.49	113.74	0.00	0.00
	5	0.00		-0.23	9.96	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
	6	0.00	0.00	-0.22	0.30	0.00	0.00
	7	0.00	0.00	-0.05	0.06	0.00	0.00
	8	0.00	0.00	0.00	0.15	0.00	0.00
	9	0.00	0.00	0.00	0.02	0.00	0.00
	10	0.00	0.00	0.00	0.01	0.00	0.00
	11	0.00	0.00	0.00	0.00	0.00	0.00
	12	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
10	1	0.00	0.00	-0.01	0.95	0.00	0.00
	2	0.00	0.00	-0.33	6.84	0.00	0.00
	3	0.00	0.00	3.77	102.69	0.00	0.00
	4	0.00	0.00	12.57	280.99	0.00	0.00
	5	0.00	0.00	3.87	102.85	0.00	0.00
	6	0.00	0.00	-0.19	10.46	0.00	0.00
	7	0.00	0.00	-0.26	-1.37	0.00	0.00
	8	0.00	0.00	-0.04	-0.10	0.00	0.00
	9	0.00	0.00	0.00	0.14	0.00	0.00
	10	0.00	0.00	0.00	0.04	0.00	0.00
	11	0.00	0.00	0.00	0.00	0.00	0.00
	12	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
13	1	0.00	0.00	-0.01	0.13	0.00	0.00
	2	0.00	0.00	-0.23	-0.97	0.00	0.00
	3	0.00	0.00	-0.23	9.73	0.00	0.00
	4	0.00	0.00	4.42	111.52	0.00	0.00
	5	0.00	0.00	12.38	266.84	0.00	0.00
	6	0.00	0.00	4.34	109.08	0.00	0.00
	7	0.00	0.00	-0.13	11.67	0.00	0.00
	8	0.00	0.00	-0.21	-0.67	0.00	0.00
	9	0.00	0.00	-0.02	0.17	0.00	0.00
	10	0.00	0.00	0.00	0.19	0.00	0.00
	11	0.00	0.00	0.00	0.04	0.00	0.00
	12	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
16	1	0.00	0.00	0.00	0.04	0.00	0.00
	2	0.00	0.00	-0.03	0.18	0.00	0.00
	3	0.00	0.00	-0.25	0.42	0.00	0.00
	4	0.00	0.00	-0.25	12.00	0.00	0.00
	5	0.00	0.00	4.90	117.97	0.00	0.00
	6	0.00	0.00	11.89	267.13	0.00	0.00
	7	0.00	0.00	4.00	96.73	0.00	0.00
	8	0.00	0.00	-0.20	8.00	0.00	0.00
	9	0.00	0.00	0.17	0.51	0.00	0.00
	10	0.00	0.00	-0.01	0.32	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
	11	0.00	0.00	0.00	0.16	0.00	0.00
	12	0.00	0.00	0.00	0.02	0.00	0.00
	13	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
19	1	0.00	0.00	0.00	0.01	0.00	0.00
	2	0.00	0.00	0.00	0.22	0.00	0.00
	3	0.00	0.00	-0.06	-0.03	0.00	0.00
	4	0.00	0.00	-0.40	-1.86	0.00	0.00
	5	0.00	0.00	-0.17	14.25	0.00	0.00
	6	0.00	0.00	4.94	110.70	0.00	0.00
	7	0.00	0.00	12.43	240.67	0.00	0.00
	8	0.00	0.00	3.53	82.44	0.00	0.00
	9	0.00	0.00	-0.40	3.62	0.00	0.00
	10	0.00	0.00	-0.18	-0.70	0.00	0.00
	11	0.00	0.00	-0.01	0.27	0.00	0.00
	12	0.00	0.00	0.00	0.11	0.00	0.00
	13	0.00	0.00	0.00	0.01	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
22	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.06	0.00	0.00
	3	0.00	0.00	0.00	0.20	0.00	0.00
	4	0.00	0.00	-0.07	-0.15	0.00	0.00
	5	0.00	0.00	-0.42	-1.27	0.00	0.00
	6	0.00	0.00	-0.32	10.92	0.00	0.00
	7	0.00	0.00	4.92	101.30	0.00	0.00
	8	0.00	0.00	13.51	235.73	0.00	0.00
	9	0.00	0.00	3.39	74.19	0.00	0.00
	10	0.00	0.00	-0.68	0.90	0.00	0.00
	11	0.00	0.00	-0.20	-0.45	0.00	0.00
	12	0.00	0.00	0.00	0.37	0.00	0.00
	13	0.00	0.00	0.00	0.09	0.00	0.00
	14	0.00	0.00	0.00	0.01	0.00	0.00
	15	0.00	0.00	0.00	0.00	0.00	0.00
25	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.01	0.00	0.00
	3	0.00	0.00	0.00	0.07	0.00	0.00
	4	0.00	0.00	0.01	0.28	0.00	0.00
	5	0.00	0.00	-0.06	0.17	0.00	0.00
	6	0.00	0.00	-0.39	-1.26	0.00	0.00
	7	0.00	0.00	-0.65	4.91	0.00	0.00
	8	0.00	0.00	4.31	85.76	0.00	0.00
	9	0.00	0.00	14.40	234.00	0.00	0.00
	10	0.00	0.00	4.42	86.12	0.00	0.00
	11	0.00	0.00	-0.30	6.20	0.00	0.00
	12	0.00	0.00	-0.12	0.22	0.00	0.00
	13	0.00	0.00	0.01	0.43	0.00	0.00
	14	0.00	0.00	0.00	0.11	0.00	0.00
	15	0.00	0.00	0.00	0.01	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
28	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.01	0.00	0.00
	4	0.00	0.00	0.00	0.06	0.00	0.00
	5	0.00	0.00	0.00	0.27	0.00	0.00
	6	0.00	0.00	0.03	0.32	0.00	0.00
	7	0.00	0.00	-0.28	-1.16	0.00	0.00
	8	0.00	0.00	-0.71	0.71	0.00	0.00
	9	0.00	0.00	3.35	73.56	0.00	0.00
	10	0.00	0.00	12.84	224.51	0.00	0.00
	11	0.00	0.00	3.20	70.42	0.00	0.00
	12	0.00	0.00	-0.49	1.21	0.00	0.00
	13	0.00	0.00	-0.09	0.28	0.00	0.00
	14	0.00	0.00	0.00	0.37	0.00	0.00
	15	0.00	0.00	0.00	0.05	0.00	0.00
31	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.01	0.00	0.00
	5	0.00	0.00	0.00	0.08	0.00	0.00
	6	0.00	0.00	0.01	0.27	0.00	0.00
	7	0.00	0.00	-0.01	0.48	0.00	0.00
	8	0.00	0.00	-0.19	-0.11	0.00	0.00
	9	0.00	0.00	0.34	6.39	0.00	0.00
	10	0.00	0.00	4.52	86.31	0.00	0.00
	11	0.00	0.00	14.45	228.67	0.00	0.00
	12	0.00	0.00	3.07	62.88	0.00	0.00
	13	0.00	0.00	-0.56	0.50	0.00	0.00
	14	0.00	0.00	-0.08	0.40	0.00	0.00
	15	0.00	0.00	-0.01	0.16	0.00	0.00
34	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.01	0.00	0.00
	6	0.00	0.00	0.00	0.04	0.00	0.00
	7	0.00	0.00	0.00	0.21	0.00	0.00
	8	0.00	0.00	0.01	0.54	0.00	0.00
	9	0.00	0.00	0.22	0.14	0.00	0.00
	10	0.00	0.00	-0.77	1.52	0.00	0.00
	11	0.00	0.00	3.71	70.69	0.00	0.00
	12	0.00	0.00	14.87	221.43	0.00	0.00
	13	0.00	0.00	3.14	60.93	0.00	0.00
	14	0.00	0.00	0.56	0.86	0.00	0.00
	15	0.00	0.00	-0.03	0.72	0.00	0.00
37	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	6	0.00	0.00	0.00	0.01	0.00	0.00
	7	0.00	0.00	0.00	0.03	0.00	0.00
	8	0.00	0.00	0.00	0.14	0.00	0.00
	9	0.00	0.00	0.00	0.49	0.00	0.00
	10	0.00	0.00	0.00	0.16	0.00	0.00
	11	0.00	0.00	-0.76	0.37	0.00	0.00
	12	0.00	0.00	3.48	65.06	0.00	0.00
	13	0.00	0.00	14.79	212.71	0.00	0.00
	14	0.00	0.00	3.27	59.63	0.00	0.00
	15	0.00	0.00	0.06	4.58	0.00	0.00
40	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.01	0.00	0.00
	8	0.00	0.00	0.00	0.02	0.00	0.00
	9	0.00	0.00	0.00	0.15	0.00	0.00
	10	0.00	0.00	0.01	0.59	0.00	0.00
	11	0.00	0.00	-0.11	0.55	0.00	0.00
	12	0.00	0.00	-0.70	0.88	0.00	0.00
	13	0.00	0.00	3.77	65.21	0.00	0.00
	14	0.00	0.00	15.15	204.27	0.00	0.00
	15	0.00	0.00	0.00	15.30	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

147. PRI FOR ENV NS 2 LIST 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 TO 44

MEMBER FORCE ENVELOPE

ALL UNITS ARE MTON METE

MEMB	DISTANCE		FY	LD	MZ	LD	FZ	LD	MY	LD
1	0.00	MAX.	0.00	15	0.00	15	20.10	1	0.00	15
		MIN.	0.00	15	0.00	15	-1.15	3	-97.03	1
	0.08	MAX.	0.00	15	0.00	15	20.10	1	0.00	15
		MIN.	0.00	15	0.00	15	-1.15	3	-95.53	1
	0.15	MAX.	0.00	15	0.00	15	20.10	1	0.00	15
		MIN.	0.00	15	0.00	15	-1.15	3	-94.02	1

MAX/MIN FORCES FOR MEMBER				1,AMONGST ALL SECT LOCATIONS					
	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	20.10	0.00	1	0.00	0.00	15	0.00	0.00	1
MIN.	0.00	0.15	15	0.00	0.15	15			
	-1.15	0.15	3	-97.03	0.00	1	0.00	0.15	15

3	0.00	MAX.	0.00	15	0.00	15	11.53	2	1.18	5
		MIN.	0.00	15	0.00	15	-0.37	4	-239.31	2
	9.80	MAX.	0.00	15	0.00	15	11.53	2	0.00	15
		MIN.	0.00	15	0.00	15	-0.37	4	-126.31	2
	19.60	MAX.	0.00	15	0.00	15	11.53	2	0.00	15
		MIN.	0.00	15	0.00	15	-0.37	4	-21.69	3

MAX/MIN FORCES FOR MEMBER				3,AMONGST ALL SECT LOCATIONS					
	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	11.53	0.00	2	1.18	0.00	5	0.00	0.00	1
MIN.	0.00	19.60	15	0.00	19.60	15			
	-0.37	19.60	4	-239.31	0.00	2	0.00	19.60	15

5	0.00	MAX.	0.00	15	0.00	15	13.57	3	0.30	6
		MIN.	0.00	15	0.00	15	0.23	5	-288.74	3
	9.80	MAX.	0.00	15	0.00	15	13.57	3	0.00	15
		MIN.	0.00	15	0.00	15	-0.23	5	-155.73	3
	19.60	MAX.	0.00	15	0.00	15	13.57	3	0.00	15
		MIN.	0.00	15	0.00	15	-0.23	5	-25.74	4

MAX/MIN FORCES FOR MEMBER				5,AMONGST ALL SECT LOCATIONS					
	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	13.57	0.00	3	0.30	0.00	6	0.00	0.00	1
MIN.	0.00	19.60	15	0.00	19.60	15			
	-0.23	19.60	5	-288.74	0.00	3	0.00	19.60	15

7	0.00	MAX.	0.00	15	0.00	15	12.57	4	1.37	7
		MIN.	0.00	15	0.00	15	-0.33	2	-280.99	4
	10.40	MAX.	0.00	15	0.00	15	12.57	4	0.00	15
		MIN.	0.00	15	0.00	15	-0.33	2	-150.27	4
	20.80	MAX.	0.00	15	0.00	15	12.57	4	0.00	15
		MIN.	0.00	15	0.00	15	-0.33	2	-24.20	3

MAX/MIN FORCES FOR MEMBER				7,AMONGST ALL SECT LOCATIONS					
	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	12.57	0.00	4	1.37	0.00	7	0.00	0.00	1
MIN.	0.00	20.80	15	0.00	20.80	15			
	-0.33	20.80	2	-280.99	0.00	4	0.00	20.80	15

9	0.00	MAX.	0.00	15	0.00	15	12.38	5	0.97	2
		MIN.	0.00	15	0.00	15	-0.23	3	-266.84	5
	9.90	MAX.	0.00	15	0.00	15	12.38	5	0.00	15
		MIN.	0.00	15	0.00	15	-0.23	3	-144.26	5
	19.80	MAX.	0.00	15	0.00	15	12.38	5	0.00	15
		MIN.	0.00	15	0.00	15	-0.23	3	-23.96	4

MAX/MIN FORCES FOR MEMBER				9,AMONGST ALL SECT LOCATIONS					
	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	12.38	0.00	5	0.97	0.00	2	0.00	0.00	1
MIN.	0.00	19.80	15	0.00	19.80	15			
	-0.23	19.80	3	-266.84	0.00	5	0.00	19.80	15

11	0.00	MAX.	0.00	15	0.00	15	11.89	6	0.51	9
		MIN.	0.00	15	0.00	15	-0.25	3	-247.13	6
	9.40	MAX.	0.00	15	0.00	15	11.89	6	0.00	15
		MIN.	0.00	15	0.00	15	-0.25	3	-135.36	6
	18.80	MAX.	0.00	15	0.00	15	11.89	6	0.00	15

		MIN.	0.00	15	0.00	15	-0.25	3	-25.80	5

MAX/MIN FORCES FOR MEMBER 11,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	11.89	0.00	6	0.51	0.00	9	0.00	0.00	1
MIN.	0.00	18.80	15	0.00	18.80	15			
	-0.25	18.80	3	-247.13	0.00	6	0.00	18.80	15

13	0.00	MAX.	0.00	15	0.00	15	12.43	7	1.86	4
		MIN.	0.00	15	0.00	15	0.40	4	-240.67	7
	8.60	MAX.	0.00	15	0.00	15	12.43	7	0.00	15
		MIN.	0.00	15	0.00	15	-0.40	4	-153.77	7
	17.20	MAX.	0.00	15	0.00	15	12.43	7	0.00	15
		MIN.	0.00	15	0.00	15	-0.40	4	-26.87	7

MAX/MIN FORCES FOR MEMBER 13,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	12.43	0.00	7	1.86	0.00	4	0.00	0.00	1
MIN.	0.00	17.20	15	0.00	17.20	15			
	-0.40	17.20	4	-240.67	0.00	7	0.00	17.20	15

15	0.00	MAX.	0.00	15	0.00	15	13.51	8	1.27	5
		MIN.	0.00	15	0.00	15	-0.68	10	-235.73	8
	7.50	MAX.	0.00	15	0.00	15	13.51	8	0.00	15
		MIN.	0.00	15	0.00	15	-0.68	10	-134.45	8
	15.00	MAX.	0.00	15	0.00	15	13.51	8	0.00	15
		MIN.	0.00	15	0.00	15	-0.68	10	-33.16	8

MAX/MIN FORCES FOR MEMBER 15,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	13.51	0.00	8	1.27	0.00	5	0.00	0.00	1
MIN.	0.00	15.00	15	0.00	15.00	15			
	-0.68	15.00	10	-235.73	0.00	8	0.00	15.00	15

17	0.00	MAX.	0.00	15	0.00	15	14.40	9	1.26	6
		MIN.	0.00	15	0.00	15	-0.65	7	-234.00	9
	6.80	MAX.	0.00	15	0.00	15	14.40	9	0.00	1
		MIN.	0.00	15	0.00	15	-0.65	7	-136.06	9

	13.60	MAX.	0.00	15	0.00	15	14.40	9	0.00	1
		MIN.	0.00	15	0.00	15	-0.65	7	-38.13	9

MAX/MIN FORCES FOR MEMBER 17,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	14.40	0.00	9	1.26	0.00	6	0.00	0.00	1
MIN.	0.00	13.60	15	0.00	13.60	15			
	-0.65	13.60	7	-234.00	0.00	9	0.00	13.60	15

19	0.00	MAX.	0.00	15	0.00	15	12.84	10	1.16	7
		MIN.	0.00	15	0.00	15	-0.71	8	-224.51	10
	7.50	MAX.	0.00	15	0.00	15	12.84	10	0.00	1
		MIN.	0.00	15	0.00	15	-0.71	8	-128.20	10
	15.00	MAX.	0.00	15	0.00	15	12.84	10	0.00	1
		MIN.	0.00	15	0.00	15	-0.71	8	-31.90	10

MAX/MIN FORCES FOR MEMBER 19,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	12.84	0.00	10	1.16	0.00	7	0.00	0.00	1
MIN.	0.00	15.00	15	0.00	15.00	15			
	-0.71	15.00	8	-224.51	0.00	10	0.00	15.00	15

21	0.00	MAX.	0.00	15	0.00	15	14.45	11	0.11	8
		MIN.	0.00	15	0.00	15	-0.56	13	-228.67	11
	6.55	MAX.	0.00	15	0.00	15	14.45	11	0.00	1
		MIN.	0.00	15	0.00	15	-0.56	13	-134.00	11
	13.10	MAX.	0.00	15	0.00	15	14.45	11	0.00	1
		MIN.	0.00	15	0.00	15	-0.56	13	-39.33	11

MAX/MIN FORCES FOR MEMBER 21,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	14.45	0.00	11	0.11	0.00	8	0.00	0.00	1
MIN.	0.00	13.10	15	0.00	13.10	15			
	-0.56	13.10	13	-228.67	0.00	11	0.00	13.10	15

23	0.00	MAX.	0.00	15	0.00	15	14.87	12	0.14	9
		MIN.	0.00	15	0.00	15	-0.77	10	-221.43	12
		MAX.	0.00	15	0.00	15	14.87	12	0.00	1

* FICHERO(CINCAPI2) TABLERO NO FISURADO POR TORSION.EFEC

	MIN.	0.00	15	0.00	15	-0.77	10	-132.20	12
12.00	MAX.	0.00	15	0.00	15	14.87	12	0.00	1
	MIN.	0.00	15	0.00	15	-0.77	10	-42.98	12

MAX/MIN FORCES FOR MEMBER 25,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	14.87 0.00 12	0.00 0.00 9	0.00	0.00 1
MIN.	0.00 12.00 15	0.00 12.00 15		
	-0.77 12.00 10	-221.43 0.00 12	0.00	12.00 15

25	0.00	MAX.	0.00	15	0.00	15	14.79	13	0.00	1
		MIN.	0.00	15	0.00	15	-0.76	11	-212.71	13
	5.70	MAX.	0.00	15	0.00	15	14.79	13	0.00	1
		MIN.	0.00	15	0.00	15	-0.76	11	-128.43	13
	11.40	MAX.	0.00	15	0.00	15	14.79	13	0.00	1
		MIN.	0.00	15	0.00	15	-0.76	11	-44.16	13

MAX/MIN FORCES FOR MEMBER 25,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	14.79 0.00 13	0.00 0.00 1	0.00	0.00 1
MIN.	0.00 11.40 15	0.00 11.40 15		
	-0.76 11.40 11	-212.71 0.00 13	0.00	11.40 15

27	0.00	MAX.	0.00	15	0.00	15	15.15	14	0.00	1
		MIN.	0.00	15	0.00	15	-0.70	12	-204.27	14
	5.30	MAX.	0.00	15	0.00	15	15.15	14	0.00	1
		MIN.	0.00	15	0.00	15	-0.70	12	-123.97	14
	10.60	MAX.	0.00	15	0.00	15	15.15	14	0.00	1
		MIN.	0.00	15	0.00	15	-0.70	12	-43.68	14

MAX/MIN FORCES FOR MEMBER 27,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	15.15 0.00 14	0.00 0.00 1	0.00	0.00 1
MIN.	0.00 10.60 15	0.00 10.60 15		
	-0.70 10.60 12	-204.27 0.00 14	0.00	10.60 15

29	0.00	MAX.	0.00	15	0.00	15	19.98	15	0.00	1
		MIN.	0.00	15	0.00	15	-1.05	13	-95.02	15

* FICHERO(CINCAPI2) TABLERO NO FISURADO POR TORSION.EFEC

0.08	MAX.	0.00	15	0.00	15	19.98	15	0.00	1
	MIN.	0.00	15	0.00	15	-1.05	13	-93.52	15
0.15	MAX.	0.00	15	0.00	15	19.98	15	0.00	1
	MIN.	0.00	15	0.00	15	-1.05	13	-92.02	15

MAX/MIN FORCES FOR MEMBER 29,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	19.98 0.00 15	0.00 0.00 1	0.00	0.00 1
MIN.	0.00 0.15 15	0.00 0.15 15		
	-1.05 0.15 13	-95.02 0.00 15	0.00	0.15 15

31	0.00	MAX.	0.00	15	0.00	15	4.45	2	0.00	2
		MIN.	0.00	15	0.00	15	-1.15	3	0.00	3
	25.00	MAX.	0.00	15	0.00	15	4.45	2	111.16	2
		MIN.	0.00	15	0.00	15	-1.15	3	-28.76	3
	50.00	MAX.	0.00	15	0.00	15	4.45	2	222.31	2
		MIN.	0.00	15	0.00	15	-1.15	3	-57.52	3

MAX/MIN FORCES FOR MEMBER 31,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	4.45 0.00 2	222.31 50.00 2	0.00	0.00 1
MIN.	0.00 50.00 15	0.00 50.00 15		
	-1.15 50.00 3	-57.52 50.00 3	0.00	50.00 15

32	0.00	MAX.	0.00	15	0.00	15	3.20	3	222.31	2
		MIN.	0.00	15	0.00	15	-4.02	2	-57.52	3
	35.00	MAX.	0.00	15	0.00	15	3.20	3	81.49	2
		MIN.	0.00	15	0.00	15	-4.02	2	-46.47	4
	70.00	MAX.	0.00	15	0.00	15	3.20	3	166.43	3
		MIN.	0.00	15	0.00	15	-4.02	2	-73.27	4

MAX/MIN FORCES FOR MEMBER 32,AMONGST ALL SECT LOCATIONS

	FY/ DIST LD	MZ/ DIST LD		
	FZ DIST LD	MY DIST LD	FX	DIST LD
MAX.	0.00 0.00 1	0.00 0.00 1		
	3.20 0.00 3	222.31 0.00 2	0.00	0.00 1
MIN.	0.00 70.00 15	0.00 70.00 15		
	-4.02 70.00 2	-73.27 70.00 4	0.00	70.00 15

33	0.00	MAX.	0.00	15	0.00	15	3.22	3	166.43	3

		MIN.	0.00	15	0.00	15	-3.23	3	-73.27	4
	35.00	MAX.	0.00	15	0.00	15	3.72	4	57.07	4
		MIN.	0.00	15	0.00	15	-3.23	3	-39.10	2
	70.00	MAX.	0.00	15	0.00	15	3.72	4	187.41	4
		MIN.	0.00	15	0.00	15	-3.23	3	-59.57	3

MAX/MIN FORCES FOR MEMBER 33,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX	0.00	0.00	1	0.00	0.00	1			
	3.72	0.00	4	187.41	70.00	4	0.00	0.00	1
MIN.	0.00	70.00	15	0.00	70.00	15			
	-3.23	70.00	3	-73.27	0.00	4	0.00	70.00	15

34	0.00	MAX.	0.00	15	0.00	15	3.36	5	187.41	4
		MIN.	0.00	15	0.00	15	-3.71	4	-59.57	3
	35.00	MAX.	0.00	15	0.00	15	3.36	5	60.90	5
		MIN.	0.00	15	0.00	15	-3.71	4	-40.49	3
	70.00	MAX.	0.00	15	0.00	15	3.36	5	178.65	5
		MIN.	0.00	15	0.00	15	-3.71	4	-72.02	4

MAX/MIN FORCES FOR MEMBER 34,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	3.36	0.00	5	187.41	0.00	4	0.00	0.00	1
MIN.	0.00	70.00	15	0.00	70.00	15			
	-3.71	70.00	4	-72.02	70.00	4	0.00	70.00	15

35	0.00	MAX.	0.00	15	0.00	15	3.91	6	178.65	5
		MIN.	0.00	15	0.00	15	-4.25	5	-72.02	4
	29.00	MAX.	0.00	15	0.00	15	3.91	6	62.78	6
		MIN.	0.00	15	0.00	15	-4.25	5	-51.26	4
	58.00	MAX.	0.00	15	0.00	15	3.91	6	176.03	6
		MIN.	0.00	15	0.00	15	-4.25	5	-68.06	5

MAX/MIN FORCES FOR MEMBER 35,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	3.91	0.00	6	178.65	0.00	5	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-4.25	58.00	5	-72.02	0.00	4	0.00	58.00	15

36	0.00	MAX.	0.00	15	0.00	15	3.58	7	176.03	6
		MIN.	0.00	15	0.00	15	-4.20	6	-68.06	5
	29.00	MAX.	0.00	15	0.00	15	3.58	7	57.15	7
		MIN.	0.00	15	0.00	15	-4.20	6	-49.24	5
	58.00	MAX.	0.00	15	0.00	15	3.58	7	160.90	7
		MIN.	0.00	15	0.00	15	-4.20	6	-67.85	6

MAX/MIN FORCES FOR MEMBER 36,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	3.58	0.00	7	176.03	0.00	6	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-4.20	58.00	6	-68.06	0.00	5	0.00	58.00	15

37	0.00	MAX.	0.00	15	0.00	15	3.08	8	160.90	7
		MIN.	0.00	15	0.00	15	-3.99	7	-67.85	6
	29.00	MAX.	0.00	15	0.00	15	3.08	8	46.36	8
		MIN.	0.00	15	0.00	15	-3.99	7	-46.46	6
	58.00	MAX.	0.00	15	0.00	15	3.08	8	135.61	8
		MIN.	0.00	15	0.00	15	-3.99	7	-70.68	7

MAX/MIN FORCES FOR MEMBER 37,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	3.08	0.00	8	160.90	0.00	7	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-3.99	58.00	7	-70.68	58.00	7	0.00	58.00	15

38	0.00	MAX.	0.00	15	0.00	15	2.80	9	135.61	8
		MIN.	0.00	15	0.00	15	-3.42	8	-70.68	7
	29.00	MAX.	0.00	15	0.00	15	2.80	9	36.50	8
		MIN.	0.00	15	0.00	15	-3.42	8	-43.65	7
	58.00	MAX.	0.00	15	0.00	15	2.80	9	116.99	9
		MIN.	0.00	15	0.00	15	-3.42	8	-62.61	8

MAX/MIN FORCES FOR MEMBER 38,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD

MAX.		0.00	0.00	1	0.00	0.00	1			
		2.80	0.00	9	135.61	0.00	8	0.00	0.00	1
MIN.		0.00	58.00	15	0.00	58.00	15			
		-3.42	58.00	8	-70.68	0.00	7	0.00	58.00	15

39	0.00	MAX.	0.00	15	0.00	15	3.56	10	116.99	9
		MIN.	0.00	15	0.00	15	-2.79	9	-62.61	8
	29.00	MAX.	0.00	15	0.00	15	3.56	10	42.13	10
		MIN.	0.00	15	0.00	15	-2.79	9	36.63	8
	58.00	MAX.	0.00	15	0.00	15	3.56	10	145.26	10
		MIN.	0.00	15	0.00	15	-2.79	9	-45.09	9

MAX/MIN FORCES FOR MEMBER 39,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	3.56	0.00	10	145.26	58.00	10	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-2.79	58.00	9	-62.61	0.00	8	0.00	58.00	15

40	0.00	MAX.	0.00	15	0.00	15	2.70	11	145.26	10
		MIN.	0.00	15	0.00	15	-3.60	10	45.09	9
	29.00	MAX.	0.00	15	0.00	15	2.70	11	40.78	10
		MIN.	0.00	15	0.00	15	-3.60	10	-29.03	9
	58.00	MAX.	0.00	15	0.00	15	2.70	11	114.98	11
		MIN.	0.00	15	0.00	15	-3.60	10	-63.70	10

MAX/MIN FORCES FOR MEMBER 40,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	2.70	0.00	11	145.26	0.00	10	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-3.60	58.00	10	-63.70	58.00	10	0.00	58.00	15

41	0.00	MAX.	0.00	15	0.00	15	2.46	12	114.98	11
		MIN	0.00	15	0.00	15	-2.85	11	-63.70	10
	30.00	MAX.	0.00	15	0.00	15	2.46	12	30.69	12
		MIN.	0.00	15	0.00	15	-2.85	11	-36.08	10
	60.00	MAX.	0.00	15	0.00	15	2.46	12	104.37	12
		MIN.	0.00	15	0.00	15	-2.85	11	-55.81	11

MAX/MIN FORCES FOR MEMBER 41,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	2.46	0.00	12	114.98	0.00	11	0.00	0.00	1
MIN.	0.00	60.00	15	0.00	60.00	15			
	2.85	60.00	11	-63.70	0.00	10	0.00	60.00	15

42	0.00	MAX.	0.00	15	0.00	15	2.50	13	104.37	12
		MIN	0.00	15	0.00	15	-2.67	12	-55.81	11
	29.00	MAX.	0.00	15	0.00	15	2.50	13	29.38	13
		MIN.	0.00	15	0.00	15	-2.67	12	-30.73	11
	58.00	MAX.	0.00	15	0.00	15	2.50	13	101.80	13
		MIN.	0.00	15	0.00	15	-2.67	12	-50.66	12

MAX/MIN FORCES FOR MEMBER 42,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	2.50	0.00	13	104.37	0.00	12	0.00	0.00	1
MIN.	0.00	58.00	15	0.00	58.00	15			
	-2.67	58.00	12	-55.81	0.00	11	0.00	58.00	15

43	0.00	MAX.	0.00	15	0.00	15	2.63	14	101.80	13
		MIN.	0.00	15	0.00	15	-2.72	13	-50.66	12
	28.00	MAX.	0.00	15	0.00	15	2.63	14	32.55	14
		MIN.	0.00	15	0.00	15	-2.72	13	-27.93	12
	56.00	MAX.	0.00	15	0.00	15	2.63	14	106.33	14
		MIN.	0.00	15	0.00	15	-2.72	13	-50.38	13

MAX/MIN FORCES FOR MEMBER 43,AMONGST ALL SECT LOCATIONS

	FY/ FZ	DIST	LD	MZ/ MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	2.63	0.00	14	106.33	56.00	14	0.00	0.00	1
MIN.	0.00	56.00	15	0.00	56.00	15			
	-2.72	56.00	13	-50.66	0.00	12	0.00	56.00	15

44	0.00	MAX	0.00	15	0.00	15	1.05	13	106.33	14
		MIN.	0.00	15	0.00	15	-2.22	14	-50.38	13
	24.00	MAX.	0.00	15	0.00	15	1.05	13	53.16	14
		MIN.	0.00	15	0.00	15	-2.22	14	-25.19	13
	48.00	MAX.	0.00	15	0.00	15	1.05	13	0.00	13

	MIN.	0.00	15	0.00	15	-2.22	14	0.00	14

MAX/MIN FORCES FOR MEMBER 44, AMONGST ALL SECT LOCATIONS

	FY/	DIST	LD	MZ/	DIST	LD			
	FZ	DIST	LD	MY	DIST	LD	FX	DIST	LD
MAX.	0.00	0.00	1	0.00	0.00	1			
	1.05	0.00	13	106.35	0.00	14	0.00	0.00	1
MIN.	0.00	48.00	15	0.00	48.00	15			
	2.22	48.00	14	-50.38	0.00	13	0.00	48.00	15

********** END OF FORCE ENVELOPE FROM INTERNAL STORAGE **********

148 PRINT JOINT DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y ROTAN	Z-ROTAN
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
13	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
19	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
28	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
34	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
43	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	1	0.00000	0.00000	-0.00008	-0.00001	0.00000	0.00000
	2	0.00000	0.00000	-0.00005	-0.00001	0.00002	0.00000
	3	0.00000	0.00000	-0.00002	0.00000	0.00001	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
5	1	0.00000	0.00000	-0.00575	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.05795	-0.00004	0.00001	0.00000
	3	0.00000	0.00000	-0.02765	0.00002	0.00001	0.00000
	4	0.00000	0.00000	0.00341	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00014	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8	1	0.00000	0.00000	-0.00177	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.02786	-0.00002	-0.00001	0.00000
	3	0.00000	0.00000	-0.07066	-0.00006	0.00000	0.00000
	4	0.00000	0.00000	0.02970	-0.00002	0.00001	0.00000
	5	0.00000	0.00000	-0.00396	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00038	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11	1	0.00000	0.00000	-0.00040	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00352	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.03023	-0.00002	-0.00001	0.00000
	4	0.00000	0.00000	-0.07687	-0.00006	0.00000	0.00000
	5	0.00000	0.00000	-0.03003	-0.00002	0.00001	0.00000
	6	0.00000	0.00000	-0.00457	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00015	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14	1	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00397	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	4	0.00000	0.00000	-0.02956	-0.00002	-0.00001	0.00000
	5	0.00000	0.00000	-0.06668	-0.00005	0.00000	0.00000
	6	0.00000	0.00000	-0.02887	-0.00002	0.00001	0.00000
	7	0.00000	0.00000	0.00442	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00025	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17	1	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00036	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00432	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.02831	-0.00002	-0.00001	0.00000
	6	0.00000	0.00000	-0.05619	-0.00005	0.00000	0.00000
	7	0.00000	0.00000	-0.02326	-0.00002	0.00001	0.00000
	8	0.00000	0.00000	-0.00294	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00409	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.02248	-0.00002	-0.00001	0.00000
	7	0.00000	0.00000	-0.04638	-0.00004	0.00000	0.00000
	8	0.00000	0.00000	-0.01697	-0.00002	0.00001	0.00000
	9	0.00000	0.00000	-0.00156	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00015	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00256	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X ROTAN	Y-ROTAN	Z ROTAN
	7	0.00000	0.00000	-0.01603	-0.00002	0.00001	0.00000
	8	0.00000	0.00000	0.03531	0.00004	0.00000	0.00000
	9	0.00000	0.00000	-0.01196	-0.00001	0.00000	0.00000
	10	0.00000	0.00000	-0.00085	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00131	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.01144	-0.00001	-0.00001	0.00000
	9	0.00000	0.00000	-0.02929	-0.00003	0.00000	0.00000
	10	0.00000	0.00000	-0.01142	-0.00001	0.00001	0.00000
	11	0.00000	0.00000	-0.00127	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00013	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00084	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.01186	-0.00001	0.00000	0.00000
	10	0.00000	0.00000	-0.03365	-0.00003	0.00000	0.00000
	11	0.00000	0.00000	-0.01136	-0.00001	0.00000	0.00000
	12	0.00000	0.00000	-0.00073	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00014	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
32	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00123	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	10	0.00000	0.00000	-0.01070	-0.00001	-0.00001	0.00000
	11	0.00000	0.00000	-0.02674	0.00003	0.00000	0.00000
	12	0.00000	0.00000	-0.00794	-0.00001	0.00000	0.00000
	13	0.00000	0.00000	-0.00044	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
35	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00059	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00757	-0.00001	0.00000	0.00000
	12	0.00000	0.00000	-0.02208	-0.00003	0.00000	0.00000
	13	0.00000	0.00000	-0.00655	-0.00001	0.00000	0.00000
	14	0.00000	0.00000	-0.00039	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
38	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00037	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00636	-0.00001	0.00000	0.00000
	13	0.00000	0.00000	-0.01934	-0.00003	0.00000	0.00000
	14	0.00000	0.00000	-0.00580	-0.00001	0.00000	0.00000
	15	0.00000	0.00000	-0.00053	0.00000	0.00000	0.00000
41	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00033	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	13	0.00000	0.00000	-0.00554	-0.00001	0.00000	0.00000
	14	0.00000	0.00000	-0.01620	-0.00002	0.00000	0.00000
	15	0.00000	0.00000	-0.00160	0.00000	0.00000	0.00000
44	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00003	0.00000	-0.00001	0.00000
	15	0.00000	0.00000	-0.00008	-0.00001	0.00000	0.00000
3	1	0.00000	0.00000	-0.00589	-0.00002	0.00000	0.00000
	2	0.00000	0.00000	-0.00419	-0.00001	0.00002	0.00000
	3	0.00000	0.00000	-0.00171	-0.00001	0.00001	0.00000
	4	0.00000	0.00000	-0.00041	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6	1	0.00000	0.00000	-0.00569	-0.00001	0.00000	0.00000
	2	0.00000	0.00000	-0.07510	-0.00004	0.00001	0.00000
	3	0.00000	0.00000	-0.03682	-0.00002	0.00001	0.00000
	4	0.00000	0.00000	-0.00532	-0.00001	0.00000	0.00000
	5	0.00000	0.00000	-0.00043	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00018	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
9	1	0.00000	0.00000	-0.00248	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.03692	-0.00002	-0.00001	0.00000
	3	0.00000	0.00000	-0.09200	-0.00005	0.00000	0.00000
	4	0.00000	0.00000	-0.03972	-0.00003	0.00001	0.00000
	5	0.00000	0.00000	0.00600	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	-0.00075	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	10	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12	1	0.00000	0.00000	-0.00058	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00537	-0.00001	0.00000	0.00000
	3	0.00000	0.00000	-0.03988	-0.00003	-0.00001	0.00000
	4	0.00000	0.00000	-0.09862	-0.00006	0.00000	0.00000
	5	0.00000	0.00000	-0.03950	-0.00003	0.00001	0.00000
	6	0.00000	0.00000	-0.00674	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	-0.00046	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15	1	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00044	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00601	-0.00001	0.00000	0.00000
	4	0.00000	0.00000	-0.03935	-0.00003	-0.00001	0.00000
	5	0.00000	0.00000	-0.08666	-0.00005	0.00000	0.00000
	6	0.00000	0.00000	-0.03841	-0.00003	0.00001	0.00000
	7	0.00000	0.00000	-0.00656	-0.00001	0.00000	0.00000
	8	0.00000	0.00000	-0.00055	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18	1	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00019	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00074	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	4	0.00000	0.00000	-0.00664	-0.00001	0.00000	0.00000
	5	0.00000	0.00000	-0.03822	-0.00003	-0.00001	0.00000
	6	0.00000	0.00000	-0.07411	-0.00005	0.00000	0.00000
	7	0.00000	0.00000	-0.03143	-0.00002	0.00001	0.00000
	8	0.00000	0.00000	-0.00455	-0.00001	0.00000	0.00000
	9	0.00000	0.00000	-0.00037	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00018	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21	1	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00043	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00643	-0.00001	0.00000	0.00000
	6	0.00000	0.00000	-0.03116	-0.00002	-0.00001	0.00000
	7	0.00000	0.00000	-0.06272	-0.00004	0.00000	0.00000
	8	0.00000	0.00000	-0.02367	-0.00002	0.00001	0.00000
	9	0.00000	0.00000	-0.00269	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00025	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00015	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00050	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00439	-0.00001	0.00000	0.00000
	7	0.00000	0.00000	-0.02335	-0.00002	-0.00001	0.00000
	8	0.00000	0.00000	-0.04987	-0.00004	0.00000	0.00000
	9	0.00000	0.00000	-0.01759	-0.00002	0.00000	0.00000
	10	0.00000	0.00000	-0.00180	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00028	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00013	0.00000	0.00000	0.00000
	13	0.00000	0.00000	0.00003	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00007	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00015	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00033	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	7	0.00000	0.00000	-0.00258	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.01741	-0.00002	-0.00001	0.00000
	9	0.00000	0.00000	-0.04285	-0.00004	0.00000	0.00000
	10	0.00000	0.00000	-0.01732	-0.00002	0.00001	0.00000
	11	0.00000	0.00000	-0.00234	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00028	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
	15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
30	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00008	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00017	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00023	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00179	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.01746	-0.00002	0.00000	0.00000
	10	0.00000	0.00000	-0.04754	-0.00004	0.00000	0.00000
	11	0.00000	0.00000	-0.01672	-0.00001	0.00000	0.00000
	12	0.00000	0.00000	-0.00149	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00028	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
33	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	-0.00002	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00014	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00028	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00232	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.01650	-0.00002	-0.00001	0.00000
	11	0.00000	0.00000	-0.03968	-0.00003	0.00000	0.00000
	12	0.00000	0.00000	-0.01238	-0.00001	0.00000	0.00000
	13	0.00000	0.00000	-0.00105	0.00000	0.00000	0.00000
	14	0.00000	0.00000	-0.00024	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00005	0.00000	0.00000	0.00000
36	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00012	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00026	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	10	0.00000	0.00000	-0.00142	0.00000	0.00000	0.00000
	11	0.00000	0.00000	0.01225	0.00001	0.00000	0.00000
	12	0.00000	0.00000	-0.03596	-0.00003	0.00000	0.00000
	13	0.00000	0.00000	-0.01064	-0.00001	0.00000	0.00000
	14	0.00000	0.00000	-0.00095	0.00000	0.00000	0.00000
	15	0.00000	0.00000	-0.00021	0.00000	0.00000	0.00000
39	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00027	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00101	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.01057	-0.00001	0.00000	0.00000
	13	0.00000	0.00000	-0.03041	-0.00003	0.00000	0.00000
	14	0.00000	0.00000	-0.00960	-0.00001	0.00000	0.00000
	15	0.00000	0.00000	-0.00098	0.00000	0.00000	0.00000
42	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	9	0.00000	0.00000	-0.00003	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00011	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00023	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00093	0.00000	0.00000	0.00000
	13	0.00000	0.00000	-0.00950	-0.00001	0.00000	0.00000
	14	0.00000	0.00000	-0.02622	-0.00003	0.00000	0.00000
	15	0.00000	0.00000	-0.00316	-0.00001	0.00000	0.00000
45	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	5	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	10	0.00000	0.00000	-0.00001	0.00000	0.00000	0.00000
	11	0.00000	0.00000	-0.00004	0.00000	0.00000	0.00000
	12	0.00000	0.00000	-0.00016	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	13	0.00000	0.00000	-0.00073	0.00000	0.00000	0.00000
	14	0.00000	0.00000	0.00252	-0.00001	-0.00001	0.00000
	15	0.00000	0.00000	-0.00576	-0.00002	0.00000	0.00000

********** END OF LATEST ANALYSIS RESULT **********

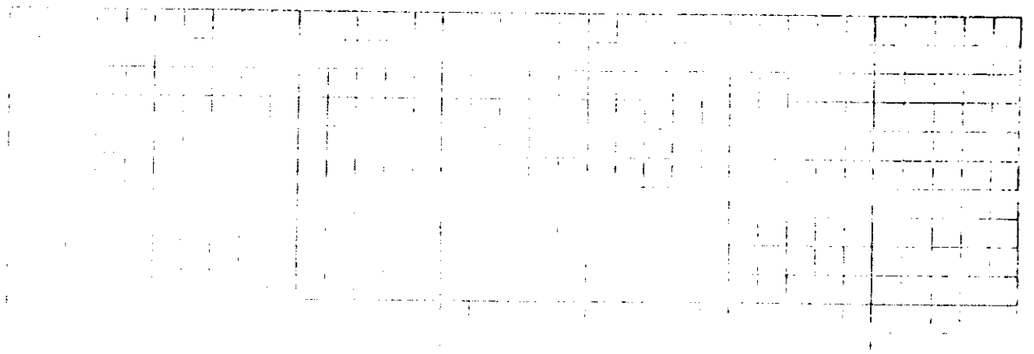
149. FINISH

********** END OF STAAD-III **********

**** DATE= FEB 20,1997 TIME= 13:19:58 ****

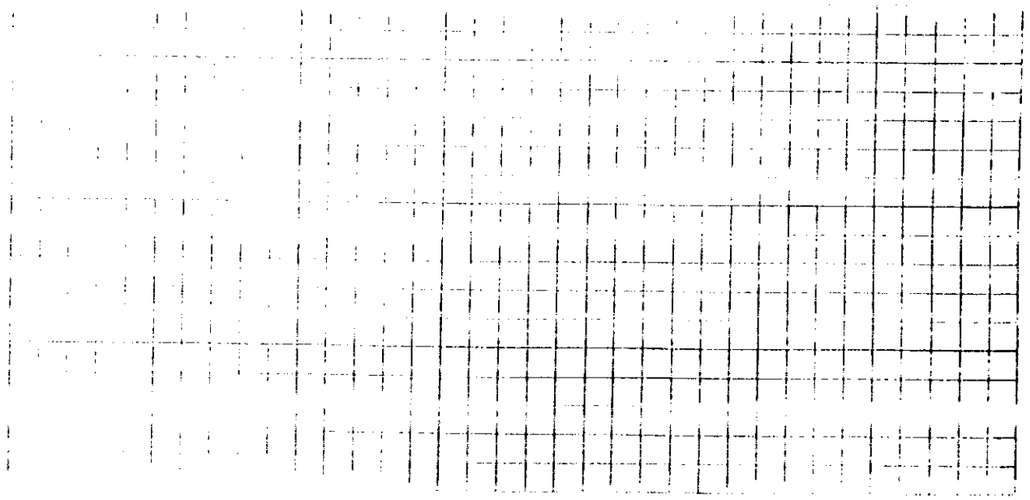
****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL.(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****

intecsa PROYECTO: HOJA DE
FECHA
EJECUTANTE:



3) TABLERO NO FIGURADO

PRETENSADO EXCENTRICO Y GRADIENTE TERMICO DE TEMPERATURAS.



```
*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    FEB 20, 1997        *
*          Time=    13:18:55            *
*                                       *
*****************************************
```

```
1. STAAD SPACE FRAME. PUENTE SOBRE EL CINCA. PILAS CON MUELLES CIMENTACION
2. * FICHERO(CINCAPI3) PRETENSADO EXCENTRICO Y GRADIENTE TRANSVERSAL.
3. UNIT METER MTON
4. JOINT COORDINATES
5. * ALINEACION TABLERO
6.   1    0.000   4.000  0.000
7.   4   50.000 -23.450  0.000
8.   7  120.000 -23.450  0.000
9.  10  190.000 -24.650  0.000
10. 13  260.000 -23.650  0.000
11. 16  318.000 -22.650  0.000
12. 19  376.000 -21.050  0.000
13. 22  434.000 -18.850  0.000
14. 25  492.000 -17.450  0.000
15. 28  550.000 -18.850  0.000
16. 31  608.000 -16.950  0.000
17. 34  668.000 -15.850  0.000
18. 37  726.000 -15.250  0.000
19. 40  782.000 -14.450  0.000
20. 43  830.000  -4.000  0.000
21.  2    0.000  -3.850  0.000
22.  5   50.000  -3.850  0.000
23.  8  120.000  -3.850  0.000
24. 11  190.000  -3.850  0.000
25. 14  260.000  -3.850  0.000
26. 17  318.000  -3.850  0.000
27. 20  376.000  -3.850  0.000
28. 23  434.000  -3.850  0.000
29. 26  492.000  -3.850  0.000
30. 29  550.000  -3.850  0.000
31. 32  608.000  -3.850  0.000
32. 35  668.000  -3.850  0.000
33. 38  726.000  -3.850  0.000
34. 41  782.000  -3.850  0.000
35. 44  830.000  -3.850  0.000
36.  3    0.000   0.000  0.000
37.  6   50.000   0.000  0.000
38.  9  120.000   0.000  0.000
39. 12  190.000   0.000  0.000
40. 15  260.000   0.000  0.000
41. 18  318.000   0.000  0.000
42. 21  376.000   0.000  0.000
43. 24  434.000   0.000  0.000
44. 27  492.000   0.000  0.000
45. 30  550.000   0.000  0.000
46. 33  608.000   0.000  0.000
47. 36  668.000   0.000  0.000
```



```
* FICHERO(CINCAPI3) PRETENSADO EXCENTRICO Y GRADIENTE TR
48.  39  726.000   0.000  0.000
49.  42  782.000   0.000  0.000
50.  45  830.000   0.000  0.000
51. MEMBER INCIDENCES
52.   1    1    2
53. R 14   2    3
54.   2    2    3
55. R 14   2    3
56.  31    3    6
57.  R     13   1    3
58. MEMBER PROPERTY
59. * ESTRIBOS (APOYOS)
60.   1 29            PR AX  2.420 IX  12.2500 IY  12.2500 IZ  0.2218
61. * TRAVIESAS
62.   2  4  6  8 10 12 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
63.  14 16 18 20 22 24 PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
64.  26 28 30          PR AX 15.000 IX  23.3435 IY   7.8125 IZ 45.0000
65. *FUSTES DE PILA
66.   3  5  7  9 11 13 PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
67.  15 17 19 21 23    PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
68.  25 27             PR AX  6.096 IX  35.5000 IY  17.1760 IZ 17.1760
69.  *TABLERO
70.  31 TO 44          PR AX 13.280 IX  56.0000 IY 124.6600 IZ 44.1200
71. MEMBER RELEASE
72. 1 3 5 7 9 11 13 15 17 19 21 23 25 27 END FY  MX MZ
73. 29                                   END MX  MZ
74. CONSTANTS
75. E        3350000.   ALL  BUT 1 29
76. E  120000  1  29
77. POISSON   0.2  ALL  BUT 1 29
78. POISSON  299   1  29
79. ALPHA 0.00001 ALL
80. SUPPORTS
81. 1  43 FIXED BUT KMX 5100000.
82. *1  43 FIXED
83. 4 7 10 13 16 19 22 25 28 31 34 37 40  FIXED BUT KMX 2550000.
84. *4 7 10 13 16 19 22 25 28 31 34 37 40 FIXED
85. LOADING 1 PRETENSADO EXCENTRICO POR ENCIMA DE C. DE G.
86. JOINT LOAD
87.  3 MZ -1000.
88. 45 MZ  1000.
89. LOADING 2 GRADIENTE TRANSVESAL DE TEMPERATURA DE 3 GRADOS
90. JOINT LOAD
91.  3 MY -2088.
92. 45 MY  2088.
93. 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 =    45/   44/   15
ORIGINAL/FINAL BAND-WIDTH =   15/    3
TOTAL PRIMARY LOAD CASES  =    2, TOTAL DEGREES OF FREEDOM =   195
SIZE OF STIFFNESS MATRIX  =    3705 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.13 MEGA-BYTES
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++ PROCESSING ELEMENT STIFFNESS MATRIX. 13:18:58
++ PROCESSING GLOBAL STIFFNESS MATRIX. 13:18:58
++ PROCESSING TRIANGULAR FACTORIZATION. 13:18:59
++ CALCULATING JOINT DISPLACEMENTS. 13:18:59
++ CALCULATING MEMBER FORCES. 13:18:59

94. LOAD LIST ALL
95. PRINT REAC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	24.40	0.00	0.00	0.00	0.00
	2	0.00	0.00	38.50	27.60	0.00	0.00
43	1	0.00	-25.89	0.00	0.00	0.00	0.00
	2	0.00	0.00	47.11	91.98	0.00	0.00
4	1	0.00	28.35	0.00	0.00	0.00	0.00
	2	0.00	0.00	-34.30	-624.86	0.00	0.00
7	1	0.00	-4.98	0.00	0.00	0.00	0.00
	2	0.00	0.00	-5.69	-152.36	0.00	0.00
10	1	0.00	1.30	0.00	0.00	0.00	0.00
	2	0.00	0.00	1.14	0.92	0.00	0.00
13	1	0.00	-0.36	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.36	2.46	0.00	0.00
16	1	0.00	0.11	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.01	-0.53	0.00	0.00
19	1	0.00	-0.03	0.00	0.00	0.00	0.00
	2	0.00	0.00	-0.01	-0.42	0.00	0.00
22	1	0.00	0.02	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	-0.09	0.00	0.00
25	1	0.00	-0.03	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	-0.10	0.00	0.00
28	1	0.00	0.11	0.00	0.00	0.00	0.00
	2	0.00	0.00	-0.01	-0.51	0.00	0.00
31	1	0.00	-0.42	0.00	0.00	0.00	0.00
	2	0.00	0.00	-0.02	-1.51	0.00	0.00
34	1	0.00	1.67	0.00	0.00	0.00	0.00
	2	0.00	0.00	1.04	4.57	0.00	0.00
37	1	0.00	-6.77	0.00	0.00	0.00	0.00
	2	0.00	0.00	1.05	-24.52	0.00	0.00
40	1	0.00	31.32	0.00	0.00	0.00	0.00
	2	0.00	0.00	-49.18	-559.92	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

96. PRINT JOINT DISP ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
13	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
19	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
28	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
34	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
43	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	1	-0.07587	0.00126	0.00000	0.00000	0.00000	-0.00010
	2	0.00000	0.00000	-0.00002	0.00000	-0.00012	0.00000
5	1	-0.02507	-0.00272	0.00000	0.00000	0.00000	0.00003
	2	0.00000	0.00000	0.14216	0.00010	0.00001	0.00000
8	1	-0.03993	0.00048	0.00000	0.00000	0.00000	-0.00001
	2	0.00000	0.00000	0.04049	0.00003	0.00002	0.00000
11	1	-0.03611	-0.00013	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00260	0.00000	0.00000	0.00000
14	1	-0.03708	0.00004	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00006	0.00000	0.00000	0.00000
17	1	-0.03685	-0.00001	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00020	0.00000	0.00000	0.00000
20	1	-0.03691	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000
23	1	-0.03689	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00002	0.00000	0.00000	0.00000
26	1	-0.03688	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00002	0.00000	0.00000	0.00000

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
29	1	-0.03694	-0.00001	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00009	0.00000	0.00000	0.00000
32	1	-0.03671	0.00003	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00023	0.00000	0.00000	0.00000
35	1	-0.03762	-0.00010	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	-0.00009	0.00000	0.00000	0.00000
38	1	-0.03415	0.00038	0.00000	0.00000	0.00000	0.00001
	2	0.00000	0.00000	0.00341	0.00001	0.00000	0.00000
41	1	-0.04735	-0.00163	0.00000	0.00000	0.00000	-0.00003
	2	0.00000	0.00000	0.04177	0.00006	-0.00002	0.00000
44	1	0.00000	0.00134	0.00000	0.00000	0.00000	0.00010
	2	0.00000	0.00000	-0.00007	-0.00001	0.00009	0.00000
3	1	-0.03689	0.00145	0.00000	0.00000	0.00000	-0.00010
	2	0.00000	0.00000	-0.00025	0.00001	-0.00012	0.00000
6	1	-0.03689	-0.00294	0.00000	0.00000	0.00000	0.00003
	2	0.00000	0.00000	0.17908	0.00009	0.00001	0.00000
9	1	-0.03689	0.00052	0.00000	0.00000	0.00000	-0.00001
	2	0.00000	0.00000	0.05450	0.00004	0.00002	0.00000
12	1	-0.03689	-0.00014	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00481	0.00001	0.00000	0.00000
15	1	-0.03689	0.00004	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00023	0.00000	0.00000	0.00000
18	1	-0.03689	-0.00001	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00030	0.00000	0.00000	0.00000
21	1	-0.03689	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00014	0.00000	0.00000	0.00000
24	1	-0.03689	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00003	0.00000	0.00000	0.00000
27	1	-0.03689	0.00000	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00003	0.00000	0.00000	0.00000
30	1	-0.03689	-0.00001	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00015	0.00000	0.00000	0.00000
33	1	-0.03689	0.00003	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00039	0.00000	0.00000	0.00000
36	1	-0.03689	-0.00011	0.00000	0.00000	0.00000	0.00000
	2	0.00000	0.00000	0.00030	0.00000	0.00000	0.00000
39	1	-0.03689	0.00043	0.00000	0.00000	0.00000	0.00001
	2	0.00000	0.00000	0.00688	0.00001	0.00000	0.00000
42	1	-0.03689	-0.00187	0.00000	0.00000	0.00000	-0.00003
	2	0.00000	0.00000	0.06378	0.00005	-0.00002	0.00000
45	1	-0.03689	0.00154	0.00000	0.00000	0.00000	0.00010
	2	0.00000	0.00000	-0.00436	-0.00001	0.00009	0.00000

********** END OF LATEST ANALYSIS RESULT **********

97. PRINT MEMBER FORC ALL

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM Z
1	1	1	-24.40	0.00	0.00	0.00	0.00	0.00
		2	24.40	0.00	0.00	0.00	0.00	0.00
	2	1	0.00	0.00	38.50	0.00	-27.60	0.00
		2	0.00	0.00	-38.50	0.00	21.82	0.00
3	1	4	28.35	0.00	0.00	0.00	0.00	0.00
		5	-28.35	0.00	0.00	0.00	0.00	0.00
	2	4	0.00	0.00	34.30	0.00	624.86	0.00
		5	0.00	0.00	34.30	0.00	47.47	0.00
5	1	7	-4.98	0.00	0.00	0.00	0.00	0.00
		8	4.98	0.00	0.00	0.00	0.00	0.00
	2	7	0.00	0.00	-5.69	0.00	152.36	0.00
		8	0.00	0.00	5.69	0.00	-40.77	0.00
7	1	10	1.30	0.00	0.00	0.00	0.00	0.00
		11	-1.30	0.00	0.00	0.00	0.00	0.00
	2	10	0.00	0.00	1.14	0.00	-0.92	0.00
		11	0.00	0.00	-1.14	0.00	-22.73	0.00
9	1	13	-0.36	0.00	0.00	0.00	0.00	0.00
		14	0.36	0.00	0.00	0.00	0.00	0.00
	2	13	0.00	0.00	0.36	0.00	-2.46	0.00
		14	0.00	0.00	-0.36	0.00	-4.69	0.00
11	1	16	0.11	0.00	0.00	0.00	0.00	0.00
		17	-0.11	0.00	0.00	0.00	0.00	0.00
	2	16	0.00	0.00	0.01	0.00	0.53	0.00
		17	0.00	0.00	-0.01	0.00	-0.78	0.00
13	1	19	-0.03	0.00	0.00	0.00	0.00	0.00
		20	0.03	0.00	0.00	0.00	0.00	0.00
	2	19	0.00	0.00	-0.01	0.00	0.42	0.00
		20	0.00	0.00	0.01	0.00	-0.22	0.00
15	1	22	0.02	0.00	0.00	0.00	0.00	0.00
		23	-0.02	0.00	0.00	0.00	0.00	0.00
	2	22	0.00	0.00	0.00	0.00	0.09	0.00
		23	0.00	0.00	0.00	0.00	-0.11	0.00
17	1	25	-0.03	0.00	0.00	0.00	0.00	0.00
		26	0.03	0.00	0.00	0.00	0.00	0.00
	2	25	0.00	0.00	0.00	0.00	0.10	0.00
		26	0.00	0.00	0.00	0.00	-0.14	0.00
19	1	28	0.11	0.00	0.00	0.00	0.00	0.00
		29	-0.11	0.00	0.00	0.00	0.00	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE - MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	2	28	0.00	0.00	-0.01	0.00	0.51	0.00
		29	0.00	0.00	0.01	0.00	-0.35	0.00
21	1	31	-0.42	0.00	0.00	0.00	0.00	0.00
		32	0.42	0.00	0.00	0.00	0.00	0.00
	2	31	0.00	0.00	-0.02	0.00	1.51	0.00
		32	0.00	0.00	0.02	0.00	-1.27	0.00
23	1	34	1.67	0.00	0.00	0.00	0.00	0.00
		35	-1.67	0.00	0.00	0.00	0.00	0.00
	2	34	0.00	0.00	1.04	0.00	-4.57	0.00
		35	0.00	0.00	-1.04	0.00	-7.94	0.00
25	1	37	-6.77	0.00	0.00	0.00	0.00	0.00
		38	6.77	0.00	0.00	0.00	0.00	0.00
	2	37	0.00	0.00	1.05	0.00	24.52	0.00
		38	0.00	0.00	-1.05	0.00	-36.54	0.00
27	1	40	31.32	0.00	0.00	0.00	0.00	0.00
		41	-31.32	0.00	0.00	0.00	0.00	0.00
	2	40	0.00	0.00	-49.18	0.00	559.92	0.00
		41	0.00	0.00	49.18	0.00	-38.67	0.00
29	1	43	-25.89	0.00	0.00	0.00	0.00	0.00
		44	25.89	0.00	0.00	0.00	0.00	0.00
	2	43	0.00	0.00	47.11	0.00	-91.98	0.00
		44	0.00	0.00	-47.11	0.00	84.91	0.00
2	1	2	-24.40	0.00	0.00	0.00	0.00	0.00
		3	24.40	0.00	0.00	0.00	0.00	0.00
	2	2	0.00	0.00	38.50	0.00	-21.82	0.00
		3	0.00	0.00	-38.50	0.00	-126.39	0.00
4	1	5	28.35	0.00	0.00	0.00	0.00	0.00
		6	-28.35	0.00	0.00	0.00	0.00	0.00
	2	5	0.00	0.00	-34.30	0.00	-47.47	0.00
		6	0.00	0.00	34.30	0.00	179.54	0.00
6	1	8	-4.98	0.00	0.00	0.00	0.00	0.00
		9	4.98	0.00	0.00	0.00	0.00	0.00
	2	8	0.00	0.00	-5.69	0.00	40.77	0.00
		9	0.00	0.00	5.69	0.00	-18.85	0.00
8	1	11	1.30	0.00	0.00	0.00	0.00	0.00
		12	-1.30	0.00	0.00	0.00	0.00	0.00
	2	11	0.00	0.00	1.14	0.00	22.73	0.00
		12	0.00	0.00	-1.14	0.00	-27.11	0.00
10	1	14	0.36	0.00	0.00	0.00	0.00	0.00
		15	0.36	0.00	0.00	0.00	0.00	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	2	14	0.00	0.00	0.36	0.00	4.69	0.00
		15	0.00	0.00	-0.36	0.00	-6.08	0.00
12	1	17	0.11	0.00	0.00	0.00	0.00	0.00
		18	-0.11	0.00	0.00	0.00	0.00	0.00
	2	17	0.00	0.00	0.01	0.00	0.78	0.00
		18	0.00	0.00	-0.01	0.00	-0.83	0.00
14	1	20	-0.03	0.00	0.00	0.00	0.00	0.00
		21	0.03	0.00	0.00	0.00	0.00	0.00
	2	20	0.00	0.00	0.01	0.00	0.22	0.00
		21	0.00	0.00	0.01	0.00	-0.17	0.00
16	1	23	0.02	0.00	0.00	0.00	0.00	0.00
		24	-0.02	0.00	0.00	0.00	0.00	0.00
	2	23	0.00	0.00	0.00	0.00	0.11	0.00
		24	0.00	0.00	0.00	0.00	-0.12	0.00
18	1	26	-0.03	0.00	0.00	0.00	0.00	0.00
		27	0.03	0.00	0.00	0.00	0.00	0.00
	2	26	0.00	0.00	0.00	0.00	0.14	0.00
		27	0.00	0.00	0.00	0.00	-0.15	0.00
20	1	29	0.11	0.00	0.00	0.00	0.00	0.00
		30	-0.11	0.00	0.00	0.00	0.00	0.00
	2	29	0.00	0.00	-0.01	0.00	0.35	0.00
		30	0.00	0.00	0.01	0.00	-0.31	0.00
22	1	32	-0.42	0.00	0.00	0.00	0.00	0.00
		33	0.42	0.00	0.00	0.00	0.00	0.00
	2	32	0.00	0.00	-0.02	0.00	1.27	0.00
		33	0.00	0.00	0.02	0.00	-1.20	0.00
24	1	35	1.67	0.00	0.00	0.00	0.00	0.00
		36	-1.67	0.00	0.00	0.00	0.00	0.00
	2	35	0.00	0.00	1.04	0.00	7.94	0.00
		36	0.00	0.00	-1.04	0.00	-11.96	0.00
26	1	38	-6.77	0.00	0.00	0.00	0.00	0.00
		39	6.77	0.00	0.00	0.00	0.00	0.00
	2	38	0.00	0.00	1.05	0.00	36.54	0.00
		39	0.00	0.00	-1.05	0.00	-40.60	0.00
28	1	41	31.32	0.00	0.00	0.00	0.00	0.00
		42	-31.32	0.00	0.00	0.00	0.00	0.00
	2	41	0.00	0.00	-49.18	0.00	38.67	0.00
		42	0.00	0.00	49.18	0.00	150.66	0.00
30	1	44	-25.89	0.00	0.00	0.00	0.00	0.00
		45	25.89	0.00	0.00	0.00	0.00	0.00

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	2	44	0.00	0.00	47.11	0.00	-84.91	0.00
		45	0.00	0.00	-47.11	0.00	-96.44	0.00
31	1	3	0.00	-24.40	0.00	0.00	0.00	-1000.00
		6	0.00	24.40	0.00	0.00	0.00	-219.84
	2	3	0.00	0.00	38.50	-126.39	-2088.00	0.00
		6	0.00	0.00	-38.50	126.39	163.23	0.00
32	1	6	0.00	3.95	0.00	0.00	0.00	219.84
		9	0.00	-3.95	0.00	0.00	0.00	56.82
	2	6	0.00	0.00	4.19	53.15	-163.23	0.00
		9	0.00	0.00	-4.19	-53.15	-130.24	0.00
33	1	9	0.00	-1.02	0.00	0.00	0.00	-56.82
		12	0.00	1.02	0.00	0.00	0.00	-14.87
	2	9	0.00	0.00	-1.50	34.30	130.24	0.00
		12	0.00	0.00	1.50	-34.30	-25.19	0.00
34	1	12	0.00	0.27	0.00	0.00	0.00	14.87
		15	0.00	-0.27	0.00	0.00	0.00	4.19
	2	12	0.00	0.00	-0.36	7.19	25.19	0.00
		15	0.00	0.00	0.36	-7.19	0.27	0.00
35	1	15	0.00	-0.09	0.00	0.00	0.00	-4.19
		18	0.00	0.09	0.00	0.00	0.00	-1.08
	2	15	0.00	0.00	0.00	1.11	-0.27	0.00
		18	0.00	0.00	0.00	-1.11	0.42	0.00
36	1	18	0.00	0.02	0.00	0.00	0.00	1.08
		21	0.00	-0.02	0.00	0.00	0.00	0.29
	2	18	0.00	0.00	0.01	0.28	-0.42	0.00
		21	0.00	0.00	-0.01	-0.28	-0.19	0.00
37	1	21	0.00	-0.01	0.00	0.00	0.00	-0.29
		24	0.00	0.01	0.00	0.00	0.00	-0.14
	2	21	0.00	0.00	0.00	0.11	0.19	0.00
		24	0.00	0.00	0.00	-0.11	-0.12	0.00
38	1	24	0.00	0.01	0.00	0.00	0.00	0.14
		27	0.00	-0.01	0.00	0.00	0.00	0.30
	2	24	0.00	0.00	0.00	-0.01	0.12	0.00
		27	0.00	0.00	0.00	0.01	-0.12	0.00
39	1	27	0.00	-0.02	0.00	0.00	0.00	-0.30
		30	0.00	0.02	0.00	0.00	0.00	-1.08
	2	27	0.00	0.00	0.00	-0.15	0.12	0.00
		30	0.00	0.00	0.00	0.15	-0.26	0.00
40	1	30	0.00	0.09	0.00	0.00	0.00	1.08
		33	0.00	-0.09	0.00	0.00	0. 0	4.16

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE - MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	2	30	0.00	0.00	-0.01	-0.46	0.26	0.00
		33	0.00	0.00	0.01	0.46	0.20	0.00
41	1	33	0.00	-0.33	0.00	0.00	0.00	-4.16
		36	0.00	0.33	0.00	0.00	0.00	-15.77
	2	33	0.00	0.00	-0.03	-1.66	-0.20	0.00
		36	0.00	0.00	0.03	1.66	1.79	0.00
42	1	36	0.00	1.33	0.00	0.00	0.00	15.77
		39	0.00	1.33	0.00	0.00	0.00	61.64
	2	36	0.00	0.00	1.02	-13.62	-1.79	0.00
		39	0.00	0.00	-1.02	13.62	-57.14	0.00
43	1	39	0.00	-5.43	0.00	0.00	0.00	-61.64
		42	0.00	5.43	0.00	0.00	0.00	-242.60
	2	39	0.00	0.00	2.07	-54.22	57.14	0.00
		42	0.00	0.00	-2.07	54.22	-173.06	0.00
44	1	42	0.00	25.89	0.00	0.00	0.00	242.60
		45	0.00	-25.89	0.00	0.00	0.00	1000.00
	2	42	0.00	0.00	-47.11	96.44	173.06	0.00
		45	0.00	0.00	47.11	-96.44	2088.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

98. FINISH

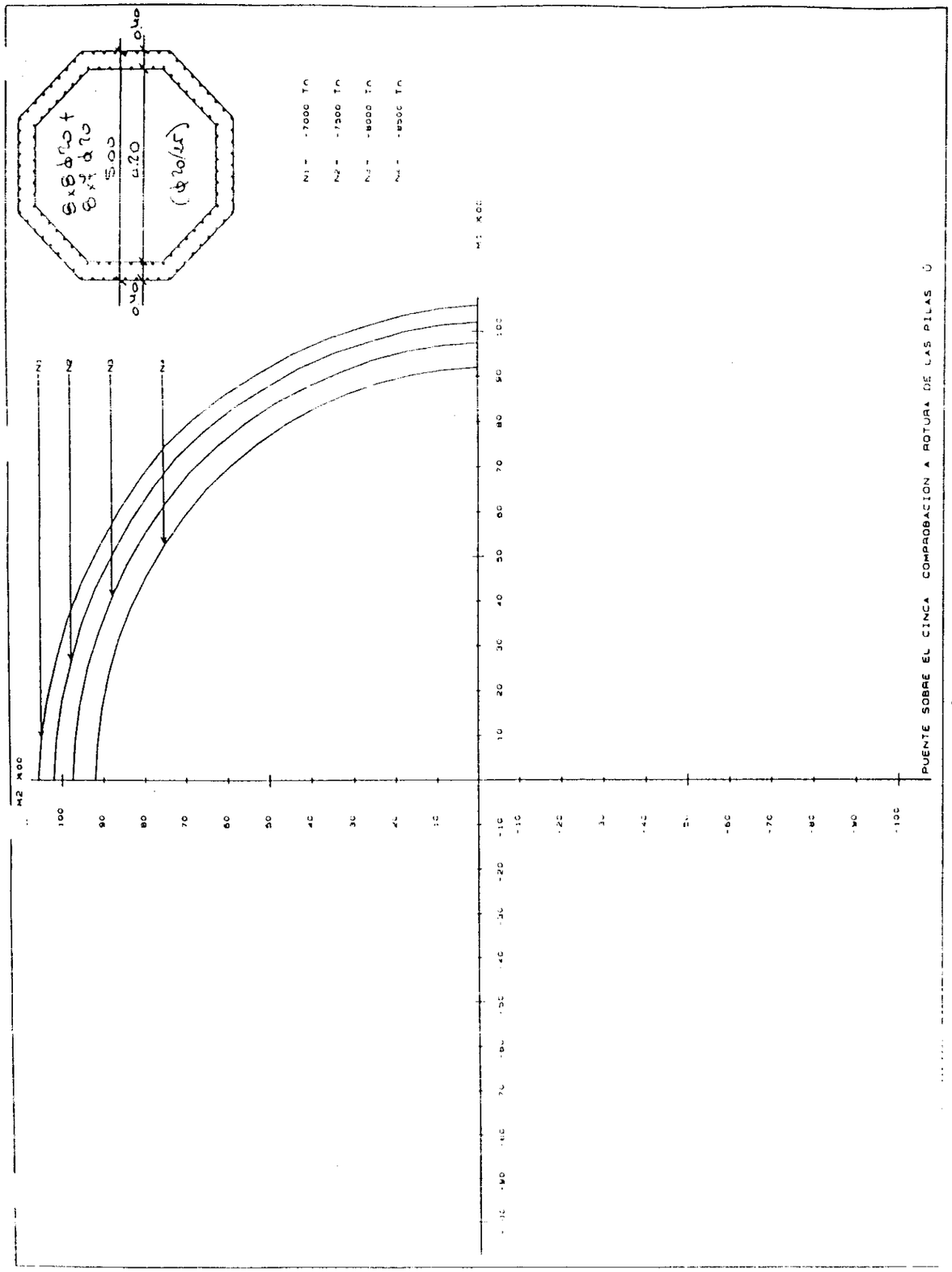
********** END OF STAAD-III **********

**** DATE= FEB 20,1997 TIME= 13:19: 1 ****

****
* 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 *
****

Address Book Keeping

Notes



Proyecto : PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. U

Tension de calculo del hormigon ..... : 2333.33t/m2
Tension de calculo del acero activo ..... : 154545.45t/m2
Tension de calculo del acero pasivo ..... : 44347.83t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3350000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 16
Numero total de circuitos ..... : 2
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 0

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	1.0355	-2.5000	2	2.5000	1.0355
3	2.5000	1.0355	4	1.0355	2.5000
5	-1.0355	2.5000	6	-2.5000	1.0355
7	-2.5000	-1.0355	8	-1.0355	-2.5000
9	-0.8700	-2.1000	10	0.8700	2.1000
11	2.1000	-0.8700	12	2.1000	0.8700
13	0.8700	2.1000	14	-0.8700	2.1000
15	-2.1000	0.8700	16	-2.1000	-0.8700

Definicion de circuitos

Circuito 1 : Numero de vertices 8 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	2	3	3	4	4
5	5	6	6	7	7	8	8

Circuito 2 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	10	3	11	4	12
5	13	6	14	7	15	8	16

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 90.00 (sex)
Variacion cada ..... 10.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de -7000.00 (t)
Axil 2 de -7500.00 (t)
Axil 3 de -8000.00 (t)
Axil 4 de -8500.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension fibra Sup. 0.000 (t/m2) a 2.50 (m) del c.d.g
Tension fibra Inf. 0.000 (t/m2) a 2.50 (m) del c.d.g

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	1.0210	-2.4650	3.14	2	1.2015	-2.2845	3.14
3	1.3820	-2.1040	3.14	4	1.5625	-1.9235	3.14
5	1.7430	-1.7430	3.14	6	1.9235	-1.5625	3.14
7	2.1040	-1.3820	3.14	8	2.2845	-1.2015	3.14
9	2.4650	-1.0210	3.14	10	2.4650	-0.7658	3.14
11	2.4650	-0.5105	3.14	12	2.4650	-0.2553	3.14
13	2.4650	0.0000	3.14	14	2.4650	0.2553	3.14
15	2.4650	0.5105	3.14	16	2.4650	0.7658	3.14
17	2.4650	1.0210	3.14	18	2.2845	1.2015	3.14
19	2.1040	1.3820	3.14	20	1.9235	1.5625	3.14
21	1.7430	1.7430	3.14	22	1.5625	1.9235	3.14
23	1.3820	2.1040	3.14	24	1.2015	2.2845	3.14
25	1.0210	2.4650	3.14	26	0.7658	2.4650	3.14
27	0.5105	2.4650	3.14	28	0.2553	2.4650	3.14
29	0.0000	2.4650	3.14	30	-0.2553	2.4650	3.14
31	-0.5105	2.4650	3.14	32	-0.7658	2.4650	3.14
33	-1.0210	2.4650	3.14	34	-1.2015	2.2845	3.14
35	-1.3820	2.1040	3.14	36	-1.5625	1.9235	3.14
37	-1.7430	1.7430	3.14	38	-1.9235	1.5625	3.14
39	-2.1040	1.3820	3.14	40	-2.2845	1.2015	3.14
41	-2.4650	1.0210	3.14	42	-2.4650	0.7658	3.14
43	-2.4650	0.5105	3.14	44	-2.4650	0.2553	3.14
45	-2.4650	0.0000	3.14	46	-2.4650	-0.2553	3.14
47	-2.4650	-0.5105	3.14	48	-2.4650	-0.7658	3.14
49	-2.4650	-1.0210	3.14	50	-2.2845	-1.2015	3.14
51	-2.1040	-1.3820	3.14	52	-1.9235	-1.5625	3.14
53	-1.7430	-1.7430	3.14	54	-1.5625	-1.9235	3.14
55	-1.3820	-2.1040	3.14	56	-1.2015	-2.2845	3.14
57	-1.0210	-2.4650	3.14	58	-0.7658	-2.4650	3.14
59	-0.5105	-2.4650	3.14	60	-0.2553	-2.4650	3.14
61	0.0000	-2.4650	3.14	62	0.2553	-2.4650	3.14
63	0.5105	-2.4650	3.14	64	0.7658	-2.4650	3.14
65	-0.8845	-2.1350	3.14	66	-0.6318	-2.1350	3.14
67	-0.3791	-2.1350	3.14	68	-0.1264	-2.1350	3.14
69	0.1264	-2.1350	3.14	70	0.3791	-2.1350	3.14
71	0.6318	-2.1350	3.14	72	0.8845	-2.1350	3.14
73	1.0631	-1.9564	3.14	74	1.2418	-1.7777	3.14
75	1.4204	-1.5991	3.14	76	1.5991	-1.4204	3.14
77	1.7777	-1.2418	3.14	78	1.9564	-1.0631	3.14
79	2.1350	0.8845	3.14	80	2.1350	-0.6318	3.14
81	2.1350	-0.3791	3.14	82	2.1350	0.1264	3.14
83	2.1350	0.1264	3.14	84	2.1350	0.3791	3.14
85	2.1350	0.6318	3.14	86	2.1350	0.8845	3.14
87	1.9564	1.0631	3.14	88	1.7777	1.2418	3.14
89	1.5991	1.4204	3.14	90	1.4204	1.5991	3.14
91	1.2418	1.7777	3.14	92	1.0631	1.9564	3.14
93	0.8845	2.1350	3.14	94	0.6318	2.1350	3.14
95	0.3791	2.1350	3.14	96	0.1264	2.1350	3.14
97	-0.1264	2.1350	3.14	98	-0.3791	2.1350	3.14
99	-0.6318	2.1350	3.14	100	-0.8845	2.1350	3.14
101	-1.0631	1.9564	3.14	102	-1.2418	1.7777	3.14
103	-1.4204	1.5991	3.14	104	-1.5991	1.4204	3.14
105	-1.7777	1.2418	3.14	106	-1.9564	1.0631	3.14
107	2.1350	0.8845	3.14	108	-2.1350	0.6318	3.14
109	-2.1350	0.3791	3.14	110	-2.1350	0.1264	3.14
111	-2.1350	-0.1264	3.14	112	-2.1350	-0.3791	3.14
113	-2.1350	-0.6318	3.14	114	-2.1350	-0.8845	3.14
115	-1.9564	-1.0631	3.14	116	-1.7777	-1.2418	3.14
117	-1.5991	-1.4204	3.14	118	-1.4204	-1.5991	3.14
119	-1.2418	-1.7777	3.14	120	-1.0631	-1.9564	3.14

Caso 1 : Axil de -7000.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.157	3.453	-6996.912	10582.99	0.00
10.0	-0.350	0.162	3.609	-7000.148	10359.03	1792.99
20.0	-0.350	0.167	3.663	-6982.205	9856.54	3577.27
30.0	-0.350	0.163	3.663	-7021.315	9058.86	5258.34
40.0	-0.350	0.160	3.545	-7000.385	8060.62	6799.97
50.0	-0.350	0.160	3.545	7000.126	6800.10	8060.74
60.0	-0.350	0.163	3.663	-7021.348	5258.33	9058.85
70.0	-0.350	0.167	3.663	-6982.238	3577.27	9856.52
80.0	-0.350	0.162	3.610	-7000.544	1792.97	10358.78
90.0	-0.350	0.157	3.455	-7000.058	0.00	10580.85

Caso 2 : Axil de -7500.00 (t)

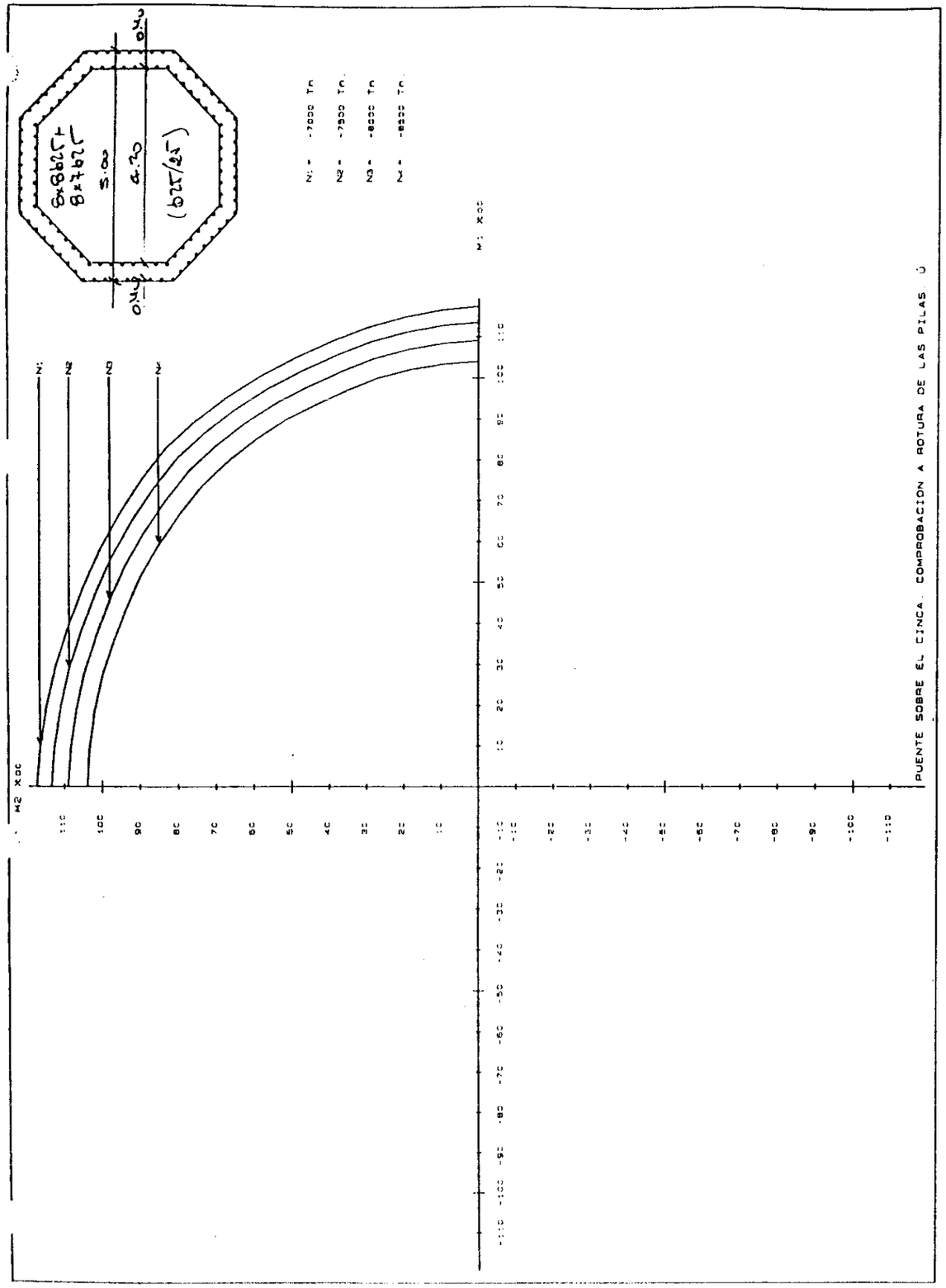
Ang	Dsup	Dinf	Prof (m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.120	3.723	-7495.409	10205.48	0.00
10.0	-0.350	0.127	3.881	-7500.106	9997.50	1772.83
20.0	-0.350	0.131	3.938	-7491.293	9522.63	3467.77
30.0	-0.350	0.127	3.938	-7528.859	8763.06	5050.90
40.0	-0.350	0.123	3.816	-7499.417	7802.93	6532.66
50.0	-0.350	0.123	3.816	-7499.709	6532.49	7802.76
60.0	-0.350	0.127	3.938	-7528.908	5050.88	8763.02
70.0	-0.350	0.131	3.938	-7491.343	3467.76	9522.59
80.0	-0.350	0.127	3.881	-7500.267	1772.83	9997.37
90.0	-0.350	0.120	3.724	-7498.792	0.00	10202.64

Caso 3 : Axil de -8000.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.089	3.987	-7999.233	9741.25	0.00
10.0	-0.350	0.095	4.154	-7999.638	9557.79	1725.33
20.0	-0.350	0.097	4.234	-8020.886	9094.01	3322.98
30.0	-0.350	0.097	4.201	-7999.898	8422.04	4824.35
40.0	-0.350	0.092	4.083	-7999.483	7463.78	6229.72
50.0	-0.350	0.092	4.083	-7999.622	6229.63	7463.68
60.0	-0.350	0.097	4.201	-7999.923	4824.33	8422.02
70.0	-0.350	0.097	4.234	-8020.888	3322.97	9094.01
80.0	-0.350	0.095	4.154	-7999.635	1725.33	9557.79
90.0	-0.350	0.089	3.987	-7999.106	0.00	9741.38

Caso 4 : Axil de -8500.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.062	4.244	-8496.574	9200.12	0.00
10.0	-0.350	0.068	4.420	-8499.511	9030.93	1615.21
20.0	-0.350	0.070	4.505	-8499.635	8624.15	3149.24
30.0	-0.350	0.070	4.475	-8499.797	7957.95	4568.98
40.0	-0.350	0.066	4.344	-8499.499	7041.55	5889.08
50.0	-0.350	0.066	4.344	-8499.547	5889.05	7041.51
60.0	-0.350	0.070	4.475	-8499.583	4569.09	7958.18
70.0	-0.350	0.070	4.505	-8499.653	3149.23	8624.13
80.0	-0.350	0.068	4.420	-8499.563	1615.20	9030.87
90.0	-0.350	0.062	4.246	-8499.402	0.00	9196.80



Proyecto : PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

Tension de calculo del hormigon ..... : 2333.33t/m2
Tension de calculo del acero activo ..... : 154545.45t/m2
Tension de calculo del acero pasivo ..... : 44347.83t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3350000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 16
Numero total de circuitos ..... : 2
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 0

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	1.0355	-2.5000	2	2.5000	-1.0355
3	2.5000	1.0355	4	1.0355	2.5000
5	-1.0355	2.5000	6	-2.5000	1.0355
7	-2.5000	-1.0355	8	-1.0355	-2.5000
9	-0.8700	-2.1000	10	0.8700	-2.1000
11	2.1000	-0.8700	12	2.1000	0.8700
13	0.8700	2.1000	14	-0.8700	2.1000
15	-2.1000	0.8700	16	-2.1000	-0.8700

Definicion de circuitos

Circuito 1 : Numero de vertices 8 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	2	3	3	4	4
5	5	6	6	7	7	8	8

Circuito 2 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	10	3	11	4	12
5	13	6	14	7	15	8	16

Definicion de variacion de angulos

Incremento de corte de franjas ...	0.01	(m)
Angulo inicial	0.00	(sex)
Angulo final	90.00	(sex)
Variacion cada	10.00	(sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de -7000.00 (t)
Axil 2 de -7500.00 (t)
Axil 3 de -8000.00 (t)
Axil 4 de -8500.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension fibra Sup.	0.000 (t/m2)	a	2.50 (m) del c.d.g
Tension fibra Inf.	0.000 (t/m2)	a	2.50 (m) del c.d.g

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	1.0210	-2.4650	4.91	2	1.2015	-2.2845	4.91
3	1.3820	-2.1040	4.91	4	1.5625	-1.9235	4.91
5	1.7430	-1.7430	4.91	6	1.9235	-1.5625	4.91
7	2.1040	-1.3820	4.91	8	2.2845	-1.2015	4.91
9	2.4650	-1.0210	4.91	10	2.4650	-0.7658	4.91
11	2.4650	-0.5105	4.91	12	2.4650	-0.2553	4.91
13	2.4650	0.0000	4.91	14	2.4650	0.2553	4.91
15	2.4650	0.5105	4.91	16	2.4650	0.7658	4.91
17	2.4650	1.0210	4.91	18	2.2845	1.2015	4.91
19	2.1040	1.3820	4.91	20	1.9235	1.5625	4.91
21	1.7430	1.7430	4.91	22	1.5625	1.9235	4.91
23	1.3820	2.1040	4.91	24	1.2015	2.2845	4.91
25	1.0210	2.4650	4.91	26	0.7658	2.4650	4.91
27	0.5105	2.4650	4.91	28	0.2553	2.4650	4.91
29	0.0000	2.4650	4.91	30	-0.2553	2.4650	4.91
31	-0.5105	2.4650	4.91	32	-0.7658	2.4650	4.91
33	-1.0210	2.4650	4.91	34	-1.2015	2.2845	4.91
35	-1.3820	2.1040	4.91	36	-1.5625	1.9235	4.91
37	-1.7430	1.7430	4.91	38	-1.9235	1.5625	4.91
39	-2.1040	1.3820	4.91	40	-2.2845	1.2015	4.91
41	-2.4650	1.0210	4.91	42	-2.4650	0.7658	4.91
43	-2.4650	0.5105	4.91	44	-2.4650	0.2553	4.91
45	-2.4650	0.0000	4.91	46	-2.4650	-0.2553	4.91
47	-2.4650	-0.5105	4.91	48	-2.4650	-0.7658	4.91
49	-2.4650	-1.0210	4.91	50	-2.2845	-1.2015	4.91
51	-2.1040	-1.3820	4.91	52	-1.9235	-1.5625	4.91
53	-1.7430	-1.7430	4.91	54	-1.5625	-1.9235	4.91
55	-1.3820	-2.1040	4.91	56	-1.2015	-2.2845	4.91
57	-1.0210	-2.4650	4.91	58	-0.7658	-2.4650	4.91
59	-0.5105	-2.4650	4.91	60	-0.2553	-2.4650	4.91
61	0.0000	-2.4650	4.91	62	0.2553	-2.4650	4.91
63	0.5105	-2.4650	4.91	64	0.7658	-2.4650	4.91
65	-0.8845	-2.1350	4.91	66	-0.6318	-2.1350	4.91
67	-0.3791	-2.1350	4.91	68	-0.1264	-2.1350	4.91
69	0.1264	-2.1350	4.91	70	0.3791	-2.1350	4.91
71	0.6318	-2.1350	4.91	72	0.8845	-2.1350	4.91
73	1.0631	-1.9564	4.91	74	1.2418	-1.7777	4.91
75	1.4204	-1.5991	4.91	76	1.5991	-1.4204	4.91
77	1.7777	-1.2418	4.91	78	1.9564	-1.0631	4.91
79	2.1350	-0.8845	4.91	80	2.1350	-0.6318	4.91
81	2.1350	-0.3791	4.91	82	2.1350	-0.1264	4.91
83	2.1350	0.1264	4.91	84	2.1350	0.3791	4.91
85	2.1350	0.6318	4.91	86	2.1350	0.8845	4.91
87	1.9564	1.0631	4.91	88	1.7777	1.2418	4.91
89	1.5991	1.4204	4.91	90	1.4204	1.5991	4.91
91	1.2418	1.7777	4.91	92	1.0631	1.9564	4.91
93	0.8845	2.1350	4.91	94	0.6318	2.1350	4.91
95	0.3791	2.1350	4.91	96	0.1264	2.1350	4.91
97	-0.1264	2.1350	4.91	98	-0.3791	2.1350	4.91
99	-0.6318	2.1350	4.91	100	-0.8845	2.1350	4.91
101	-1.0631	1.9564	4.91	102	-1.2418	1.7777	4.91
103	-1.4204	1.5991	4.91	104	-1.5991	1.4204	4.91
105	-1.7777	1.2418	4.91	106	-1.9564	1.0631	4.91
107	-2.1350	0.8845	4.91	108	-2.1350	0.6318	4.91
109	-2.1350	0.3791	4.91	110	-2.1350	0.1264	4.91
111	-2.1350	-0.1264	4.91	112	-2.1350	-0.3791	4.91
113	-2.1350	-0.6318	4.91	114	-2.1350	-0.8845	4.91
115	-1.9564	-1.0631	4.91	116	-1.7777	-1.2418	4.91
117	-1.5991	-1.4204	4.91	118	-1.4204	-1.5991	4.91
119	-1.2418	-1.7777	4.91	120	-1.0631	-1.9564	4.91

Caso 1 : Axil de -7000.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.175	3.331	-7006.927	11733.77	0.00
10.0	-0.350	0.181	3.483	-7000.235	11473.89	1971.98
20.0	-0.350	0.183	3.553	-7015.335	10886.05	3948.78
30.0	-0.350	0.183	3.525	-7000.248	10033.40	5836.90
40.0	-0.350	0.179	3.417	-7000.926	8927.48	7544.18
50.0	-0.350	0.179	3.417	-7000.290	7544.49	8927.82
60.0	-0.350	0.183	3.525	-7000.124	5836.95	10033.47
70.0	-0.350	0.183	3.553	-7015.338	3948.78	10886.05
80.0	-0.350	0.181	3.483	-7000.506	1971.96	11473.71
90.0	-0.350	0.176	3.329	-7002.827	0.00	11736.79

Caso 2 : Axil de -7500.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.141	3.564	-7503.815	11346.08	0.00
10.0	-0.350	0.148	3.714	-7500.240	11105.81	1939.64
20.0	-0.350	0.150	3.785	-7517.917	10545.06	3832.58
30.0	-0.350	0.150	3.755	-7500.217	9733.28	5636.96
40.0	-0.350	0.145	3.650	-7500.561	8653.53	7279.99
50.0	-0.350	0.145	3.650	-7500.300	7280.14	8653.68
60.0	-0.350	0.150	3.755	-7500.126	5637.00	9733.34
70.0	-0.350	0.150	3.785	-7517.920	3832.58	10545.06
80.0	-0.350	0.148	3.714	-7500.388	1939.63	11105.69
90.0	-0.350	0.141	3.562	-7499.853	0.00	11349.39

Caso 3 : Axil de -8000.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.111	3.797	-8000.452	10904.18	0.00
10.0	-0.350	0.118	3.954	-8000.111	10682.35	1903.86
20.0	-0.350	0.120	4.028	-8021.932	10151.44	3700.36
30.0	-0.350	0.120	3.996	-8000.194	9388.21	5405.60
40.0	-0.350	0.115	3.889	-7999.924	8341.80	6977.01
50.0	-0.350	0.115	3.889	-7999.957	6976.99	8341.78
60.0	-0.350	0.120	3.996	-8000.131	5405.63	9388.25
70.0	-0.350	0.120	4.028	-8021.932	3700.36	10151.44
80.0	-0.350	0.118	3.954	-8000.103	1903.87	10682.36
90.0	-0.350	0.111	3.797	-8000.015	0.00	10904.60

Caso 4 : Axil de -8500.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.084	4.031	-8499.930	10398.16	0.00
10.0	-0.350	0.091	4.198	-8499.773	10198.41	1836.64
20.0	-0.350	0.092	4.283	-8528.630	9694.36	3542.62
30.0	-0.350	0.092	4.246	-8499.918	8984.72	5148.28
40.0	-0.350	0.088	4.126	-8499.992	7962.46	6650.55
50.0	-0.350	0.088	4.126	-8500.000	6650.55	7962.45
60.0	-0.350	0.092	4.246	-8499.930	5148.28	8984.71
70.0	-0.350	0.092	4.283	-8528.629	3542.62	9694.36
80.0	-0.350	0.091	4.198	-8499.798	1836.63	10198.38
90.0	-0.350	0.084	4.031	-8499.978	0.00	10398.11

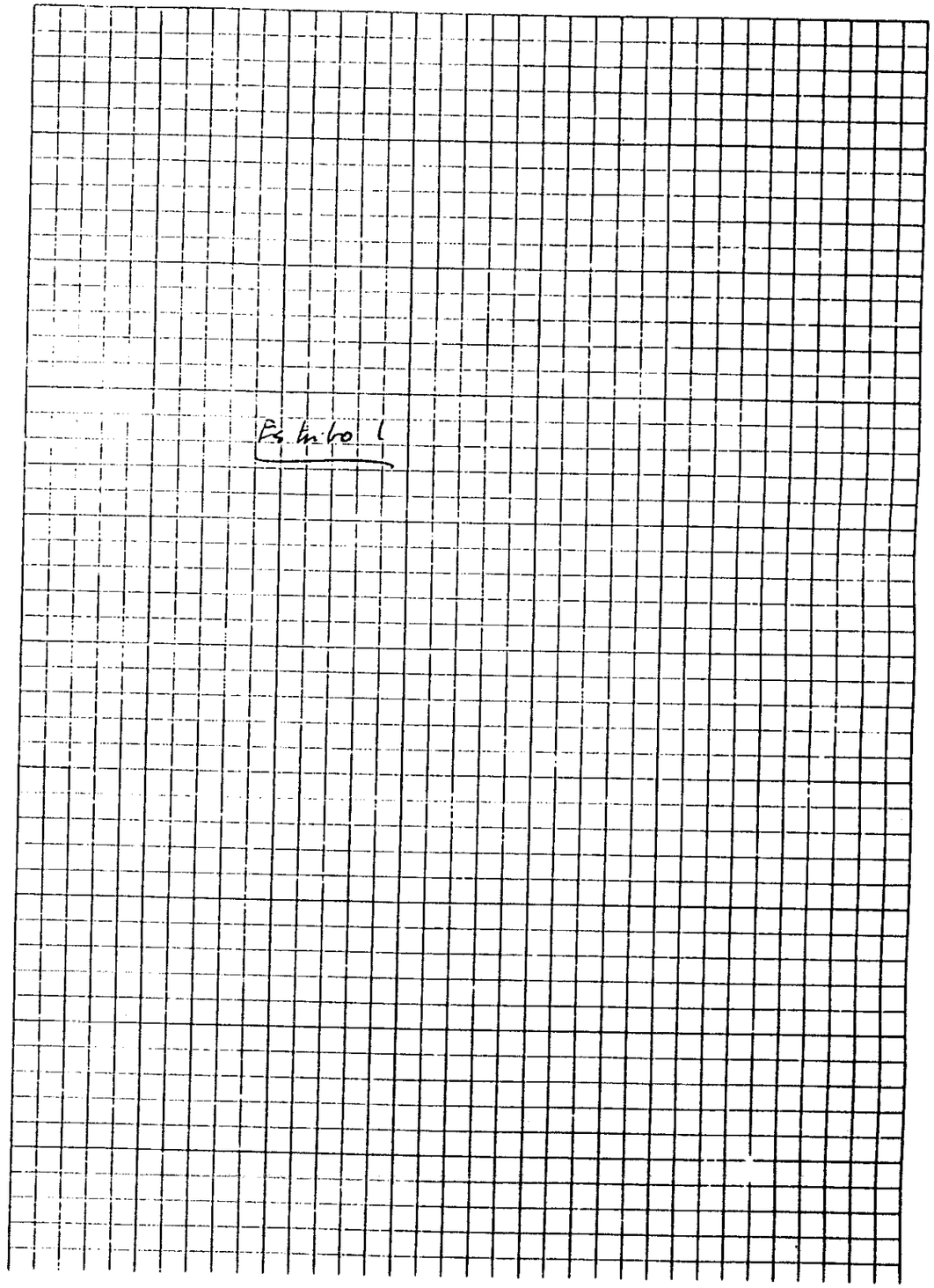
4.- CÁLCULO DE LOS ESTRIBOS

intecsa
INTERNACIONAL DE INGENIERIA Y ESTUDIOS TECNICOS S.A.

PROYECTO:_____ HOJA 1 DE ____

FECHA_____

EJECUTANTE:_____



1- Análisis de fuerza longitudinal

La acción de rozamiento del tablero sobre los pilas, por frenado y la dilatación térmica se absorben en el estribo 2 - punto fijo

Se toma como rozamiento el 5% de la reacción vertical de cargas muertas

$F = 0.05 (778 + 292 + 78) = 55$ t

2: Control de estabilidad del estribo

Reacción vertical del tablero $N_{max} = 1562$ t

$N_{min} = 975$ t

Empuje de tierras $z = 0.7$ h $= 0.54$ t/m²

Sobrecarga $(0.7 \times 1.6 + 3) 0.27 = 1.16$ t/m²

Δ por sismo

Empuje de tierras 0.093 t/m²

Sobrecarga $(3 + 0.3 \times 1.6) 0.046 = 0.102$ t/m²

Altura de estribo sobre base de zapata = 16.00 m

Anchura de estribo = 3.20 m

- Empuje de tierras

$F_H = \frac{1}{2} 0.54 \cdot 16^2 \cdot 13.2 = 912.4$ t

$M = 912.4 \times 16/3 = 4866$ mt

Incremento por sismo

$\Delta F_{HS} = \frac{1}{2} 0.093 \times 16^2 \times 13.2 = 157$ t

$\Delta M = 157 \times 16/2 = 1257$ mt

Sobrecarga

$F = (3 + 1.3) 0.27 \times 16 \times 13.2 = 245$ t

$M = 245 \times 16/2 = 1962$ mt

Incremento por sismo

$\Delta F = 0.102 \times 16 \times 13.2 = 21.5$ t

$\Delta M = 21.5 \times 16/2 = 172$ mt

Cargas verticales de sobrecarga

N sin sismo

$N = (1.3 \times 9.5 + 24) 4 = 145$ t

$M_A = 145 (7 + 2) = 1305$ mt

N con sismo

$N = (1.3 \times 9.5 + 24 \times 0.3) 4 = 38$ t

$M_A = 78 \times 9 = 704$ mt

- Cargas verticales

- Peso propio

$N_1 = 2,5(4,2 \times 6 \times 8,1 - 2 \times (\pi 8,)) = 504 - 20 = 484$ t

$M_{1A} = -504 \cdot 3,9 + 20 \cdot 2,45 = -1917$ mt

$N_2 = 2,5 \times 1,0 \times 13,5 \times 13,2 = 445,5$ t

$M_{2A} = 445,5 (6 + 0,5) = -2896$ mt

$N_3 = 2 \times 0,8 \times 13,4 \times 2,5 = 216$ t

$M_{3A} = 216 (6 + 1 + 2) = -1944$ mt

$N_4 = 14 \times 11 \times 8,5 \times 2,5 = 962,5$ t

$M_{4A} = 962,5 \times 11/2 = -5294$ mt

- Peso de tierras

En trasdós de zapata

$N = 1,16 \cdot 13,5 \cdot 4,2 = 1253$ t

$M_A = 253 \times (7+2) = -11275$ mt

No se tienen en cuenta las tierras sobre las mensulas de la zapata por ser escasa volumen

Comprobación a deslizamiento

a) Sin sismo

$\Sigma F_H = 912 + 245 + 55 = 1712$ t

b) Con sismo

$\Sigma F_H = 912 + 245 + 157 + 21 = 1335$ t

Suma de cargas verticales

a) Sin sismo

$N = 484 + 645 + 216 + 962 + 1253 + 145 + 975 = 6480$

$C_d = \frac{4480 \cdot 0,9 \operatorname{tg} \varphi}{1212} = \frac{4480 \cdot 0,5 \times 0,7}{1212} = 2,33$

b) Con sismo

$C_d = \frac{4413 \cdot 0,9 \times 0,7}{1335} = 2,08$ ...

En los valores son ampliamente suficientes.

Momento volcador

$M_V = 55 \times 10,5 + 4866 + 1962 = 7405$ mt

Momento estabilizador

$M_e = 1917 + 2896 + 1944 + 5294 + 11275 + 1309 +$
$+ 975 (1,8+1,5) = 27852$

$C_V = \frac{27,852 \times 0,9}{7405} = 3,38 \rightarrow$ válido

Tensiones en cimentación

Equilibrio en el cdg

a) Axil mínimo en apoyo

$N = 4480$

$M = 4480 \times 55 + 7405 - 27858 = 4183$

$\sigma = \frac{4480}{16 \times 11} \pm \frac{6 \cdot 4183}{14 \cdot 11^2} = 29,1 \pm 14,9$ → 44 t/m²; 14,2 t/m²

b) Con reacción máxima de la bóveda

$\Delta N = 1562 - 975 = 587$ t

$\Delta M = 587 (5,5 - 1,8 - 1,5) = 1291$ mt

$\Delta\sigma = \frac{587}{14 \cdot 11} \pm \frac{6 \cdot 1291}{14 \cdot 11^2} = 3,8 \pm 4,6$ → 8,4; −0,8

La peor de las tensiones

$\sigma_{max} = 44 + 8,4 = 52,4$ t/m²

$\sigma_{min} = 14,2 - 0,8 = 13,6$ t/m²

Las máximas tensiones, mayoradas de forma empírica, siendo el efecto lazo → aparecen transversales en los valores siguientes en apoyo

$M_x = 2108 + 944 + 28 = 2230$ mt

$F_z = 78 + 20 + 38 = 136$ t

En base de zapata

$M_T = 2230 + 136 \times 10,5 = 3658$

$\Delta\sigma = \frac{6 \times 3658}{14^2 \cdot 11} = \pm 0,3$

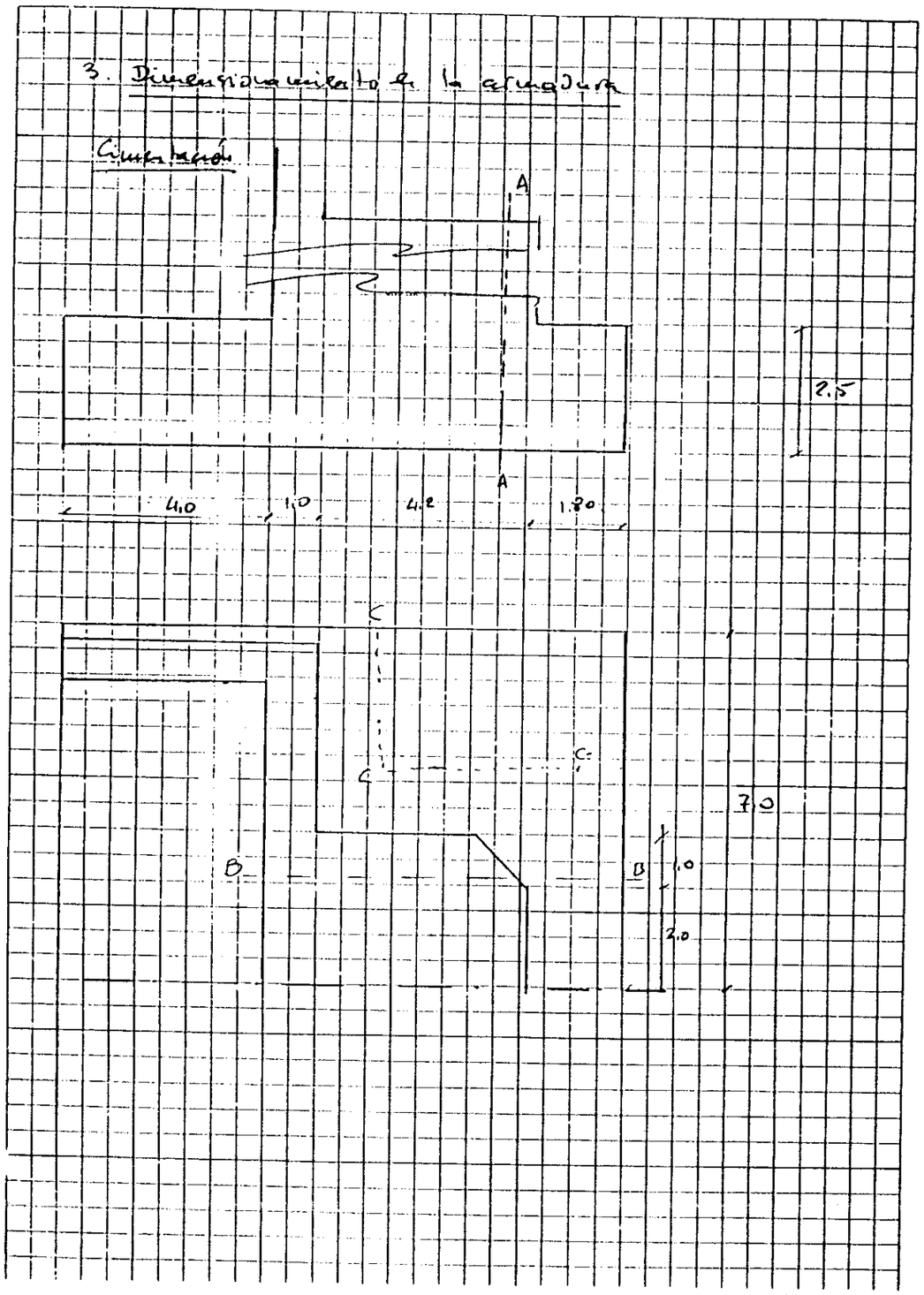
Las tensiones obtenidas en primera versión

$\sigma_{max} = 52,4 + 10,2 = 62,6$ t/m² } admisibles

$\sigma_{min} = 13,6 - 10,2 + 3,4$ t/m² }

3. Dimensionamiento de la armadura

Cimentación



Vuelo de la losa respecto sección A-A

$$y = 1.8 + 0.15 \cdot 2 = 2.58 \text{ m}$$

$$M_{AA} = \frac{1}{2} 2.58^2 (62.6 - 6.25) = 196 \text{ m-t}$$

$$U = \frac{1.6 \cdot 196}{2.4} = 130 \text{ t} \rightarrow \quad (\phi 25\ @ 12.5)$$

Vuelo lateral respecto a sección B-B

$$y = (14 - 6)/2 + 0.15 \times 6 = 4.9$$

$$M_{BB} = \frac{1}{2} 4.9^2 \left(62.6 - 6.25\right) - \frac{1}{3} 4.9^2 \left(\frac{10.2}{7} \cdot 4.9\right) =$$

$$= 270 - 57 = 213 \text{ m-t}$$

$$U = \frac{1.6 \times 213}{2.4} = 142 \text{ t/m} \rightarrow \phi 25\ @ 12.5$$

Comprobaciones a cortante

Vuelo longitudinal a la cara del pantalón

$$V_d = 1.6 \cdot (62.6 - 6.2) \cdot \left(1.8 - \frac{2.8}{2}\right) = 94 \text{ t}$$

$$V_{cu} = 64.5 \times 2.4 = 154 \gg V_d$$

Vuelo lateral

Se comprueba la sección C-C

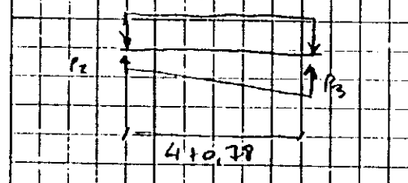
El área en planta es

$(6-1{,}7)(4-1{,}7) = 13{,}44$

$V_d \leq 13{,}44\,(62{,}6-6{,}7)\cdot 1{,}6 = 1213\,t$

$V_{uno} = 6{,}45 \cdot 2{,}45\,(2{,}8+4{,}8) = 1201\,t \simeq V_d$

En la zona más cargada las cargas son



$P_1 = 13{,}5 \times 2 + 1{,}3 + 3 + 2{,}5 + 2{,}5 = 37{,}6\,t/m^2$

$P_2 = 13{,}6$

$P_3 = 13{,}6 + \frac{52{,}4 - 13{,}6}{11} \cdot 4{,}78 = 30{,}5\,t/m^2$

El momento en una sección a 0,15 x 5,70 es aproximadamente

$$M = \frac{1}{2} 4{,}78^2 \left(37{,}6 - 13{,}6\right) + \frac{1}{6} 4{,}78^2 \left(30{,}5 - 13{,}6\right) =$$

$M = 274 - 64 = 210\ mt/m$

$U = \frac{1{,}6 \cdot 210}{240} = 140\ t \rightarrow \phi 25\ /17{,}5$

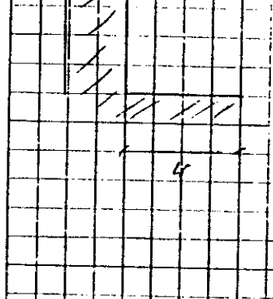
- Alas

Se dimensionan en voladizo como en los 5,5 en dirección.

Las zonas inferiores como las transversales

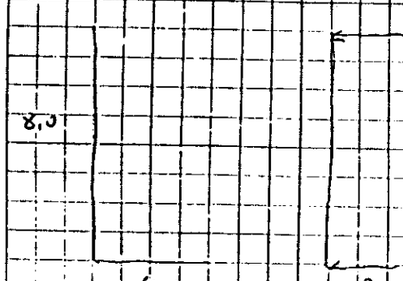
$P_2 = 0{,}54\,h + 1{,}16 \quad t/m^2$

$M = \frac{1}{2}(4+0{,}8)^2 \cdot P = 11{,}52\,P$



h	M
1	19,6
3/5	32,0
5	44,5

En la zona inferior



$p_1 = 0,54 \times 5,5 + 1,16 = 4,13$ t/m²

$p_2 = 0,54 \cdot 8 = 4,32$ t/m²

$a/b = 4/8 = 0,5$

$M_1 = 0,043 \cdot 4,13 \cdot 4^2 + 0,088 \cdot 4,32 \cdot 4^2 = 34,5$ mt

$M_2 = 0,125 \cdot 4,13 \cdot 8^2 + 0,089 \cdot 4,32 \cdot 8^2 = 52,4$ mt

Armadura horizontal

$M_{min} = 44,5$

$U = 0,97 \dfrac{1,6 \cdot 44,5}{0,75}\left(1 + \dfrac{1,6 \cdot 44,5}{1666\ 0,75^2}\right) = 99$ t (Φ25 /20)

Armadura vertical

$M_{vd} = 52,4 \times 1,6 = 83,8$ mt

$U = 0,97 \cdot \dfrac{83,8}{0,75}\left(1 + \dfrac{83,8}{1666\ 0,75^2}\right) = 118$ t (Φ20 /15)

Cuerpo central

El máximo momento en la base

$M = \left[\frac{1}{6} 0,54 \cdot 13,5^3 \cdot 11,6 + \frac{1}{2} 1,16 \cdot 13,5^2 \cdot 11,6 + 55 \times 8\right] = 4235$ mt

Reacción de apoyo

$N_1 = 975$

Para el cuerpo del extremo

$N_2 = 8 \times 6 \times 4,2 \times 2,5 = 504$ t

$N_3 = 13,5 \times 11,6 \times 1 \times 2,5 = 391$ t

Momento respecto a la armadura de la izquierda

$M = 4235 + 975\,(0,9 + 4,2 - 1,5) + 504\,(0,9 + 2,1) + 391\,(0,4) = 4235 + 3510 + 2016 + 156$

$M_d = 4235 \times 1,6 + 5682 \times 0,9 = 11890$ mt

$U = 0,97 \dfrac{11890}{5,1}\left(1 + \dfrac{11890}{1666 \cdot 6 \cdot 5,1^2}\right) = 99\,(975 + 504 + 391) =$

$U = 2364 - 1683 = 682$ t en 11,6 m

Se pone como mínima Φ25 /12,5

intecsa

PROYECTO:_____ HOJA____ DE____

FECHA_____

EJECUTANTE:_____

Ejemplo 2

1. Análisis de fuerzas longitudinales

- Rozamiento 5% de Pes y carga permanente

PP tablero $53,2 \times 1,03 = 54,2$ t/m

Pes bas carriles $4 \times 4,8 \times 2,5 \times 2 = 100$ t

Pes bas en tablero $4 \times 4,8 \times 2,5 \times 3 = 170$ t

Carga permanent $= 12$ t/m

$F_r = \left[(830 - 0,4 \cdot 50)(34,2 + 12) + 170 + 13 \times 100 \right] \times 0,05$

$F_r = 38892 \times 0,05 \simeq 1950$ t

- Frenada

Real: $F_f = 1,9 (12 \times 30 + 270 \times 10)/8 \simeq 727$ t

UIC: $F_f = 6000 \times (1 + 0,9)/9,8 \simeq 1162$ t

- Fuerza de retracción térmica no balasto

$F_t = 1100 \times 2 / 9,8 \simeq 224$ t

- Eliminación de tensiones producidas en lanzamiento

Rozamiento 5%.

$F = 830 \times 33,7 \times 0,05 \simeq 1400$ t.

- Acción sísmica longitudinal sobre tablero con 2 frenos de 300 t a) 30%.

Sismo sobre tablero

$F_{s1} = 0,064 (38892 + 30 \cdot 46,2 + 170) \simeq$

$F_{s1} = 0,064 \times 39986 \simeq 2560$ t

Sismo sobre 2 trenes Renfe

$0,064 \times 2 \left[12 \times 30 + 10 \times 270 \right] \times 0,3 = 117$ t

Sismo sobre 2 Trenes UIC

$0,064 \times 2 \left[100 + (300 - 6,4) 8 \right] \times 0,3 = 94$ t

- Características del material

$\varphi = 35^\circ$, $\delta = 0$

Empuje activo $K = 0,27$

Densidad 2 t/m³

Sobrecarga en coronación 3 t/m²

Incremento de empuje por sismo

$K_{ad} = 0,3166$

$\Delta K = 0,3166 - 0,27 = 0,0466$

$\gamma \Delta K = 2 \cdot 0,0466 = 0,093$ t/m³ (aplicado a H/2)

Este coeficiente se aplicará también a la sobrecarga estática incrementada 30% de la máxima ($0,3 \times 3 = 0,9$ t/m²)

Fuerza a transmitir en el tope

a) Sin sismo

F = 1950 + 1162 + 224 = 3336 t

b) Con sismo (Se eliminan rozamientos)

F = 1162 x 0,3 + 2560 + 117 = 3026 t

El sismo no condiciona

Se pretensará para absorber las 3336 t en servicio y dejar un remanente que puede estimarse en 10 kg/cm²

Se precisa un esfuerzo de 7500 t

$$N = 2 \times 3336 + 100 \times \frac{3.5^2 \pi}{4}$$

N = 6672 + 706 = 7380 t

Se considerarán pérdidas por penetración de cuña (5 mm) fricción y relajación

$$\varepsilon = \frac{\Delta l}{l} = \frac{0,005}{67} = 0,74 \cdot 10^{-3}$$

Si se consideran las pérdidas por fluencia y acortamiento elástico del hormigón

$$\sigma = \frac{4000}{7} = 600 \text{ kg/cm}^2$$

$$\varepsilon_h = \frac{60}{300.000}\left(1 + 0,5\right) = 0,3 \cdot 10^{-3}$$

Para un cable de 24 ϕ 0,6"

$$\Delta N = 24 \times 1,4 \times 1,95 \cdot 10^6 \left(0,74 + 0,3\right) 10^{-3} \cdot 10^{-3} \text{ t}$$

$$\Delta N = 48,5 + 19,6 = 68,1 \text{ t}$$

Supuesto un 5% de pérdidas por relajación se precisa un esfuerzo inicial P_0 en cada uno de los anclajes

$$\frac{3336 + 706}{10} = P_0 - 48,5 - 19,6 - 0,05\left(P_0 - 48,5 - 2.19,6\right)$$

P_0 = 497,5 t (10 cables 24 ϕ 0,6 Tensión = 1770 kg/cm² la carga de rotura

En rotura tiene que siguiendo cumplirse la siguiente desigualdad:

Carga de rotura $N = 24 \times 10 \times 1,4 \times 17 / 1,15 = 4967$ t

$$\gamma = \frac{4967}{1950 + 1162 + 224} = 1,49 \quad (> 1,4 \text{ OK})$$

$$\gamma = \frac{4967}{2.360 + 0,3.1162 + 94} = 1.65$$

Coeficientes que se consideran suficientes

Se considera un aparato de apoyo circular con una tenal elastómero confinado trabajando a una tensión media de 250 Kg/cm²

$$\text{Area} = \frac{7500}{7500} = 3,00 \text{ m}^2 \rightarrow \phi = 1.9 \text{ m}$$

Se considera una tensión exterior

$\phi_e = 1,95 + 2 \times 0,15 = 2,25$ m equivalente

a un cuadrado de 2,00 m de lado

Se dispone un espesor total de unos 25 cm

2. Cortina de estribos 1&2 estribos

Reacciones vertical de tablero $N_{max} = 1448$ t
$N_{min} = 922$ t

Empuje de tierras $2 \times 0,77 h = 0,54 h$ t/m²

Sobrecarga $(1,3+3) 0,77 = 1,16$ t/m²

A Por ancho

Empuje tierras 0,093 h t/m²

Sobrecarga $(3 \times 0,3 + 1,3) \cdot 0,046 = 0,102$ t/m²

Rozamientos 195 t

Frenado 116 t

Interaccion con tablero 224 t

Esfuerzo con frenado compatible 300 t

Altura de cortina sobre base de zapata 15,10 m

Ancho de cortina 13,70 m

- Empuje de tierras

$F_H = \frac{1}{2} 0,54 \cdot 15,1^2 \cdot 13,2 = 813$ t

$M = 813 \times 15,1/3 = 4090$ mt

Incremento por sismo

$\Delta F_H = \frac{1}{2} \cdot 0,093 \cdot 15,1^2 \cdot 13,2 = 140$ t

$\Delta M = 140 \times 15,1/2 = 1057$ mt

Sobrecarga

$F = (3+1,3) 0,27 \cdot 15,1 \cdot 13,2 = 231,4$ t

$M = 231,4 \times 7,5 = 1736$ mt

Incremento por sismo

$\Delta F = 2,102 \cdot 15,1 \cdot 7,2 = 20,3$ t

$\Delta M = 20,3 \times 7,5 = 152$ mt

N sobrecarga sin sismo

$N = (13 \times 3,8 + 24) \cdot 18 = 615$ t

$M_a = -615 (11+7) = -11061$ mt

N sobrecarga con sismo

$N = (1,3 \times 3,8 + 24 \times 0,8) \cdot 18 = 312$ t

$M_a = -312 (11+7) = -5618$ mt

- Peso tablero

$N_1 = 2,5 (4 \times 6 \times 6,0 - 1 \cdot 1 \cdot 6,0) \cdot 36,0 - 15 = 3417$ t

$M_{1A} = -360 \times 5 + 15 \cdot 3,33 = -1750$ mt

$N_2 = 2,5 \times 4 \times 12,1 \times 13,2 = 1597,2$ t

$M_{2A} = 1597,2 \cdot 9 = -14375$ mt

$N_3 = 2,5 \times 2,4 \times 12,1 \times 14 = 1016,4$ t

$M_{3A} = 1016,4 (11+7) = -18295$ mt

$N_4 = 3,0 \times 19,2 \times 2,5 \times ,25 = 2850$ t

$M_{4A} = -2850 \times 12,5 = -35625$ mt

- Peso de hierro

Sobre región de rampla

$N = 2 \times 10,80 \cdot 12,10 \times 14 = 3659$ t

$M_a = -3659 \times (11+7) = -65863$ mt

Zona horizontal de las vías

$N = 3 \times 6 \times 1 \times 2 = 36$ t

$M_a = -36 \times 1,5 = -54$ mt

Zonas horizontales laterales

$N = (19,2-6) 7 \times 1 \times 2 = 128,8$ t

$M_a = -128,8 \times 3,5 = -450$ mt

$N = 2 \cdot 1 \cdot 0,5 \cdot 18 \cdot 12 \cdot 2 = 432$ t

$M_a = -432 (7+1 \; 18 \times 2/3) = +8208$ mt

- Empuje pasivo del recalzo H/10 = 1,45 m retenido

$K_p = 0,6 \cdot K_p^{\gamma} (1,5 + t/2) = 2,21$

$\Sigma K_p = 2 \cdot 2,21 = 4,41$

$P_H = \frac{1}{2} (1 + 2,5 - 1,45)^2 \cdot 4,41 \cdot 15,2 = 140$ t

Comprobación a la traslación

a) Sin sismo

$\Sigma F = 950 + 1162 + 224 + 813 + 231 - 140 = 4240$ t

b) Con sismo

$\Sigma F = 3003 + 813 + 140 + 231 + 21 - 140 = 4068$ t

Suma de cargas verticales

$\Sigma N = 345 + 1597 + 1016 + 2850 + 3659 + 36 + 129 + 432 + 922 = 10986$

$C_d = \frac{10986 \cdot 0,9 \cdot tg\,\varphi}{4240} = \frac{10986 \cdot 0,9 \cdot 0,7}{4240} = 1,63 > 1,50$

Momento volcador

$M_V = (1950 + 1162 + 224)(15,10 - 2,) + 4090 + 1736 = 49528$ m t

Momento estabilizador

$M_e = 1750 + 14375 + 18295 + 35625 + 65863 + 54 + 450 + 8208 + 922 (1,50 + 3,00) = 148769$

$C_V = \frac{148769 \cdot 0,9}{49528} = 2,70 \gg 1,50$

Expresiones referidas al c de g

a) Axil centrado en zapata

$N = 10986$ t

$M = 10986 \cdot (12,7) + 49528 - 148769 = 38084$

$\sigma = \frac{10986}{15,2 \cdot 2,5} \pm \frac{6 \cdot 38084}{15,2 \cdot 2,5^2} = 28,9 \pm 24,0 =$ 52,9 t/m² ; 4,9 t/m²

b) Con reacción máxima 4 ejes

$\Delta N = 1448 - 922 = 526$ t

$\Delta M = 526\ (12,5 - 4,5) = 4208$

$\Delta\sigma = \frac{526}{15,2 \cdot 25} \pm \frac{6 \cdot 4208}{15,2 \cdot 25^2} = 1,4 \pm 2,6 \begin{cases} 4,0 \\ -1,2 \end{cases}$

lo que da cargas tensiones

$\sigma_{max} = 52,9 + 4 = 56,9$ t/m²

$\sigma_{min} = 4,9 - 1,2 = 3,7$ t/m²

El máximo tensión corresponde a dos ejes centrados con rigidez en eje izq y gradiente transversal

$M_x = 95 + 446 + 92 = 1633$ mt

$F_z = 20 + 28 + 47 = 125$ t

En base de zapata

$M_x = 1633 + 25\ (6,5 + 2,5) = 2758$ mt

$\Delta\sigma = \pm \frac{6 \cdot 2758}{15,2^2 \cdot 25} = 2,9$ t/m²

Con lo que la tensión máxima en suelo es

$\sigma_{max} = 56,9 + 2,9 = 59,8$ t/m² admisible.

$\sigma_{min} = 3,7 - 2,9 = 0,8$ t/m²

3 Dimensionamiento de la armadura.

Armadura de pilotes.

- Parrilla de reparto

a) La fuerza total sobre el apoyo es de 7500 kn

Calculando pilotes a dos líneas y por pares de cada que se producen con anterioridad a los efectos de fijación, se toma

$F = 7500 - 10\left[48,5 + 0,05\ (492,5 - 49,5 - 2 \cdot 19,6)\right] = 6822$ kn

$N = 6822 \times 0,04 = 273$ t

$A = 273/21 = 130$ cm² (26 ø 25 ó 20 ø 20)

En la cara de tracción se dispone una parrilla superficial para el pretensado

$0,04\ P = 0,04 \cdot 492 = 19,7$

$A = \frac{19,7}{2,1} = 9,4$ cm² que van 6 ø 16 perimetrales.

Horizontales 6 ø 16 por cada lado → 5 x 6 ø 16

Verticales 6 ø 16 por cada lado → 2 x 6 ø 16 centrales

- Dirección principal

Solo hay que dispuesta la fuerza horizontal ya que el pte transversal de autoequilibra.

De acuerdo con la EH-91

$$F = 0,3 \left(1 - \frac{y_o}{d}\right) \cdot R$$

$R = 1950 + 1162 + 224 = 3336$

$y_o = 2.00$ m

En hilo vertical $y = 1,95 \times 2 = 3.90$

$$F_b = 3336 \times 0,3 \left(1 - \frac{2}{3.90}\right) = 487 \text{ kn}$$

$A = 487 / 2,1 = 232 \text{ cm}^2$ (4 capas de 21 ϕ 20, a 0,15 m)

En hilo horizontal $y = 13,20$

$$F_b = 3336 \times 0,3 \left(1 - \frac{2}{13,20}\right) = 849 \text{ kn}$$

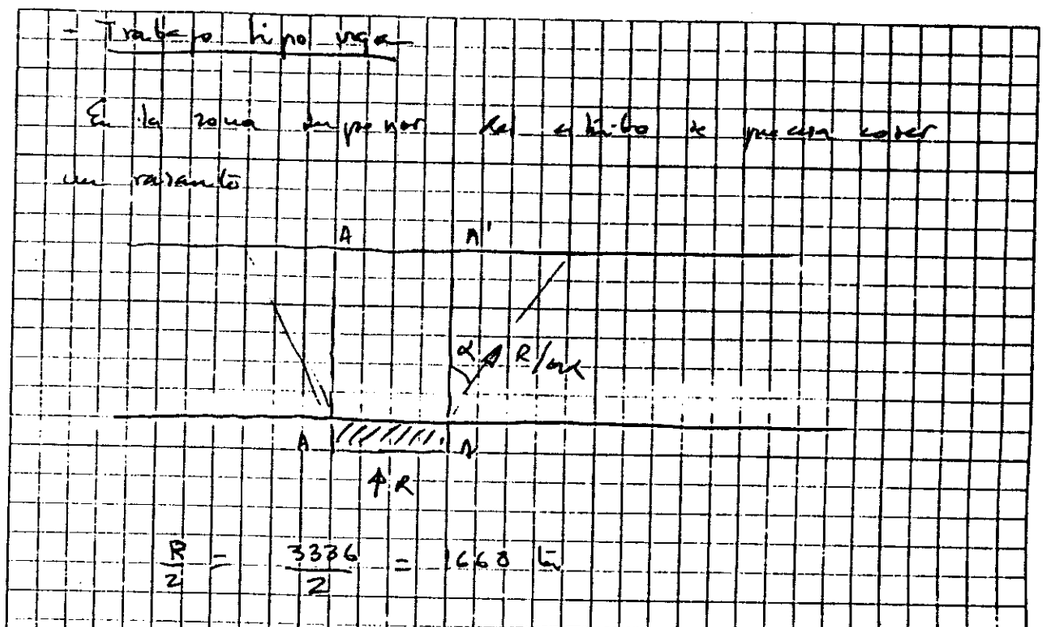
$A = 849 / 2,1 = 404 \text{ cm}^2$ (4 capas de 21 ϕ 25 a 0,15 m)

En las capas de 5m hacia cada 50 cm, eliminando la primera a 25 cm del paramento lado parcela

(Colocaremos a 25 - 75 - 125 - 175

- Trabajo tipo viga

En la zona superior del estribo se producirá tracción un rasgado



$$\frac{R}{2} = \frac{3336}{2} = 1668 \text{ kn}$$

$$A = \frac{1668 + 116}{4,2} = 535 \text{ cm}^2$$

Si disponen 2/3 de la armadura en los 30 cm más próximos a cada cara 424 cm^2

Cara lado calle $A = 217 \text{ cm}^2$

Se prolongan los 26 ϕ 25 de armadura principal

Si prolongan la 1ª capa horizontal 21 ϕ 25

$A = (26 + 21) \times 4,91 = 230 \text{ cm}^2$

Cara lado fincas

Armadura principal 26 ϕ 25 →

Si combinan 10 5 x 6 ϕ 6 a 5 x 6 ϕ 25

$A = (26 + 32) 4,91 = 275 \text{ cm}^2$

En el alzado se colocan tres placas una de armadura horizontal a 75 - 125 y 175 cm del paramento inferior, de 21 ⌀ 20 a 15 cm (L = 9 m)

$A = 3 \times 21 \times \pi = 198 \text{ cm}^2$

$\Sigma A = 230 + 275 + 198 = 703 > 635 \text{ cm}^2$

Como armadura vertical se disponen 43 ⌀ 20 por plano cada 15 cm.

Con objeto de anclar la hoja se disponen a cada lado del espacio de apoyo una armadura

$$A = \frac{1}{2} \frac{3336 \cdot 1.6}{4.43} = 602 \text{ cm}^2$$

Se colocan en una altura de 2.10 m 24 planos separados 15 cm con 4 horquillas ⌀ 20 en cada plano

$A = 24 \times 4 \times 2 \times \pi = 603 \text{ cm}^2$

La tensión rasante en el hormigón contando solo la componente por la cara inferior será

$$S = (2 + 3.90) 3.90 = 23 \text{ m}^2$$

$$\tau_d = \frac{3336 \times 1.6}{23} = 231 \text{ kg/m}^2 \text{ admisible}$$

Flexión

Con objeto de cuantificar la transferencia de carga se ha hecho una estimación en la que puede absorber el pedón como ménsula a flexión vertical y como viga horizontal apoyada en los ejes laterales.

En el caso de la ménsula, la placa para una longitud L_1 y una carga P_1 y una anchura eficaz de unos $\left(2 + 2 \times \frac{3}{4} \times 4 = 8\right)$ m

$$\delta = \frac{P_1 \cdot L_1^3}{48 E I_1}$$

En el caso de la flexión horizontal incluyendo una anchura colaborante de unos 6,6 m al tener en cuenta la distancia de la carga al borde inferior d

$$d = 1.95 + 0.65 = 2.60$$

$$b = 2.6 + 1 + \frac{3}{4} \times 4 = 6.6 \text{ m}$$

Se tendrá

$$\delta = \frac{P_1 \cdot 3.5^3}{3 \cdot E \cdot 8 \cdot h^3/12} = \frac{P_2 \cdot 12.2^3}{48 \cdot E \cdot 6.6 \cdot h^3/12}$$

$$\left.\begin{array}{l} P_1 = 3.2\, P_2 \\ P_1 + P_2 = 3336 \end{array}\right\} \quad \begin{array}{l} P_1 = 2542 \text{ t} \\ P_2 = 794 \text{ t} \end{array}$$

que se reparten aproximadamente el 75% y el 25%

De acuerdo con ello se dimensiona la flexión vertical para toda la carga, suponiendo, en mecanismo horizontal para el 25% de la carga.

Flexión horizontal

$P = 3336/4 = 834$ kg

$M_h = 834 \times \frac{12,2}{4} - \frac{834 \cdot 0,5}{2} = 2335$ mt

$U = 0,93 \frac{2335 \cdot 1,6}{3,7} \left(1 + \frac{2335 \cdot 1,6}{666 \cdot 5,6\ 3,85^2}\right) = 968$ kg

En la dirección perpendicular en 5,6 m tenemos 146 kg/cm equivalentes a 34 cm²/m, muy inferior a la existente

Armadura de tendido

$V_d = \frac{1}{2} 834 \times 1,6 = 667$ kg

$V_{cu} = 64 \times 6,6 \times 3,7 = 1647$ kg $> V_d$

No es precisa

Acortante puede considerarse una anchura colaborante

$b = 2 + 3,85 = 9,90$ cm

El empuje de tierras en 9,9m será

$E = \left(\frac{1}{2} 0,27 \cdot 2 \cdot 5,43^2 + 0,29 \cdot (3+1,9) \cdot 5,43\right) 9,9 = 142$ kg

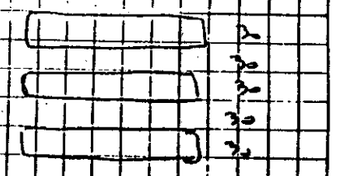
$V_d = (3336 + 142)\ 1,6 = 5565$ kg

$N_{cu} = 64,5 \cdot 9,9 \cdot 3,85 = 2458$ kg

$A_s = \frac{5565 - 2458}{0,9 \cdot 4,7 \cdot 3,85 \cdot 9,9} = 22$ cm²/m²

5 pares planos de cercos ϕ 16

separados 30 cm



$A = \frac{4 \times 4 \times 2}{1,2\ 1,2} = 22,2$ cm²/m²

Flexión vertical $z = 4,43 + 0,5 - 1,95 = 3,48$

Como anteriormente con la sección

$M_d = 3336 \times 3,48 \times 1,6 = 18575$ mt

$A_{sf} = \frac{18575}{3,85 \cdot 4,43} = 1090\ cm^2$

$A_{sv} = \frac{3336 \times 1,6}{4,7\ ctg\ \theta} = \frac{3336 \times 1,6}{4,2} = 1270\ cm^2$

$\tau_d = \frac{3336 \times 1,6}{(2+3,85) \cdot 3,85} = 736\ t/m^2$ admisible

Siendo $A_{sf} > 2/3\ A_{sv}$ se dispone como armadura de flexión $A_{sf} = 1090\ cm^2$ en un ancho de $2+2\times3 \simeq 8$ m y estribos verticales $A_{se} = 0,5\ A_{sf} = 545\ cm^2$

Para el dimensionamiento se incluyen los empujes de tierra considerando el peso de balasto y la sobrecarga.

Sólo se comprueba la hipótesis de servicio sin sismo, ya que la acción sísmica libera las tensiones normales en las secciones que son determinantes.

En horizontal por m de ancho,

$M = \frac{1}{6} 2 \cdot 0,27 \cdot 5,437^3 + \frac{1}{2}(3+1,3) 0,27 \cdot 5,437^2 \cdot 3,1 = 6$ mt/m

que es prácticamente despreciable frente a la anterior

Zona marina

En esta zona se precisa armadura de cortante para

$V_{cu} = 64,5 \times 6 \times 7,8 \simeq 3020$ t

En empuje total contando empuje de tierra resulta

$V_d = 1,6 \left(3336 + \frac{1}{2} 10,8 \times 12,1^2 \cdot 0,54 + 10,8 \times 12,1 \times 1,16 \right) =$

$V_d = 1,6 \left(3336 + 427 + 151 \right) = 6262$

$A = \frac{6262 - 3020}{0,9 \cdot 4,2 \cdot 7,8} = 110\ cm^2$ por m de alineación

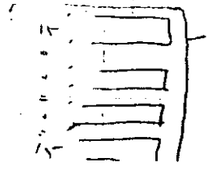
en 6 m de ancho, equivalente a $19\ cm^2/m^2$

Se colocan placas horizontales de 19 horquillas ϕ 16 separadas 60 cm

$A = \frac{19 \times 2 \times 2}{0,6} = 126\ cm^2$ /m alineación

Para anclar el empuje horizontal se colocan bajo apoyo una armadura horizontal

$A = \frac{3336 \times 1,6}{4,43} = 1270\ cm^2$ repartidos en 6 m de ancho en 1,50 m profundidad



10 Planos de 19 horquillas ϕ 20 a 15 cm

$A = \frac{1,5}{0,15} \times 2 \times 4,94 + 60 \times 4,9 + 19 \times 2 \times 2 \times \pi = 1250\ cm^2$

Armadura a flexion

En el caso de esfuerzo en el sentido de la hoja el momento que se produce en la base y la dirección los empujes de hoja

$$M = 3336\left(6,1 + 0,5 + 3\right) + \left[\frac{1}{6}\,0,54 \cdot 12,1^3 + \frac{1}{2}\,1,16 \cdot 12,1^2\right]10,8 =$$

$$M = 31692 + 2640 = 34332$$

Reacción de apoyo $H_1 = 922$ kn

Peso del muro

$$N_2 = 6 \times 6,0 \times 4 \times 2,5 = 360\ t$$

$$N_3 = 4 \times 10,8 \times 12,1 \times 2,5 = 1307\ t$$

Hormigón respecto a la armadura de tracción

a) Tracción en base hoja

$$\Delta M = 922\,(7,8 - 1,5) + 360\,(4 + 1,9) + 1307 \times 1,90 = 10416$$

$$\Sigma N = 922 + 360 + 1307 = 2589$$

$$M_d = 34332 \times 1,6 + 10416 \times 0,9 = 64306$$

$$U = 0,9 \cdot \frac{64306}{7,85}\left(1 + \frac{64306}{1666 \cdot 6 \cdot 7,85^2}\right) - 0,9 \cdot 2589 = 8775 - 2330 =$$

$$= 6445\ t$$

$U = 6445$ kn $\rightarrow$ 596 t/m $\rightarrow$ 135 cm²/ml

b) Tracción en el lado de puente

$$\Delta M = 922 \times 1,5 + 360 \cdot 1,9 + 1307\,(4 + 1,9) = 9778$$

$$M_d = (31692 - 2640)\,1,6 + 9778 \cdot 0,9 = 55283$$

$$U = 0,9 \cdot \frac{55283}{7,85}\left(1 + \frac{55283}{1666 \cdot 13,20 \cdot 7,85^2}\right) - 0,9 \cdot 2589 =$$

$U = 7110 - 2330 = 4780$ en 6 m de ancho

$$A = \frac{4780}{4,43} = 1080\ cm^2$$

2 capas de 10 ϕ 32 en los 6 m = 960 cm²

Se ponen también los ϕ 25 / 15 cm visibles en las caras laterales.

Parrilla de reparto en apoyos

La máxima reacción en apoyo es

$N = 1143$ tn.

Se incrementa en

$\Delta N = \frac{1}{2}\ 9,5 \times 0,65 \times 2,5 \times 48 \times 2/5 = 150$ tn

Tener en cuenta el incremento de espesor de losa en las nervaduras produce por efecto del KV 30.000

Se toma $N = 1300$ tn

Parrilla superficial

$N = 0,04 \times 1300 = 52$ tn →

$A = \frac{52}{21} = 25\ cm^2$ → 15 ϕ 16 por apoyo

Dirección principal

$\gamma_0 = 0,62$

$\gamma = 1,50$

$F = 0,3 \cdot 1300 \left(1 - \frac{0,62}{1,50}\right) = 229$ tn

$A = \frac{229}{2,1} = 109\ cm^2$ (banda armadura dispuesta para el tiro longitudinal)

En la otra dirección 4 planchuelas 15 ϕ 16 → 80 cm²

Esfuerzos transversales

Se comprueba la sección inferior

$M_b = 95 + 1446$ mt en plano de apoyos

$F_z = 20 + 58 = 78$ tn

En la base se tiene

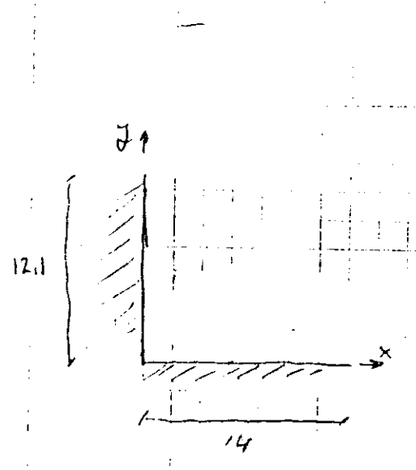
$M = 1633 + 125 \times 6,5 = 2445$

$M_d = 2445 \cdot 1,6 = 3913$ mt

$U = \frac{3913}{13} = 300$ tn en 4 m → 75 tn/m

$A = 75 / 4,63 = 17\ cm^2/m$ — ϕ 20 / 15

Aletas



Dadas las dimensiones hubiera sido preferible empotrarlas en 2 bordes con el esquema de carga de la figura

$P_1 = (3 + 1,3)0,24 = 1,16\ t/m^2$

$P_2 = 1,82 - 0,54\ Z = 6,53\ t/m^2$

De acuerdo con la tabla de Bares (1.41 y 1.97) los momentos máximos para la relación

$$\frac{a}{b} = \frac{12,1}{14} = 0,86 \quad \text{son}$$

Flexion horizontal: banda superior

$$M_x = 0,33 \times 1,16 \cdot 10^2 + 0,075 \cdot 6,53 \cdot 14^2 = 171 \text{ mt/m}$$

$$R_x = 1,14 \cdot 1,16 \cdot 14 + 0,155 \times 6,53 \times 14 = 32,7 \text{ t/m}$$

Flexion vertical borde extremo

$$M_y = 0,246 \cdot 1,16 \cdot 12,1^2 + 0,101 \cdot 6,53 \cdot 12,1^2 = 138 \text{ mt/m}$$

$$F_y = 1,15 \cdot 1,16 \cdot 12,1 + 0,55 \cdot 6,53 \times 12,1 = 59,6 \text{ t/m}$$

Comprobación a cortante (Se comprueba a 1/2 canto)

$$V_d = \left[59,6 - (6,5+1,16)0,6\right]1,6 = 88 \text{ t/m}$$

$$V_{cu} = 64,5 \times 1,15 = 74 \text{ t/m}$$

$$A_\alpha = \frac{88 - 74}{0,9 \cdot 4,2 \cdot 1,15} = 3,2 \text{ cm}^2/\text{m}$$

Se armará a cortante solo los 3 m inferiores ya que a 9,1 m de profundidad) el cortante

máximo es

$$V = 59,6 - 3\,(1,16 + 0,54 \cdot 10,5) = 39 \text{ t/m}$$

$$V_d = 39 \times 1,6 = 62,4 \leq V_{cu}$$

A flexion en los 3 m superiores y en los 3 m extremos se dispone las siguientes armaduras con 8 m de longitud

$$M_d = 171 \times 1,6 = 274 \text{ mt}$$

$$U = 0,97\,\frac{274}{4,15}\left(1 + \frac{274}{1666 \cdot 1,15^2}\right) = 260 \text{ t/m}$$

$$A = \frac{260}{4,43} = 58,7 \text{ cm}^2/\text{m} \rightarrow 2\,\phi\,25/15 \text{ cm}$$

El resto del paramento se arma con:

Cara interior # ϕ25/15

Cara exterior # ϕ20/15

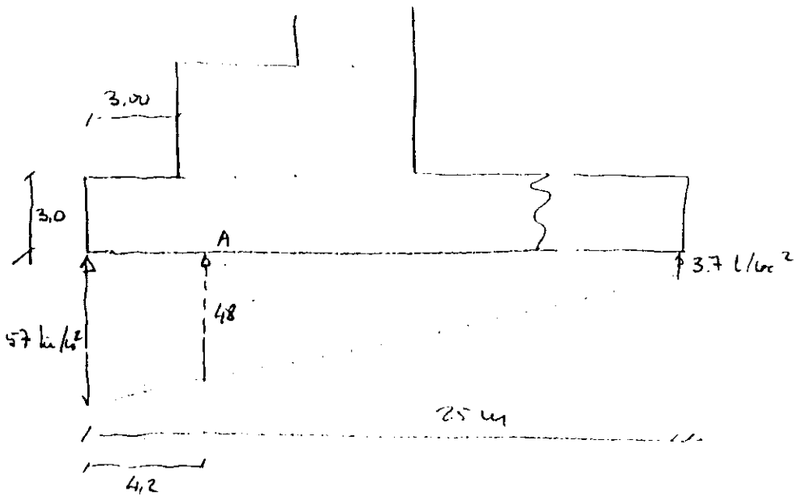
Armadura de la cimentación

- Zona de tablero ($L = 7$ m)

Vuelo longitudinal:

$$V = 3 + 0{,}15\,(4+4) = 4{,}20$$

Diagrama de tensiones



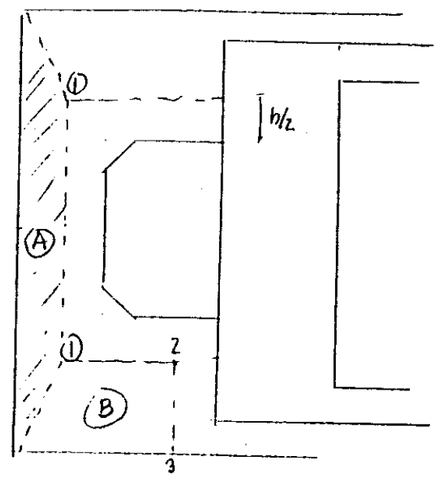
En la sección A es

$$M = \tfrac{1}{2}\,4{,}2^2\left[48 - 7{,}5\right] + \tfrac{1}{3}\,4{,}2^2\,(57-48) = 410 \text{ mT}$$

$$U = \frac{410 \times 1{,}6}{2{,}9} = 226 \text{ t} \rightarrow 2\,\phi 25\ /15 \text{ cm}$$

A cortante, tomando una sección de ancho

$$b = 6 + 2{,}9 = 8{,}9 \text{ m}$$



Las cargas en la zona A son

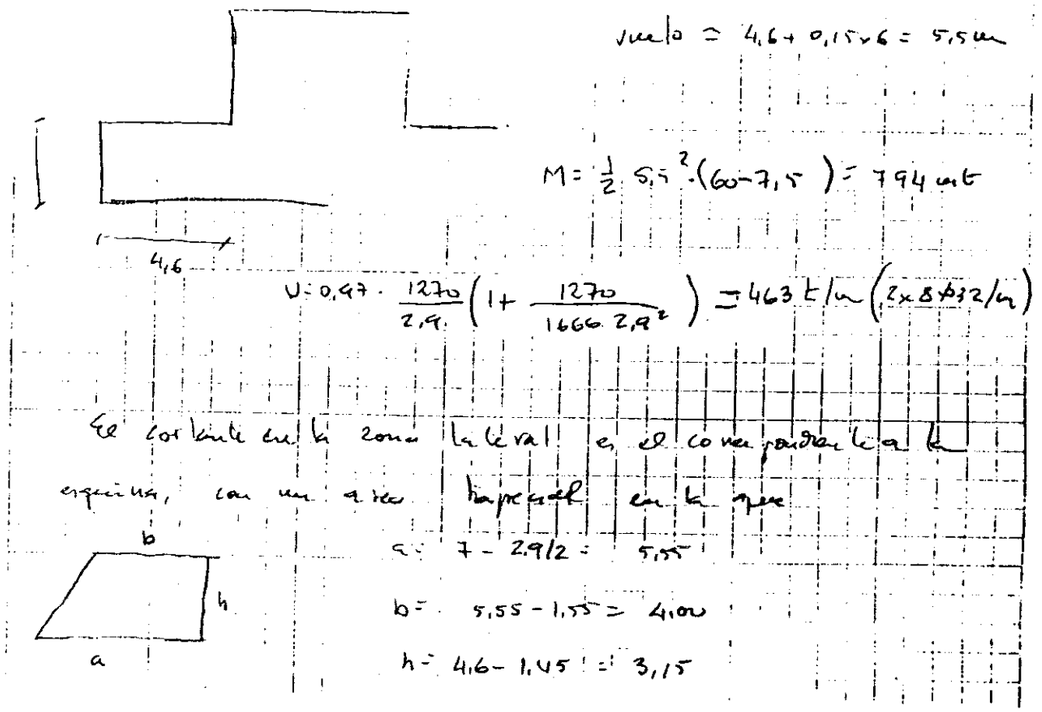
$$V_d = 1{,}6\ \frac{15{,}2 + 8{,}9}{2} \times 49{,}5 \times (3 - 1{,}45) = 1479$$

$$V_d = 1479$$

$$V_{cu} = 64{,}5 \times 8{,}9 \times 2{,}9 = 1666 \text{ t}$$

$V_{cu} > V_d$.

En sentido transversal a viene en la zona de tablero



$$M = \tfrac{1}{2}\,5{,}5^2 \cdot (60 - 7{,}5) = 794 \text{ mt}$$

$$U = 0{,}47 \cdot \frac{1270}{2{,}9}\left(1 + \frac{1270}{1666 \cdot 2{,}9^2}\right) = 463 \text{ t/m}\ (2 \times 8\,\phi 32/\text{m})$$

El cortante en la zona lateral es el correspondiente a la esquina, con un ancho tributario en la que

$$c = 7 - 2{,}9/2 = 5{,}55$$

$$b = 5{,}55 - 1{,}55 = 4{,}00 \text{ m}$$

$$h = 4{,}6 - 1{,}45 = 3{,}15$$

$V_d = 1,6.(59-7,5)\left(\frac{5,55+4}{2}\right)3,15 = 1240$ t

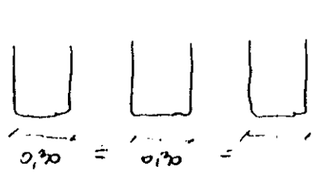
$V_{cuo} = 64,5\ (b+h)\times 2,9 =$

$V_{cuo} = 64,5\ (4+3,15)\times 2,9 = 1337$ t

Se dispone armadura mínima

$A = \frac{1666\times 0,02}{4,2} \geq 8\ cm^2/m^2$

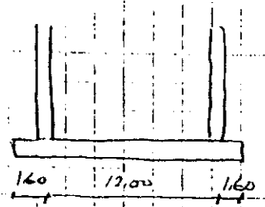
Se colocan 2 horquillas ϕ 16 cada 1.2 de ancho



separación de 50 cm en la otra dirección.

$A = \frac{4\times 2}{1,2\cdot 0,5} = 13\ cm^2/m^2$

· Zona en las aletas laterales



Puede suponerse el arranque de ménsula de sección

Carga sobre viga

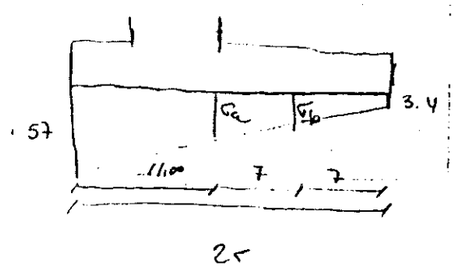
Peso de viga y sobrecarga y solera

$12,1\times 2 + \frac{9,5\times 0,7\times 1,6 + 24}{10,8} + 2,5\times 3,0 = 34,9\ t/m^2$

Reacciones en el terreno de acuerdo con el diagrama de tensiones obtenido ocasionan en él los valores

$\sigma_a = 33.4\ t/m^2$

$3,4\ t/m^2$



Zona próxima a espaldón

Interior: $\Delta\sigma = 34,9 - 33,4 = 1,5\ t/m^2$ ↓

Voladizo. $\sigma = 12,1\times 2 + 2,5\times 3 - 33,4 = -1,7\ t/m^2$ (↑)

Zona exterior:

Interior $\Sigma\sigma = 34,9 - 3,4 = 31,5\ t/m^2$ (↓)

Voladizo $\Sigma\sigma = 12,1\times 2 + 7,5 - 3,4 = 26,6\ t/m^2$ (↓)

Momento en cara de viga:

Arranque interior $M_d = \left(\frac{1}{8}\cdot 12^2\cdot 31,5 - \frac{1}{2}\,26,6\cdot 1,6^2\right)1,6 - 0,9\cdot 138 =$

$M_d = 853 - 124 = 729$ mt

$U = 0,97\cdot\frac{729}{2,9}\left(1+\frac{729}{1666\cdot 2,9^2}\right) = 252$ t (ϕ32/12,5)

En cara interior

$M_d = 1,6\times 138 = 220$ mt — $U = 76$ t — ϕ25/12,5

Comprobación en cubierta

Se verifica la sección situada a 1/2 canto de las aletas:

$V_d = 1{,}6 \cdot \left[\frac{1}{2}\,10{,}8 - 1{,}45\right] \times 31{,}5 = 194$ t

$V_{cu} = 64{,}5 \times 2{,}9 \simeq 187 \simeq V_d$.

- Celda de losa

La máxima profundidad en la celda de presión del terreno tiene el valor

$p = 0{,}27 \cdot 2{,}6 + (1{,}3+3) \times 9{,}27 = 44$ t/m²

La luz libre es

$L = 2{,}55 + 2 \times 0{,}55 = 3{,}6$

Se toma para armar un momento

$M \simeq \frac{1}{10} pL^2 \simeq \frac{1}{10} \cdot 4{,}4 \cdot (3{,}6+0{,}6)^2 \simeq 7$ mt

$V = 0{,}97 \frac{7 \cdot 1{,}6}{0{,}35}\left(1 + \frac{7 \cdot 1{,}6}{1666 \cdot 0{,}35^2}\right) \simeq 32{,}9$ t/m (4 ϕ 16/m)

Como armadura vertical se ponen 4 ϕ 12 /m.

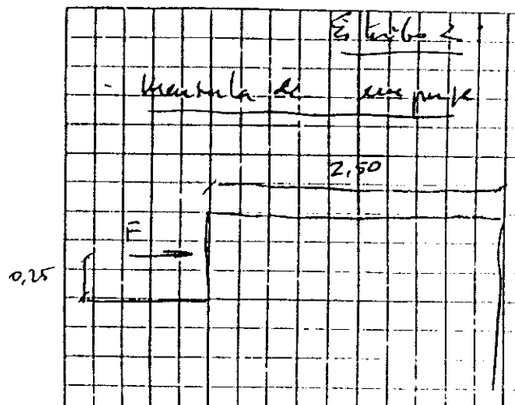
En la solera de fondo se pone # 4 ϕ 12 /m

Estribos 2 Zona de compresión

- Hipótesis de compresión

Fuerza de compresión = 325 t/m

por apoyo



$$A_{sv} = \frac{V_d}{f_{yd}\cos\theta}$$

Con $\cos\theta = 1$

$$A_{sv} = \frac{325 \times 1,6}{4112} = 24 \text{ cm}^2$$

$$M_d = 350 \times 0,25 \times 1,6 = 140 \text{ m·t}$$

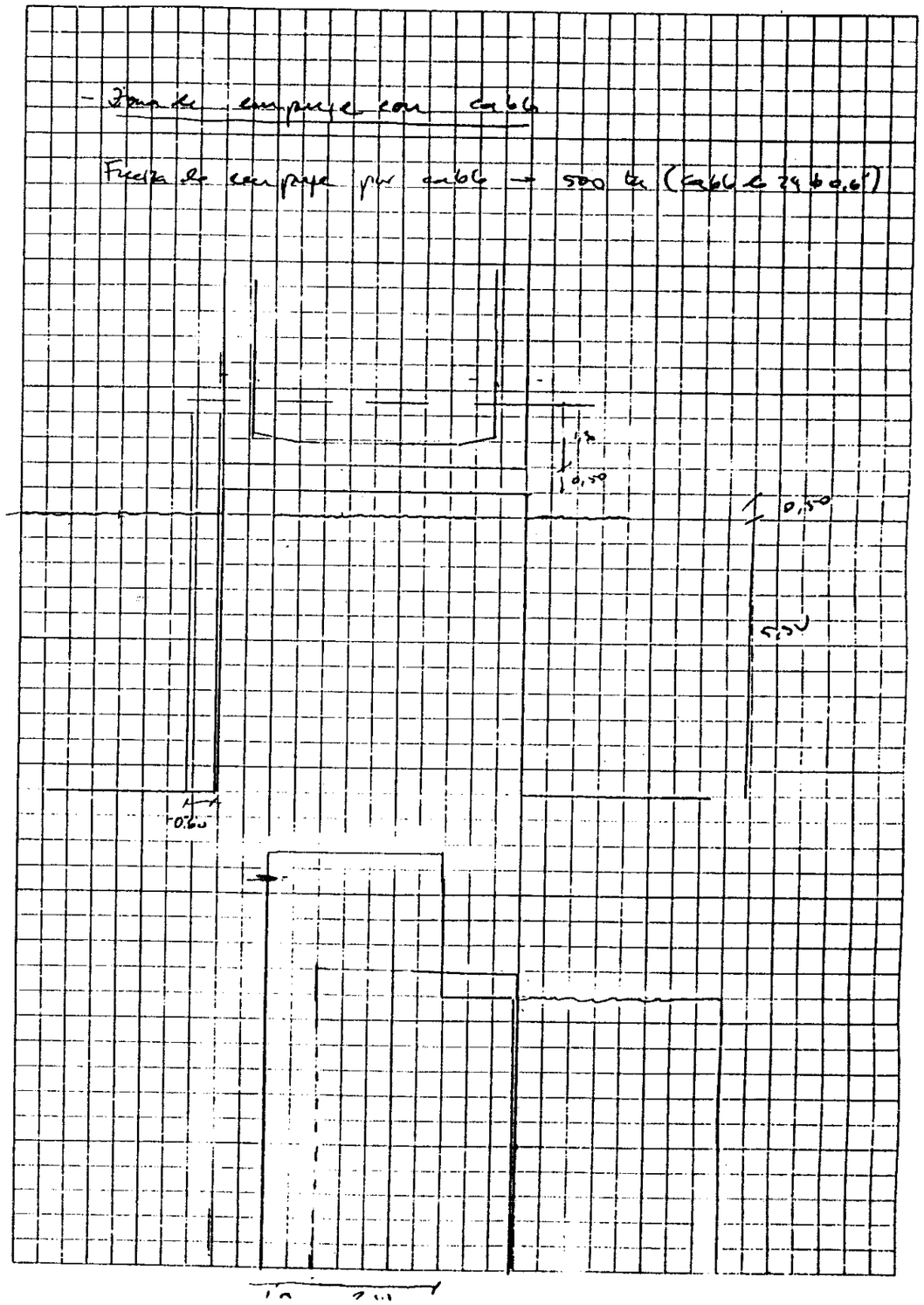
$$A_{sf} = \frac{140}{2,4} = 98 \text{ cm}^2 \ll A_{sv}$$

$A_s = \frac{2}{3} A_{sv} \cong 83 \text{ cm}^2$ en cara de apoyo de la carga

$A_{se} = \frac{1}{3} A_{sv} = 42 \text{ cm}^2$ de tracción en 1,65 m

- Zona de compresión con cable

Fuerza de compresión por cable → 500 t (Cable ∠ 29 a 0,6°)



Fuerza F = 500 t

Canto 3,5 , anchura 7,60

Brazo z = 1,3 + 0,5 + 0,5 = 2,3 < canto

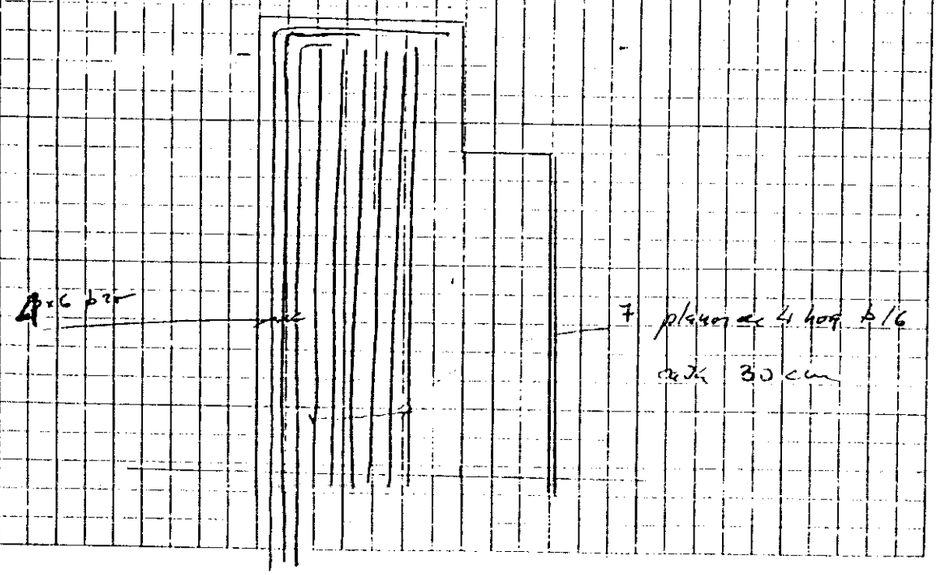
$M_1 = 500 \times 2,3 \times 1,5 = 1725$ mt

$A_{sf} = \frac{1725}{3,35} = 515$ t → 116 cm² (4x6 ϕ25)

$A_{sv} = \frac{500 \times 1,5}{2,2 \cdot 1,4} = 174$ cm²

$A_{sf} \geq \frac{2}{3} A_{sv}$ → cargo $A_{se} = 0,5 \cdot A_{sf} = 0,5 \times 116 = 58$ cm²

$\tau_d = \frac{500 \times 1,5}{3,35 \cdot 0,6} = 373$ t/m² < 0,10 · 250 = 625 t/m²

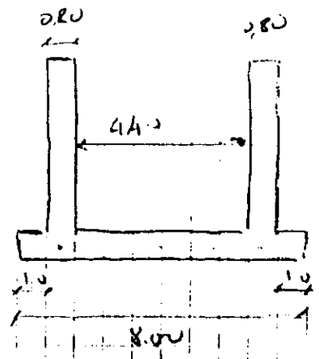


Zona de empuje

- Zona trasera (sección en U)

Carga vertical

Peso cajón = 13,8 × 2,5 = 34,5 t/m



Carga total sobre cimentación:

Relleno de tierra

P = 1,8 × 4,4 × 7,6 = 60 t

Carga tablero 34,5 t

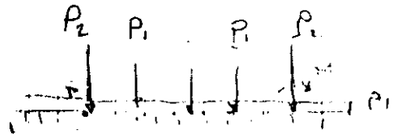
Carga total 54 + 57 + 34,5 = 146 t

El momento por empuje de tierras sería

$M = \frac{1}{6} \gamma \phi h^3 \cdot \frac{1}{6} \cdot 0,33 \cdot 1,8 \cdot 7,6^3 = 43,9$

$$U = 0{,}9\,\frac{1{,}6\cdot 43{,}9}{0{,}76}\left(1+\frac{1{,}6\cdot 43{,}9}{1666\cdot 0{,}76^2}\right) = 96\ t \rightarrow \neq 20/10$$

El esquema de carga adoptado sería el siguiente



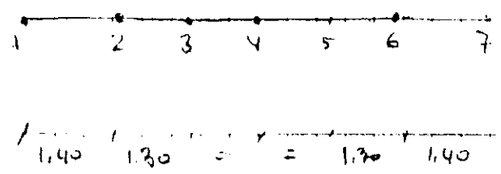
$p_1 = 0{,}8 \times 2{,}5 = 2\ t/m^2$

$P_1 = \frac{7{,}6 \times 4{,}4}{3} \times 1{,}8 = 20\ t$

$P_2 = 0{,}8 \cdot 1{,}6 \times 7{,}5 + 17{,}3 = 32{,}5\ t$

Se ha analizado la zapata como viga flotante sobre apoyos elásticos con coeficiente de balasto de 2 a 10 kg/cm³

El esquema de cargas y barra es el de la figura




```
*************************************************
*                                               *
*          S T A A D - III                      *
*          Revision 17.0a                       *
*          Proprietary Program of               *
*          RESEARCH ENGINEERS, Inc.             *
*          Date=    APR 10, 1997                *
*          Time=    14:20:44                    *
*                                               *
*************************************************
```

```
1.    STAAD PLANE FRAME. ZAPATAS ZONA EMPUJE PUENTE RIO CINCA
2.    * FICHERO(CINCAEST).   K = 2 KG/CM3
3.    UNIT METER MTON
4.    JOINT COORDINATES
5.    * ALINEACION TABLERO
6.     1    0.000   0.000  0.000
7.     2    1.400   0.000  0.000
8.     3    2.700   0.000  0.000
9.     4    4.000   0.000  0.000
10.    5    5.300   0.000  0.000
11.    6    6.600   0.000  0.000
12.    7    8.000   0.000  0.000
13.   MEMBER INCIDENCES
14.    1  1  2; 2  2  3; 3  3  4; 4  4  5; 5  5  6; 6  6  7
15.   MEMBER PROPERTY
16.    1 TO 6  PR AX 1.25 IZ  0.0426
17.   CONSTANTS
18.   E        3000000.   ALL
19.   SUPPORTS
20.    1       FIXED BUT    MZ KFY  1400.
21.    7       FIXED BUT FX MZ KFY  1400.
22.    2 6     FIXED BUT FX MZ KFY  2700.
23.    3   5   FIXED BUT FX MZ KFY  2600.
24.    4       FIXED BUT FX MZ KFY  2700.
25.   LOADING 1  CARGAS CENTRADAS
26.   JOINT LOADS
27.   2 6   FY -32.50
28.   2     MZ  43.90
29.     6   MZ -43.90
30.   3 4 5 FY -20.0
31.   MEMBER LOADS
32.   1 TO 6 UNI GY -2.0
33.   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 =      7/    6/    7
ORIGINAL/FINAL BAND-WIDTH =     1/    1
TOTAL PRIMARY LOAD CASES  =     1, TOTAL DEGREES OF FREEDOM =    20
SIZE OF STIFFNESS MATRIX =      120 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.01 MEGA-BYTES
```

PROCESSING ELEMENT STIFFNESS MATRIX. 14:20:45
++ PROCESSING GLOBAL STIFFNESS MATRIX. 14:20:45
++ PROCESSING TRIANGULAR FACTORIZATION. 14:20:45
++ CALCULATING JOINT DISPLACEMENTS. 14:20:45
++ CALCULATING MEMBER FORCES. 14:20:45

34. LOAD LIST ALL 1
35. PRINT REAC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	13.40	0.00	0.00	0.00	0.00
7	1	0.00	13.40	0.00	0.00	0.00	0.00
2	1	0.00	24.09	0.00	0.00	0.00	0.00
6	1	0.00	24.09	0.00	0.00	0.00	0.00
3	1	0.00	21.87	0.00	0.00	0.00	0.00
5	1	0.00	21.87	0.00	0.00	0.00	0.00
4	1	0.00	22.26	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

36. PRINT MEMBER FORCES ALL

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	1	1	0.00	13.40	0.00	0.00	0.00	0.00
		2	0.00	-10.60	0.00	0.00	0.00	16.80
2	1	2	0.00	2.19	0.00	0.00	0.00	27.10
		3	0.00	0.41	0.00	0.00	0.00	-25.93
3	1	3	0.00	1.47	0.00	0.00	0.00	25.93
		4	0.00	1.13	0.00	0.00	0.00	-25.72
4	1	4	0.00	1.13	0.00	0.00	0.00	25.71
		5	0.00	1.47	0.00	0.00	0.00	-25.94
5	1	5	0.00	0.41	0.00	0.00	0.00	25.94
		6	0.00	2.19	0.00	0.00	0.00	-27.10
6	1	6	0.00	-10.60	0.00	0.00	0.00	-16.80
		7	0.00	13.40	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

37. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	0.00000	-0.95724	0.00000	0.00000	0.00000	0.00043
2	1	0.00000	-0.89234	0.00000	0.00000	0.00000	0.00053
3	1	0.00000	-0.84134	0.00000	0.00000	0.00000	0.00026
4	1	0.00000	-0.82448	0.00000	0.00000	0.00000	0.00000
5	1	0.00000	-0.84134	0.00000	0.00000	0.00000	-0.00026
6	1	0.00000	-0.89234	0.00000	0.00000	0.00000	-0.00053
7	1	0.00000	-0.95724	0.00000	0.00000	0.00000	-0.00043

********** END OF LATEST ANALYSIS RESULT **********

38. FINISH

********** END OF STAAD-III **********

**** DATE= APR 10,1997 TIME= 14:20:46 ****

****
* 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 *
****

```
*************************************************
*                                               *
*          S T A A D - III                      *
*          Revision 17.0a                       *
*          Proprietary Program of               *
*          RESEARCH ENGINEERS, Inc.             *
*          Date=    APR 10, 1997                *
*          Time=    14:20:30                    *
*                                               *
*************************************************
```

```
 1.      STAAD PLANE FRAME. ZAPATAS ZONA EMPUJE PUENTE RIO CINCA
 2.      * FICHERO(CINCAES1).   K = 10 KG/CM3
 3.      UNIT METER MTON
 4.      JOINT COORDINATES
 5.      * ALINEACION TABLERO
 6.        1    0.000   0.000  0.000
 7.        2    1.400   0.000  0.000
 8.        3    2.700   0.000  0.000
 9.        4    4.000   0.000  0.000
10.        5    5.300   0.000  0.000
11.        6    6.600   0.000  0.000
12.        7    8.000   0.000  0.000
13.      MEMBER INCIDENCES
14.        1   1   2;  2  2  3;  3  3  4;  4   4   5; 5   5   6;  6   6   7
15.      MEMBER PROPERTY
16.        1  TO 6  PR AX 1.25 IZ  0.0426
17.      CONSTANTS
18.      E         3000000.   ALL
19.      SUPPORTS
20.        1        FIXED BUT    MZ KFY  7000.
21.        7        FIXED BUT FX MZ KFY  7000.
22.        2 6      FIXED BUT FX MZ KFY 13500.
23.        3    5   FIXED BUT FX MZ KFY 13000.
24.        4        FIXED BUT FX MZ KFY 13500.
25.      LOADING 1  CARGAS CENTRADAS
26.      JOINT LOADS
27.      2 6   FY -32.50
28.      2     MZ  43.90
29.        6   MZ -43.90
30.      3 4 5 FY -20.00
31.      MEMBER LOADS
32.      1 TO 6 UNI GY -2.
33.      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 =      7/    6/    7
ORIGINAL/FINAL BAND-WIDTH =     1/    1
TOTAL PRIMARY LOAD CASES  =     1, TOTAL DEGREES OF FREEDOM =    20
SIZE OF STIFFNESS MATRIX =      120 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =    12.01 MEGA-BYTES
```



```
  PROCESSING ELEMENT STIFFNESS MATRIX.          14:20:31
++ PROCESSING GLOBAL STIFFNESS MATRIX.          14:20:31
++ PROCESSING TRIANGULAR FACTORIZATION.         14:20:31
++ CALCULATING JOINT DISPLACEMENTS.             14:20:31
++ CALCULATING MEMBER  FORCES.                  14:20:31

 34.      LOAD LIST ALL  1
 35.      PRINT REAC ALL
```

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	15.95	0.00	0.00	0.00	0.00
7	1	0.00	15.95	0.00	0.00	0.00	0.00
2	1	0.00	25.18	0.00	0.00	0.00	0.00
6	1	0.00	25.18	0.00	0.00	0.00	0.00
3	1	0.00	19.80	0.00	0.00	0.00	0.00
5	1	0.00	19.80	0.00	0.00	0.00	0.00
4	1	0.00	19.14	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

36. PRINT MEMBER FORCES ALL

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	1	1	0.00	15.95	0.00	0.00	0.00	0.00
		2	0.00	-13.15	0.00	0.00	0.00	20.37
2	1	2	0.00	5.83	0.00	0.00	0.00	23.53
		3	0.00	-3.23	0.00	0.00	0.00	-17.64
3	1	3	0.00	3.03	0.00	0.00	0.00	17.64
		4	0.00	-0.43	0.00	0.00	0.00	-15.39
4	1	4	0.00	-0.43	0.00	0.00	0.00	15.39
		5	0.00	3.03	0.00	0.00	0.00	-17.64
5	1	5	0.00	-3.23	0.00	0.00	0.00	17.64
		6	0.00	5.83	0.00	0.00	0.00	-23.53
6	1	6	0.00	-13.15	0.00	0.00	0.00	-20.37
		7	0.00	15.95	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

37. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	0.00000	-0.22788	0.00000	0.00000	0.00000	0.00026
2	1	0.00000	-0.18652	0.00000	0.00000	0.00000	0.00037
3	1	0.00000	-0.15228	0.00000	0.00000	0.00000	0.00017
4	1	0.00000	-0.14180	0.00000	0.00000	0.00000	0.00000
5	1	0.00000	-0.15228	0.00000	0.00000	0.00000	-0.00017
6	1	0.00000	-0.18652	0.00000	0.00000	0.00000	-0.00037
7	1	0.00000	-0.22788	0.00000	0.00000	0.00000	-0.00026

********** END OF LATEST ANALYSIS RESULT **********

38. FINISH

********** END OF STAAD-III **********

**** DATE= APR 10,1997 TIME= 14:20:31 ****

****
* 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 *
****

Las máximas tensiones que se tienen en el terreno son

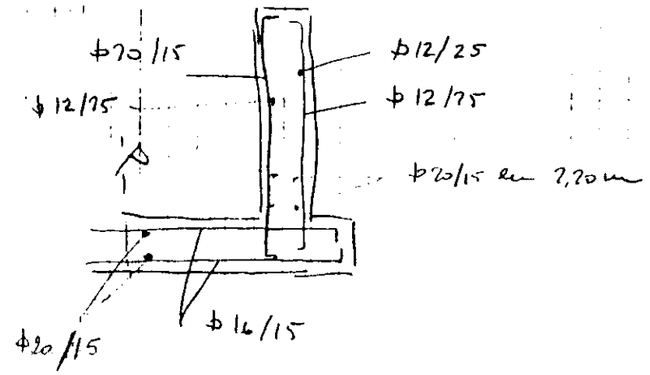
$$\sigma = \frac{25,1}{1,3} \simeq 19,3 \text{ kg/cm}^2$$

El máximo momento en cimentación es

$M = 26 \text{ mt}$

$$V = 0,9 \cdot \frac{1,6 \cdot 26}{0,75} \left(1 + \frac{16,26}{1666 \cdot 0,75^2}\right) = 56 \text{ t} \quad (\phi 16/15)$$

Se dispone la armadura siguiente



- Pilar intermedio

Se supone una carga vertical

$$P = \frac{1}{2} \cdot \frac{1}{2} \, 34{,}5 \left(10 + 10 \right) \times 1{,}2 = 207 \text{ t}$$

Se supone un momento en el alineamiento base 5%

$$M = 207 \times 0{,}05 \times 6 = 62 \text{ mt}$$

A efectos de pandeo longitudinal la esbeltez geométrica es

$$\frac{2 \times 6}{1{,}8} < 10$$

por lo que no le corresponde pandeo longitudinal.

A efectos transversales se toma un canto ficticio de excentricidad mínima de 3 cm.

$$e_a = 4{,}25 \; \frac{0{,}6 + 0{,}6}{0{,}6 + 0{,}3} \cdot \frac{0{,}12^2}{0{,}6} = 0{,}136$$

$N_d = 207 \times 1{,}6 = 331$

$M_{td} = 207 \cdot 1{,}6 \, (0{,}03 + 0{,}135) = 44 \text{ mt}$

$M_{Ld} = 62 \times 1{,}6 = 100 \text{ mt}$

Proyecto : PUENTE SOBRE EL RIO CINCA. ROTURA. PILAR ZONA EMPUJE.

Tension de calculo del hormigon ..... : 1667.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 44348.00t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3000000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 4
Numero total de circuitos ..... : 1
Numero total de inclusiones circulares .... : 0

efinicion de armaduras activas

Numero total de tramos de armadura ..... : 0

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 1

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	-0.6500	-0.3000	2	0.6500	-0.3000
3	0.6500	0.3000	4	-0.6500	0.3000

Definicion de circuitos

Circuito 1 : Numero de vertices 4 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	2	3	3	4	4

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.02 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 90.00 (sex)
Variacion cada ..... 6.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de -270.00 (t)
Axil 2 de -300.00 (t)
Axil 3 de -330.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. 0.000 (t/m2) a 0.30 (m) del c.d.g
Tension fibra Inf. 0.000 (t/m2) a 0.30 (m) del c.d.g

efinicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	-0.4067	-0.2600	3.14	2	-0.2711	-0.2600	3.14
3	-0.1356	-0.2600	3.14	4	0.0000	-0.2600	3.14
5	0.1356	-0.2600	3.14	6	0.2711	-0.2600	3.14
7	0.4067	-0.2600	3.14	8	0.6100	-0.2600	3.14
9	0.6100	-0.1300	3.14	10	0.6100	0.0000	3.14
11	0.6100	0.1300	3.14	12	0.6100	0.2600	3.14
13	0.4067	0.2600	3.14	14	0.2711	0.2600	3.14
15	0.1356	0.2600	3.14	16	0.0000	0.2600	3.14
17	-0.1356	0.2600	3.14	18	-0.2711	0.2600	3.14
19	-0.4067	0.2600	3.14	20	-0.6100	0.2600	3.14
21	-0.6100	0.1300	3.14	22	-0.6100	0.0000	3.14
23	-0.6100	-0.1300	3.14	24	-0.6100	-0.2600	3.14

Caso 1 : Axil de -270.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.632	0.214	-270.024	134.13	0.00
6.0	-0.350	0.524	0.293	-269.983	129.72	43.75
12.0	-0.350	0.457	0.372	-269.221	119.16	89.67
18.0	-0.350	0.427	0.438	-270.100	104.12	130.90
24.0	-0.350	0.418	0.491	-270.051	89.65	162.77
30.0	-0.350	0.422	0.531	-269.970	76.74	186.64
36.0	-0.350	0.431	0.560	-269.996	65.03	206.61
42.0	-0.350	0.442	0.582	-270.020	54.46	222.07
48.0	-0.350	0.454	0.595	-270.644	45.04	234.41
54.0	-0.350	0.470	0.600	-270.248	36.92	243.21
60.0	-0.350	0.484	0.598	-269.969	29.41	250.61
66.0	-0.350	0.499	0.590	-269.799	22.70	256.19
72.0	-0.350	0.514	0.576	-269.535	16.83	259.91
78.0	-0.350	0.530	0.555	-269.546	11.19	262.98
84.0	-0.350	0.548	0.528	-269.826	5.77	265.13
90.0	-0.350	0.568	0.496	-270.034	0.00	267.00

Caso 2 : Axil de -300.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.565	0.229	-300.248	137.15	0.00
6.0	-0.350	0.483	0.308	-299.501	132.67	43.48
12.0	-0.350	0.427	0.386	-299.490	121.53	90.19
18.0	-0.350	0.403	0.452	-300.049	105.70	132.00
24.0	-0.350	0.396	0.506	-299.851	90.64	164.86
30.0	-0.350	0.398	0.547	-299.834	77.35	190.37
36.0	-0.350	0.407	0.578	-299.932	65.30	210.45
42.0	-0.350	0.416	0.601	-299.984	54.56	226.50
48.0	-0.350	0.427	0.616	-300.020	45.05	238.71
54.0	-0.350	0.440	0.623	-300.723	36.74	248.16
60.0	-0.350	0.452	0.623	-300.949	29.39	255.16
66.0	-0.350	0.464	0.615	-299.835	22.57	260.84
72.0	-0.350	0.476	0.602	-300.254	16.76	264.56
78.0	-0.350	0.489	0.582	-299.805	11.05	267.66
84.0	-0.350	0.504	0.556	-300.412	5.54	270.17
90.0	-0.350	0.521	0.523	-300.752	0.00	271.96

Caso 3 : Axil de -330.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.350	0.506	0.245	-329.799	139.83	0.00
6.0	-0.350	0.444	0.323	-328.923	135.34	43.28
12.0	-0.350	0.400	0.400	-329.819	123.33	90.74
18.0	-0.350	0.381	0.466	-329.841	106.97	132.91
24.0	-0.350	0.374	0.520	-329.521	91.51	166.70
30.0	-0.350	0.377	0.563	-329.623	77.56	193.21
36.0	-0.350	0.384	0.596	-330.082	65.36	213.79
42.0	-0.350	0.393	0.620	-330.030	54.66	229.84
48.0	-0.350	0.402	0.637	-330.024	45.09	242.52
54.0	-0.350	0.411	0.646	-330.748	36.59	252.52
60.0	-0.350	0.423	0.646	-329.769	29.36	259.08
66.0	-0.350	0.432	0.641	-330.046	22.77	264.49
72.0	-0.350	0.441	0.629	-329.934	16.69	268.74
78.0	-0.350	0.451	0.610	-330.506	11.10	271.77
84.0	-0.350	0.464	0.583	-329.974	5.43	274.41
90.0	-0.350	0.476	0.551	-331.146	0.00	276.39

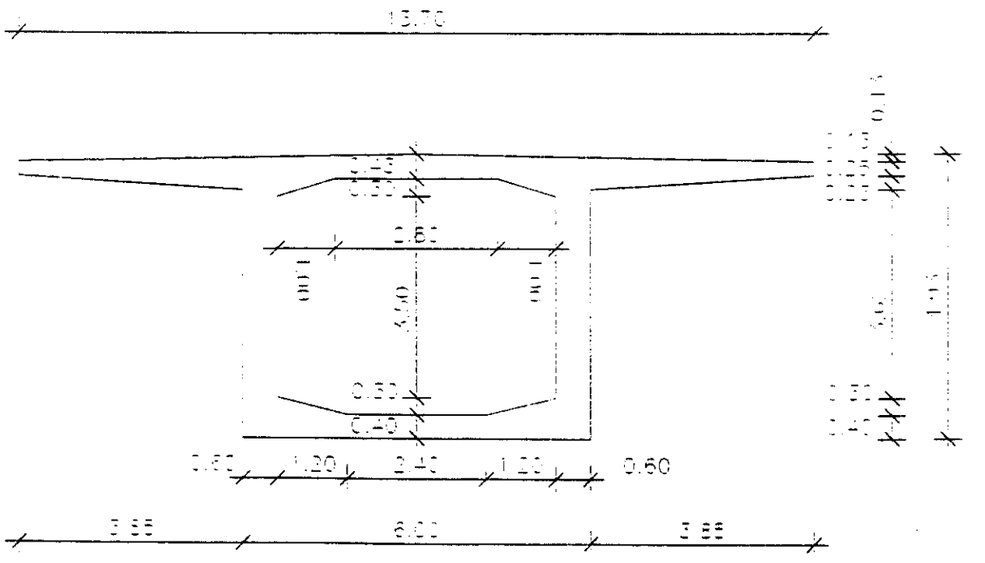
Se alunga con 5 ϕ 20 in fo, cava, e 60 cm

7 ϕ 20 in br. le 1/30 m.

Vena ϕ 12/20 Trabeculae ϕ 8/20

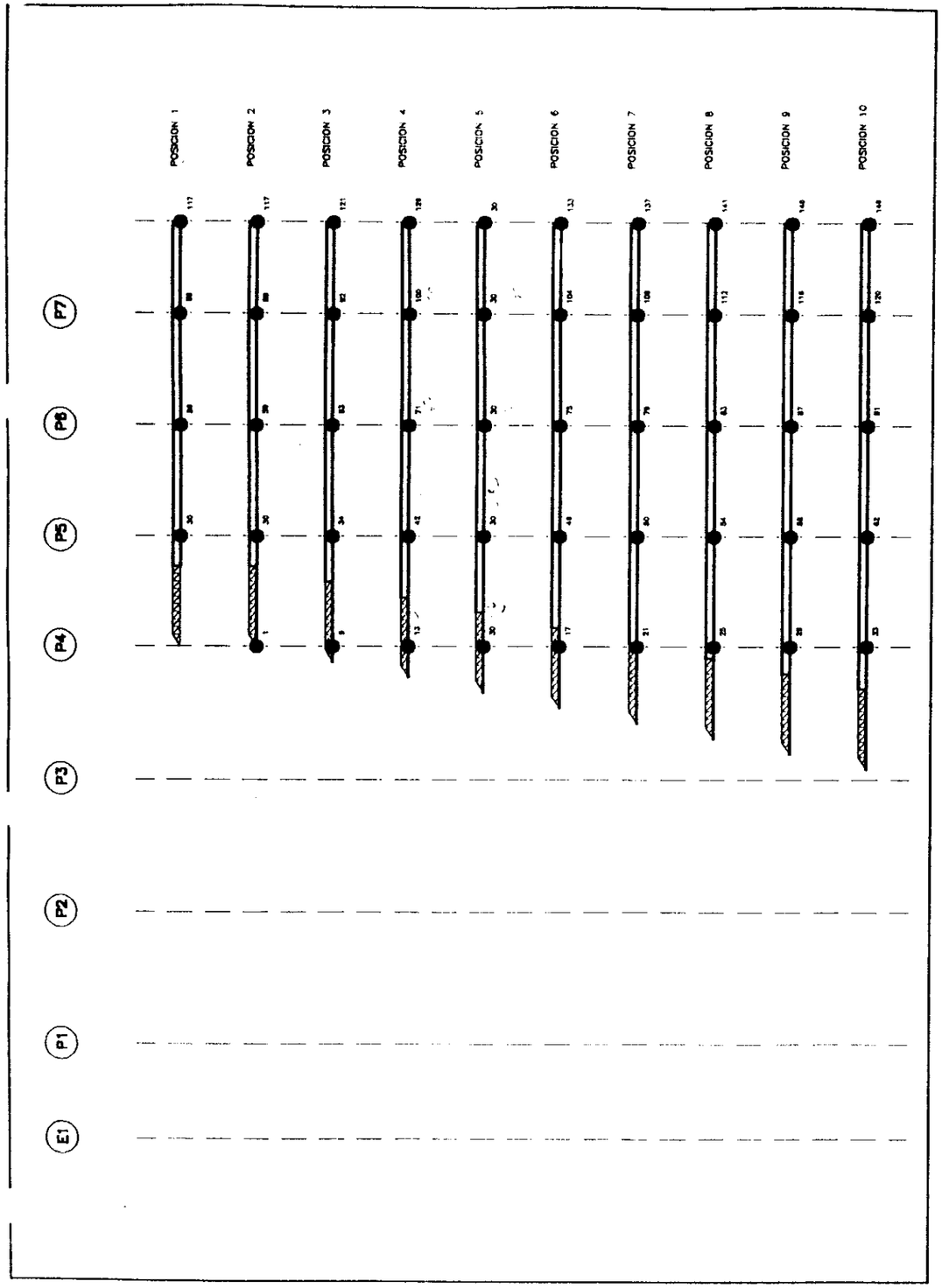
5.- EMPUJE DEL TABLERO

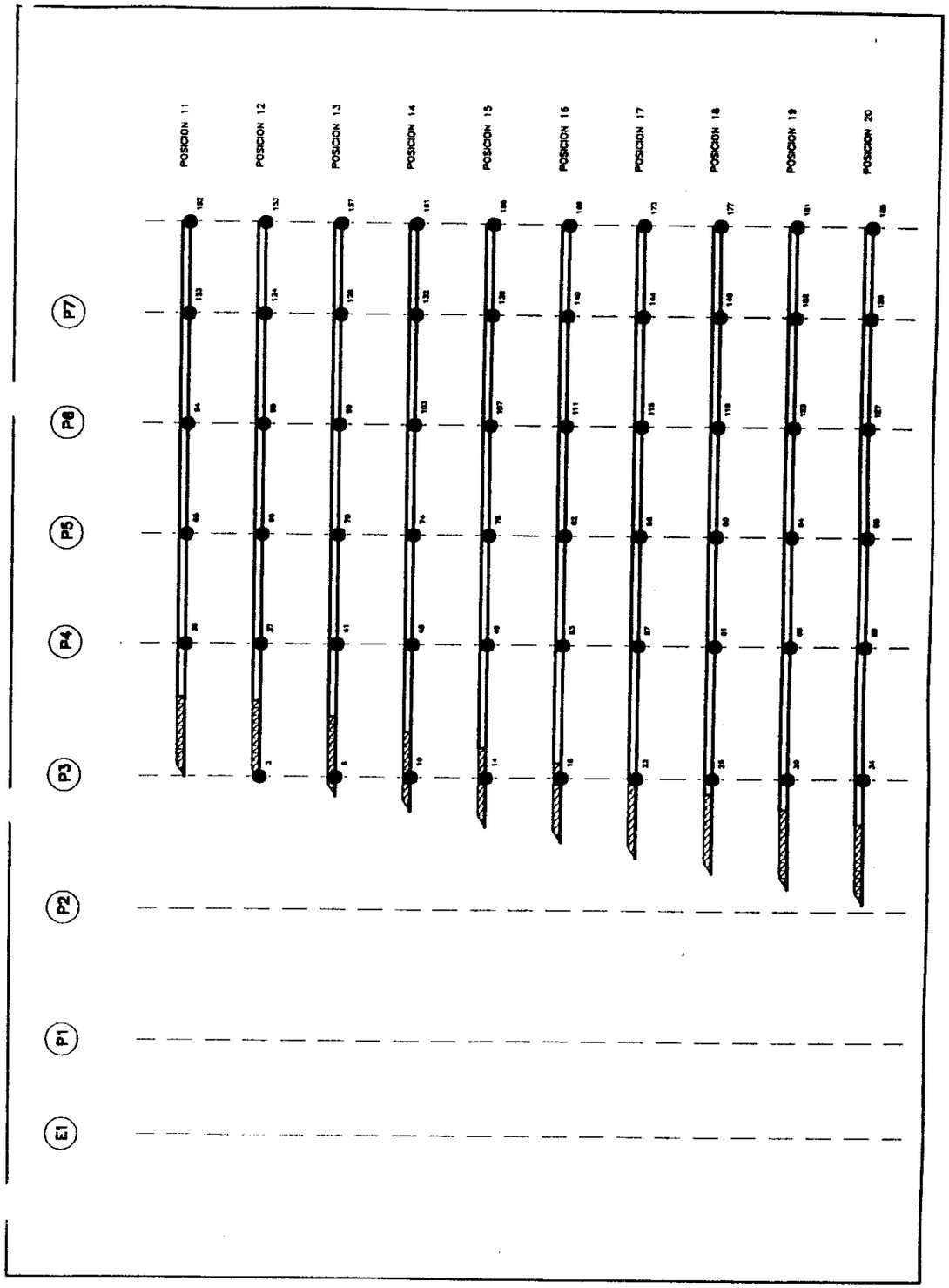
5.1.- CARACTERÍSTICAS GEOMÉTRICAS Y MECÁNICAS DE LA SECCIÓN TRANSVERSAL

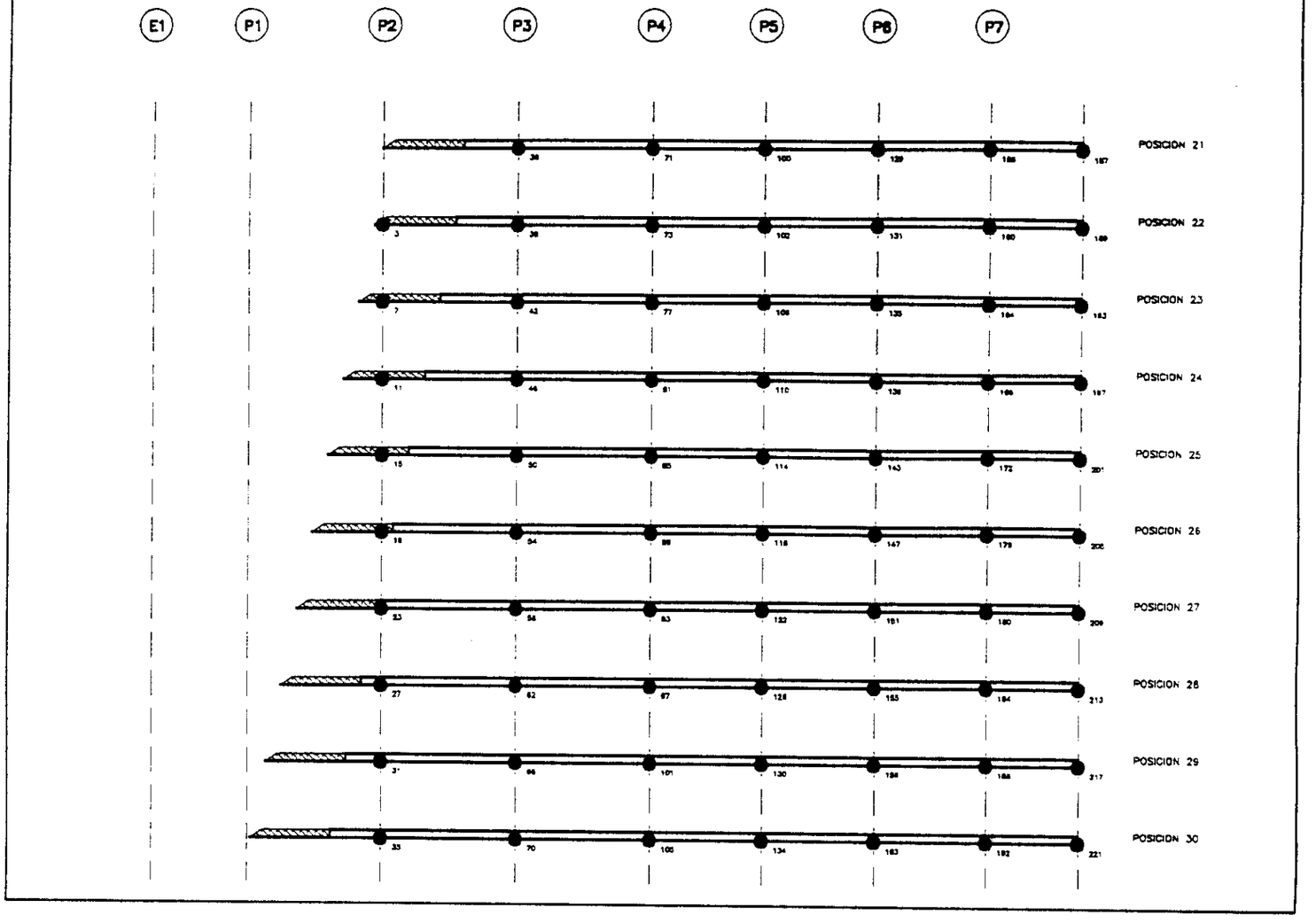


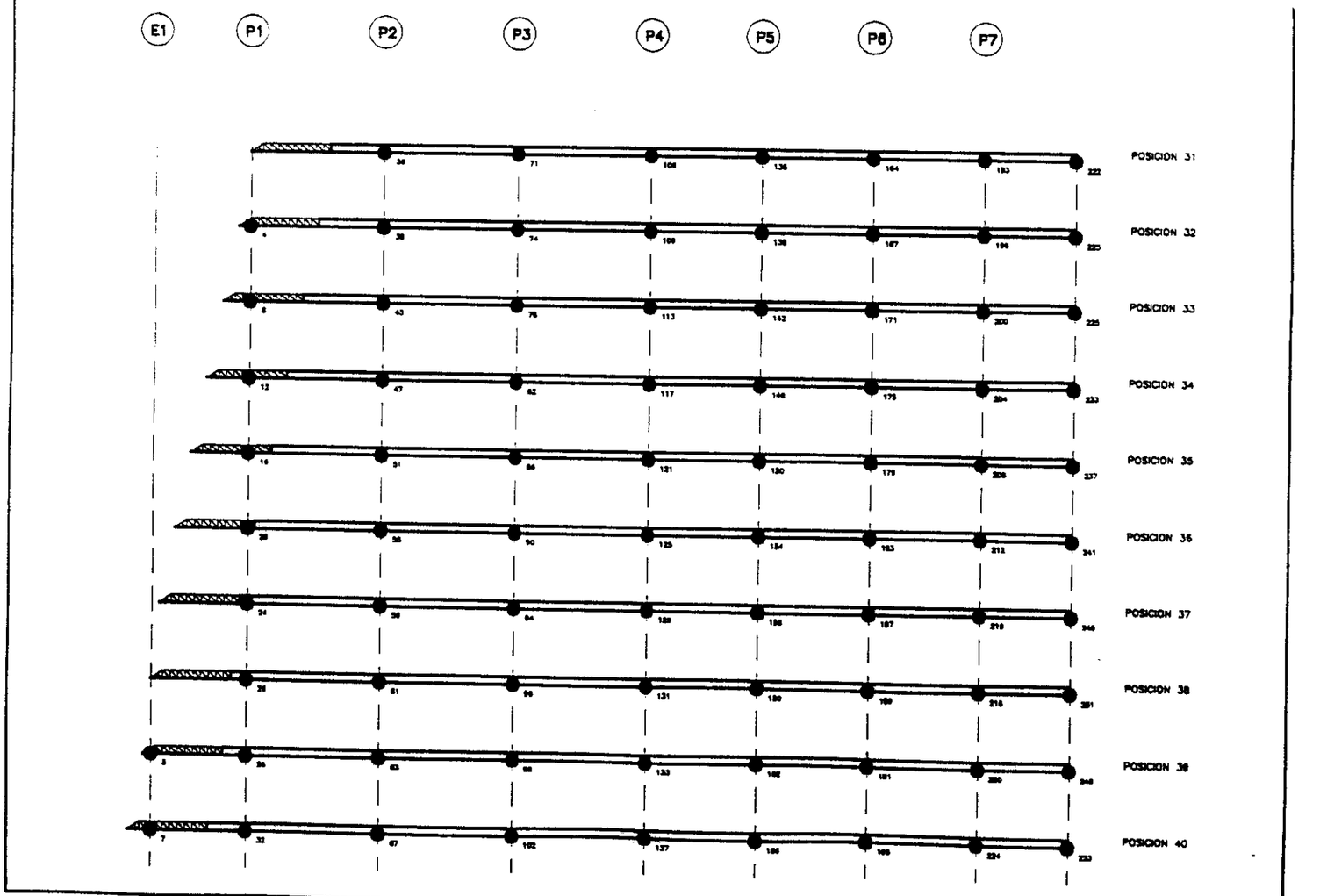
SECCION TRANSVERSAL

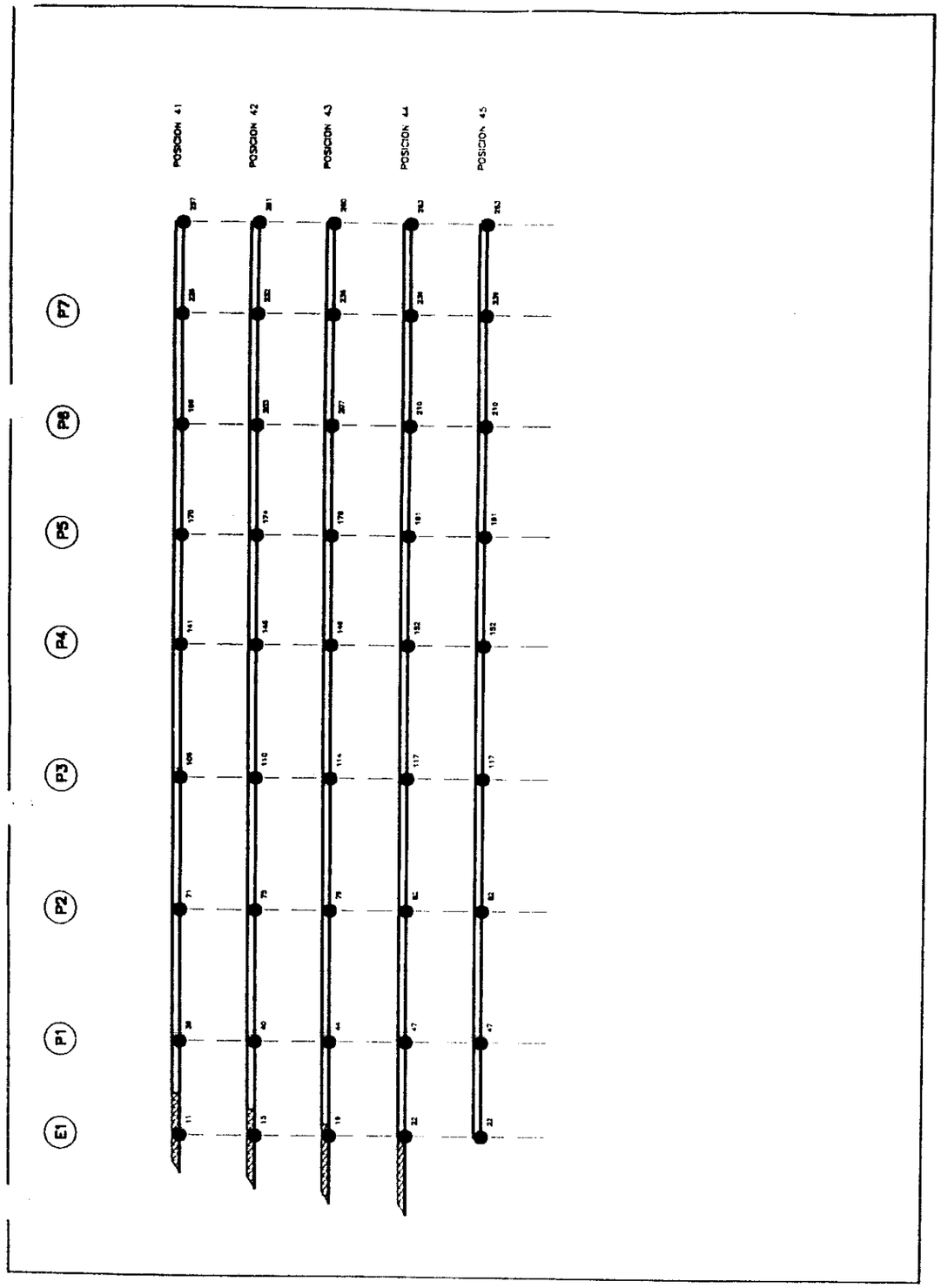
5.2.- DEFINICIÓN POSICIONES DE AVANCE


P7
P6
P5
P4
P3
P2
P1
E1
POSICION 1
POSICION 2
POSICION 3
POSICION 4
POSICION 5
POSICION 6
POSICION 7
POSICION 8
POSICION 9
POSICION 10


P7
P6
P5
P4
P3
P2
P1
E1
POSICION 11
POSICION 12
POSICION 13
POSICION 14
POSICION 15
POSICION 16
POSICION 17
POSICION 18
POSICION 19
POSICION 20


E1
P1
P2
P3
P4
P5
P6
P7
POSICION 21
POSICION 22
POSICION 23
POSICION 24
POSICION 25
POSICION 26
POSICION 27
POSICION 28
POSICION 29
POSICION 30


E1
P1
P2
P3
P4
P5
P6
P7
POSICION 31
POSICION 32
POSICION 33
POSICION 34
POSICION 35
POSICION 36
POSICION 37
POSICION 38
POSICION 39
POSICION 40



ENUMERACION NUDOS-APOYOS
SEGUN DIVERSAS POSICIONES DE AVANCE

POS	E1	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	E2
1						30	59	88	117	146	175	204	233	262	263
2					1	30	59	88	117	146	175	204	233	262	263
3					5	34	63	92	121	150	179	208	237	263	
4					9	38	67	96	125	154	183	212	241	263	
5					13	42	71	100	129	158	187	216	245	263	
6					17	46	75	104	133	162	191	220	249	263	
7					21	50	79	108	137	166	195	224	253	263	
8					25	54	83	112	141	170	199	228	257	263	
9					29	58	87	116	145	174	203	232	261	263	
10					33	62	91	120	149	178	207	236	263		
11					36	65	94	123	152	181	210	239	263		
12				2	37	66	95	124	153	182	211	240	263		
13				6	41	70	99	128	157	186	215	244	263		
14				10	45	74	103	132	161	190	219	248	263		
15				14	49	78	107	136	165	194	223	252	263		
16				18	53	82	111	140	169	198	227	256	263		
17				22	57	86	115	144	173	202	231	260	263		
18				26	61	90	119	148	177	206	235	263			
19				30	65	94	123	152	181	210	239	263			
20				34	69	98	127	156	185	214	243	263			
21				36	71	100	129	158	187	216	245	263			
22			3	38	73	102	131	160	189	218	247	263			
23			7	42	77	106	135	164	193	222	251	263			
24			11	46	81	110	139	168	197	226	255	263			
25			15	50	85	114	143	172	201	230	259	263			
26			19	54	89	118	147	176	205	234	263				
27			23	58	93	122	151	180	209	238	263				
28			27	62	97	126	155	184	213	242	263				
29			31	66	101	130	159	188	217	246	263				
30			35	70	105	134	163	192	221	250	263				
31			36	71	106	135	164	193	222	251	263				
32		4	39	74	109	138	167	196	225	254	263				
33		8	43	78	113	142	171	200	229	258	263				
34		12	47	82	117	146	175	204	233	262	263				
35		16	51	86	121	150	179	208	237	263					
36		20	55	90	125	154	183	212	241	263					
37		24	59	94	129	158	187	216	245	263					
38		26	61	96	131	160	189	218	251	263					
39	3	28	63	98	133	162	191	220	249	263					
40	7	32	67	102	137	166	195	224	253	263					
41	11	36	71	106	141	170	199	228	257	263					
42	15	40	75	110	145	174	203	232	261	263					
43	19	44	79	114	149	178	207	236	263						
44	22	47	82	117	152	181	210	239	263						
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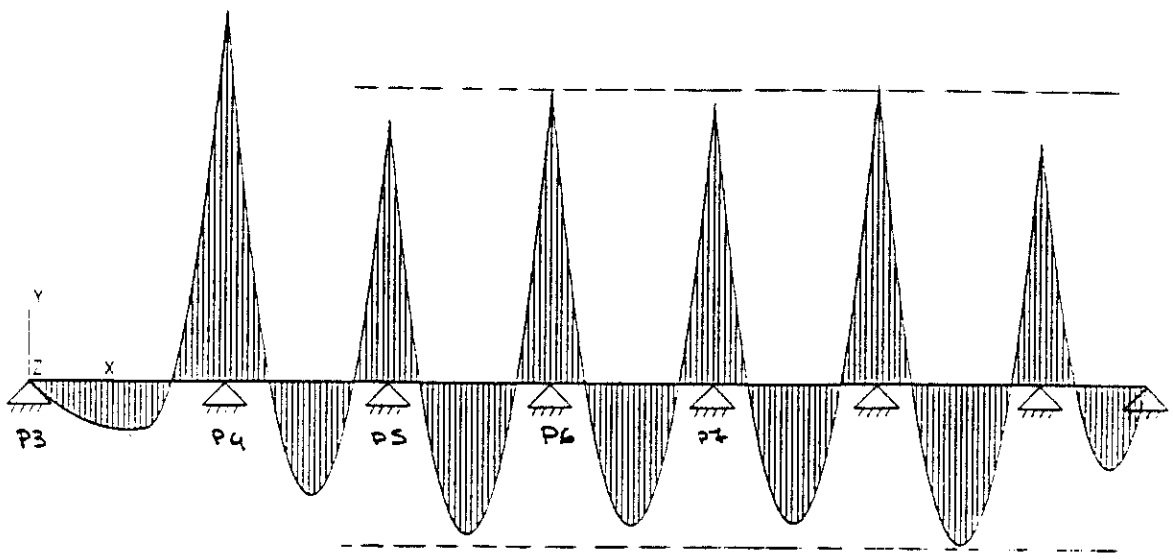
5.3.- ESFUERZOS DE FLEXIÓN DURANTE EL AVANCE

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MOMENT MZ LN= 1

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 8
NL = 1
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YMAX= 0 0
ZMAX= 0 0



METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)

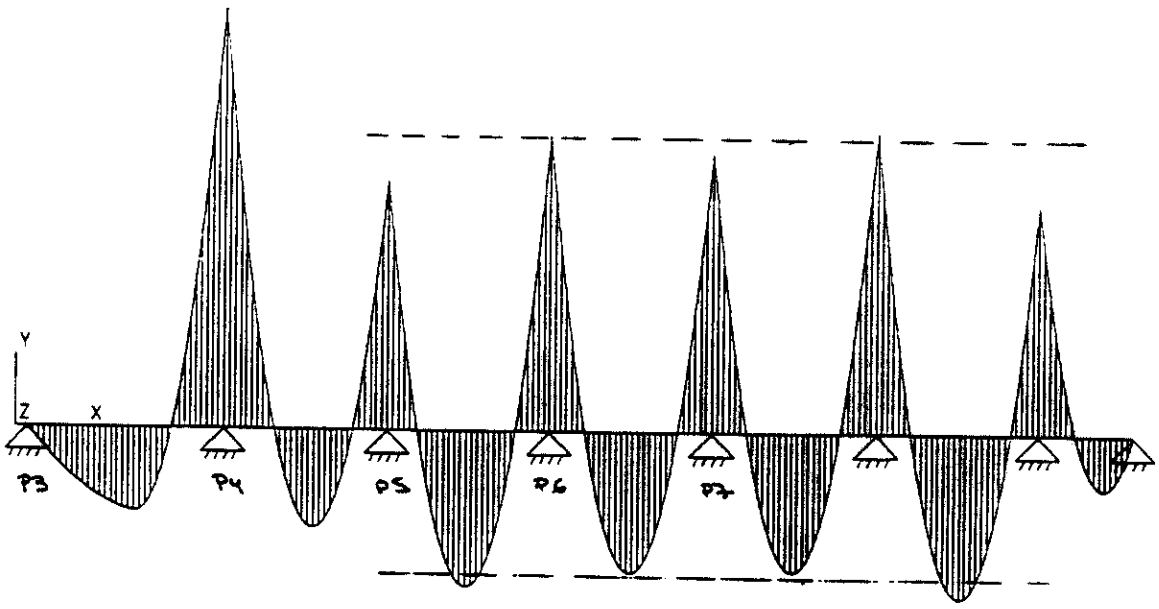
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

MOMENT MZ LN= 1

STRUCTURE DATA

TYPE = PLANE
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NL = 1
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METE MTON

COMPANY: INTECSA

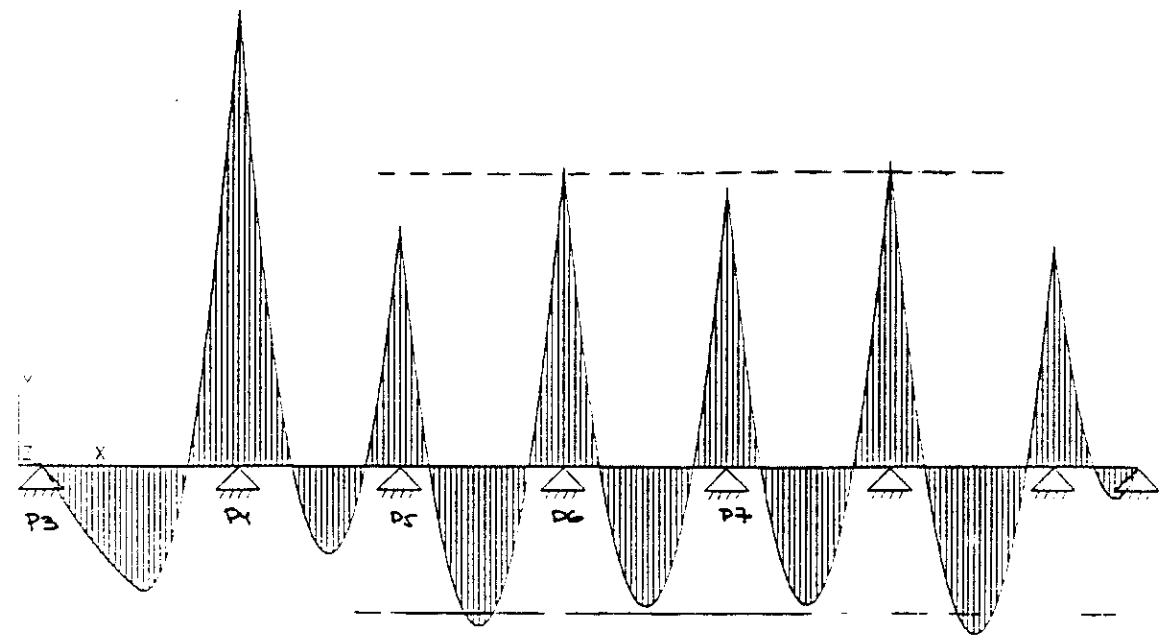
S T A A D P D - P L O T (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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METE MTON

COMPANY INTECSA

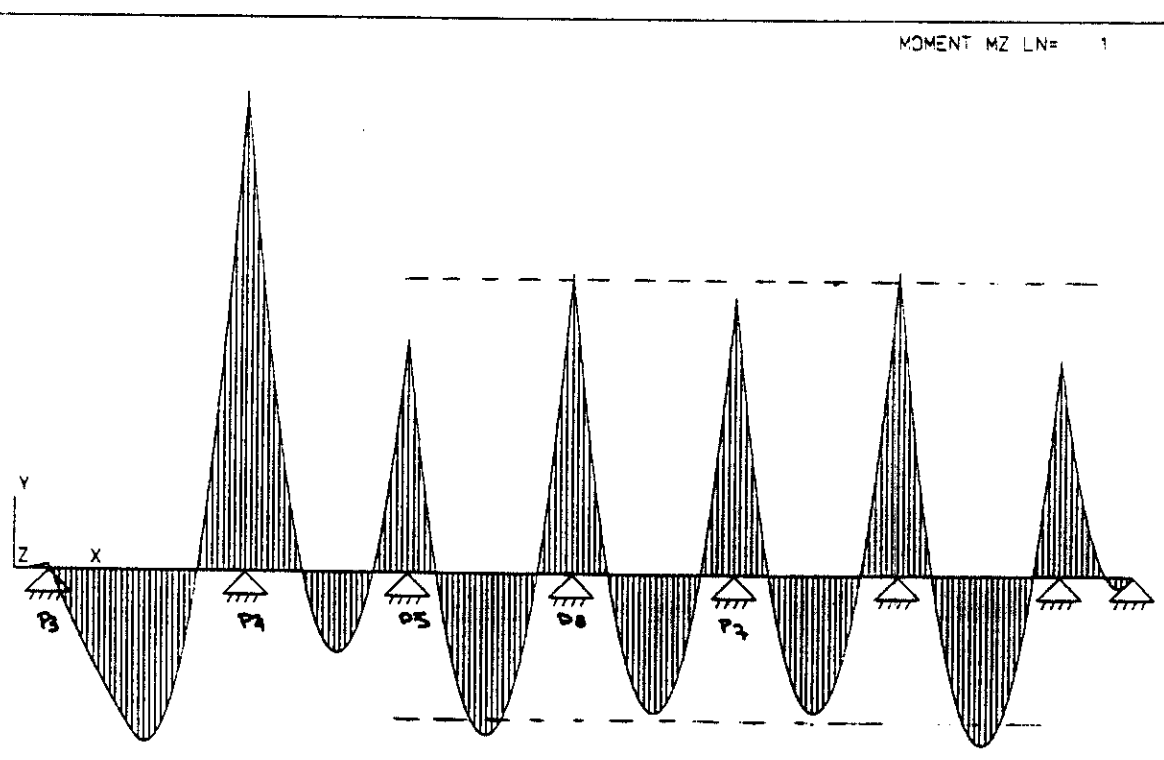
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

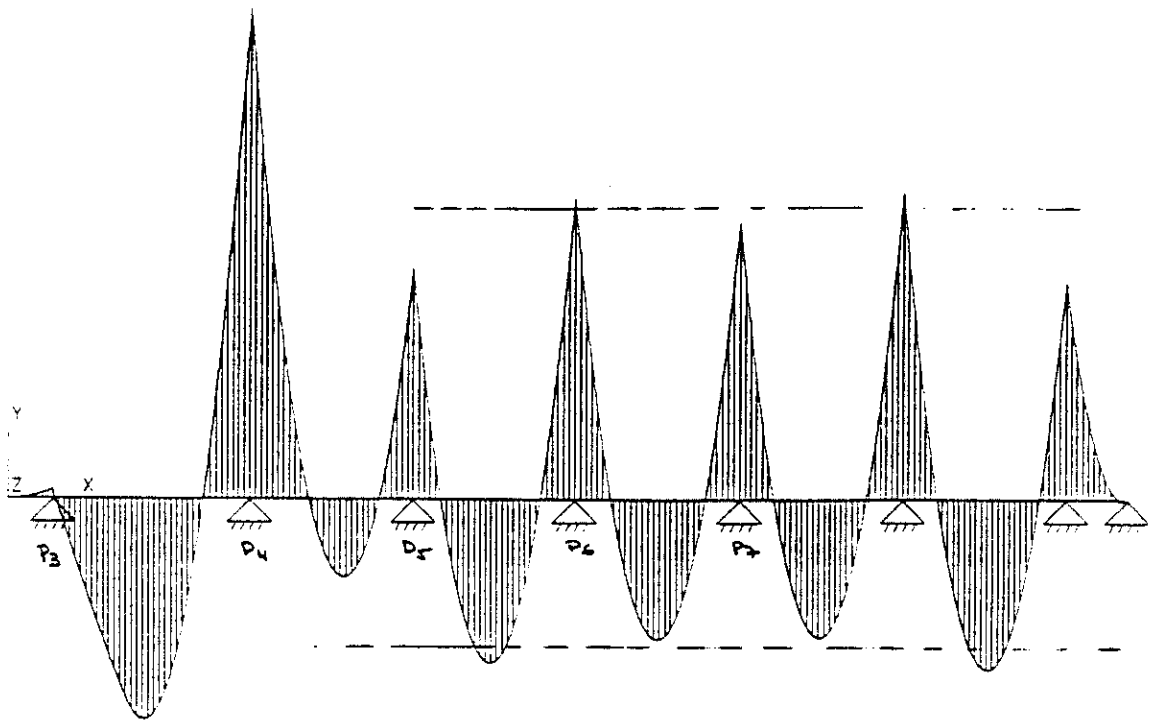
DATE MAR 6, 1997

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TYPE = PLANE
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NM = 199
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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

STAADPD - PLOT (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

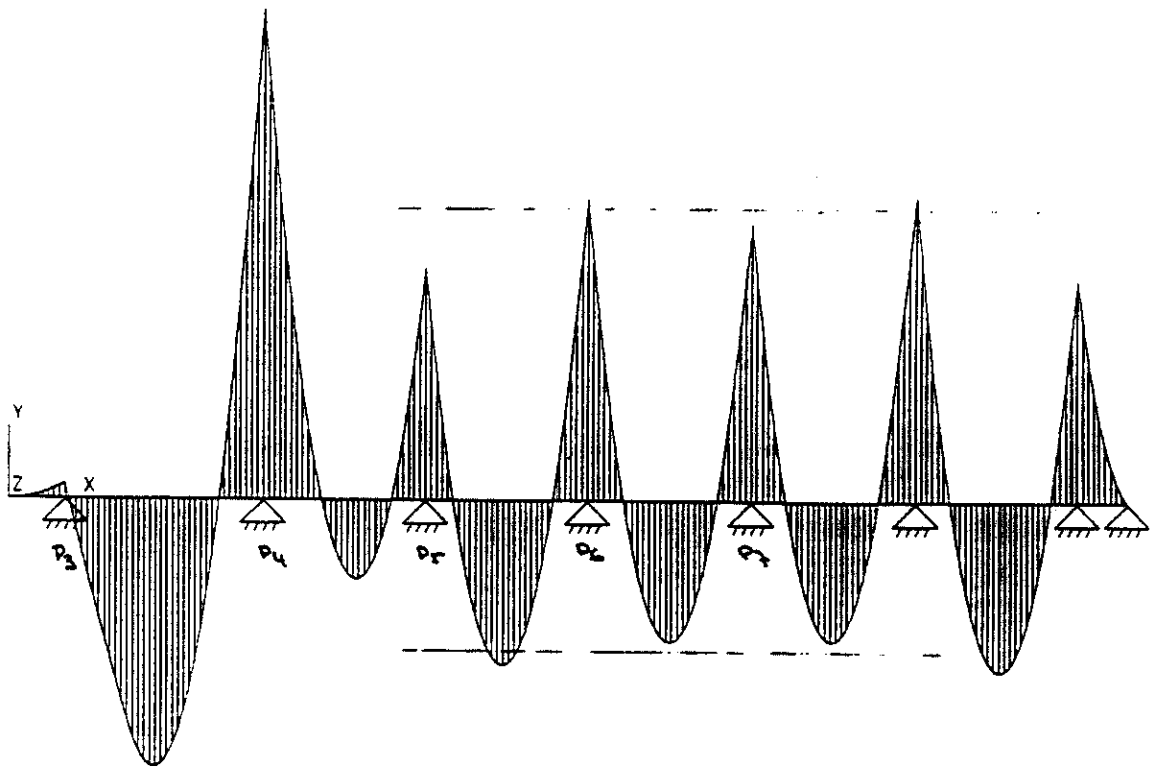
DATE MAR 6, 1997

STRUCTURE DATA:

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NM = 199
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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

STAADPD - PLOT (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

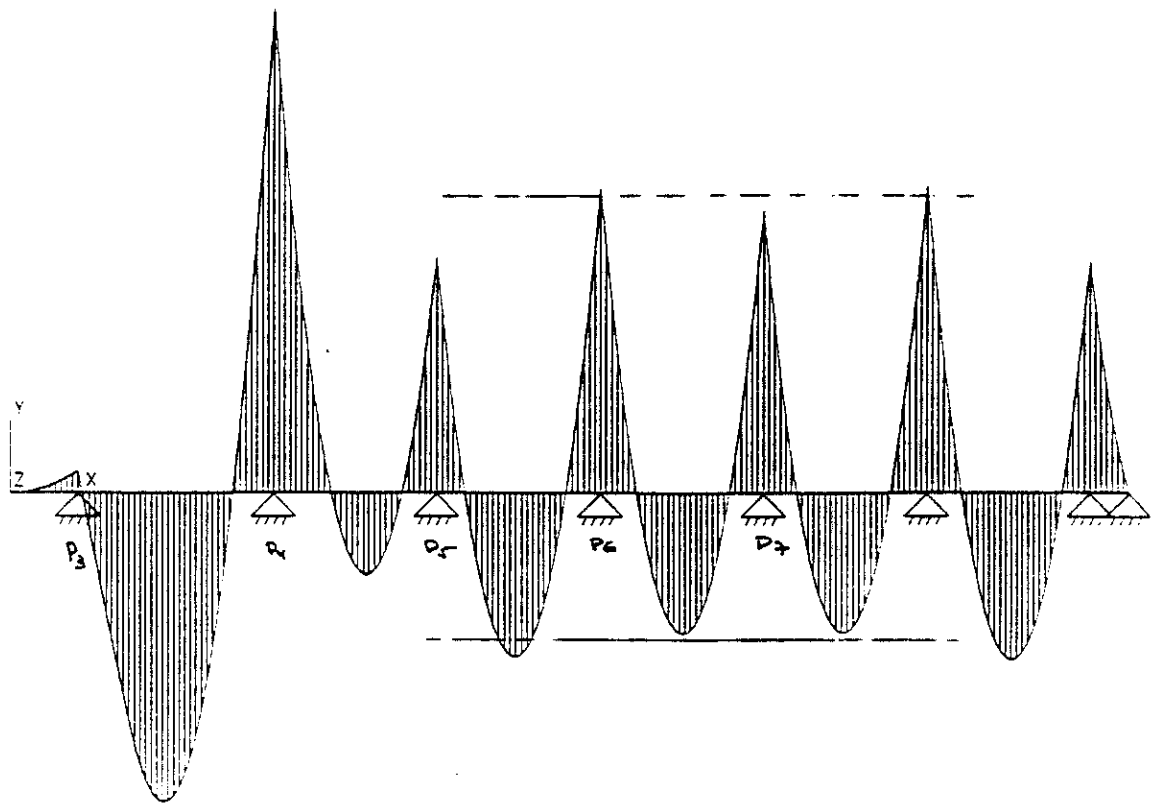
DATE MAR 6, 1997

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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

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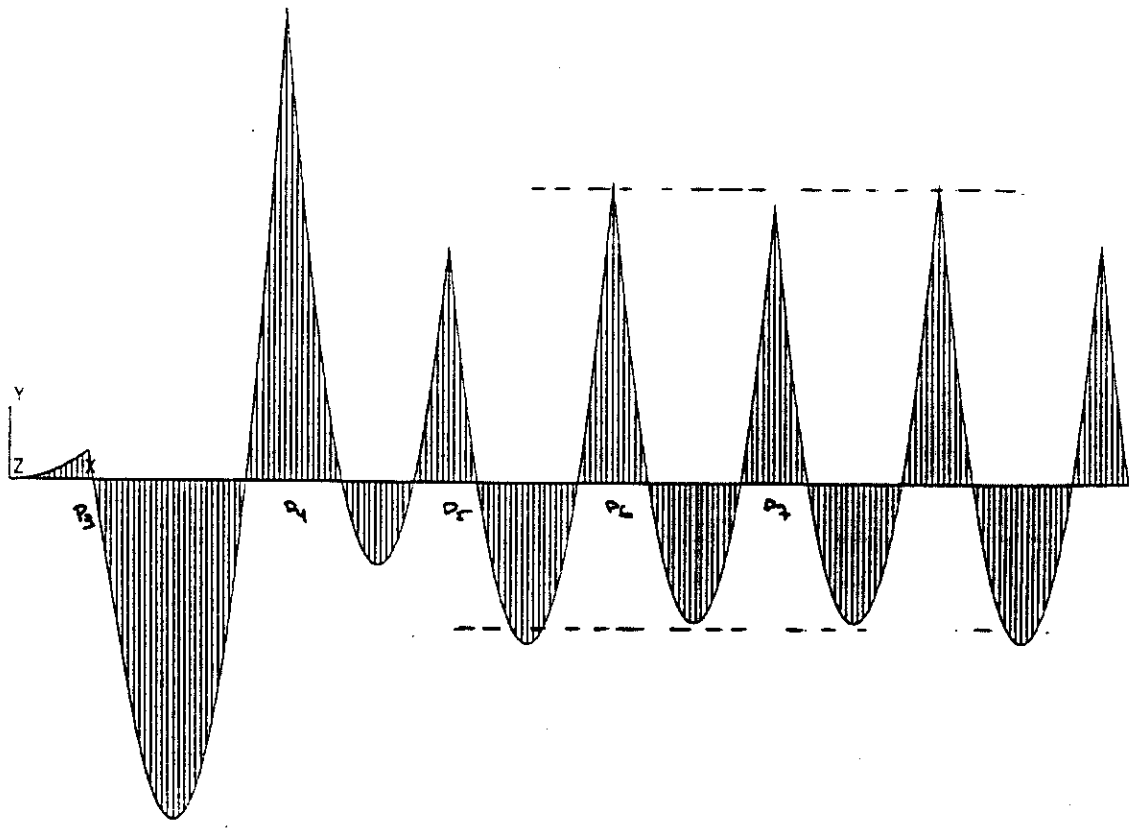
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DATE MAR 6, 1997

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TYPE = PLANE
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MOMENT MZ LN= 1



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COMPANY INTECSA

S T A A D P D - P L O T (REV: 17.0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

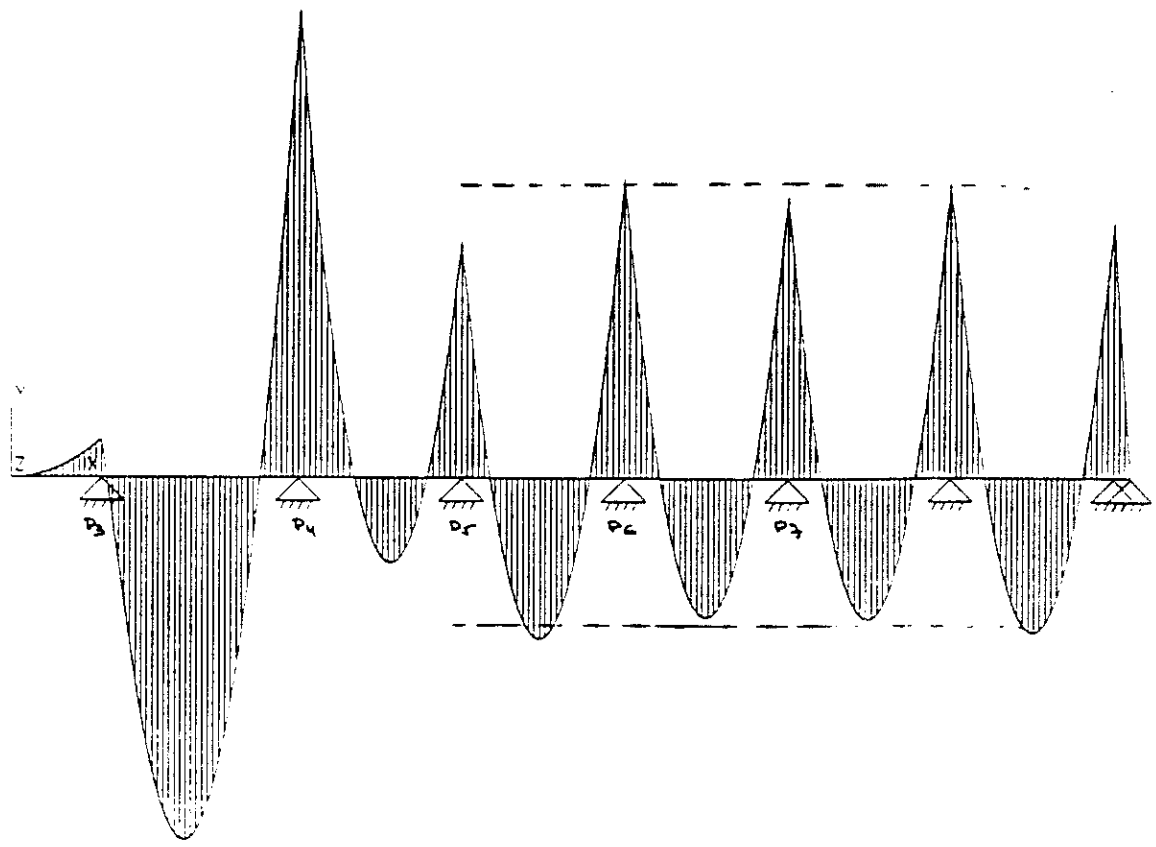
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MOMENT MZ LN= 1



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COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)

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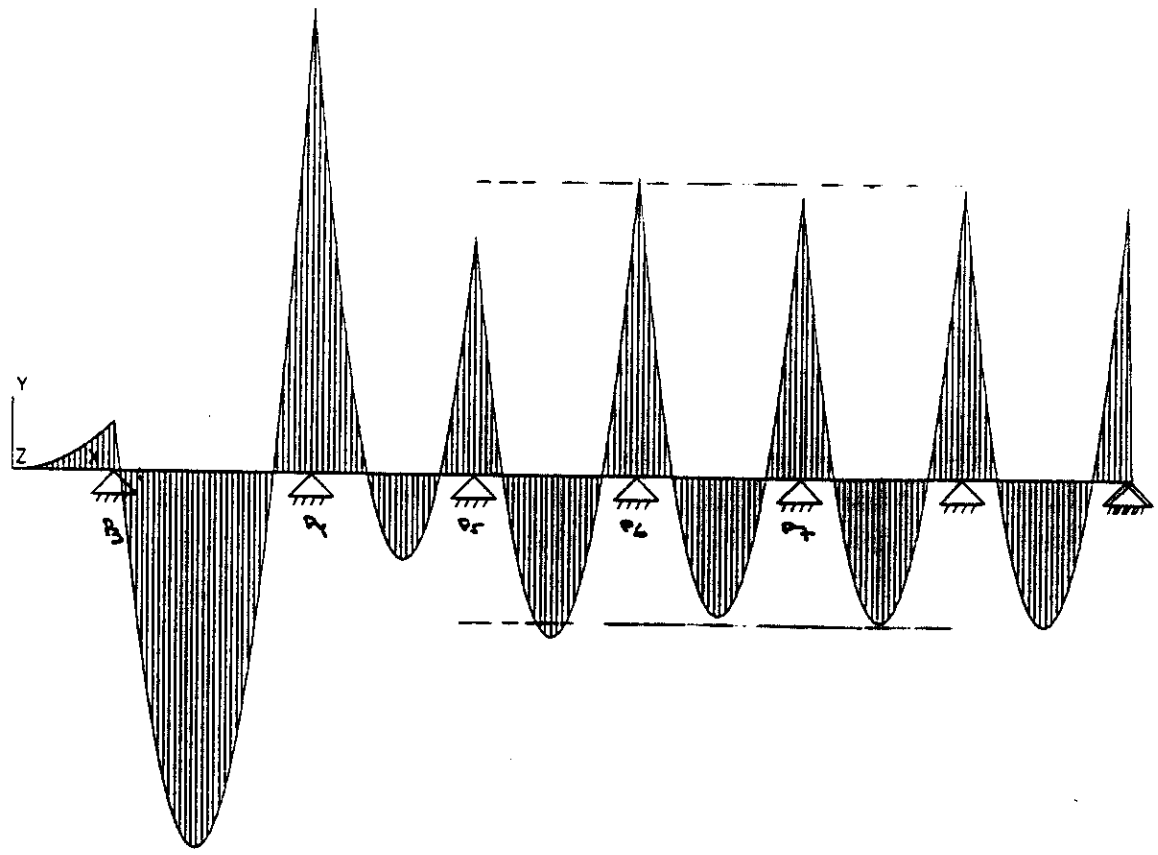
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METE MTON

COMPANY INTECSA

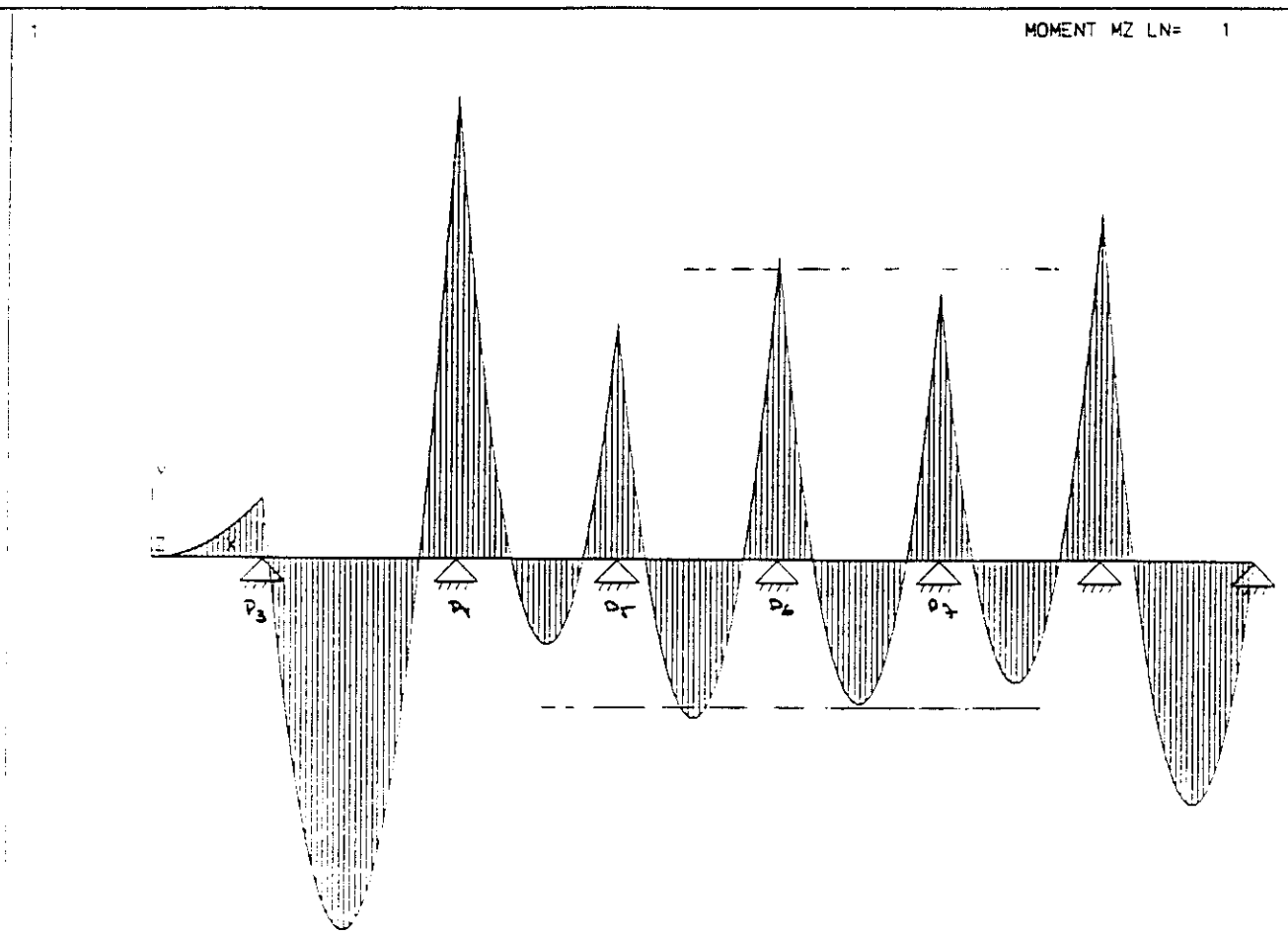
S T A A D P D - P L O T (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 7
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XMAX= 398.0
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METE MTON

COMPANY INTECSA

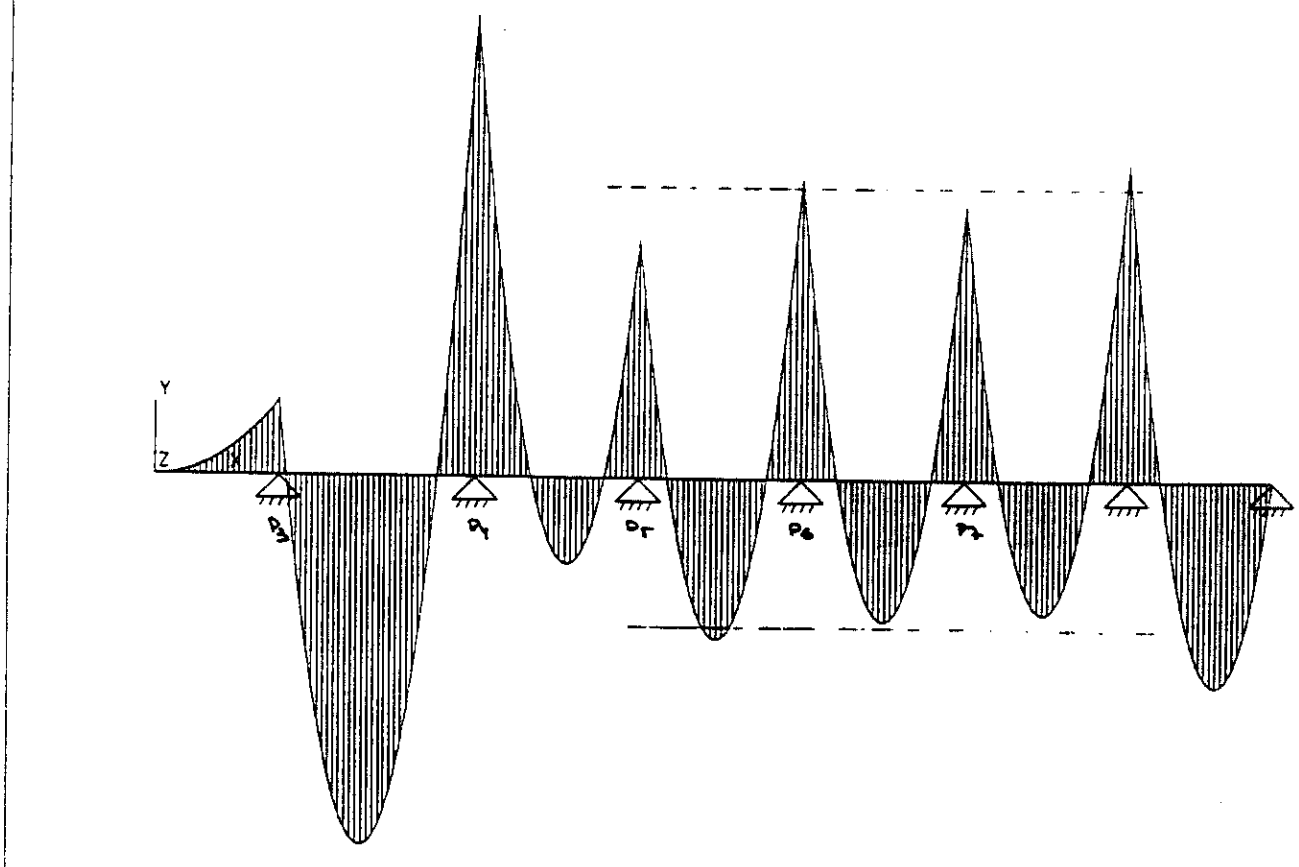
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DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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COMPANY INTECSA

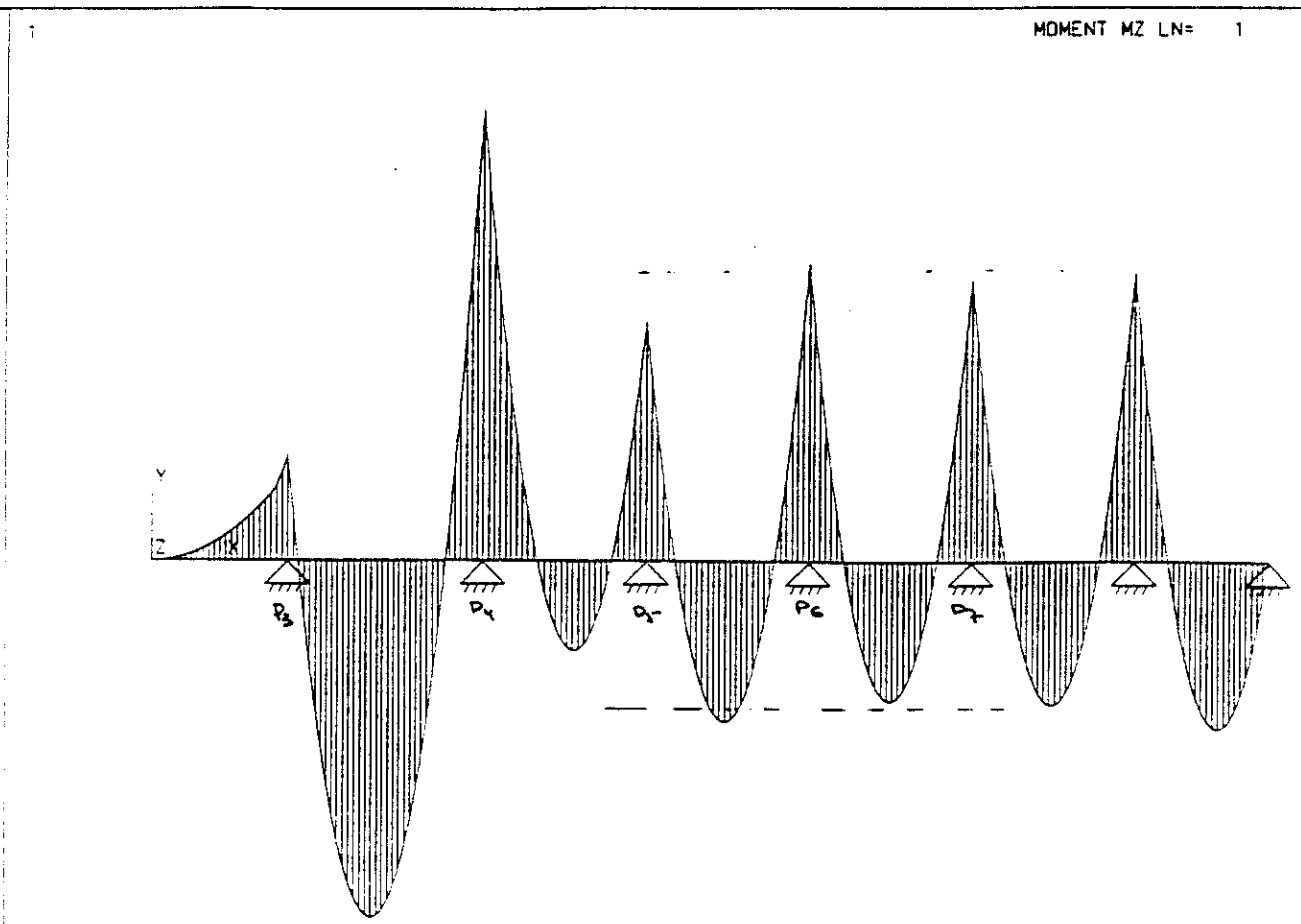
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DATE MAR 6, 1997

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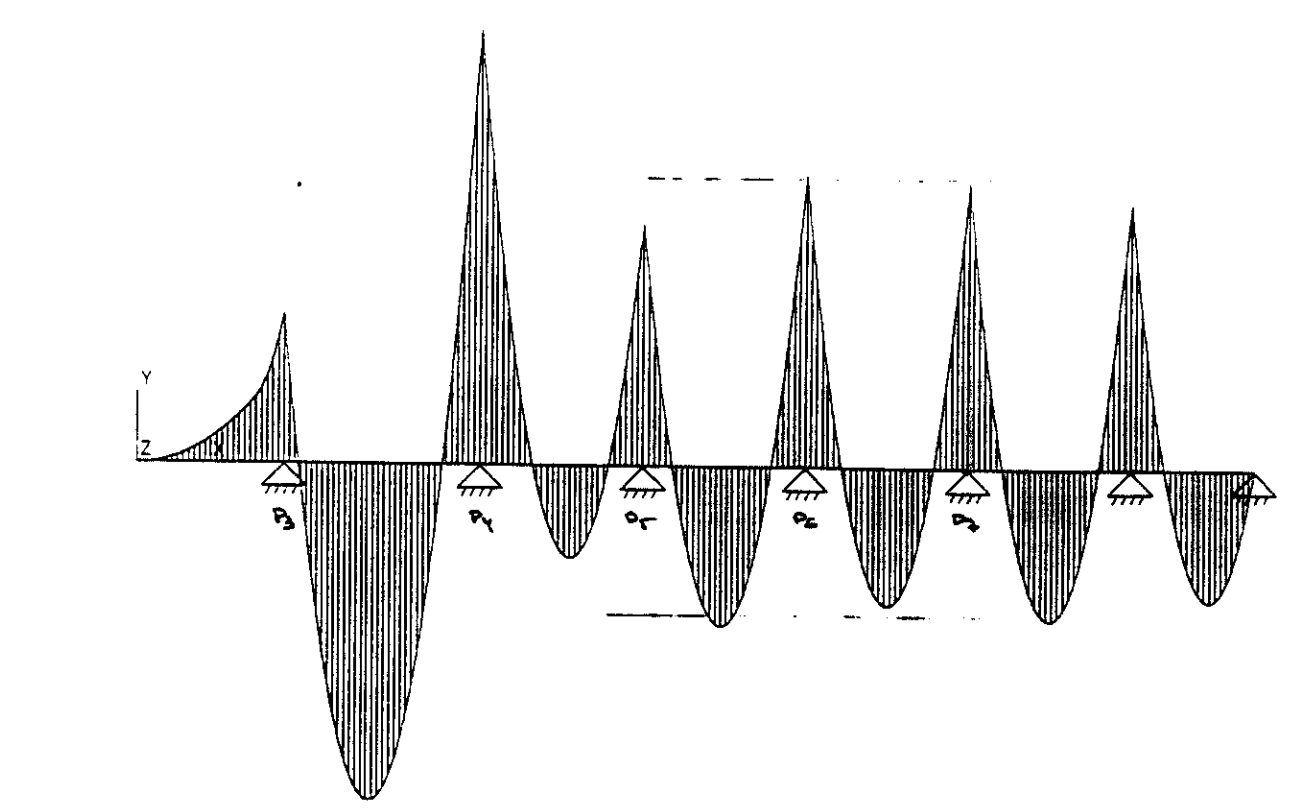
COMPANY INTECSA

S T A A D P D - P L O T (REV. 17.0a)
TITLE. PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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COMPANY: INTECSA

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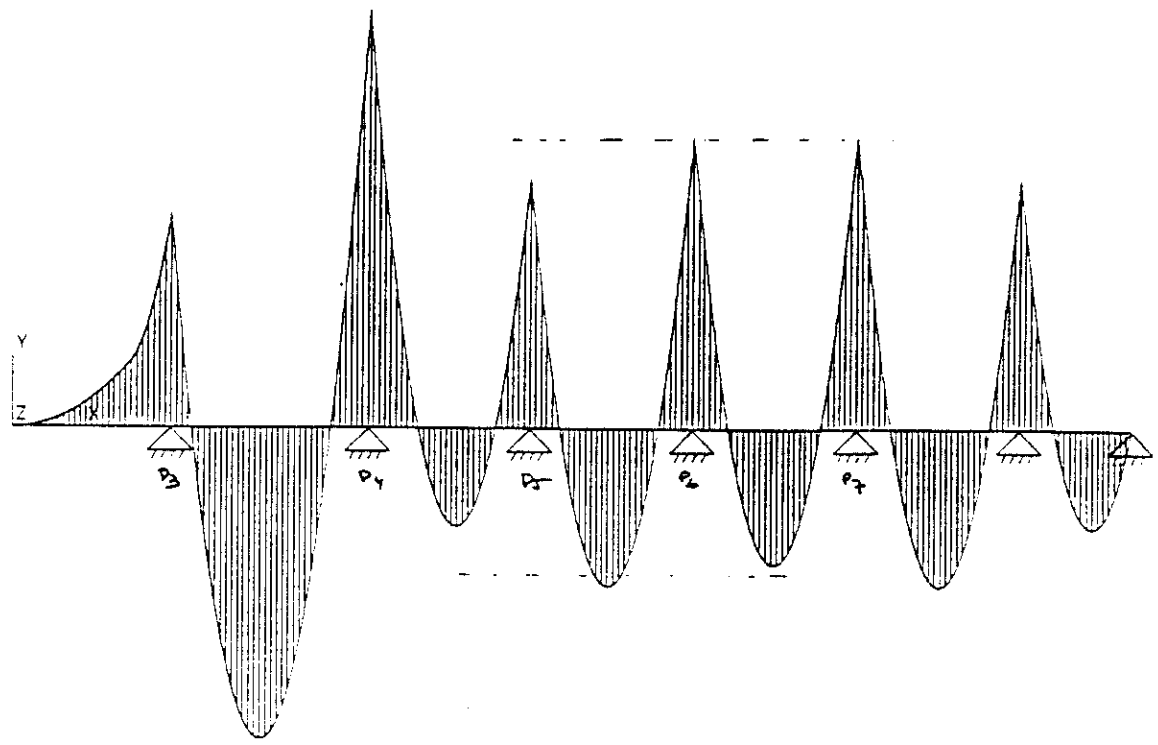
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COMPANY INTECSA

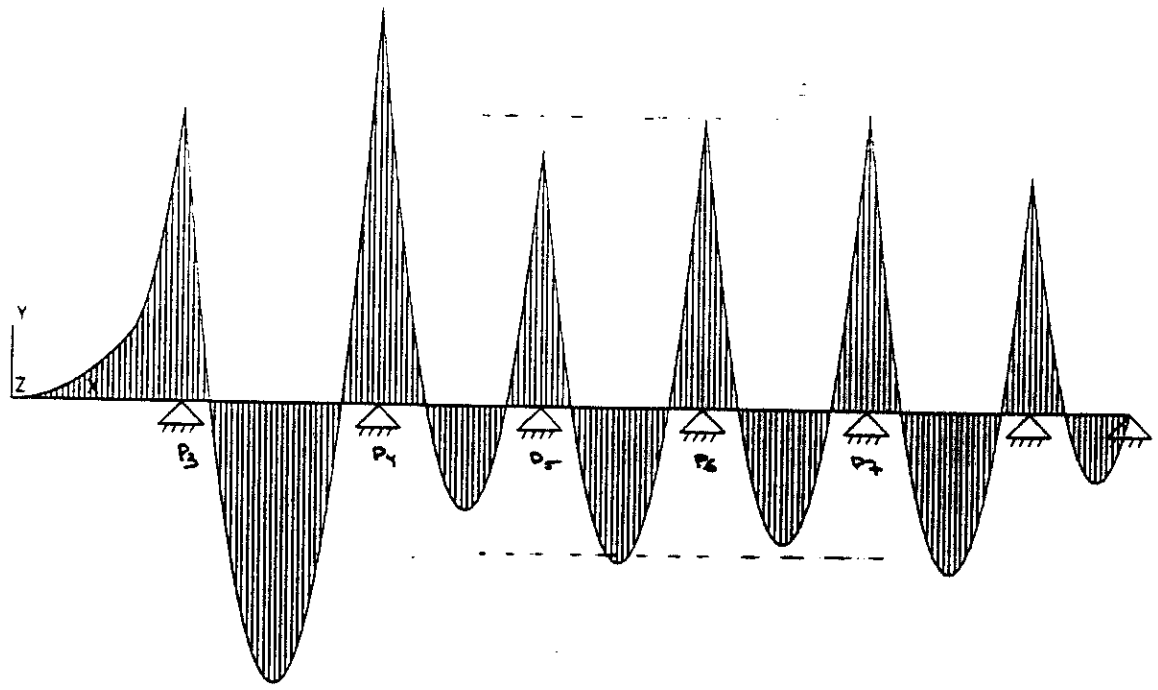
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DATE MAR 5, 1997

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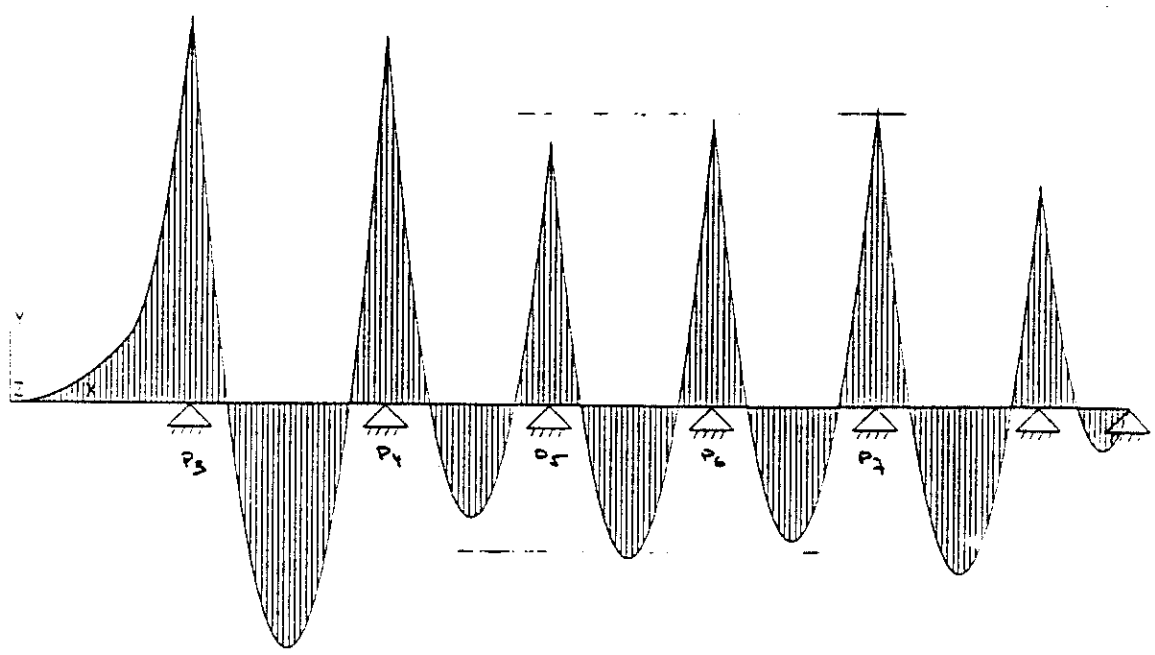
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STRUCTURE DATA

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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

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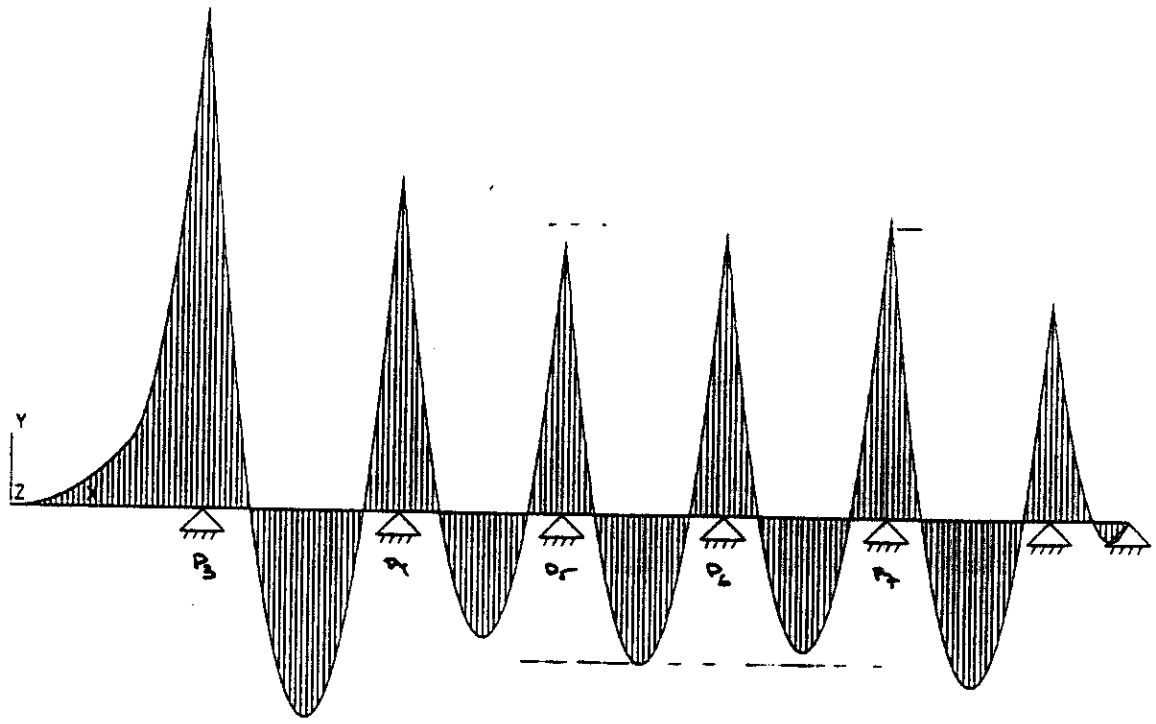
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DATE: MAR 5, 1997

STRUCTURE DATA

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MOMENT MZ LN= 1



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COMPANY INTECSA

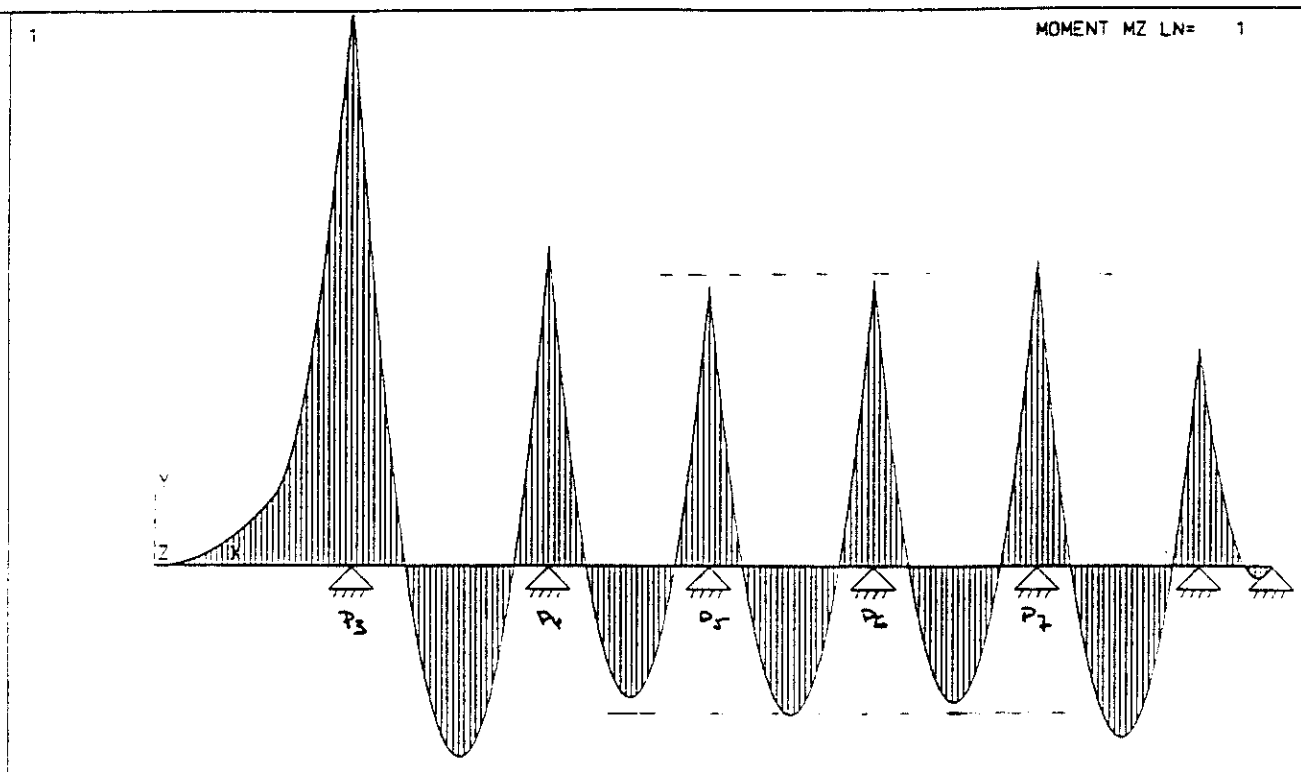
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 6, 1997

STRUCTURE DATA

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METE MTON

COMPANY INTECSA

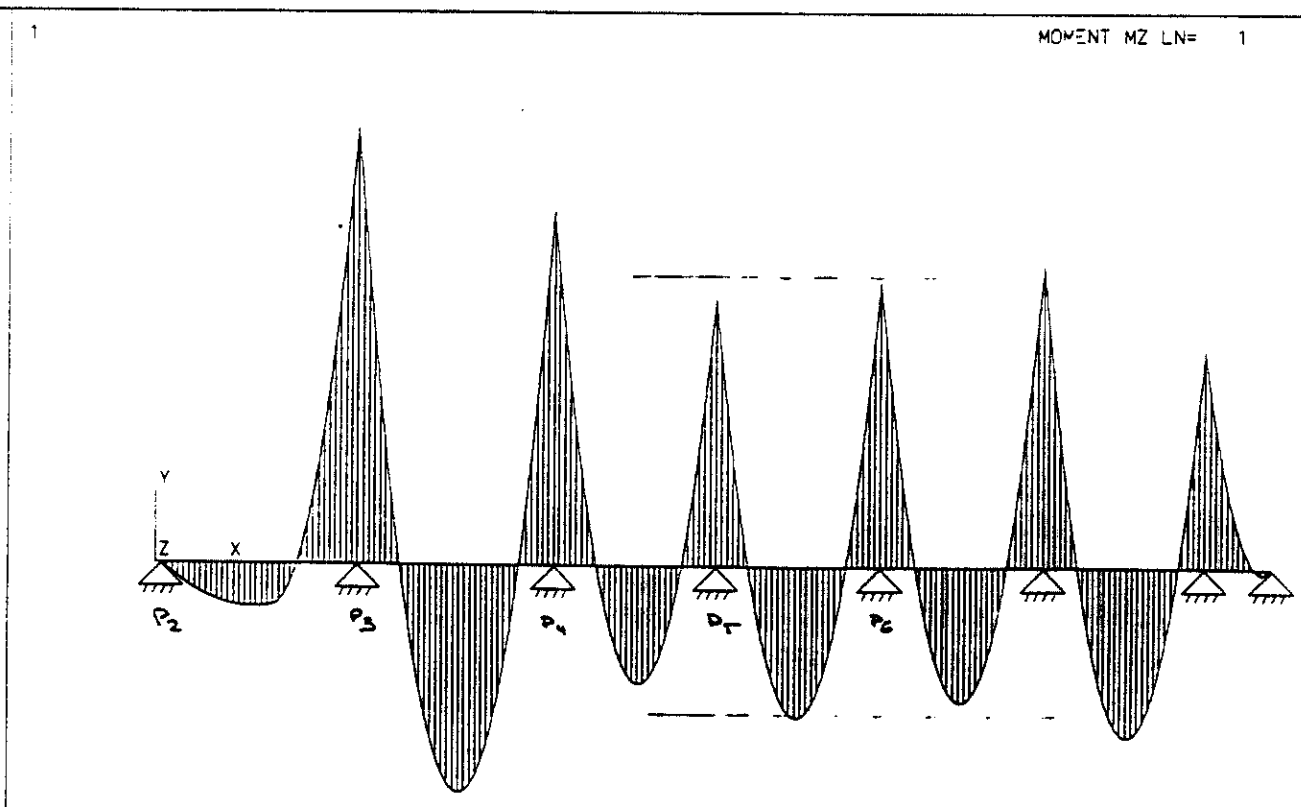
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 8
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XMAX= 398.0
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METE MTON

COMPANY INTECSA

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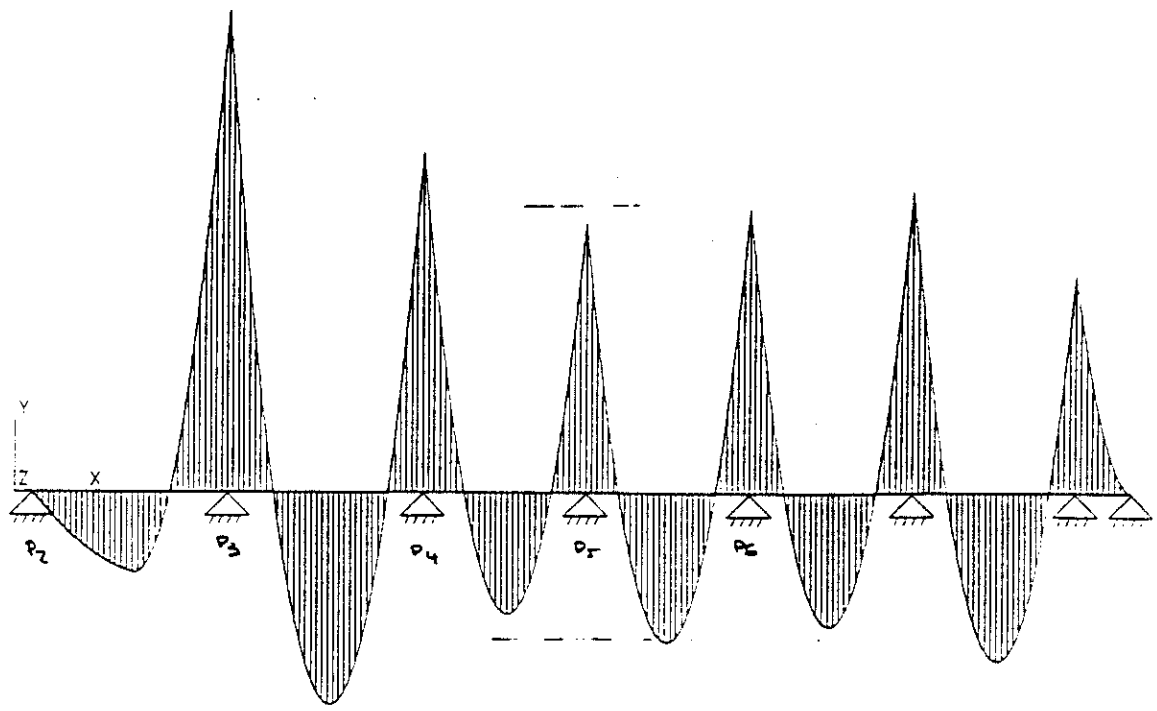
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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

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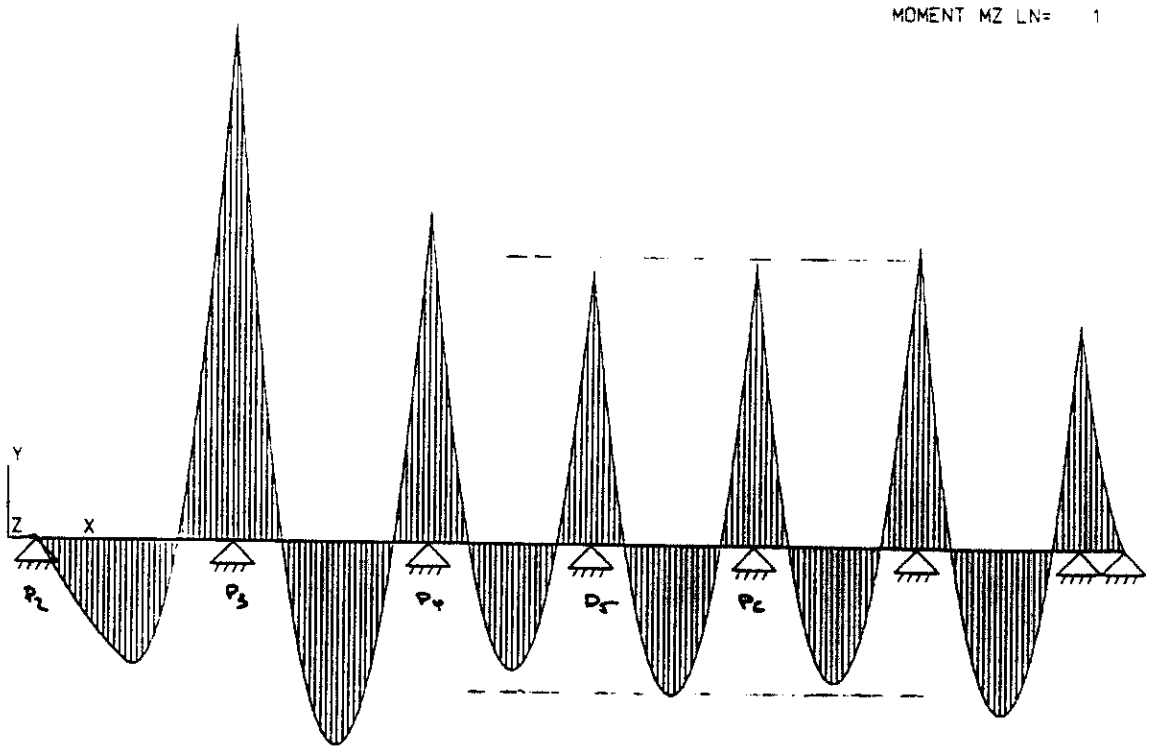
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DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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MOMENT MZ LN= 1



METE MTON

COMPANY: INTECSA

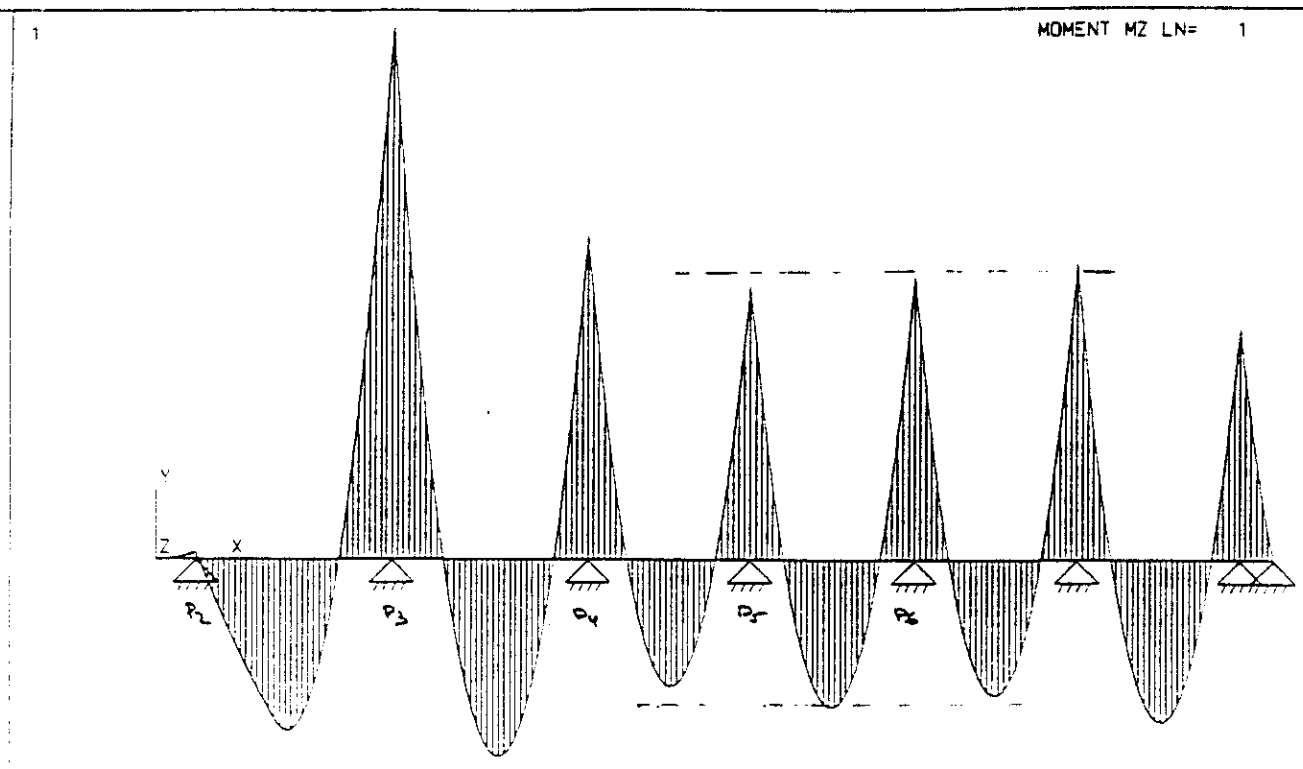
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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METE MTON

COMPANY INTECSA

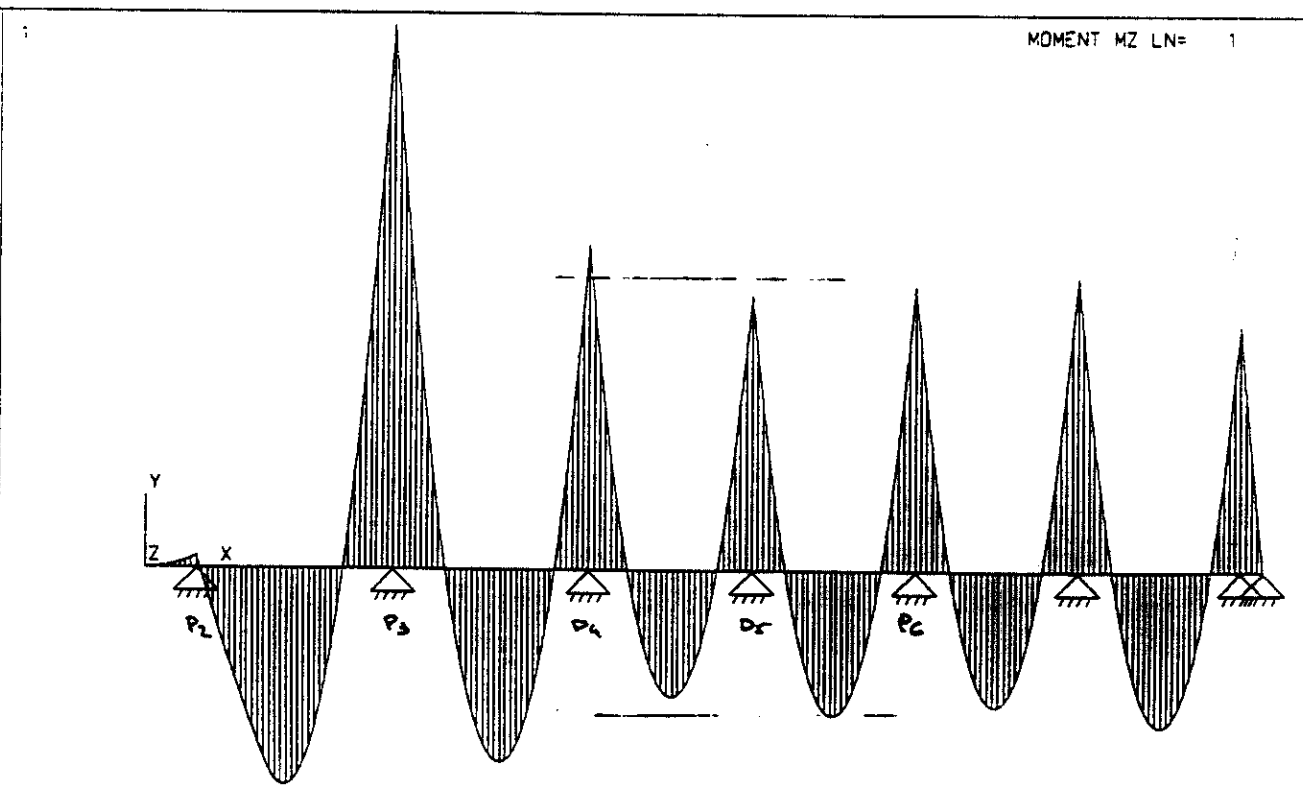
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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COMPANY INTECSA

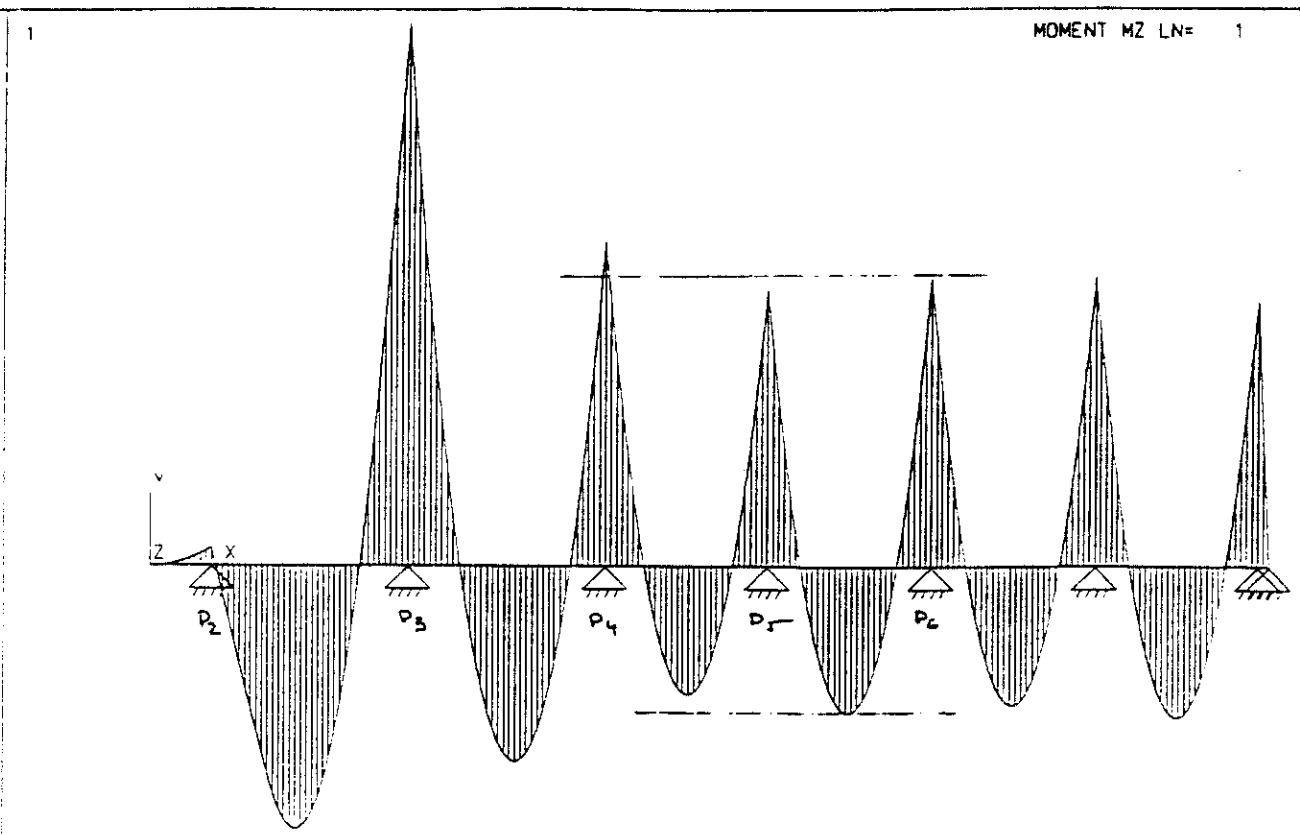
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

STRUCTURE DATA

TYPE = PLANE
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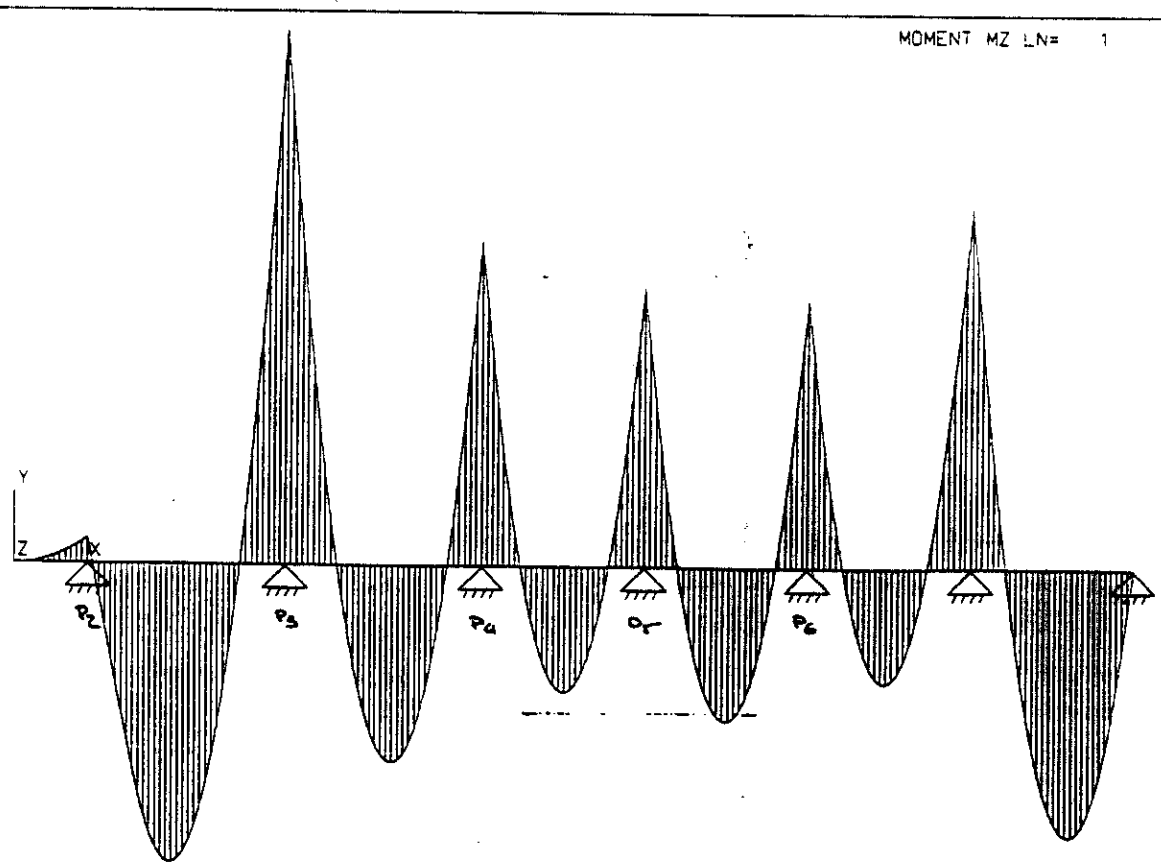
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 6, 1997

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TYPE = PLANE
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COMPANY INTECSA

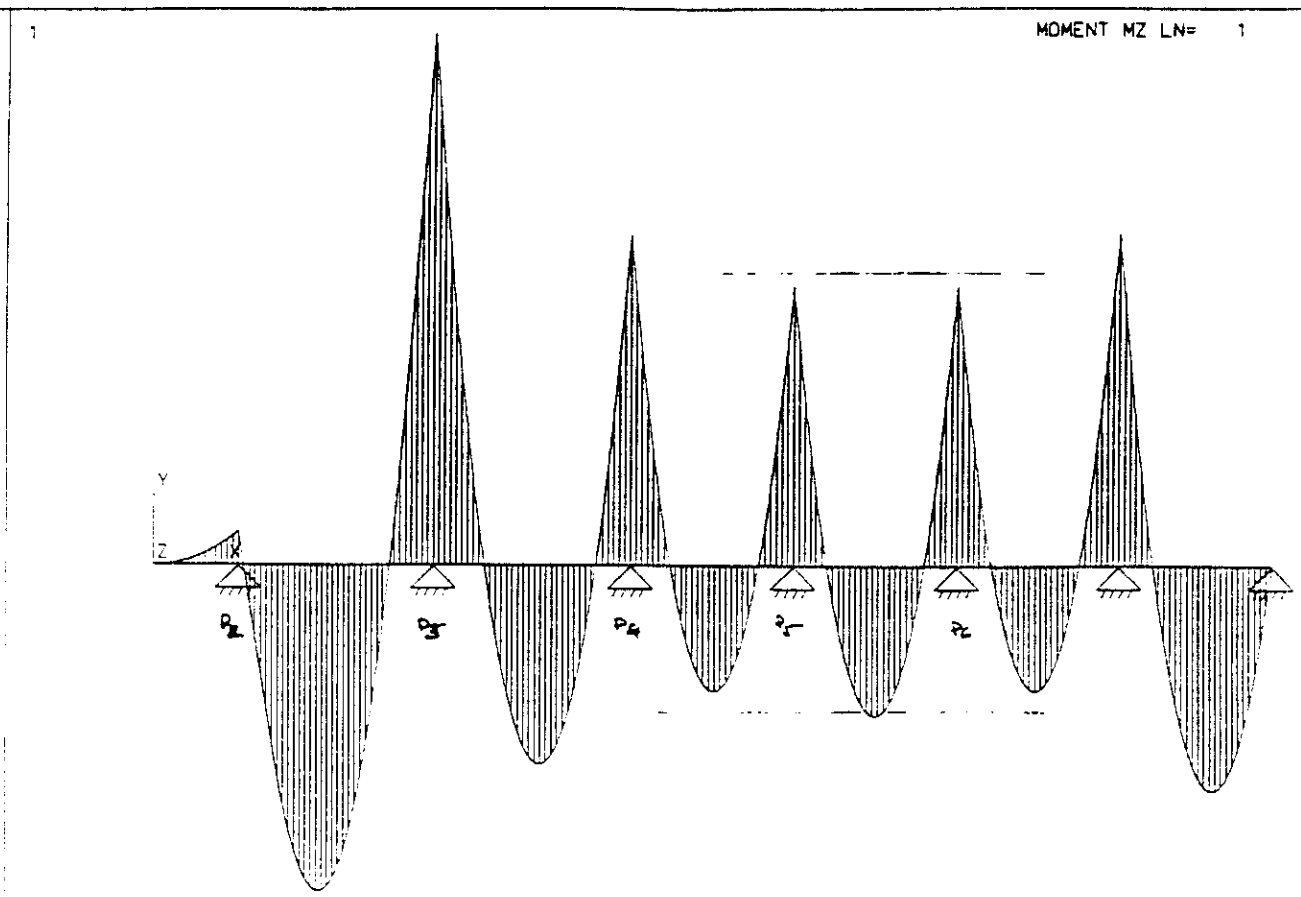
S T A A D P D - P L O T (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 6, 1997

STRUCTURE DATA

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METE MTON

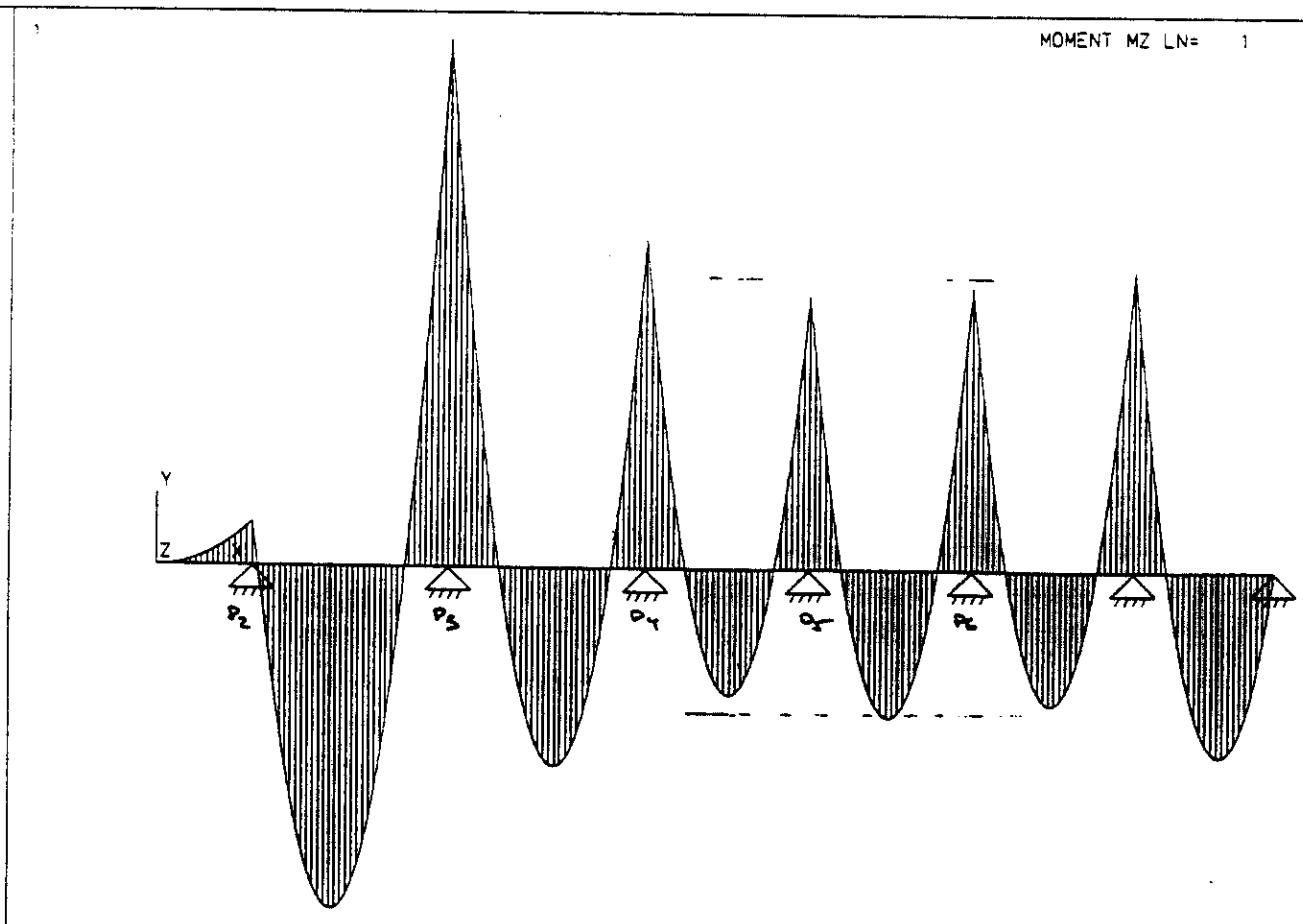
COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)
TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

STRUCTURE DATA

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METE MTON

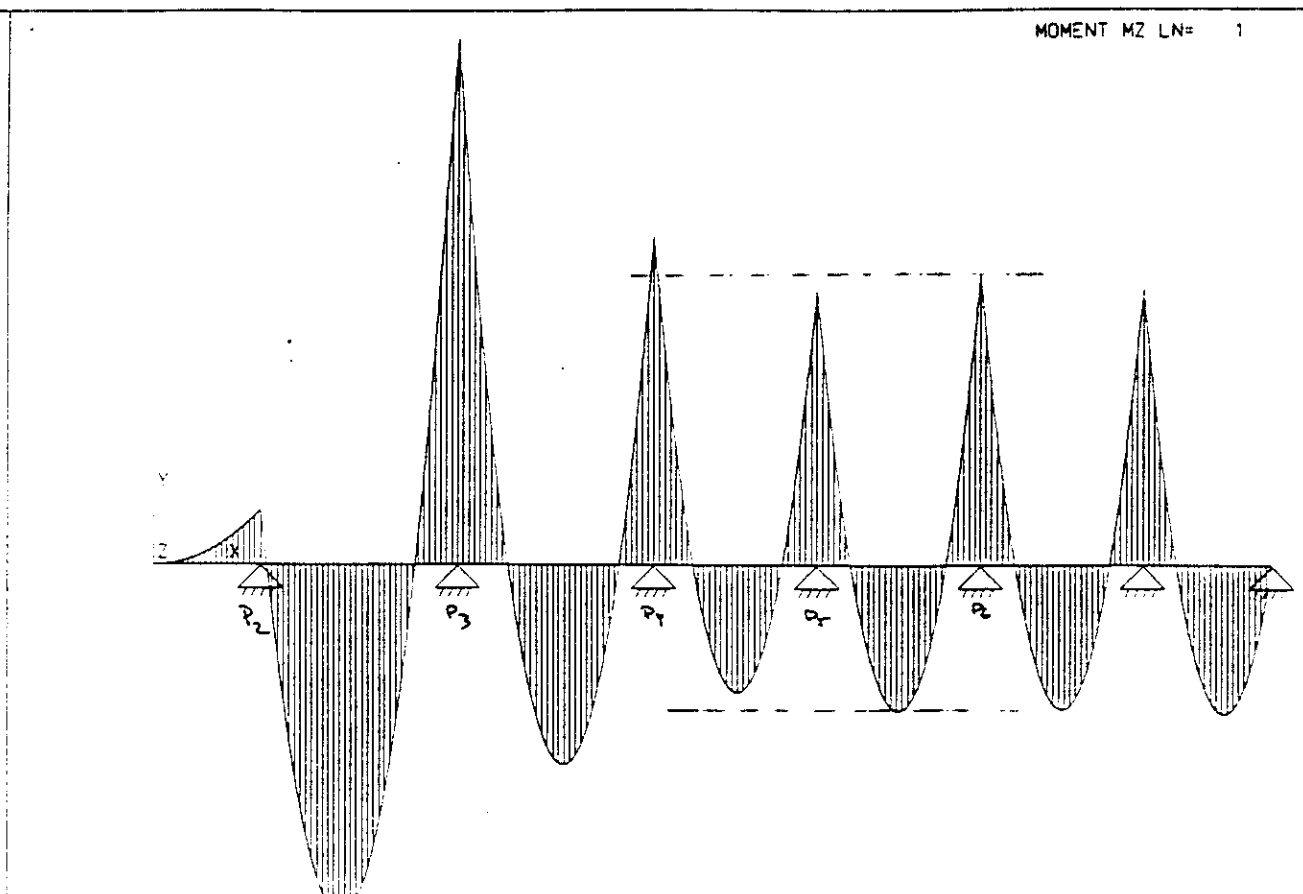
COMPANY: INTECSA

S T A A D P D - P L O T (REV: 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 7, 1997

STRUCTURE DATA

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METE MTON

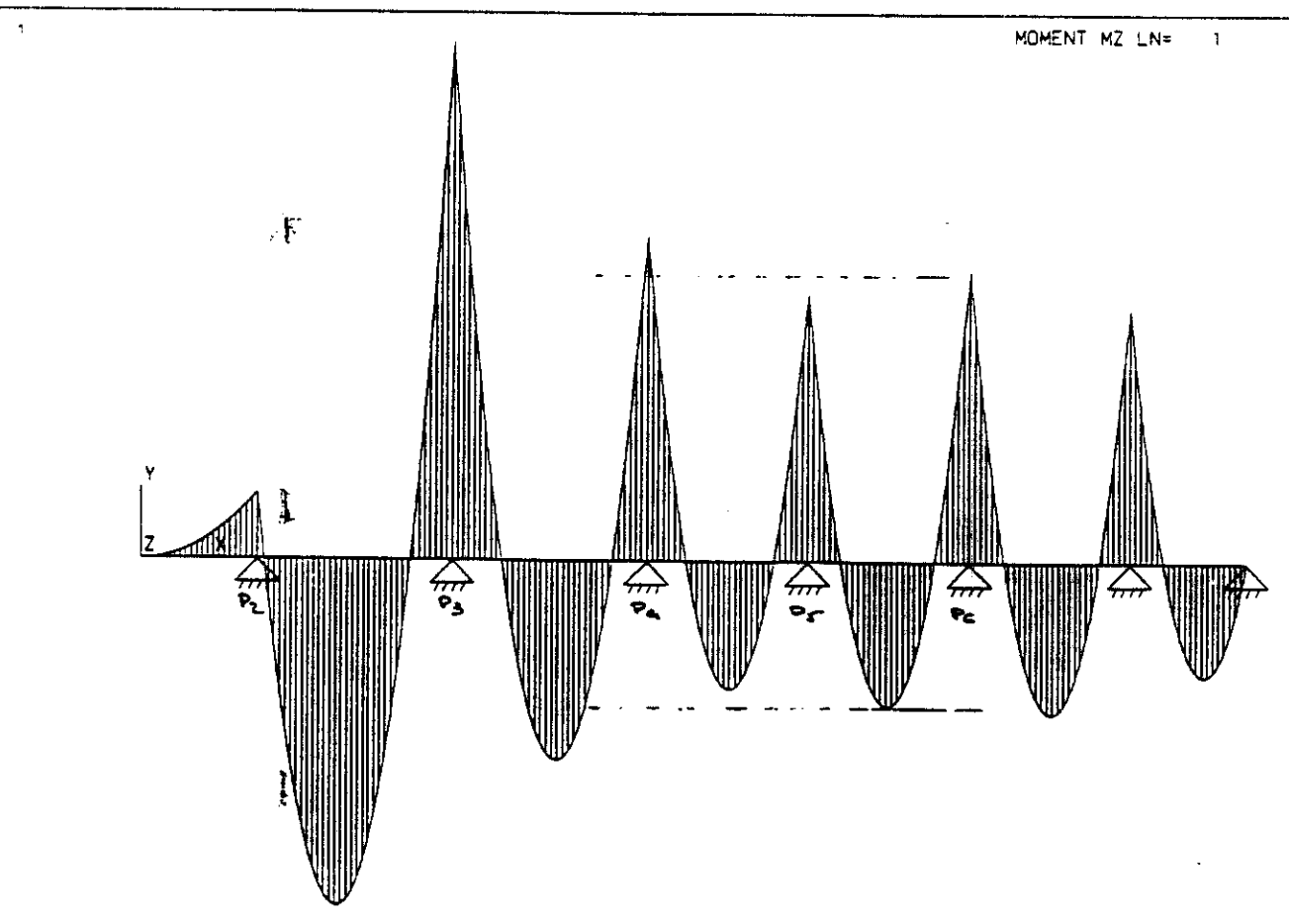
COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)
TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 7, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 7
NL = 1
XMAX= 398.0
YMAX= 0.0
ZMAX= 0.0



METE MTON

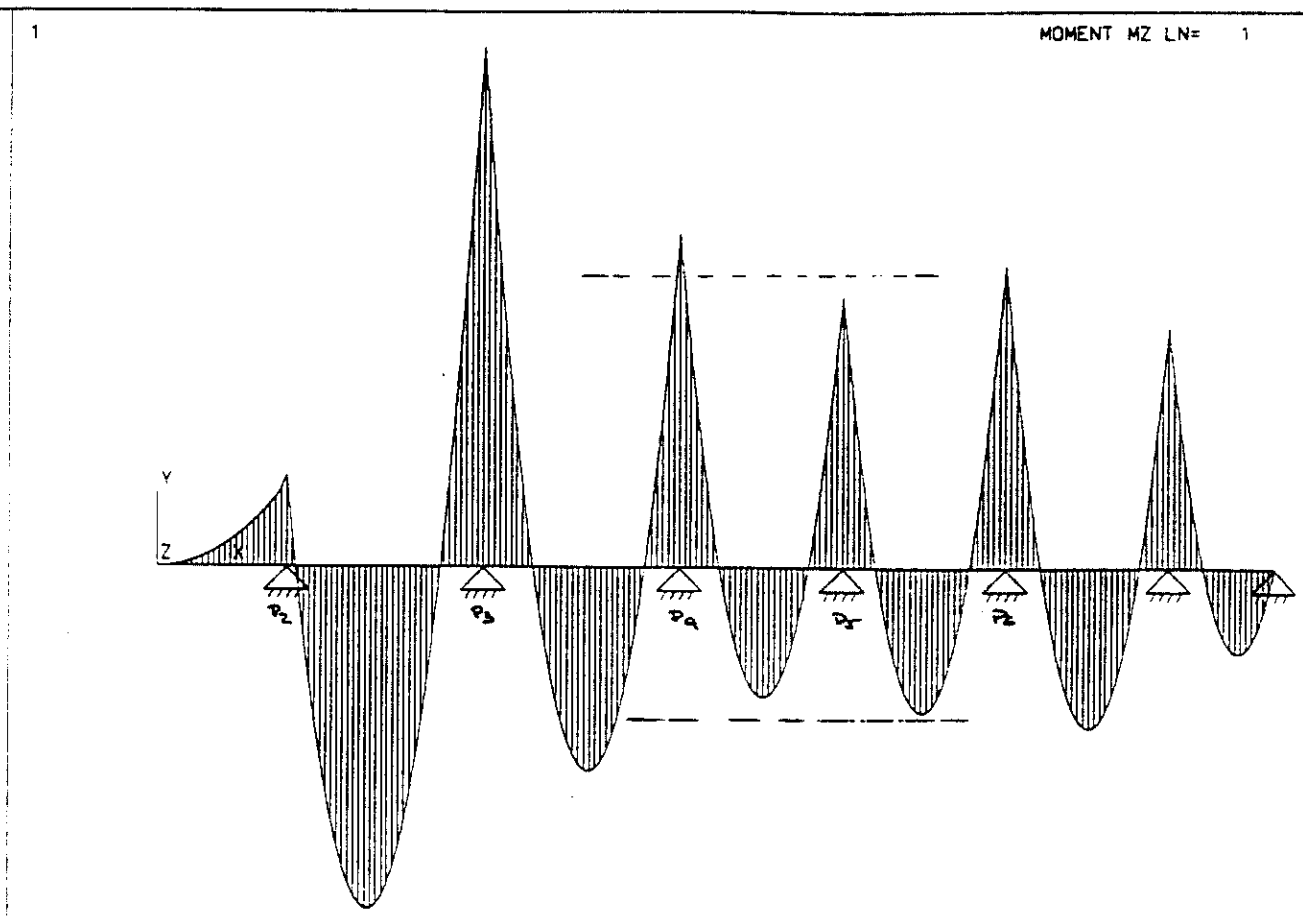
COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)
TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: MAR 7, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
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METE MTON

COMPANY INTECSA

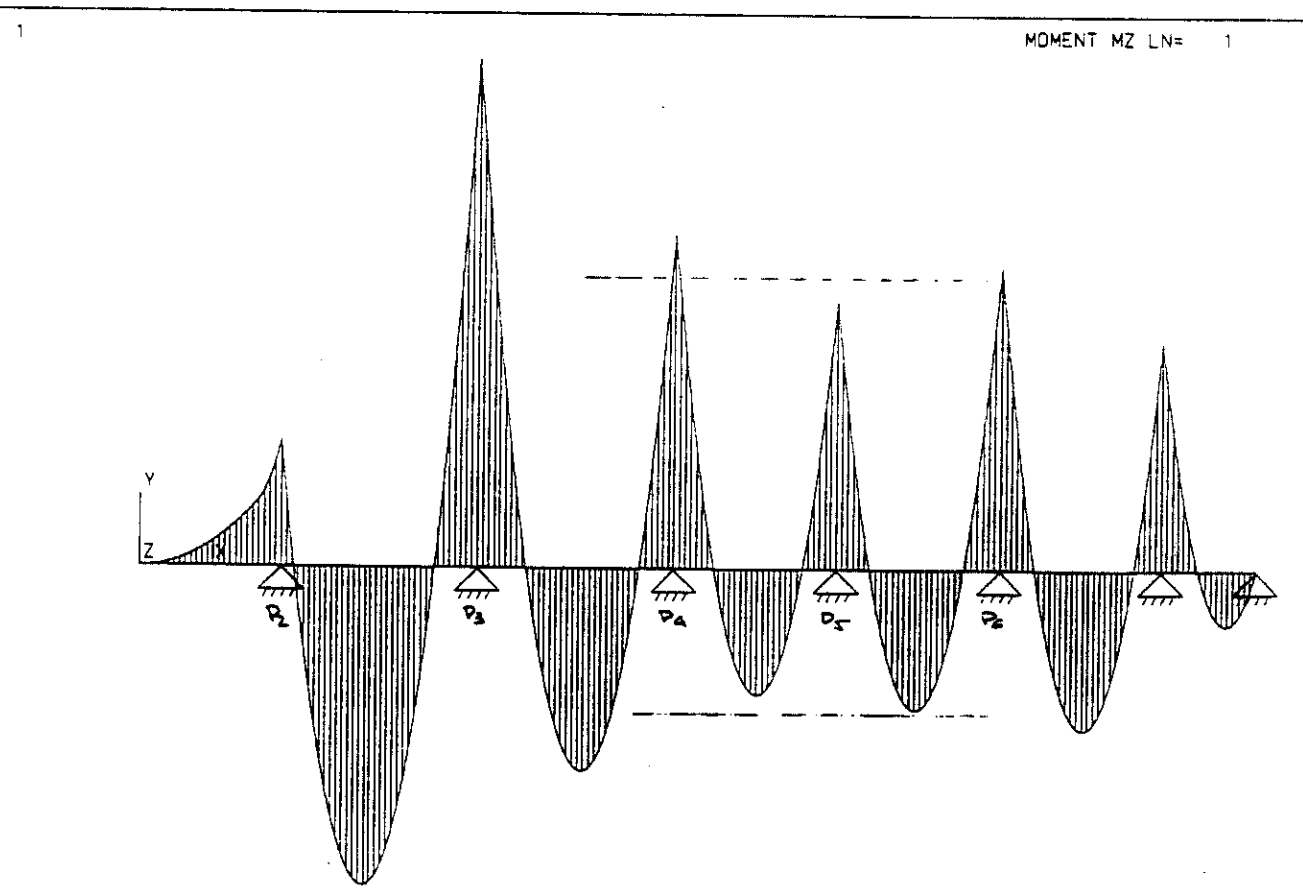
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
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COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

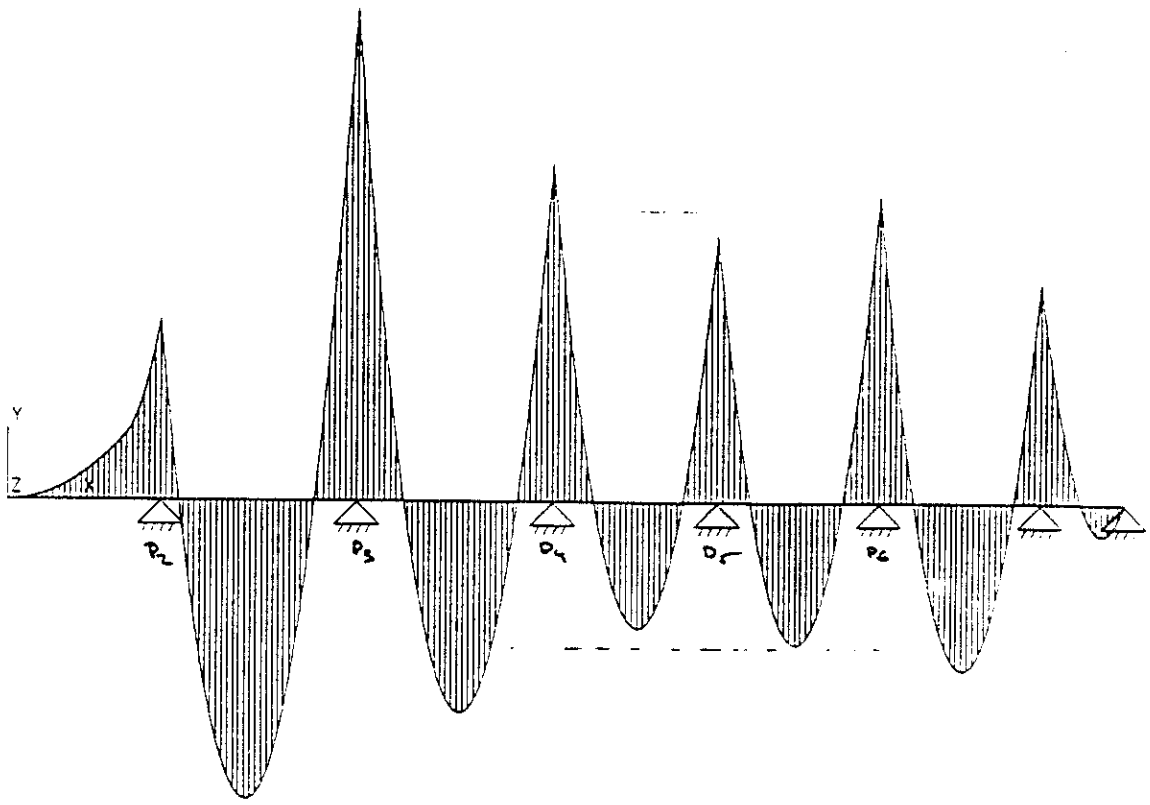
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MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

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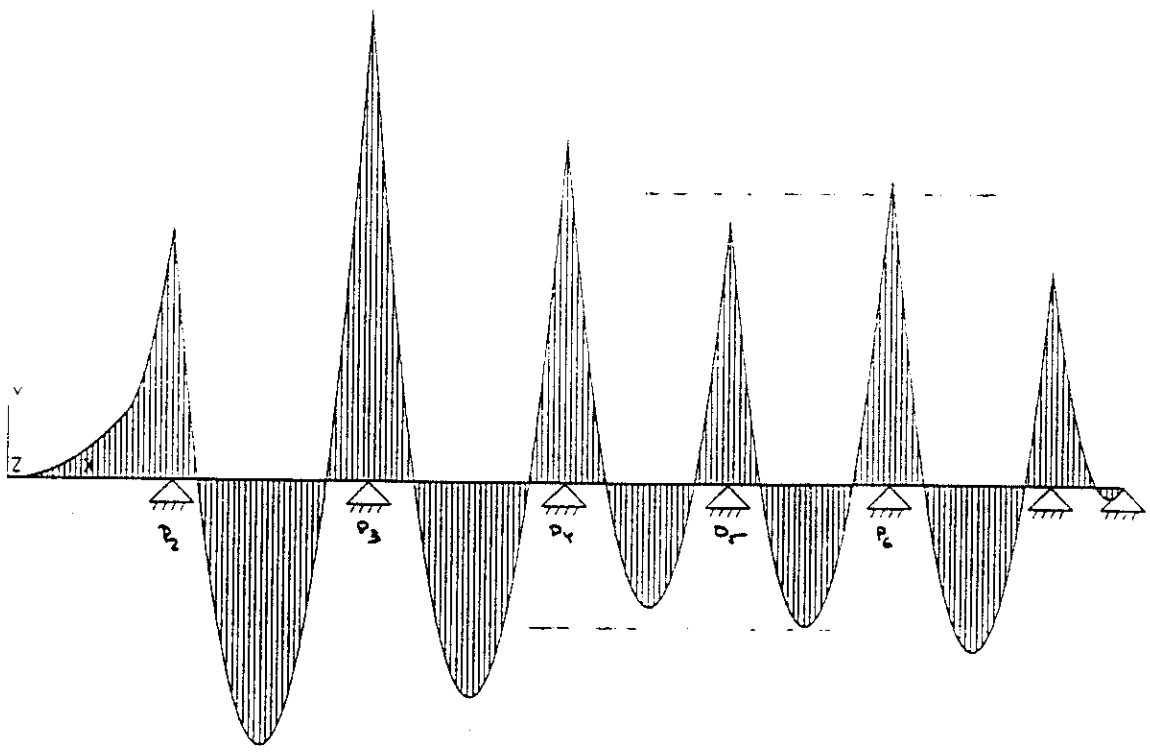
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METE MTON

COMPANY INTECSA

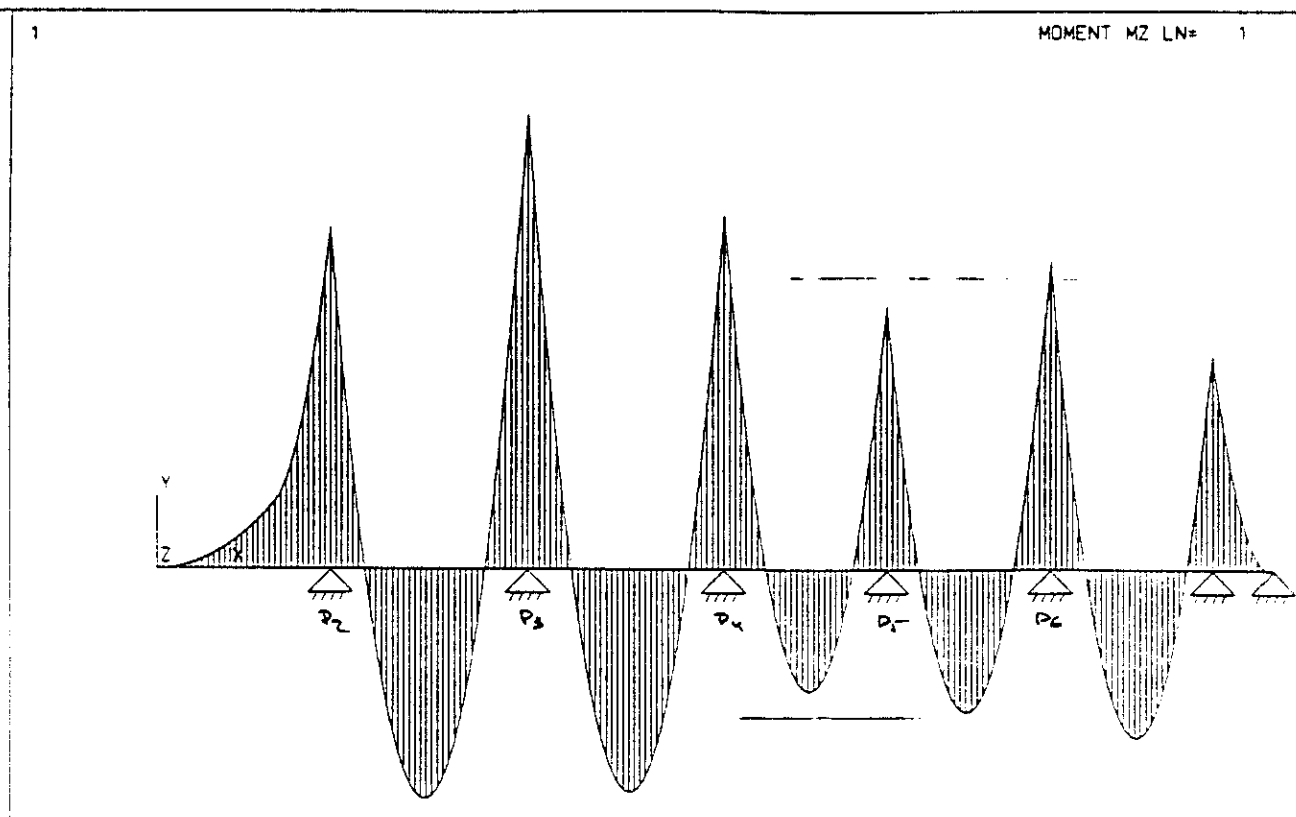
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

STRUCTURE DATA

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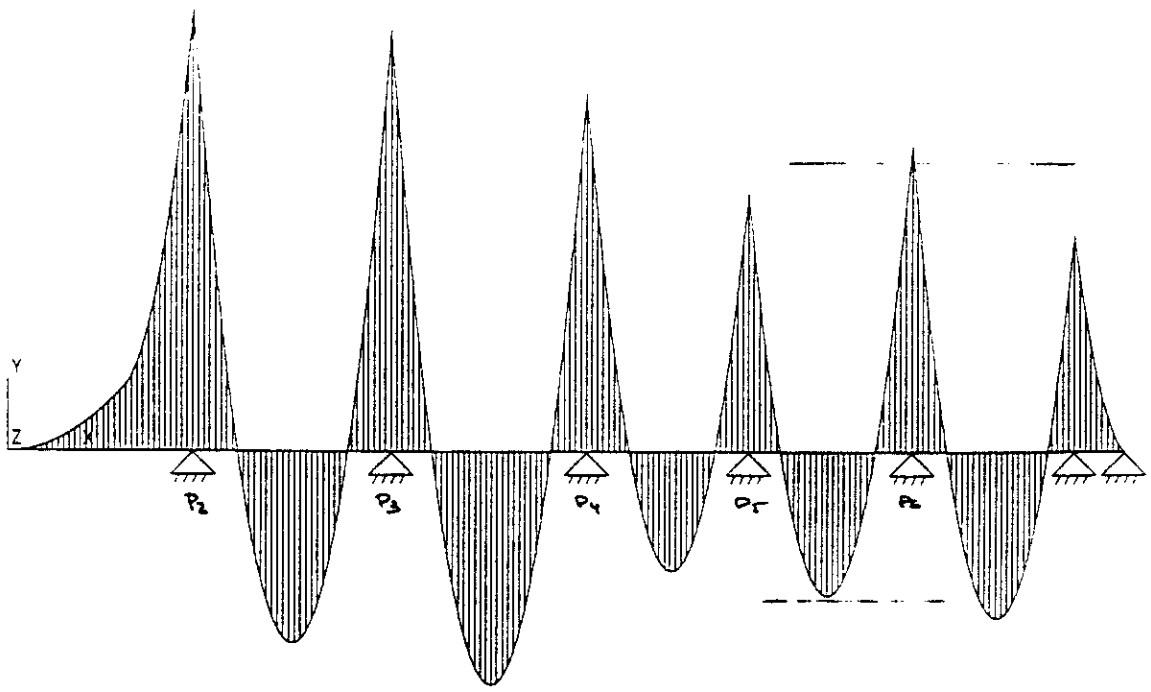
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S T A A D P D - P L O T (REV 17 0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

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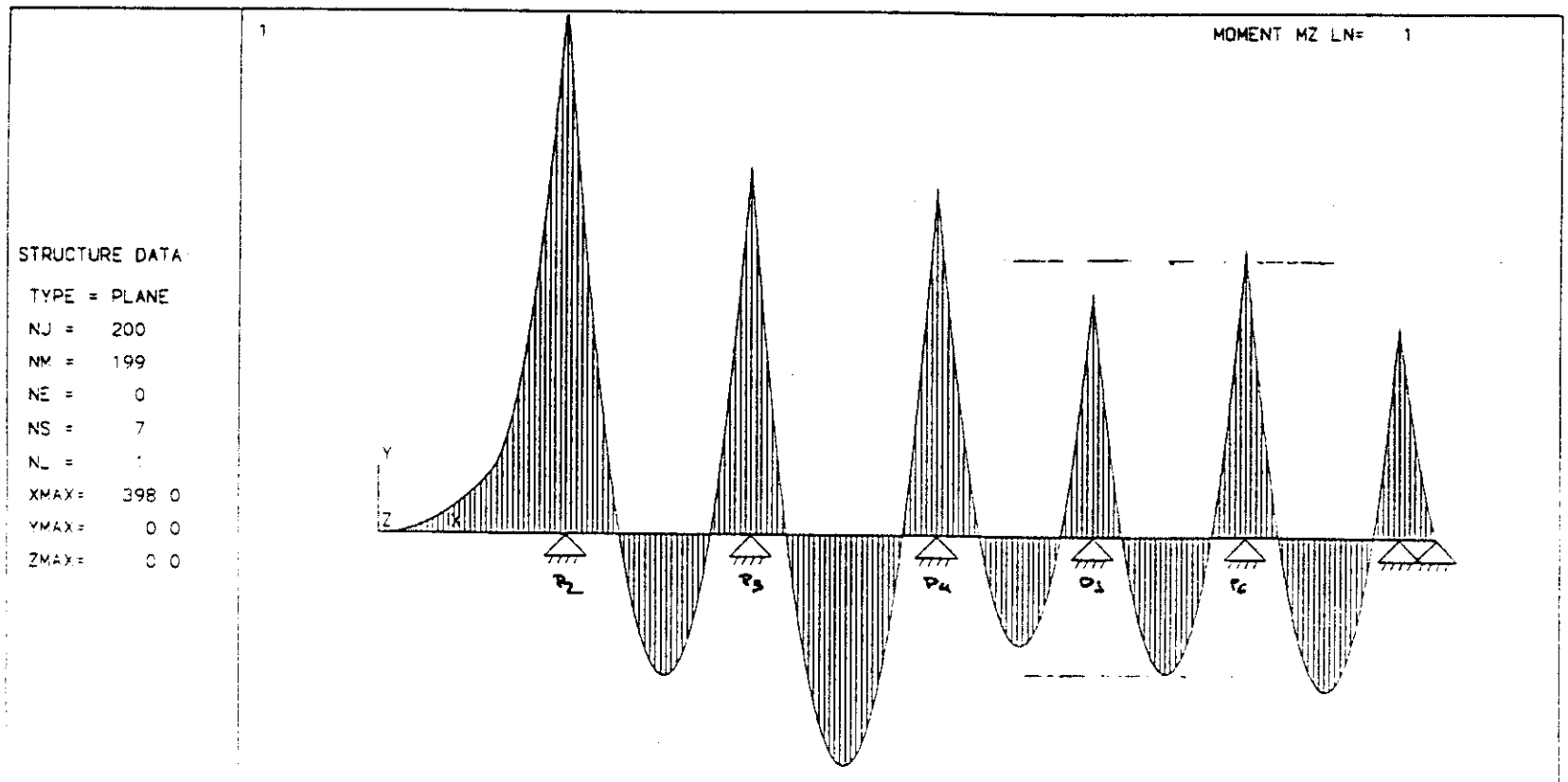
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S T A A D P D - P L O T (REV 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

STRUCTURE DATA

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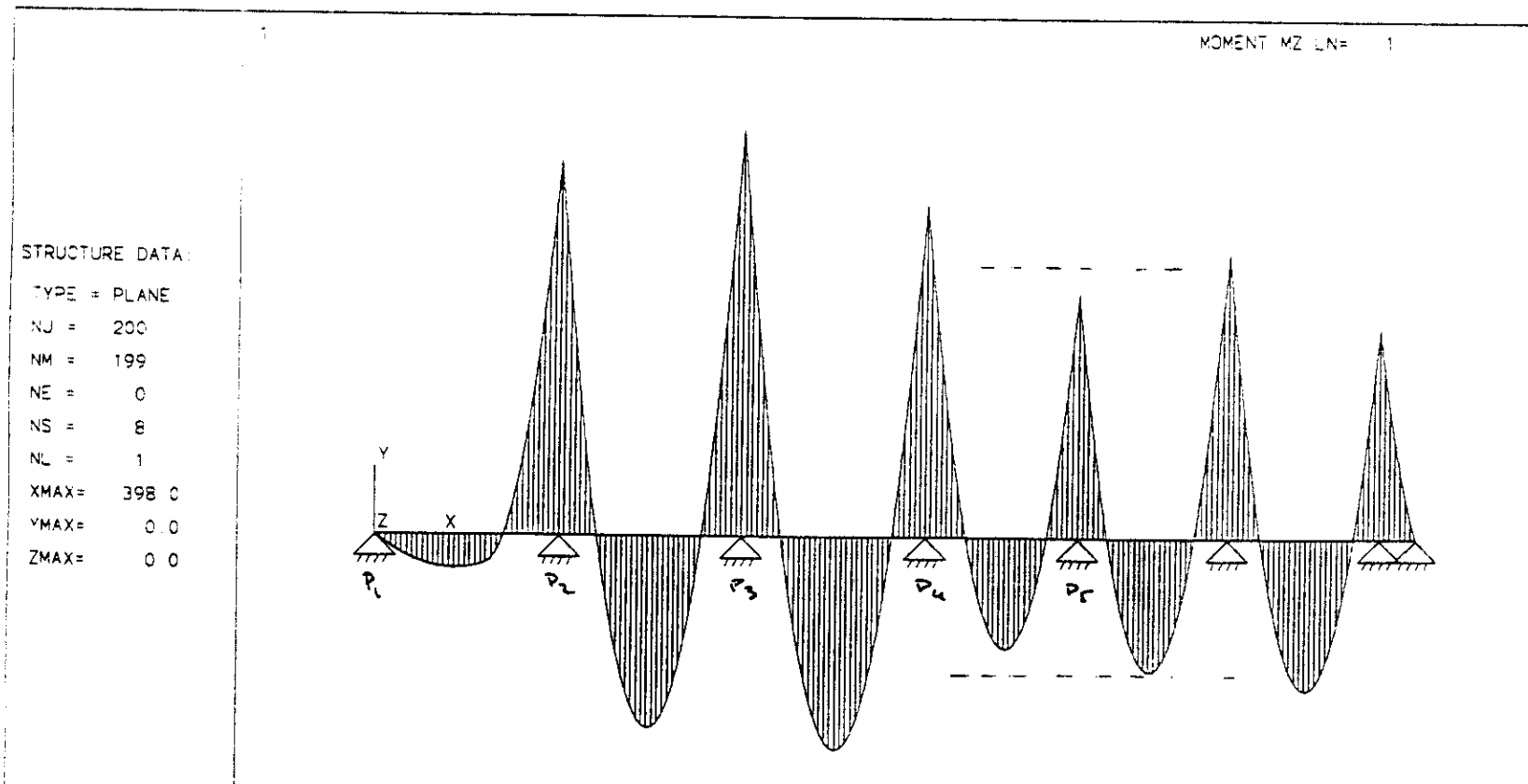
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 7, 1997

STRUCTURE DATA

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COMPANY INTECSA

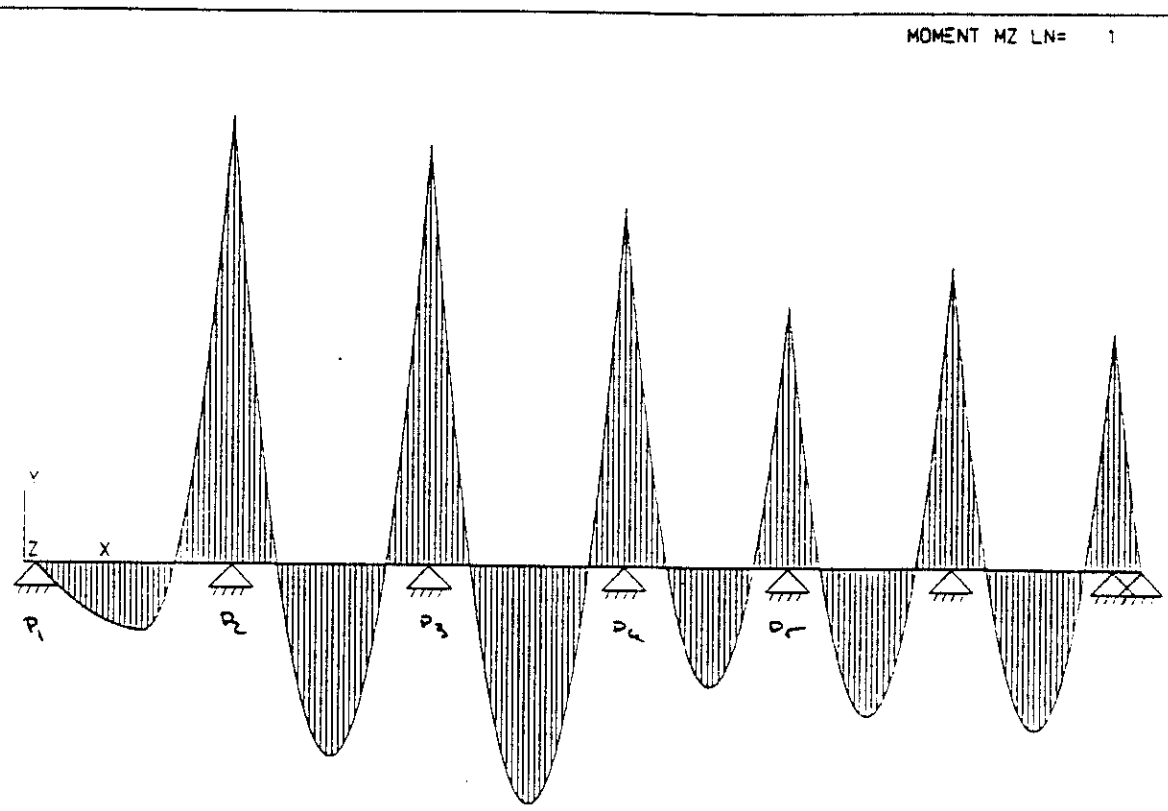
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 10, 1997

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COMPANY INTECSA

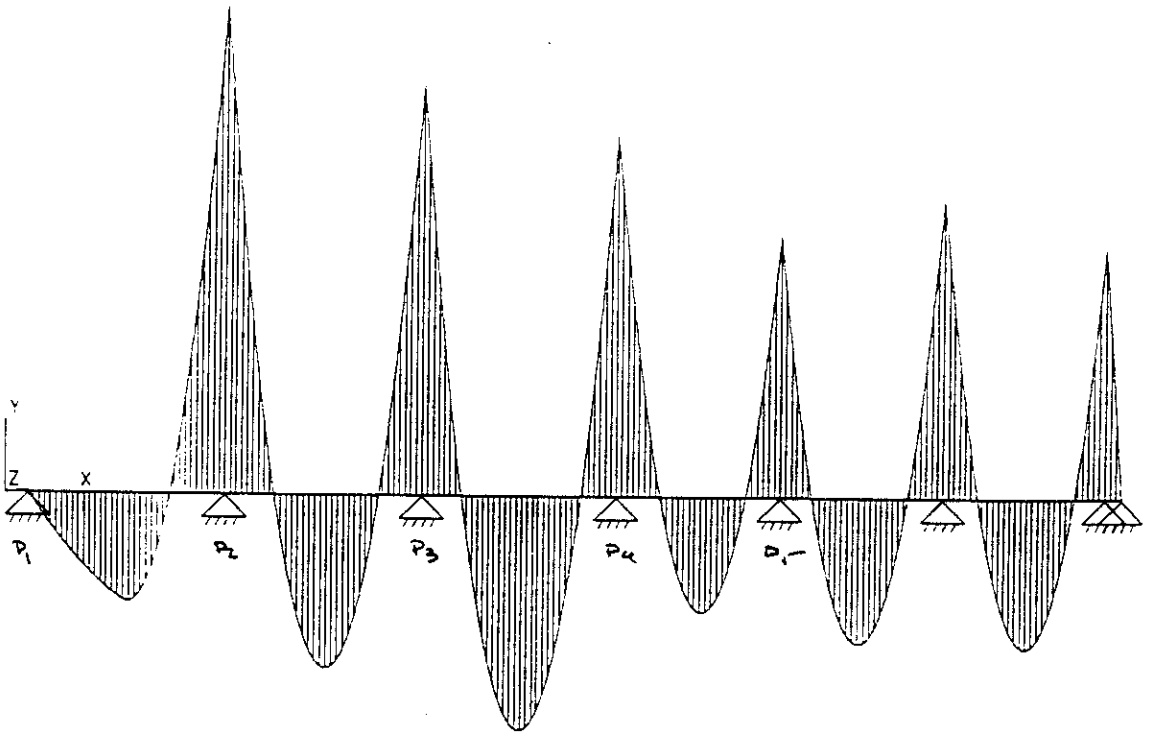
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DATE MAR 10, 1997

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COMPANY INTECSA

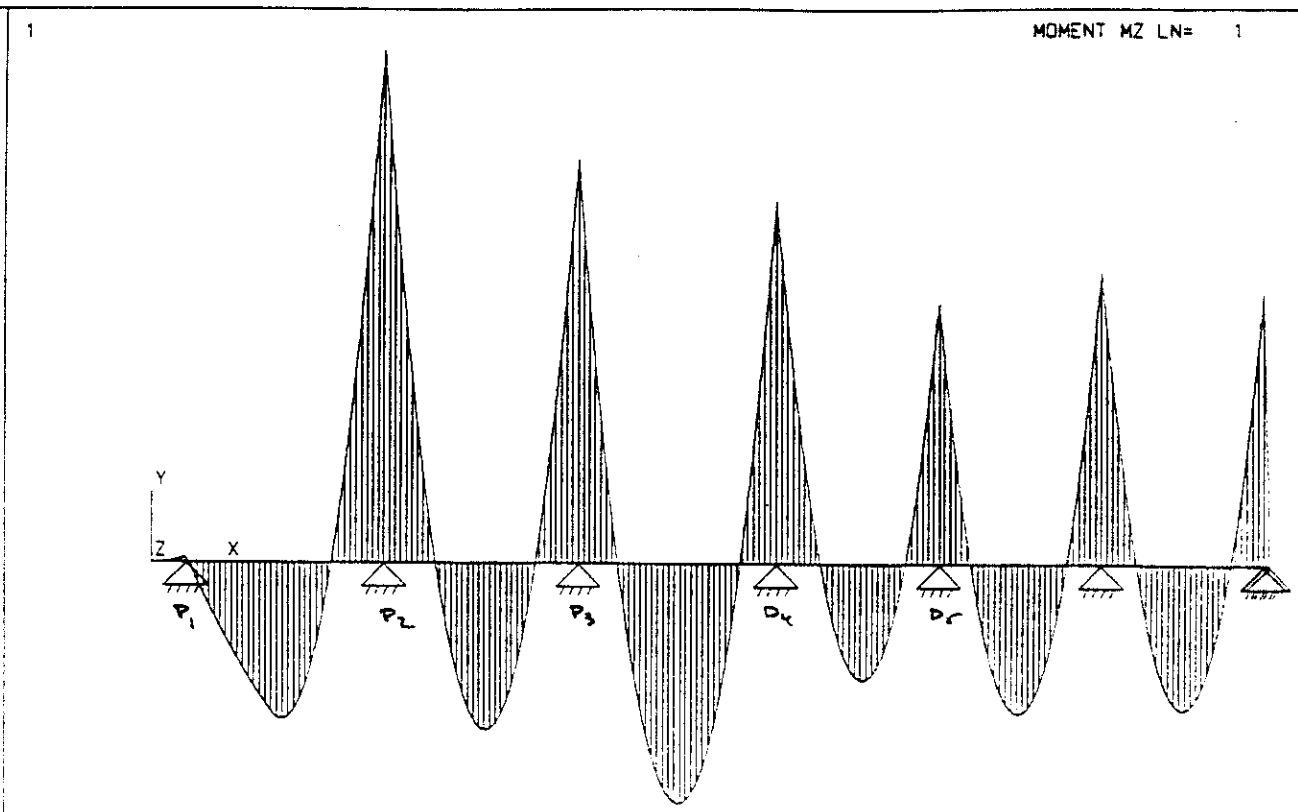
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DATE MAR 10, 1997

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METE MTON

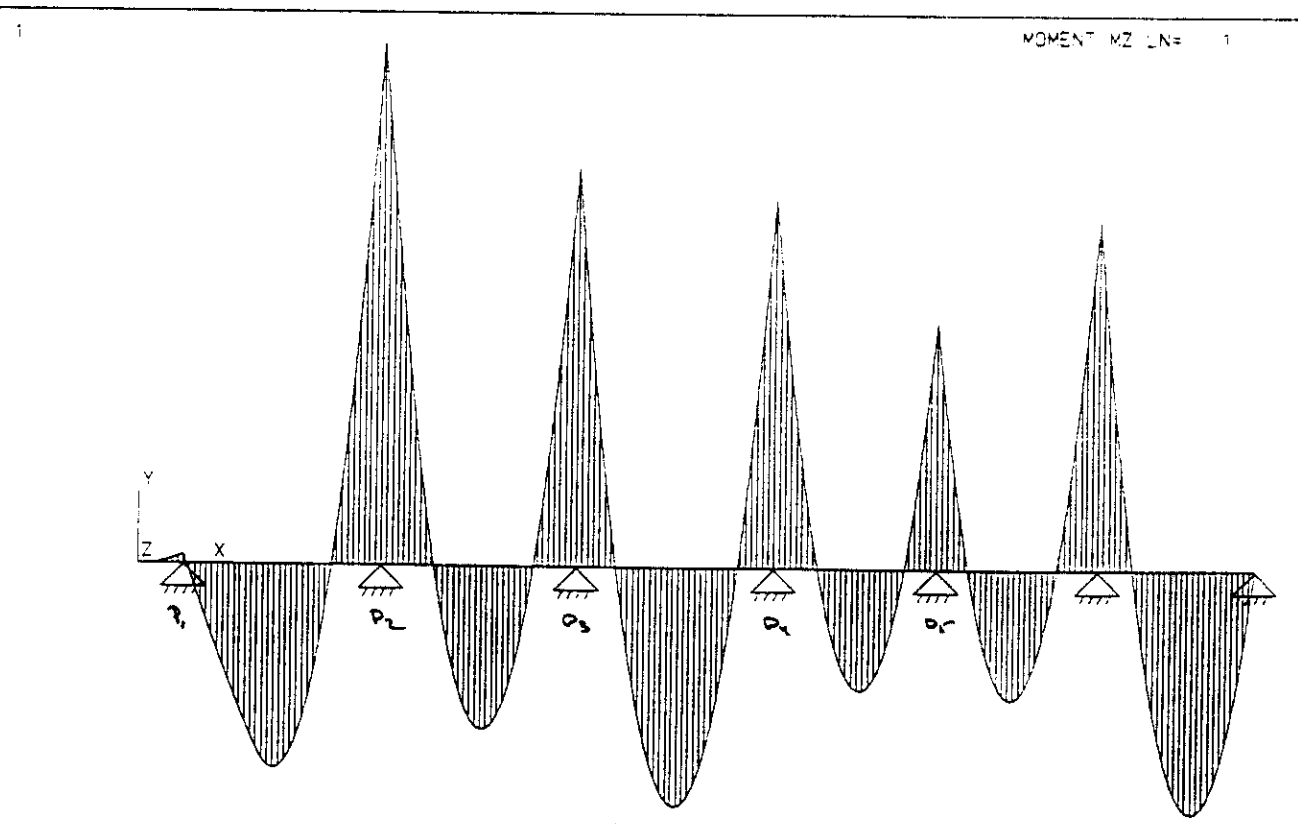
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S T A A D P D - P L O T (REV 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 10, 1997

STRUCTURE DATA

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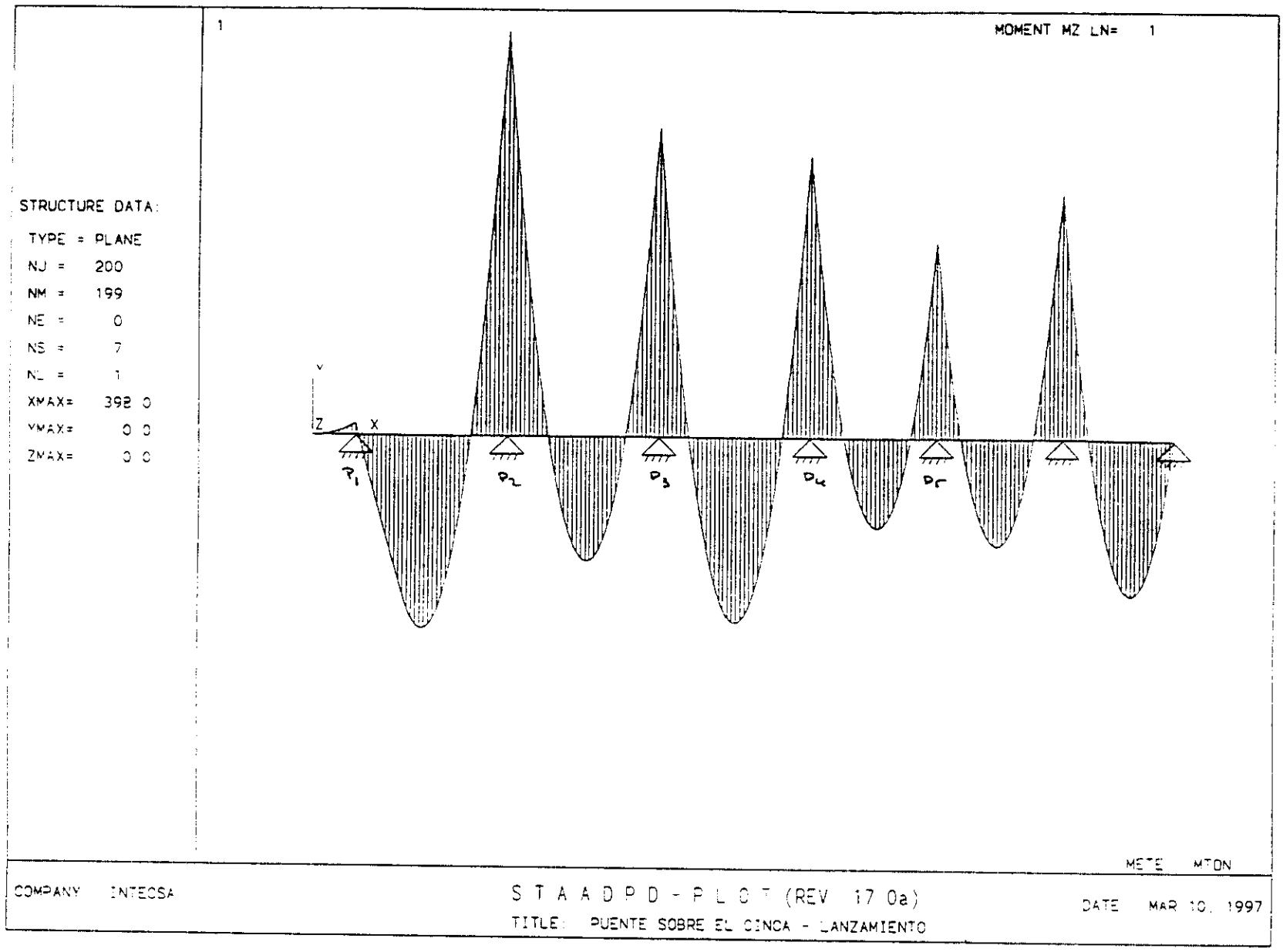


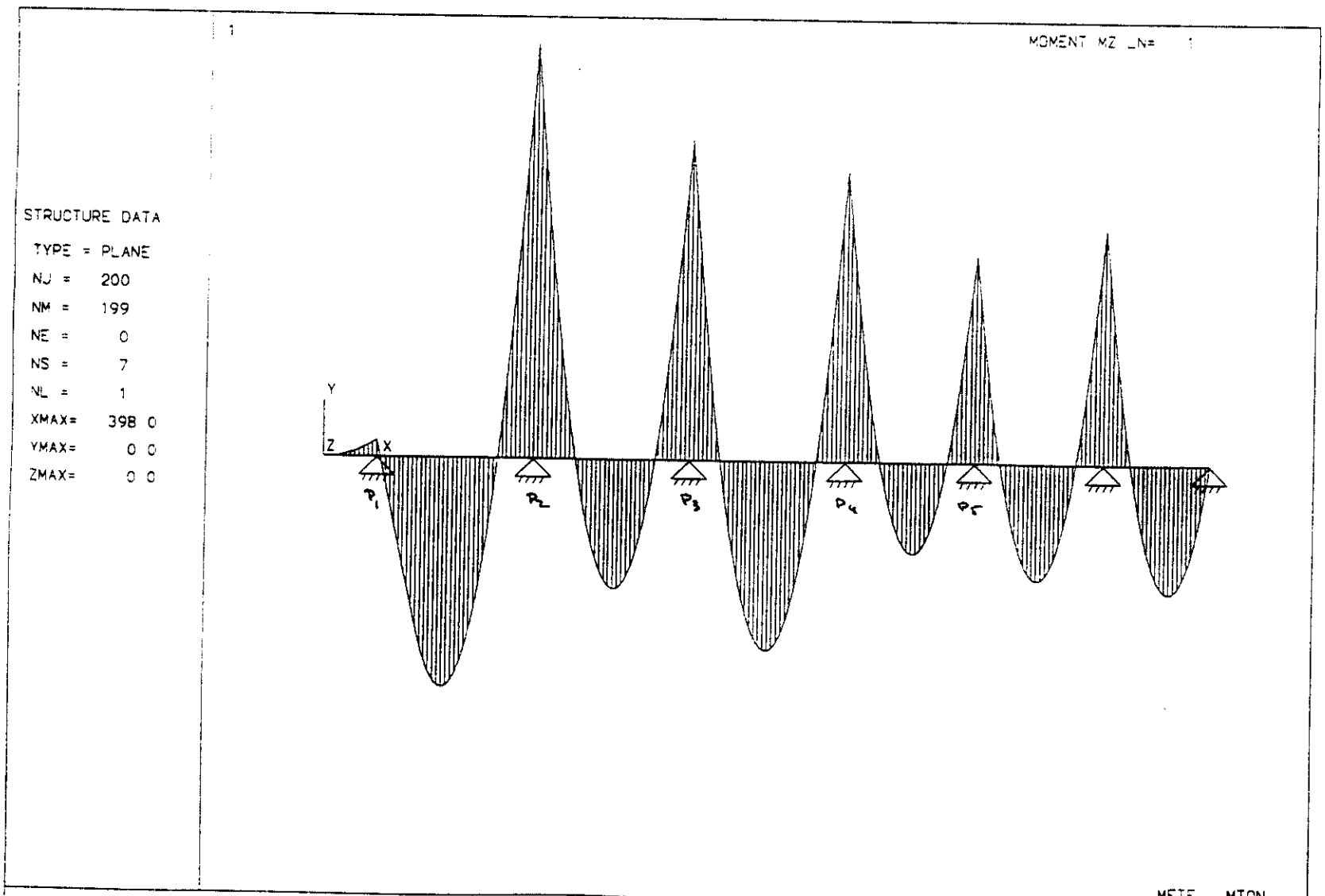
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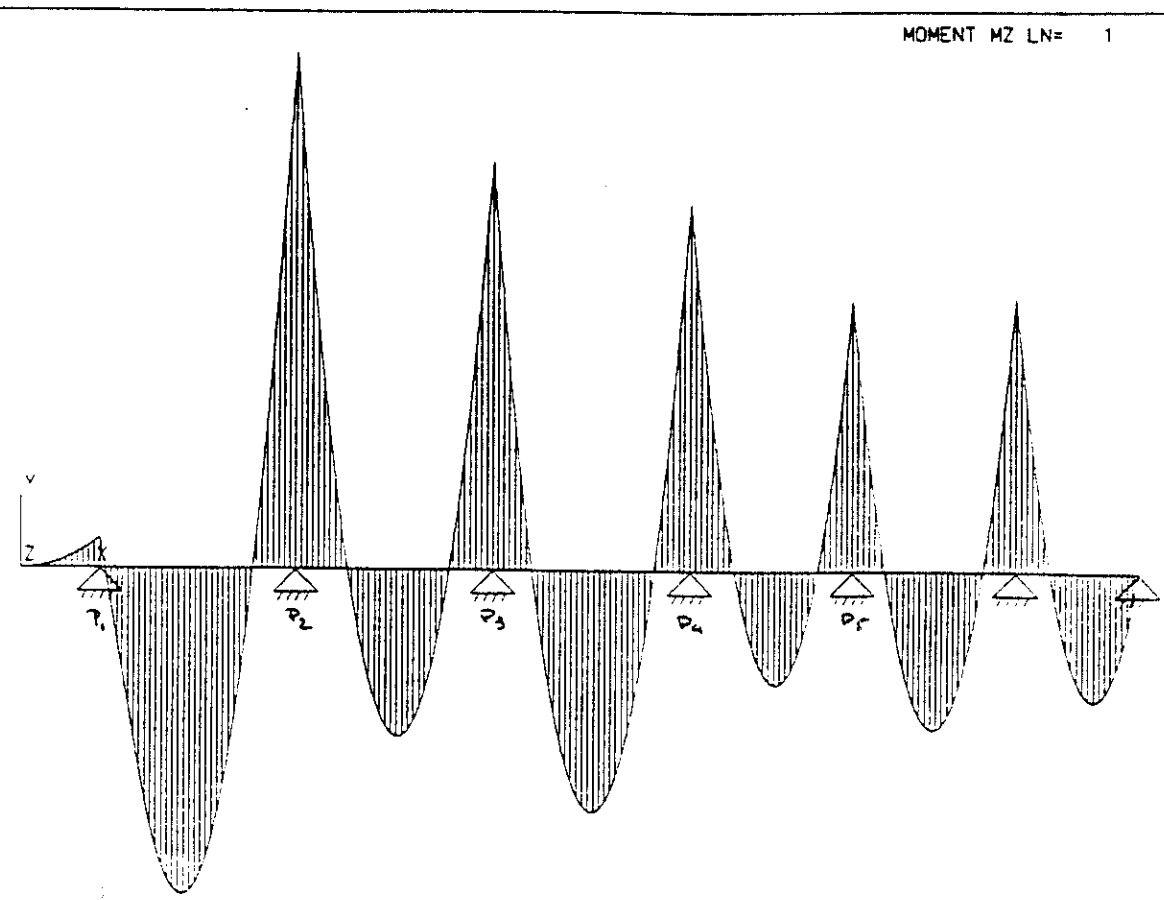
DATE MAR 10, 1997


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Z
X
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P2
P3
P4
P5
METE MTON
COMPANY INTECSA
S T A A D P D - P L O T (REV 17 0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO
DATE MAR 10, 1997


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Z
X
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P2
P3
P4
P5
METE MTON
COMPANY INTECSA
S T A A D P D - P L O T (REV 17 0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO
DATE MAR 10, 1997

STRUCTURE DATA:

TYPE = PLANE
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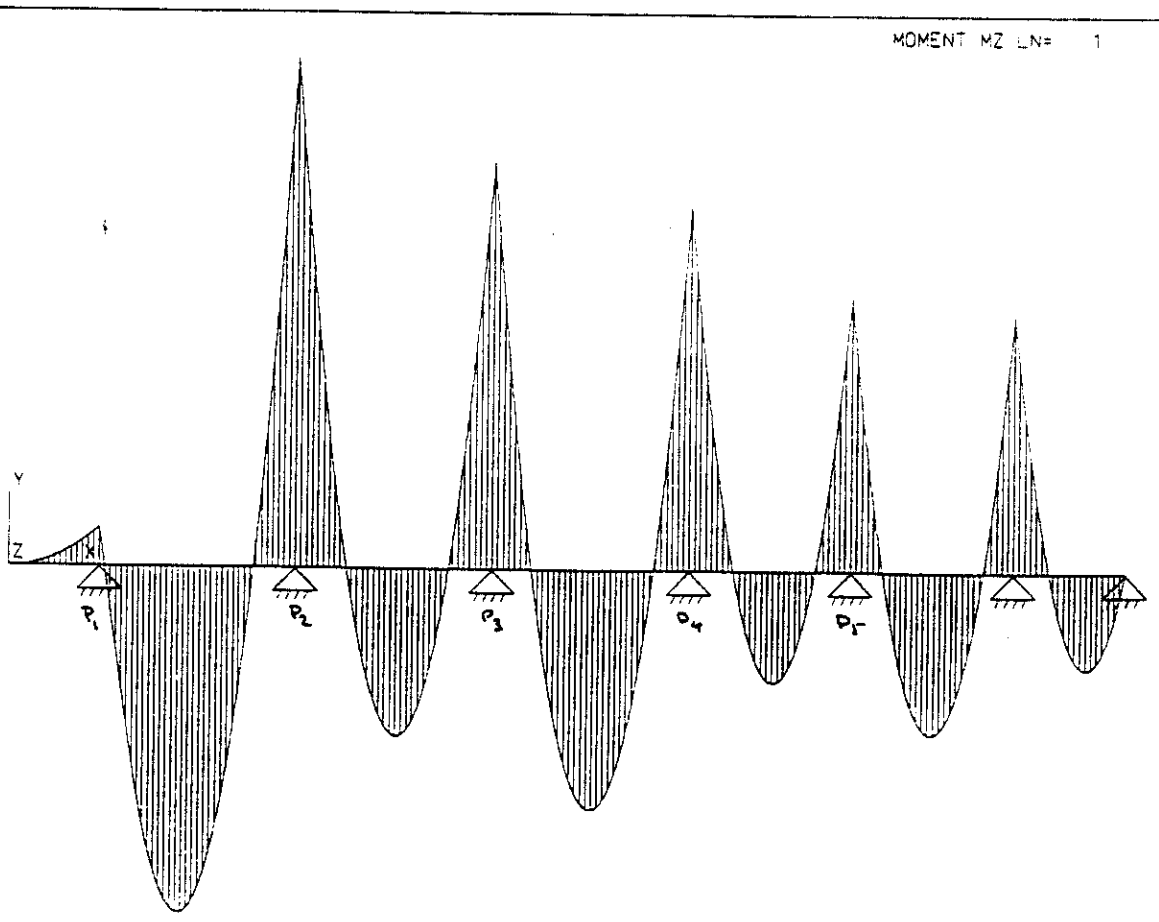
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S T A A D P D - P L O T (REV. 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 10, 1997

STRUCTURE DATA

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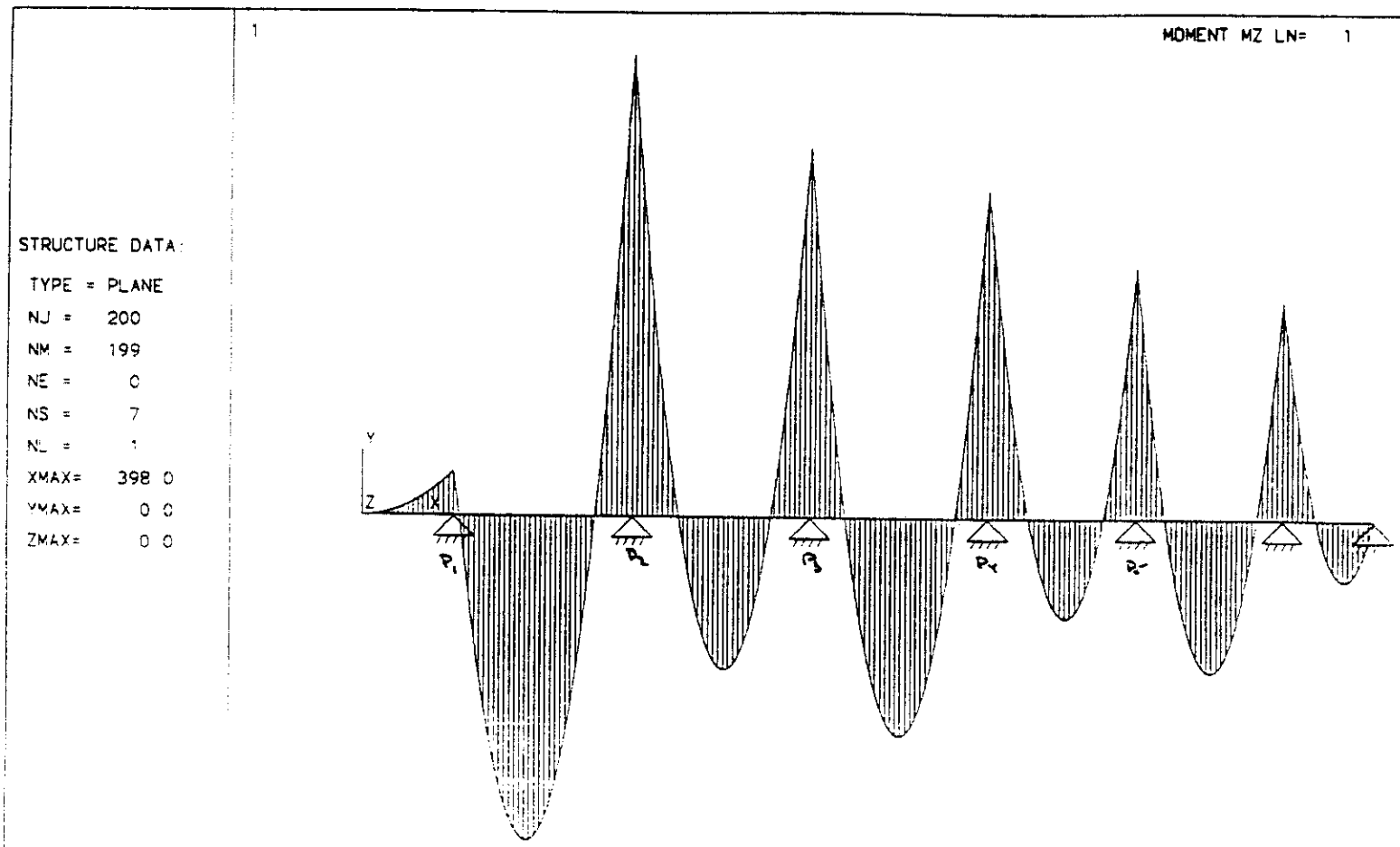
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S T A A D P D - P L O T (REV. 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 10, 1997

STRUCTURE DATA:

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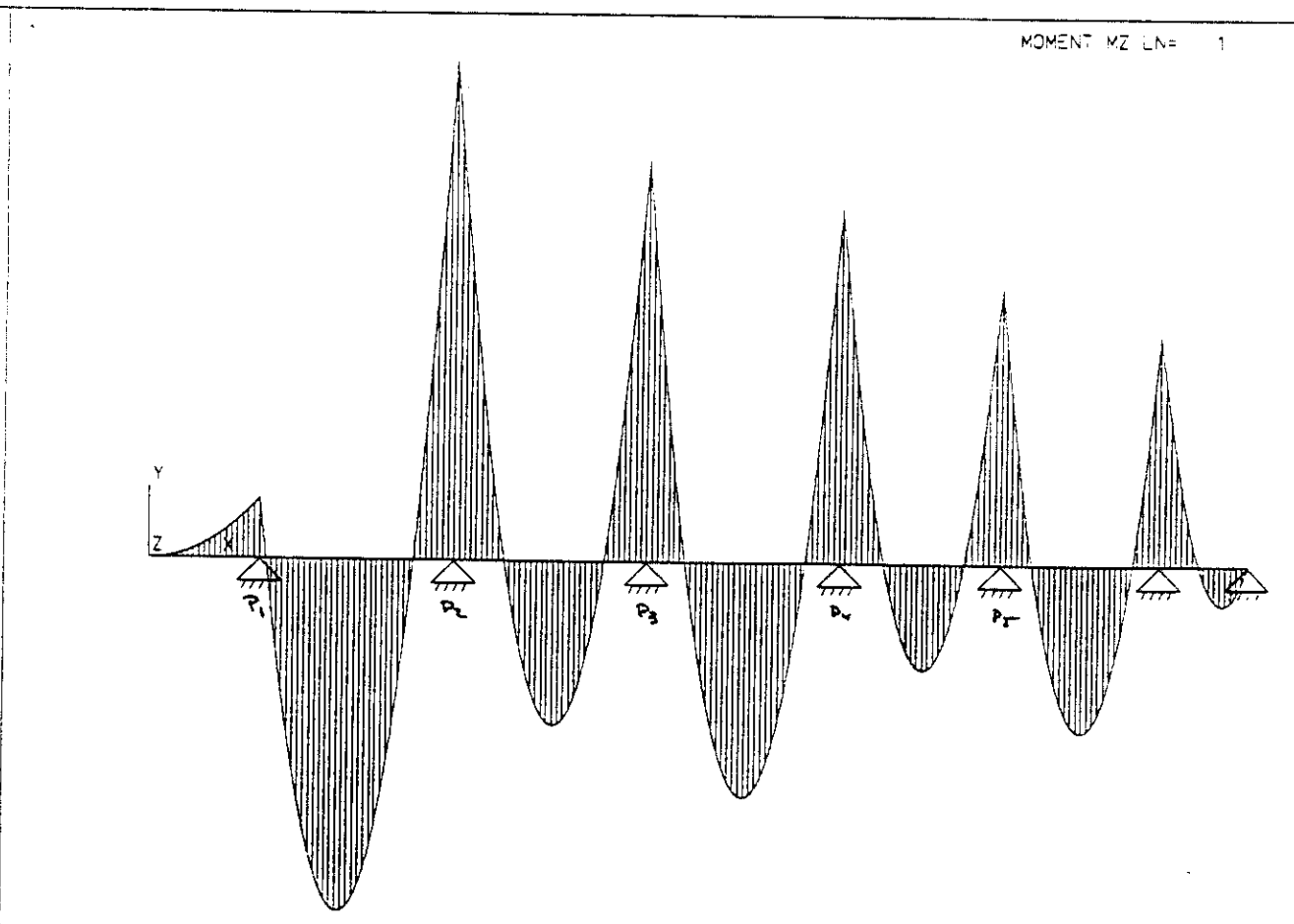
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STAADPD - PLOT (REV 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 10, 1997

STRUCTURE DATA

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NJ = 200
NM = 199
NE = 0
NS = 7
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XMAX= 398.0
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COMPANY INTECSA

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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

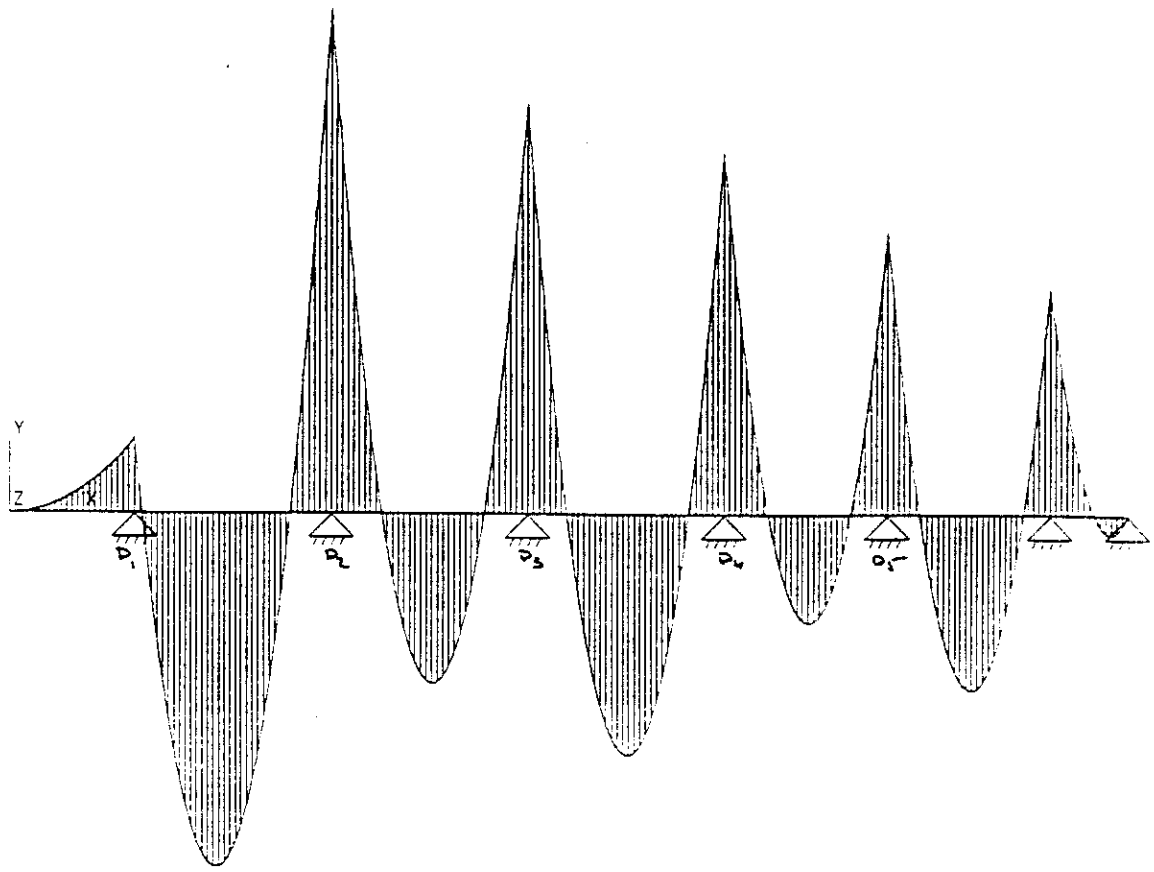
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COMPANY: INTECSA

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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

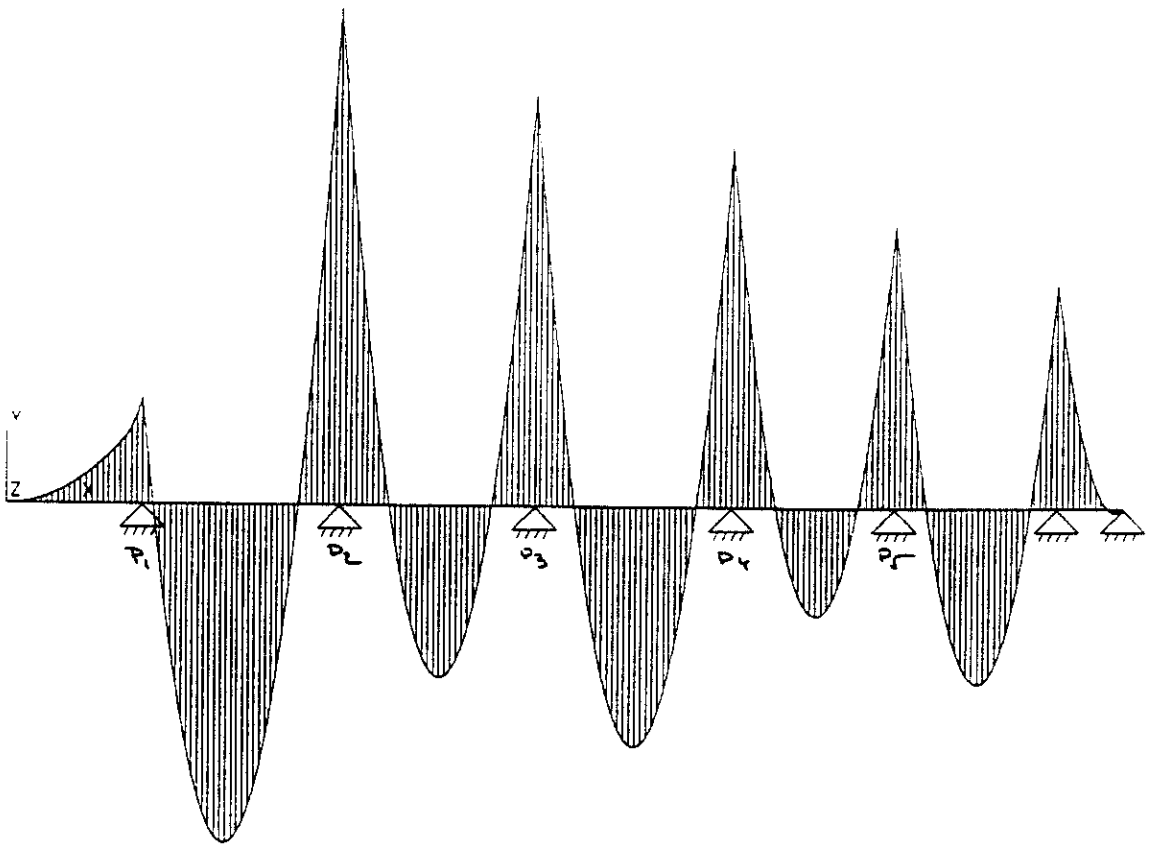
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COMPANY: INTECSA

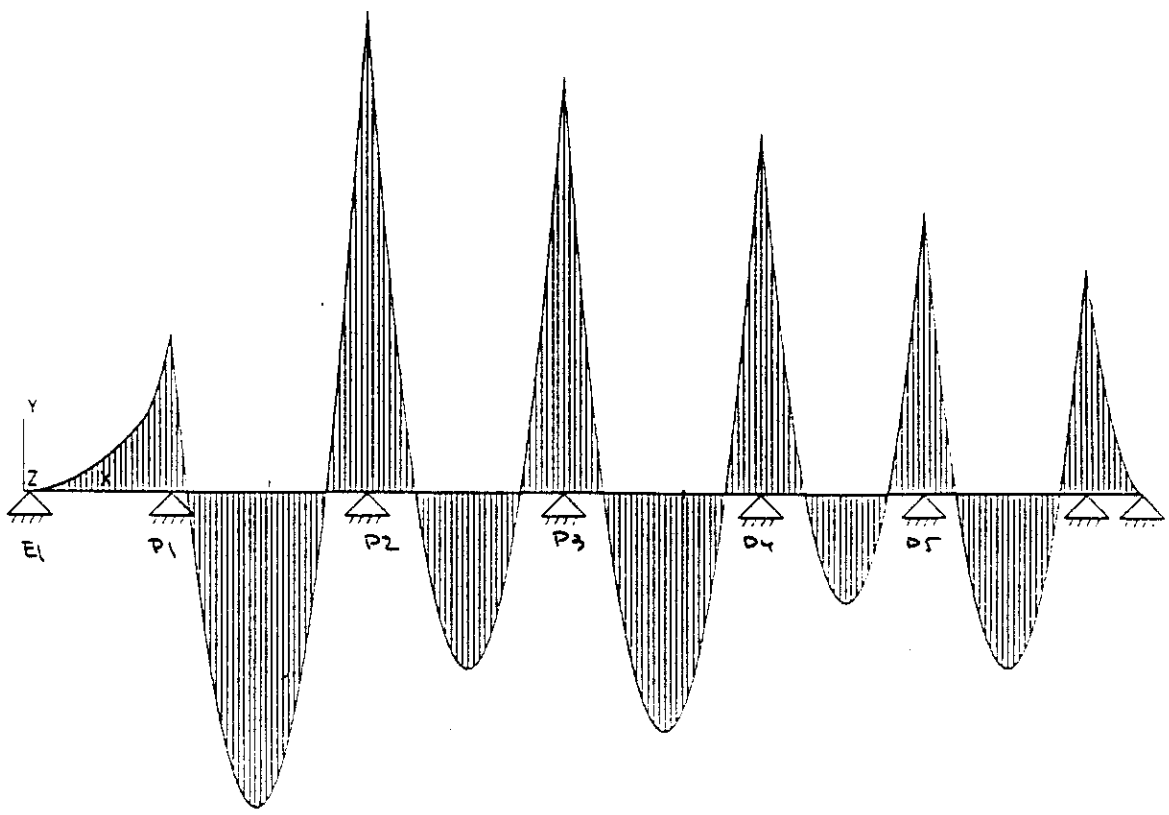
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 11, 1997

STRUCTURE DATA

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COMPANY INTECSA

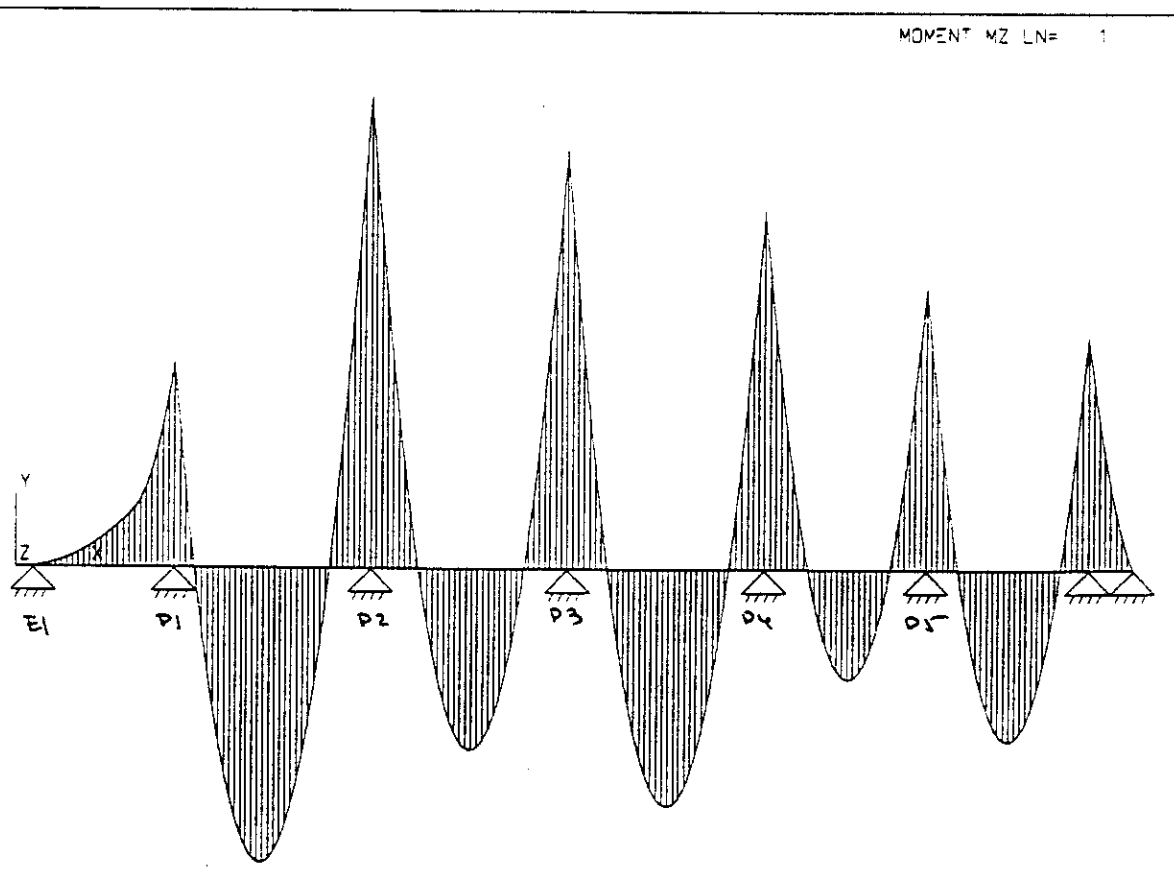
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

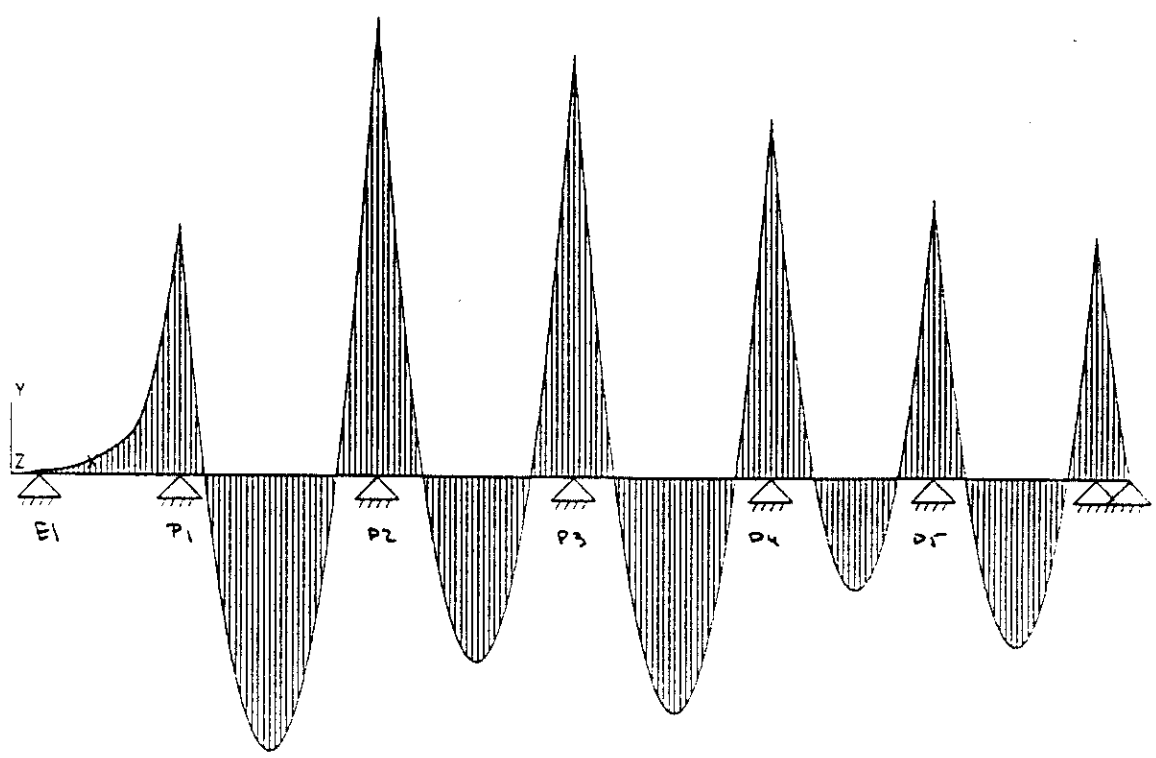
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

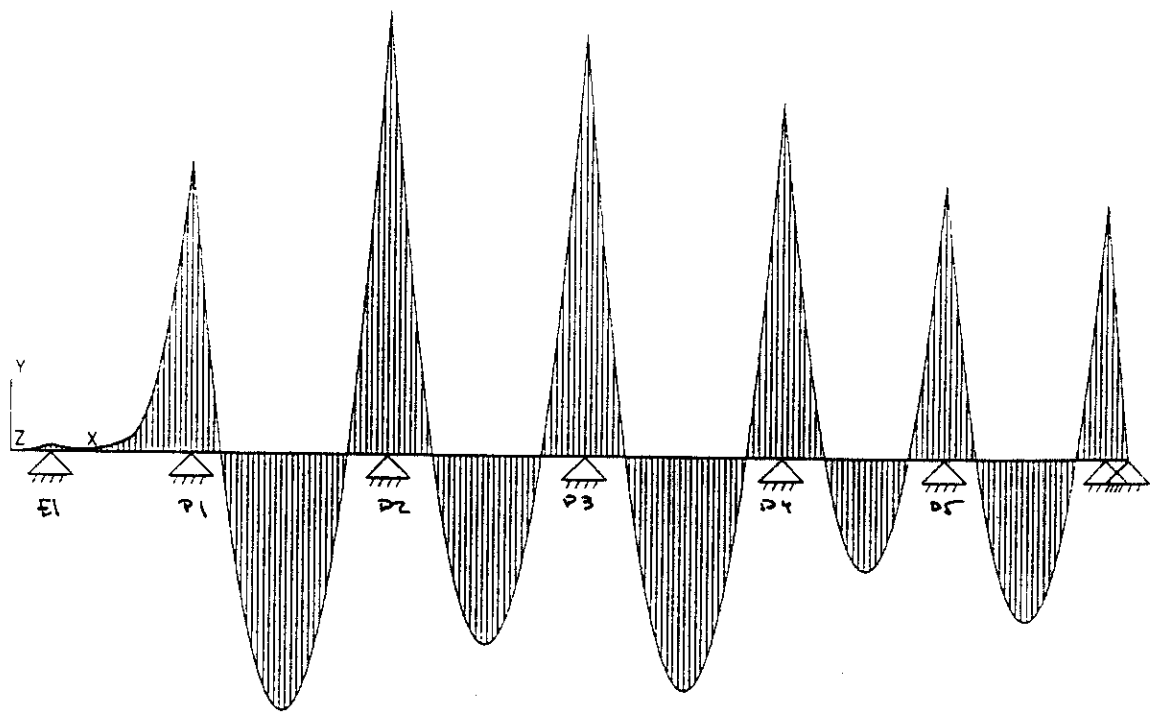
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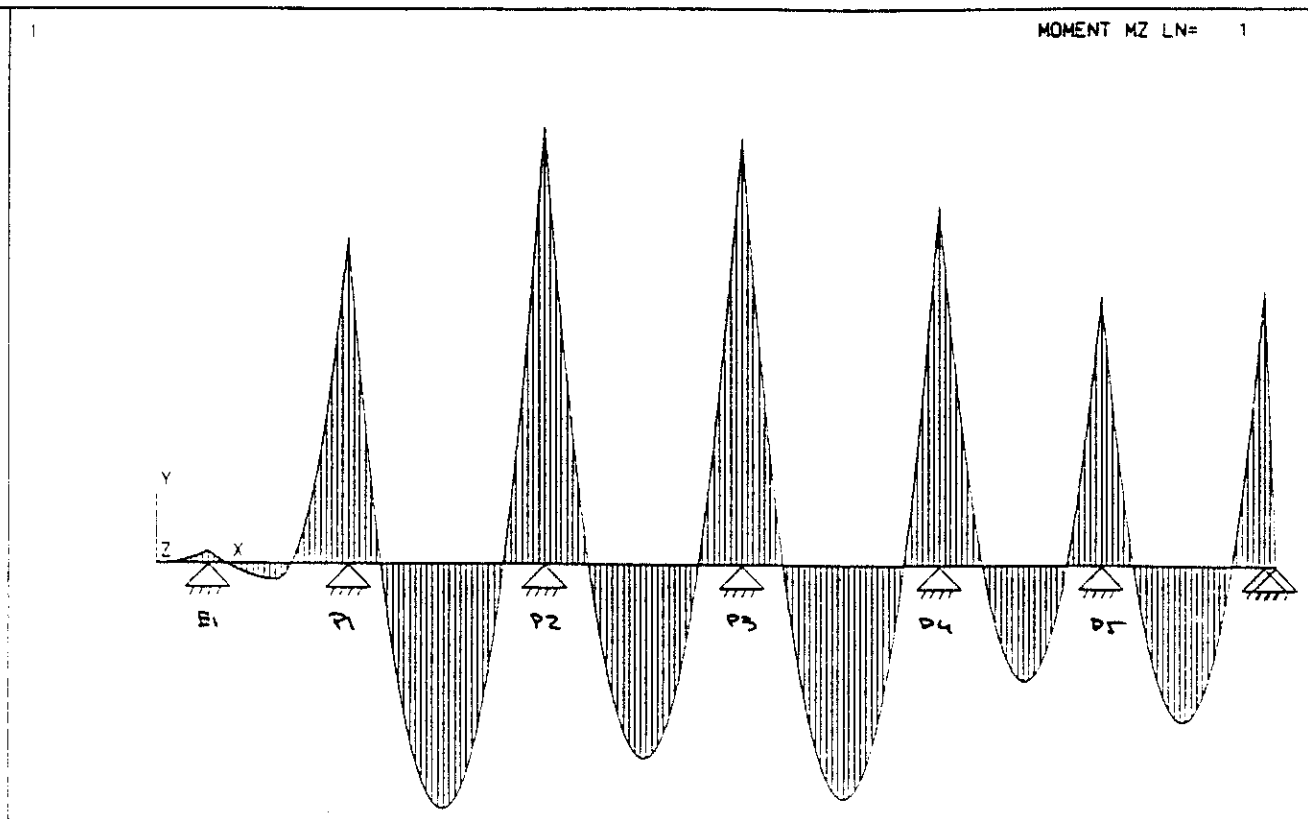
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TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 11, 1997

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COMPANY INTECSA

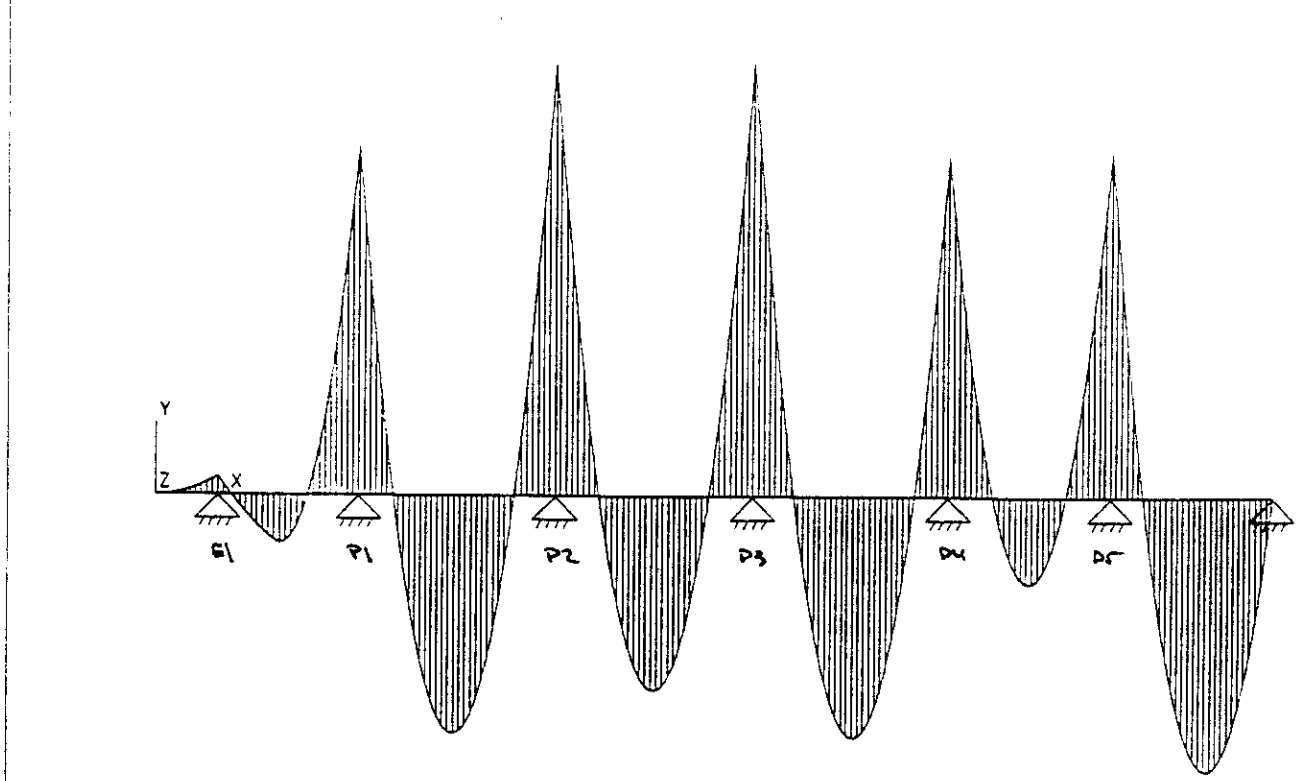
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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

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COMPANY INTECSA

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TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

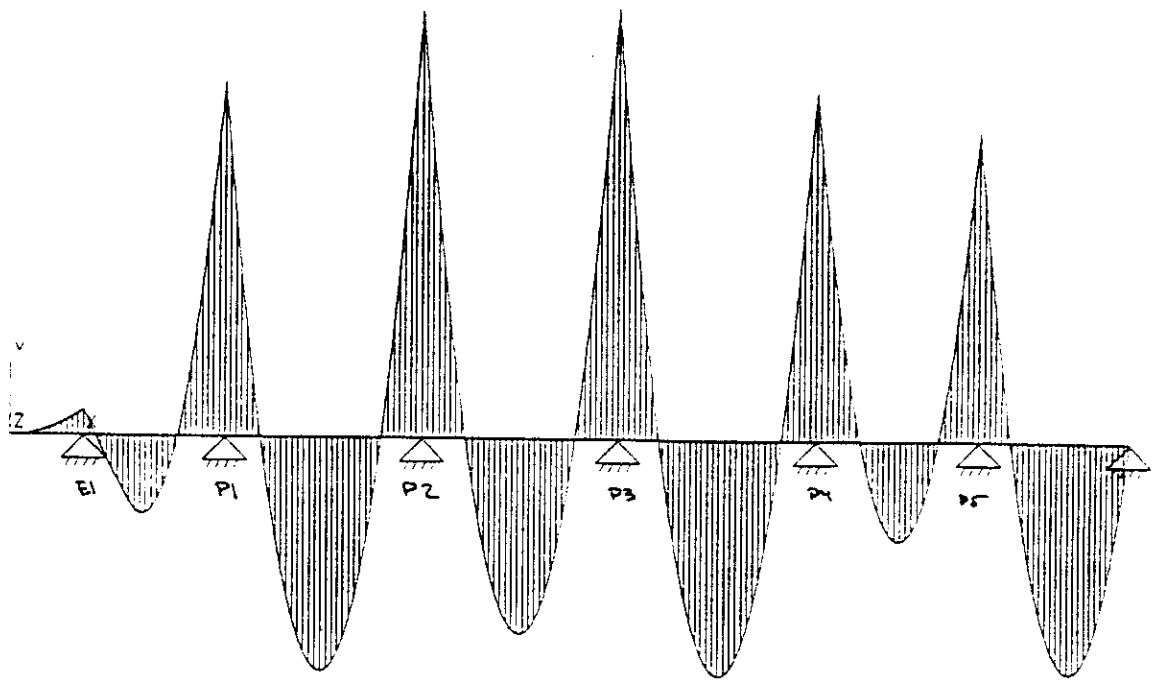
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COMPANY INTECSA

STAADPD - PLOT (REV 17.0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

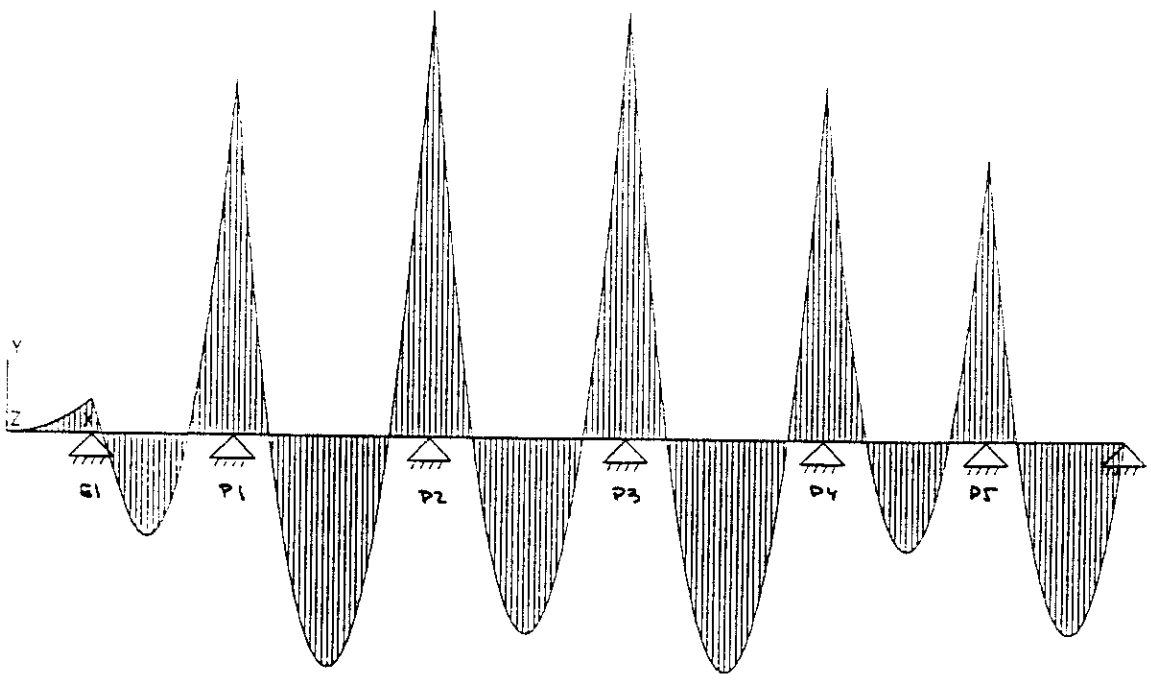
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COMPANY INTECSA

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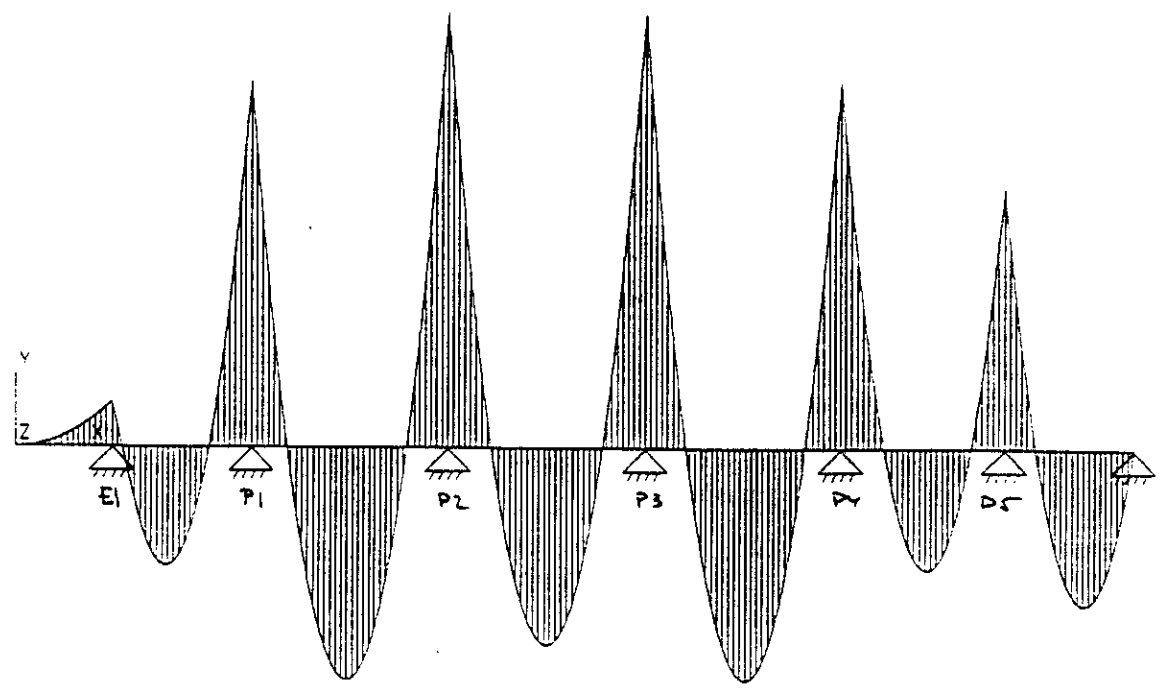
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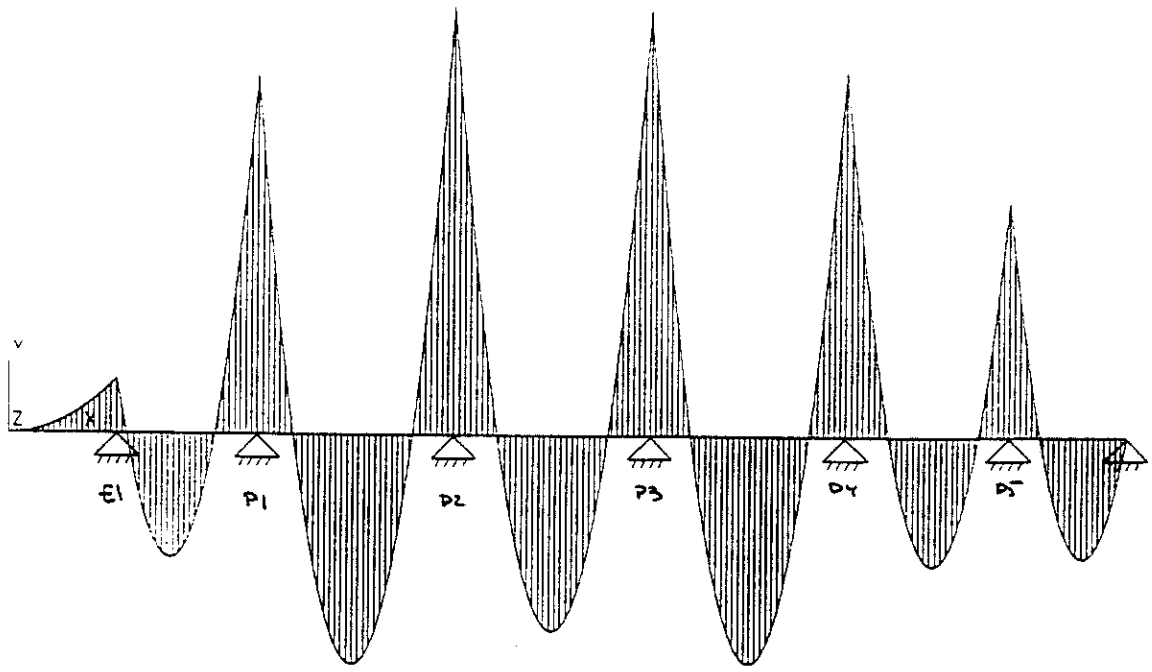
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METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV 17.0a)
TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

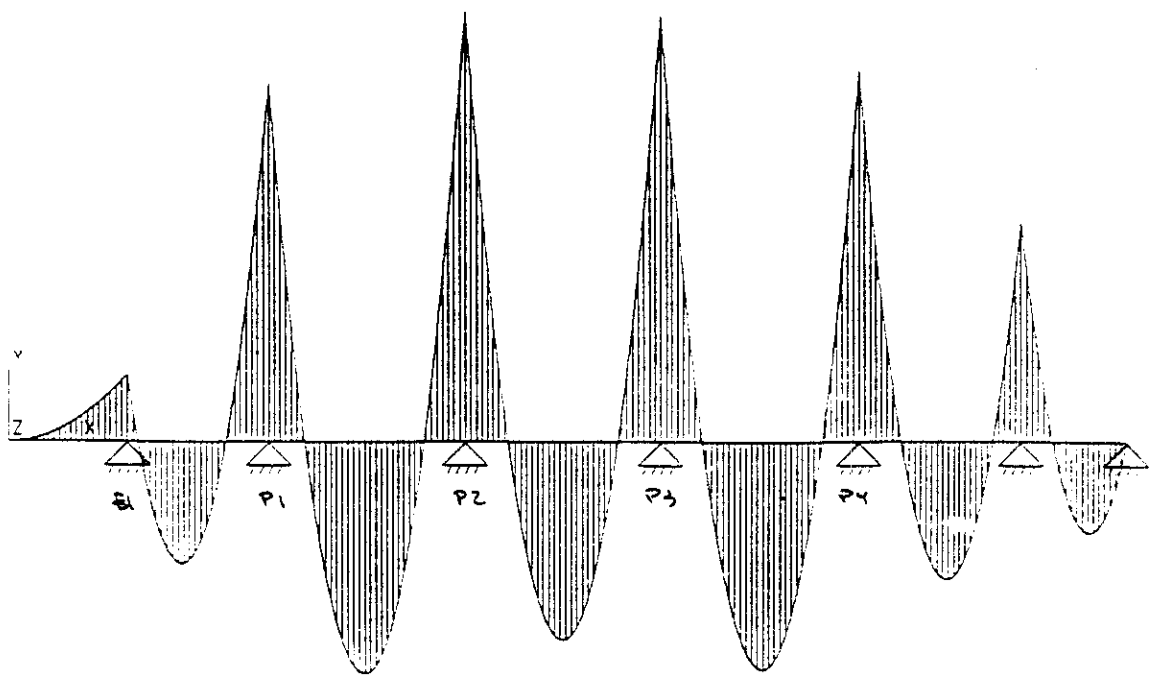
DATE MAR 11, 1997

STRUCTURE DATA:

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 7
NL = 1
XMAX= 398.0
YMAX= 0.0
ZMAX= 0.0

1

MOMENT MZ LN= 1



METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV 17 0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

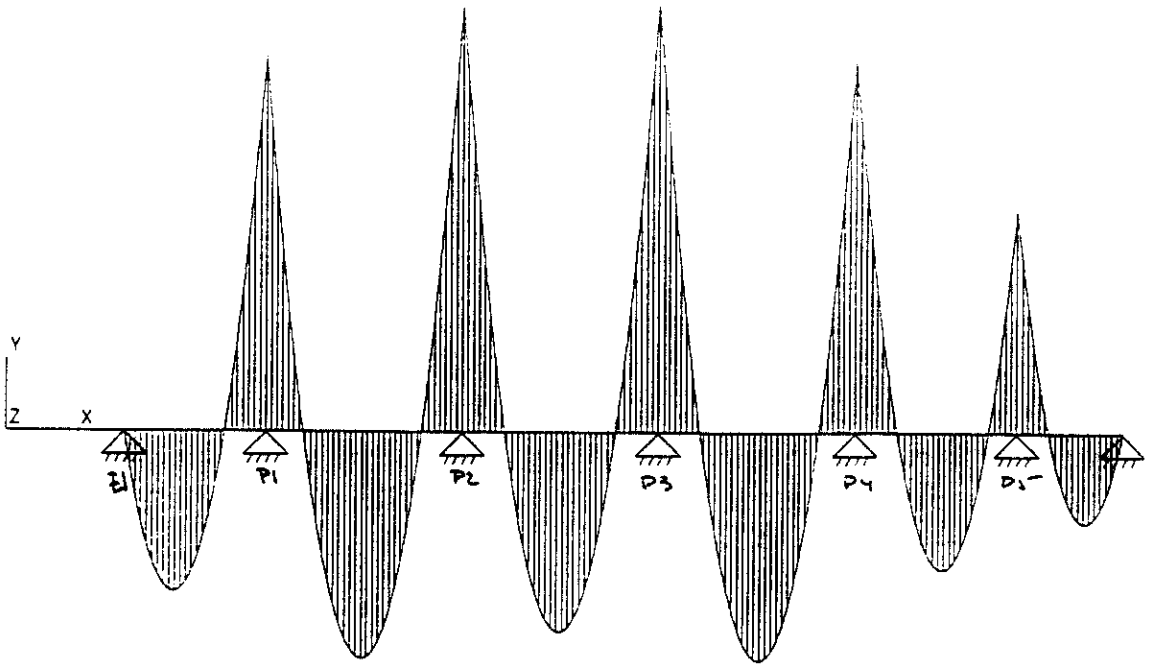
DATE MAR 11, 1997

STRUCTURE DATA

TYPE = PLANE
NJ = 200
NM = 199
NE = 0
NS = 7
NL = 1
XMAX= 398.0
YMAX= 0.0
ZMAX= 0.0

1

MOMENT MZ LN= 1



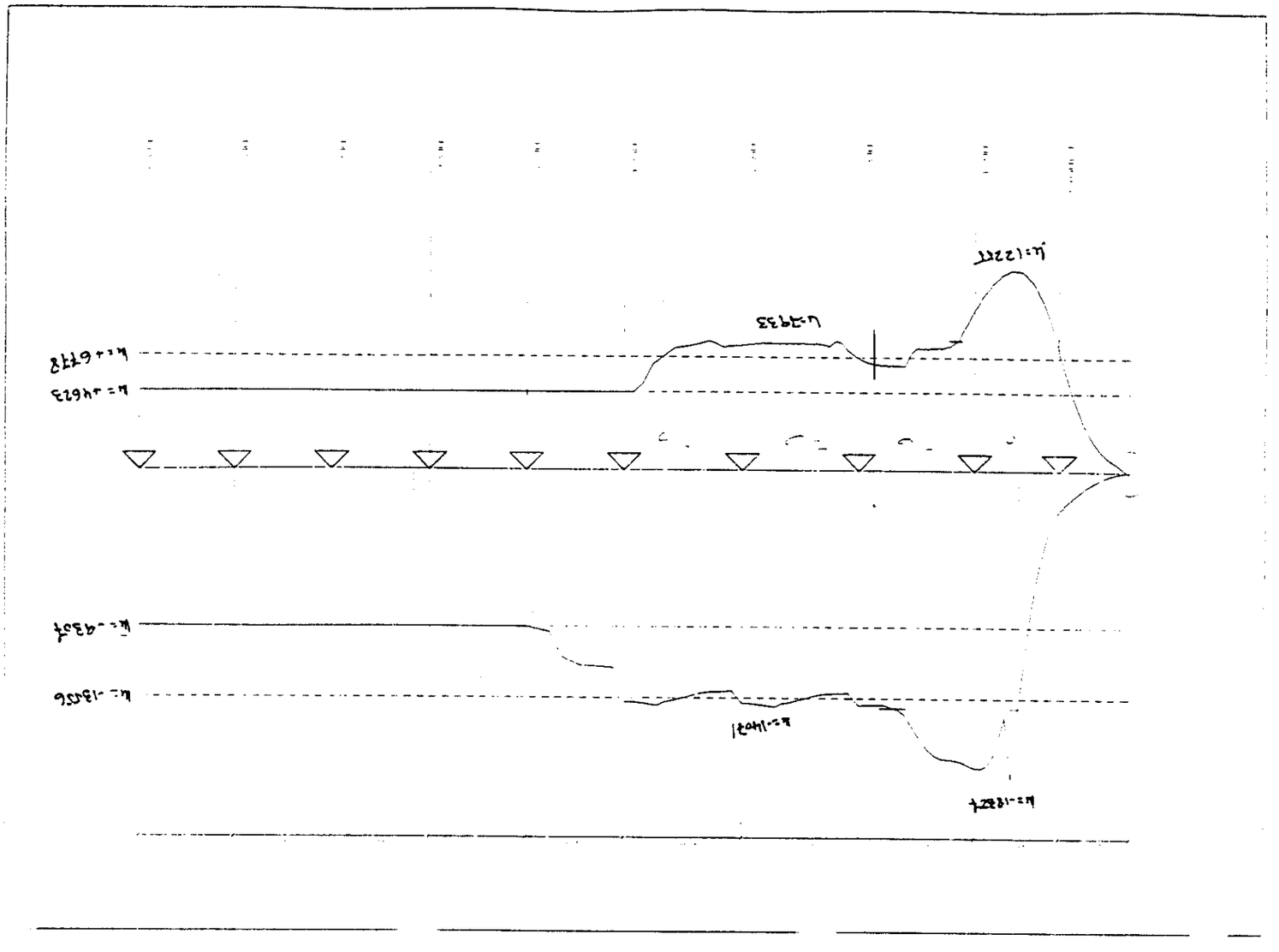
METE MTON

COMPANY INTECSA

S T A A D P D - P L O T (REV 17 0a)

TITLE PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE MAR 11, 1997


h=.1227
h=.3933
h=.6738
h=.4623
h=-.4354
h=-.1355
h=-.1827
h=-.1402

5.4.- ESTIMACIÓN DEL PRETENSADO MÍNIMO NECESARIO Y DEL DISPUESTO EN FASE DE MONTAJE

CALCULO DEL PRETENSADO DE MONTAJE

POSICIÓN DE CDG RESPECTO A FIBRA SUP

$$y_6 = \frac{1.619 - 6 + 0.433 + 2 \times 0.256}{9} = 3.199$$

$$e \times c = 3.199 - 2.943 = 0.256$$

a) ZONA DE MOMENTOS 5800 m

$\mu^- = -9357$ t/m

$\mu^+ = +4623$ t/m

Sup. 18×12 bd6 $\leq 18 \times 12 \times 20 \times 0.90 = 3888$.

$$\sigma_s = -\frac{3888}{13.081} - 3888 \times 0.256 \times 0.044 + 9357 \times 0.044 =$$

$$= -288 - 44 + 410 = 79 \text{ t/m}^2$$

$$\sigma_i = -\frac{3888}{13.081} + 3888 \times 0.256 \times 0.065 + 4623 \times 0.065 =$$

$$= -288 + 65 + 300 = 77 \text{ t/m}^2$$

b) ZONA DE 10 00 m

$\mu^- = 10.09$ t/m

$\mu^+ = 7937$ t/m

Sup. 18×19 bd6 $\leq 18 \times 19 \times 20 \times 0.9 = 6156$

$$\sigma_s = -\frac{6156}{13.481} - 6156 \times 0.254 \times 0.044 + 14071 \times 0.044 =$$

$$= -456 - 69 + 619 = 94 \text{ t/m}^2$$

$$\sigma_i = -\frac{6156}{13.481} + 6156 \times 0.065 \times 0.256 + 7933 \times 0.065 =$$

$$= -456 + 102 + 516 = 162 \text{ T/m}^2$$

c) ZONA DE JUNTA DIZO

$\mu^- = 18327$ t/m

$\mu^+ = 12755$ t/m

Sup. 18×24 bd6 $= 7776$ Ton

$$\sigma_s = -\frac{7776}{13.481} - 7776 \times 0.214 \times 0.044 + 18377 \times 0.044 =$$

$$= -576 - 84 + 806 = 143 \text{ T/m}^2$$

$$\sigma_i = -\frac{7776}{13.481} + 7776 \times 0.214 \times 0.065 + 12755 \times 0.065 =$$

$$= -576 + 128 + 796 = 348 \text{ T/m}^2 \text{ (mitad)}$$

$$\sigma_i = 348 - \frac{N}{13.081} - N(2.943 - 0,2) \times 0065 = 200$$

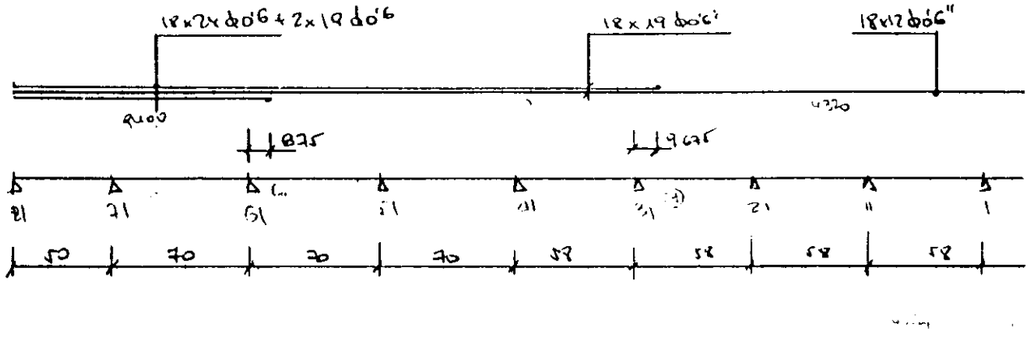
$$N = \frac{348-200}{0074 + 0.178} = \frac{148}{0251} = 587 \text{ ton}$$

& compresión con $2 \times 19\phi 06''$ en CABEZA SUPERIOR

$$\sigma_s = +143 - \frac{684}{13.481} + 684(2.943-0.2)\times 0044 = 175 \text{ t/m}^2$$

$$\sigma_i = +348 - \frac{684}{13.481} - 684(2.943-0.2)\times 0065 = 176 \text{ t/m}^2$$

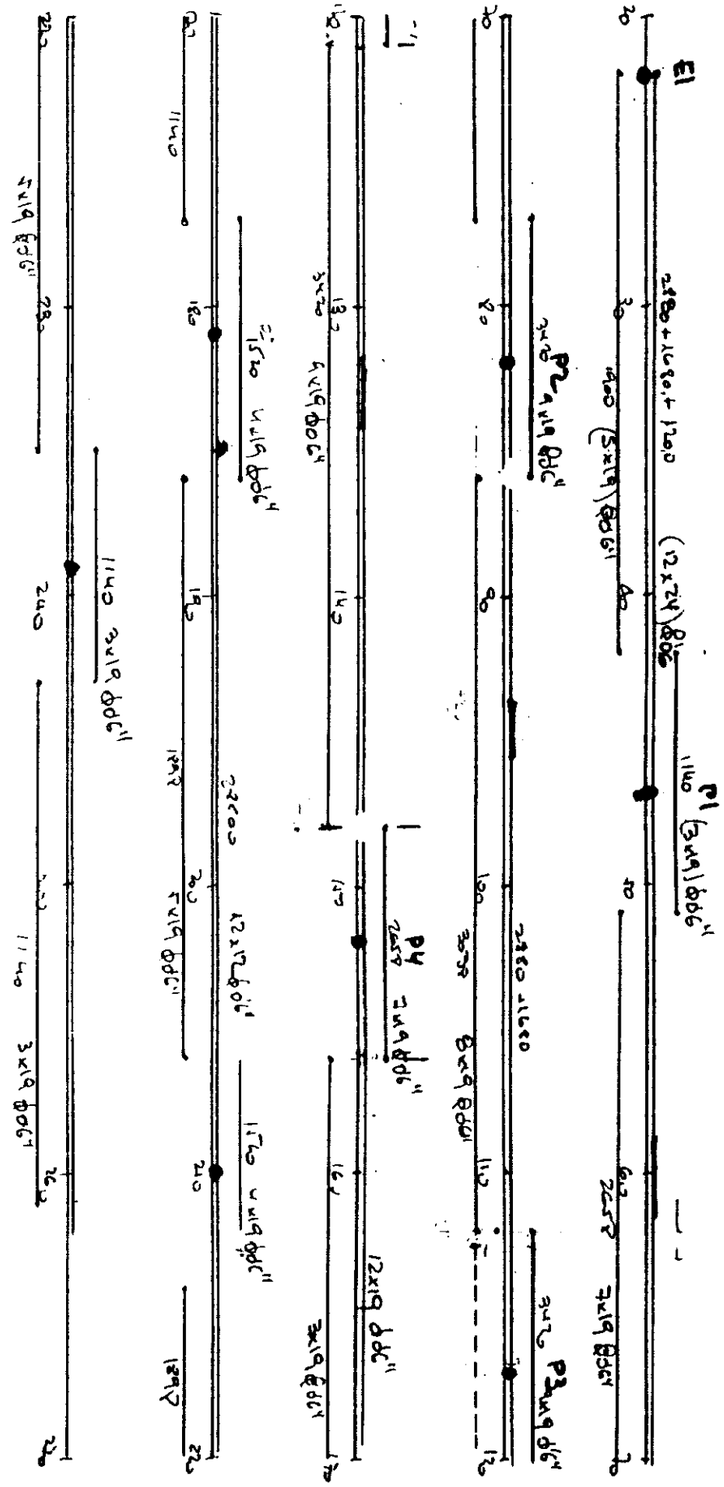
DISEÑO PRETENSADO MINIMO

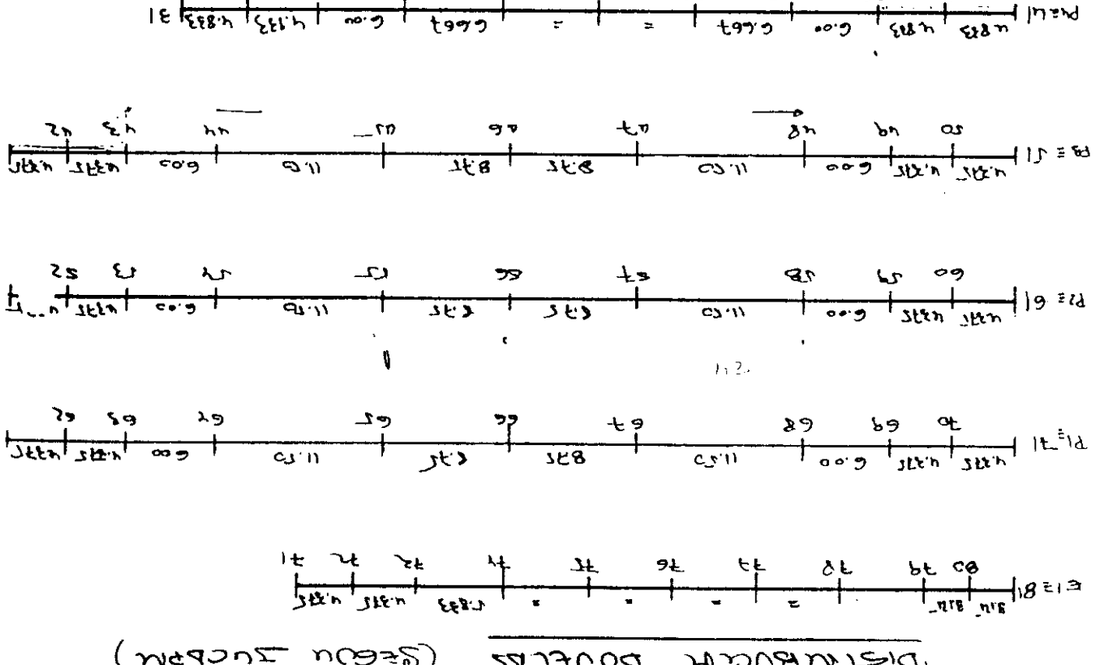


DIMENSIONADO REAL QUE SE APLICA EN LA FASE DE LANZAMIENTO

A LA VISTA DE LOS VALORES ANTERIORMENTE CALCULADOS Y DE LOS NECESARIOS PARA EL PRETENSADO EN FASE DE SERVICIO, SE ESTUDIAN LOS EFECTOS DE LAS DIVERSAS POSICIONES DE LANZAMIENTO CON UN PRETENSADO REAL CONSTITUIDO POR EL MÍNIMO MÁS UNA FRACCIÓN DEL TOTAL, AJUSTANDO ESTA FRACCIÓN DEL TOTAL AL Nº EXACTO DE CORDONES DISPUESTOS EN LA SECCIÓN

- LA DISPOSICIÓN DE CABLES EN ESTA FASE PUEDE VERSE EN EL ESQUEMA SIGUIENTE
- DE ACUERDO CON ELLO, EN EL CAPÍTULO SIGUIENTE SE ESTUDIAN LAS TENSIONES NORMALES EN FASE DE LANZAMIENTO


Distribution Network
Pump House
Reservoir
Tank
Valve
Pipeline


Distribution Network Details

5.5.- CONTROL DE TENSIONES EN LA FASE DE LANZAMIENTO

```
NE PUENTE SOBRE EL CINCA - LANZAMIENTO
R MTON
RDINATES
.000   0.000  0.000  263   524.000  0.000  0.000
ICIDENCES
    2
>1  1   1
:OPERTY
 18                          PR   AX  0.318   IZ  0.8709
 21                          PR   AX  0.432   IZ  1.1844
 42  51 TO 77   86 TO 112    PR   AX 13.481   IZ 45.3025
 50  78 TO 85   113 TO 120   PR   AX 15.001   IZ 47.4753
 47 156 TO 262               PR   AX 13.481   IZ 45.3025
 55                          PR   AX 15.001   IZ 47.4753

000.  MEMBER  1 TO  21
000.  MEMBER 22 TO 262
      MEMBER  1 TO  21
      MEMBER 22 TO 262
      0.2  ALL

  1
 117 146 175 204 233 262   FIXED BUT FX MZ
  2
 88 117 146 175 204 233 262 FIXED BUT FX MZ
  3
 92 121 150 179 208 237 261 FIXED BUT FX MZ
  4
 96 125 154 183 212 241     FIXED BUT FX MZ
  5
 100 129 158 187 216 245    FIXED BUT FX MZ
  6
 104 133 162 191 220 249    FIXED BUT FX MZ
  7
  108 137 166 195 224 253   FIXED BUT FX MZ
  8
  112 141 170 199 228 257   FIXED BUT FX MZ
  9
  116 145 174 203 232 261   FIXED BUT FX MZ
  10
  120 149 178 207 236 260   FIXED BUT FX MZ
  11
  123 152 181 210 239       FIXED BUT FX MZ
  12
 95 124 153 182 211 240     FIXED BUT FX MZ
  13
 99 128 157 186 215 244     FIXED BUT FX MZ
  14
  103 132 161 190 219 248   FIXED BUT FX MZ
  15
  107 136 165 194 223 252   FIXED BUT FX MZ
  16
  111 140 169 198 227 256   FIXED BUT FX MZ
  17
 115 144 173 202 231 260    FIXED BUT FX MZ
  18
  119 148 177 206 235 259   FIXED BUT FX MZ
 19
  123 152 181 210 239       FIXED BUT FX MZ
: 20
 127 156 185 214 243        FIXED BUT FX MZ
 21.
)0 129 158 187 216 245      FIXED BUT FX MZ
```

```
 195    CMOM GZ   950   1.000
 202    CON  GX  -560   0.334
 202    CMOM GZ   950   0.334
        CON  GX  1200   0.000
        CMOM GZ -2036   0.000
 86     CON  GX  -400   0.750
 86     CMOM GZ   679   0.750
 95     CON  GX  -400   0.250
 95     CMOM GZ   679   0.250
 103    CON  GX  -400   1.750
 103    CMOM GZ   678   1.750
*CABLE CONTINUO INFERIOR  EXC -2.786
 22     CON  GX  1440   0.000
 22     CMOM GZ  4012   0.000
 262    CON  GX -1440   2.000
 262    CMOM GZ -4012   2.000
 22     CON  GX   840   0.000
 22     CMOM GZ  2340   0.000
 185    CON  GX  -280   1.666
 185    CMOM GZ  -780   1.666
 195    CON  GX  -280   1.000
 195    CMOM GZ  -780   1.000
        CON  GX  -280   0.334
        CMOM GZ  -780   0.334
 22     CON  GX   600   0.000
 22     CMOM GZ  1671   0.000
 147    CON  GX  -200   1.250
 147    CMOM GZ  -557   1.250
 156    CON  GX  -200   1.666
 156    CMOM GZ  -557   1.666
 166    CON  GX  -200   1.000
 166    CMOM GZ  -557   1.000
*CABLE CONTINUO CENTRAL  EXC -0.500
 22     CON  GX  1920   0.000
 22     CMOM GZ   960   0.000
 214    CON  GX   960   1.666
 214    CMOM GZ   480   1.666
 262    CON  GX -2880   2.000
 262    CMOM GZ -1440   2.000
LOADING 3 CABLES SOMBRERO  E 1.697
MEMBER LOAD
        CON  GX  1140   1.250
        CMOM GZ -1933   1.250
 51     CON  GX -1140   0.750
 51     CMOM GZ  1933   0.750
 77     CON  GX  3420   1.250
 77     CMOM GZ -5804   1.250
 86     CON  GX -3420   0.750
 86     CMOM GZ  5804   0.750
 112    CON  GX  3420   1.250
 112    CMOM GZ -5804   1.250
 121    CON  GX -3420   0.750
 121    CMOM GZ  5804   0.750
 147    CON  GX  2658   1.250
 147    CMOM GZ -4510   1.250
 156    CON  GX -2658   1.666
 156    CMOM GZ  4510   1.666
 176    CON  GX  1520   0.333
 176    CMOM GZ -2579   0.333
 185    CON  GX -1520   1.666
        CMOM GZ  2579   1.666
 205    CON  GX  1520   0.333
 205    CMOM GZ -2579   0.333
 214    CON  GX -1520   1.666
```

```
214     CMOM GZ  2579    1.666
234     CON  GX  1140    0.333
234     CMOM GZ -1934    0.333
        CON  GX -1140    1.666
        CMOM GZ  1934    1.666
LOADING 4 CABLES DE VANO E -2.786
MEMBER LOAD
22      CON  GX  1900    0.000
22      CMOM GZ  5293    0.000
42      CON  GX -1900    1.250
42      CMOM GZ -5293    1.250
51      CON  GX  1900    0.750
51      CMOM GZ  5293    0.750
77      CON  GX -1900    1.250
77      CMOM GZ -5293    1.250
86      CON  GX  2280    0.750
86      CMOM GZ  6352    0.750
112     CON  GX -2280    1.250
112     CMOM GZ -6352    1.250
121     CON  GX  2660    0.750
121     CMOM GZ  7410    0.750
147     CON  GX -2660    1.250
        CMOM GZ -7410    1.250
        CON  GX  1140    1.666
156     CMOM GZ  3176    1.666
176     CON  GX -1140    0.333
176     CMOM GZ -3176    0.333
185     CON  GX  1900    1.666
185     CMOM GZ  5293    1.666
205     CON  GX -1900    0.333
205     CMOM GZ -5293    0.333
214     CON  GX  1900    1.666
214     CMOM GZ  5293    1.666
234     CON  GX -1900    0.333
234     CMOM GZ -5293    0.333
243     CON  GX  1140    1.666
243     CMOM GZ  3176    1.666
262     CON  GX -1140    2.000
262     CMOM GZ -3176    2.000
LOADING COMBINATION 5
2  1.0   3  1.0   4  1.0
LOADING COMBINATION 6
1  1.0   2  0.96  3  0.96   4  0.96
PERFORM ANALISIS
LOAD LIST  6
PRINT MEMBER FORCES ALL
PRINT JOI DIS ALL
PRINT REACC ALL
*LOAD LIST  1  4  6
*PLOT BEND FILE
FINISH
```

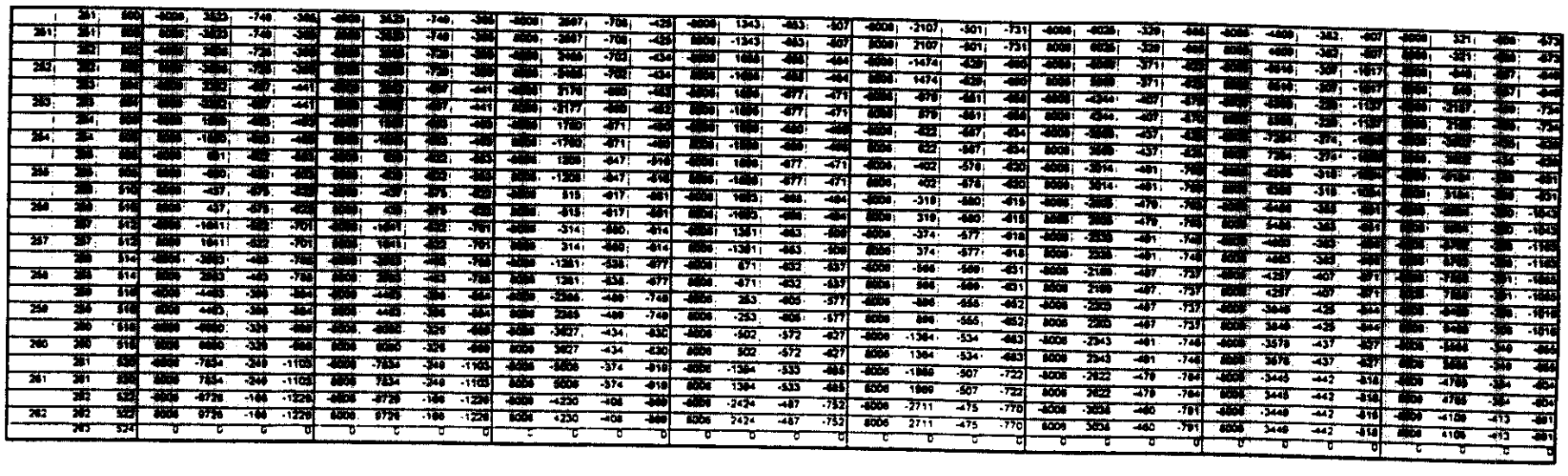

B	N	D	1 N	1 M	1 FS	1 FI	2 N	2 M	2 FS	2 FI	3 N	3 M	3 FS	3 FI	4 N	4 M	4 FS	4 FI	5 N	5 M	5 FS	5 FI	6 N	6 M	6 FS	6 FI	7 N	7 M	7 FS	7 FI	8 N	8 M	8 FS	8 FI
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	2	0	0	0	0	0	165	-5	7	0	-4	0	0	0	-6	0	0	0	-5	0	0	0	-5	0	0	0	-5	0	0	0	-5	0	0
2	2	2	0	0	0	0	0	103	-5	7	0	-4	0	0	0	-6	0	0	0	-5	0	0	0	-5	0	0	0	-5	0	0	0	-5	0	0
	3	4	0	-20	1	-1	0	197	-6	13	0	-20	1	-1	0	-20	1	-1	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0
3	4	4	0	20	1	-1	0	197	-6	13	0	20	1	-1	0	20	1	-1	0	-20	1	-1	0	-20	1	-1	0	-20	1	-1	0	-20	1	-1
	4	6	0	-45	2	-3	0	280	-12	18	0	-45	2	-3	0	-45	2	-3	0	20	1	-1	0	20	1	-1	0	20	1	-1	0	20	1	-1
	5	8	0	45	2	-3	0	384	-16	25	0	45	2	-3	0	45	2	-3	0	-45	2	-3	0	-45	2	-3	0	-45	2	-3	0	-45	2	-3
	5	8	0	-60	4	-5	0	384	-16	25	0	-60	4	-5	0	-60	4	-5	0	45	2	-3	0	45	2	-3	0	45	2	-3	0	45	2	-3
	6	10	0	80	4	-5	0	417	-18	27	0	80	4	-5	0	80	4	-5	0	-60	4	-5	0	-60	4	-5	0	-60	4	-5	0	-60	4	-5
	6	10	0	-125	5	-8	0	417	-18	27	0	115	-5	7	0	125	5	-8	0	80	4	-5	0	80	4	-5	0	80	4	-5	0	80	4	-5
	7	12	0	180	8	-12	0	471	-21	31	0	300	-13	20	0	180	8	-12	0	-125	5	-8	0	125	5	-8	0	125	5	-8	0	125	5	-8
	7	12	0	180	8	-12	0	471	-21	31	0	300	-13	20	0	180	8	-12	0	180	8	-12	0	180	8	-12	0	180	8	-12	0	180	8	-12
	8	14	0	245	11	-16	0	514	-23	33	0	475	-21	31	0	245	11	-16	0	180	8	-12	0	180	8	-12	0	180	8	-12	0	180	8	-12
	8	14	0	245	11	-16	0	514	-23	33	0	475	-21	31	0	245	11	-16	0	245	11	-16	0	245	11	-16	0	245	11	-16	0	245	11	-16
	9	16	0	320	14	-21	0	548	-24	36	0	640	-28	42	0	320	14	-21	0	245	11	-16	0	245	11	-16	0	245	11	-16	0	245	11	-16
	9	16	0	320	14	-21	0	548	-24	36	0	640	-28	42	0	320	14	-21	0	320	14	-21	0	320	14	-21	0	320	14	-21	0	320	14	-21
	10	18	0	404	18	-26	0	691	-25	37	0	799	-35	52	0	81	-4	5	0	320	14	-21	0	320	14	-21	0	320	14	-21	0	320	14	-21
	10	18	0	404	18	-26	0	691	-25	37	0	799	-35	52	0	472	-21	31	0	404	18	-26	0	404	18	-26	0	404	18	-26	0	404	18	-26
	11	20	0	499	22	-32	0	848	-28	38	0	941	-41	61	0	472	-21	31	0	404	18	-26	0	404	18	-26	0	404	18	-26	0	404	18	-26
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	12	22	0	604	27	-39	0	842	-28	38	0	1316	-58	86	0	1224	-54	80	0	719	32	-47	0	719	32	-47	0	719	32	-47	0	719	32	-47
	13	24	0	719	32	-47	0	888	-25	37	0	1316	-58	86	0	1584	-70	103	0	844	37	-55	0	844	37	-55	0	844	37	-55	0	844	37	-55
	14	26	0	844	37	-55	0	888	-25	37	0	1431	-63	93	0	1835	-81	120	0	879	43	-64	0	879	43	-64	0	879	43	-64	0	879	43	-64
	14	26	0	879	43	-64	0	888	-25	37	0	1431	-63	93	0	2276	-100	148	0	1125	49	-73	0	1125	49	-73	0	1125	49	-73	0	1125	49	-73
	15	28	0	1125	49	-73	0	888	-25	37	0	1517	-67	99	0	2276	-100	148	0	1278	56	-83	0	1278	56	-83	0	1278	56	-83	0	1278	56	-83
	15	28	0	1278	56	-83	0	888	-25	37	0	1602	-70	104	0	2607	-115	169	0	1443	63	-94	0	1443	63	-94	0	1443	63	-94	0	1443	63	-94
	16	30	0	1443	63	-94	0	888	-25	37	0	1677	-74	109	0	2877	-129	187	0	1616	71	-105	0	1616	71	-105	0	1616	71	-105	0	1616	71	-105
	16	30	0	1616	71	-105	0	888	-25	37	0	1742	-77	113	0	3236	-142	210	0	1788	79	-117	0	1788	79	-117	0	1788	79	-117	0	1788	79	-117
	18	34	0	1788	79	-117	0	888	-25	37	0	1742	-77	113	0	3337	-146	216	0	1960	86	-128	0	1960	86	-128	0	1960	86	-128	0	1960	86	-128
	18	34	0	1960	86	-128	0	888	-25	37	0	1742	-77	113	0	3337	-146	216	0	2132	94	-139	0	2132	94	-139	0	2132	94	-139	0	2132	94	-139
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	19	36	0	2304	101	-150	0	888	-25	37	0	1742	-77	113	0	3337	-146	216	0	2476	108	-161	0	2476	108	-161	0	2476	108	-161	0	2476	108	-161
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	194	368	-9427	-3704	-536	-640	-9427	178	-767	-668	-9427	1882	-782	-577	-9427	1895	-787	-570	-9427	1894	-787	-570	0	-787	0	-1454
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214	214	406	7480	9881	-882	86	7480	-8581	-882	82	7480	-6876	-835	-136	7480	-2831	-668	-346	7480	-2828	-668	-346	82	-688	166	-850
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216	216	410	8758	1816	-718	-648	8758	-1853	-733	-622	8758	-184	-688	-838	8758	-2775	-638	-486	8758	-2778	-638	-486	0	-741	0	-1482
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236	236	470	8006	-6310	-872	-184	8006	-1296	-651	-510	8006	4663	-360	-810	8006	-27	-595	-562	8006	-27	-595	-562	0	-1116	181	-914
	237	472	-8006	7200	-911	-126	-8006	2710	-713	-418	-8006	-3082	-458	-784	-8006	1624	-523	-699	-8006	1624	-522	-699	0	-1108	186	-962
237	237	472	8006	-7200	-911	-126	8006	-2710	-713	-418	8006	3082	-458	-784	8006	1624	-523	-699	8006	1624	-522	-699	0	-1108	186	-962
	238	474	-8006	7953	-944	-77	-8006	3966	-769	-335	-8006	-1436	-531	-667	-8006	-3412	-444	-818	-8006	-3412	-444	-818	0	-1092	142	-917
238	238	474	8006	-7953	-944	-77	8006	-3966	-769	-335	8006	1436	-531	-667	8006	3412	-444	-818	8006	3412	-444	-818	0	-1092	142	-917
	239	476	-8006	8567	-971	-37	-8006	5124	-819	-261	-8006	-66	-567	-590	-8006	-5337	-356	-941	-8006	-5336	-356	-941	0	-1070	110	-943
239	239	476	8006	-8567	-971	-37	8006	-5124	-819	-261	8006	66	-567	-590	8006	5337	-356	-941	8006	5336	-356	-941	0	-1070	110	-943
	240	478	-8006	9045	-992	-6	-8006	6125	-863	-196	-8006	1437	-657	-501	-8006	-3479	-441	-820	-8006	-3479	-441	-820	0	-1042	88	-923
240	240	478	8006	-9044	-992	-6	8006	-6125	-863	-196	8006	-1437	-657	-501	8006	3479	-441	-820	8006	3479	-441	-820	0	-1042	88	-923
	241	480	-8006	9385	-1007	16	-8006	6988	-901	-140	-8006	2666	-711	-421	-8006	-1758	-517	-708	-8006	-1758	-517	-708	0	-1024	41	-909
241	241	480	8006	-9385	-1007	16	8006	-6988	-901	-140	8006	-2666	-711	-421	8006	1758	-517	-708	8006	1758	-517	-708	0	-1024	41	-909
	242	482	-8006	9587	-1016	29	-8006	7714	-933	-93	-8006	3761	-759	-349	-8006	-175	-586	-805	-8006	-175	-586	-805	0	-1021	37	-887
242	242	482	8006	-9587	-1016	29	8006	-7714	-933	-93	8006	-3761	-759	-349	8006	175	-586	-805	8006	175	-586	-805	0	-1021	37	-887
	243	484	-8006	9851	-1019	33	-8006	8302	-956	-54	-8006	4717	-802	-287	-8006	1271	-650	-511	-8006	1271	-650	-511	0	-1019	33	-872
243	243	484	8006	-9852	-1019	33	8006	-8302	-956	-54	8006	-4717	-802	-287	8006	-1271	-650	-511	8006	-1271	-650	-511	0	-1019	33	-872
	244	486	-8006	4873	-800	-290	-8006	3847	-763	-344	-8006	630	-622	-583	-8006	-2326	-492	-745	-8006	-2326	-492	-745	0	-800	0	-1177
244	244	486	8006	-4873	-800	-290	8006	-3848	-763	-344	8006	-630	-622	-583	8006	2326	-492	-745	8006	2326	-492	-745	0	-800	0	-1177
	245	488	-8006	4483	-790	-304	-8006	4161	-777	-324	-8006	1311	-652	-569	-8006	-1155	-543	-666	-8006	-1155	-543	-666	0	-795	0	-1166
245	245	488	8006	-4483	-790	-304	8006	-4161	-777	-324	8006	-1311	-652	-569	8006	1155	-543	-666	8006	1156	-543	-666	0	-795	0	-1166
	246	490	-8006	4115	-775	-326	-8006	4337	-785	-312	-8006	1855	-676	-473	-8006	-121	-588	-602	-8006	-122	-588	-602	0	-791	0	-1155
246	246	490	8006	-4115	-775	-326	8006	-4336	-785	-312	8006	-1856	-676	-473	8006	121	-588	-602	8006	122	-586	-602	0	-791	0	-1155
	247	492	-8006	3830	-754	-358	-8006	4375	-786	-310	-8006	2281	-693	-447	-8006	775	-628	-544	-8006	774	-628	-544	0	-786	0	-1148
247	247	492	8006	-3830	-754	-358	8006	-4375	-786	-310	8006	-2281	-693	-447	8006	-775	-628	-544	8006	-775	-628	-544	0	-786	0	-1148
	248	494	-8006	3007	-726	-386	-8006	4278	-782	-316	-8006	2530	-705	-430	-8006	1533	-661	-494	-8006	1533	-661	-494	0	-782	0	-1141
248	248	494	8006	-3007	-726	-386	8006	-4278	-782	-316	8006	-2530	-705	-430	8006	-1533	-661	-494	8006	-1533	-661	-494	0	-782	0	-1141
	249	496	-8006	2247	-683	-448	-8006	4039	-772	-331	-8006	2681	-711	-421	-8006	2154	-689	-454	-8006	2154	-689	-454	0	-776	0	-1136
249	249	496	8006	-2247	-683	-448	8006	-4039	-772	-331	8006	-2681	-711	-421	8006	-2154	-689	-454	8006	-2154	-689	-454	0	-776	0	-1136
	250	498	-8006	1349	-653	-506	-8006	3664	-755	-356	-8006	2654	-711	-421	-8006	2637	-710	-423	-8006	2637	-710	-423	0	-783	0	-1156
250	250	498	8006	-1349	-653	-506	8006	-3665	-755	-356	8006	-2654	-711	-421	8006	-2637	-710	-423	8006	-2637	-710	-423	0	-783	0	-1156

	251	500	-8006	314	-806	-574	-8006	3153	-733	-389	-8006	2510	-704	-431	-8006	2663	-725	-460	-8006	2643	-725	-460	0	-783	0	-1206
251	251	500	8006	-314	-806	-574	8006	-3153	-733	-389	8006	-2510	-704	-431	8006	-2663	-725	-460	8006	-2643	-725	-460	0	-783	0	-1206
	252	502	-8006	-886	-598	-680	-8006	2504	-704	-431	-8006	2226	-662	-448	-8006	3182	-734	-386	-8006	3182	-734	-386	0	-797	0	-1206
252	252	502	8006	886	-598	-680	8006	-2504	-704	-431	8006	-2226	-662	-448	8006	-3182	-734	-386	8006	-3182	-734	-386	0	-797	0	-1206
	253	504	-8006	-2189	-489	-736	-8006	1717	-699	-482	-8006	1810	-674	-476	-8006	3265	-737	-342	-8006	3262	-737	-342	0	-784	0	-1136
253	253	504	8006	2189	-489	-736	8006	-1717	-699	-482	8006	-1810	-674	-476	8006	-3265	-738	-342	8006	-3262	-737	-342	0	-784	0	-1136
	254	506	-8006	-3617	-435	-829	-8006	793	-629	-642	-8006	1253	-648	-512	-8006	3186	-738	-386	-8006	3186	-738	-386	0	-786	0	-1141
254	254	506	8006	3617	-435	-829	8006	-793	-629	-642	8006	-1253	-648	-512	8006	-3186	-738	-386	8006	-3186	-738	-386	0	-786	0	-1141
	255	508	-8006	-5202	-365	-932	-8006	269	-582	-811	-8006	569	-618	-568	-8006	2982	-726	-386	-8006	-2982	-726	-386	0	-771	0	-1147
255	255	508	8006	5202	-365	-932	8006	-269	-582	-811	8006	-569	-618	-568	8006	-2982	-726	-386	8006	2982	-726	-386	0	-771	0	-1147
	256	510	-8006	-6925	-299	-1044	-8006	-1446	-526	-669	-8006	-272	-662	-612	-8006	2650	-711	-422	-8006	2650	-711	-422	0	-750	0	-1156
256	256	510	8006	6925	-299	-1044	8006	1446	-526	-669	8006	272	-662	-612	8006	-2650	-711	-422	8006	-2650	-711	-422	0	-750	0	-1156
	257	512	-8006	-8785	-207	-1166	-8006	-2805	-471	-776	-8006	-1241	-636	-678	-8006	2171	-689	-463	-8006	2171	-689	-463	0	-723	0	-1166
257	257	512	8006	8785	-207	-1166	8006	2805	-471	-776	8006	1241	-636	-678	8006	-2171	-689	-463	8006	1954	-662	-463	0	-691	0	-1173
	258	514	-8006	-7576	-261	-1088	-8006	-4280	-406	-672	-8006	-2348	-491	-747	-8006	1584	-662	-463	-8006	-1584	-662	-463	0	-691	0	-1173
258	258	514	8006	7576	-261	-1088	8006	4280	-406	-672	8006	2348	-491	-747	8006	-1586	-662	-463	8006	1584	-662	-463	0	-691	0	-1173
	259	516	-8006	-6504	-308	-1017	-8006	-5891	-335	-877	-8006	-3582	-436	-627	-8006	800	-629	-542	-8006	800	-629	-542	0	-832	0	-1166
259	259	516	8006	6504	-308	-1017	8006	5891	-335	-877	8006	3582	-436	-627	8006	-800	-629	-542	8006	-800	-629	-542	0	-832	0	-1166
	260	518	-8006	-5589	-349	-956	-8006	-7841	-256	-1091	-8006	-4973	-375	-817	-8006	-91	-560	-660	-8006	-91	-560	-660	0	-807	0	-1166
260	260	518	8006	5589	-349	-956	8006	7841	-254	-1091	8006	4973	-375	-817	8006	91	-560	-660	8006	91	-560	-660	0	-807	0	-1166
	261	520	-8006	-4775	-384	-904	-8006	-9527	-175	-1213	-8006	-4375	-401	-678	-8006	-1121	-545	-667	-8006	-1121	-545	-667	0	-856	0	-1213
261	261	520	8006	4775	-384	-904	8006	9527	-175	-1213	8006	4375	-401	-678	8006	1121	-545	-667	8006	1121	-545	-667	0	-856	0	-1213
	262	522	-8006	-4113	-413	-861	-8006	-6491	-308	-1016	-8006	-3914	-422	-648	-8006	-2267	-483	-743	-8006	-2267	-483	-743	0	-499	0	-1226
262	262	522	8006	4113	-413	-861	8006	6491	-308	-1016	8006	3914	-422	-648	8006	2267	-483	-743	8006	2267	-483	-743	0	-499	0	-1226
	263	524	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

En los cuadros anteriores, las barras 1 a 21 corresponden al fuste y su dimensionamiento se estudia más adelante en el capítulo 17 y siguientes.

En el caso de barras (estructura de hormigón) la máxima compresión que admite es

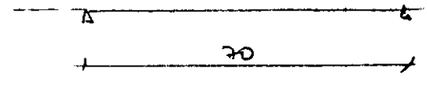
$$\sigma_c = -229 < \frac{4000}{1.6} = 2500\ T/m2 = 250\ kg/cm^2$$

y la máxima tracción es

$$\sigma_T = 251 < 0.45\sqrt[3]{400^2} = 24\ kg/cm^2$$

Comprobación a cortante durante el empuje.

a) como estaticamente determinada



$Q = 13.48 \times 2.5 \times 35 = 1179\ t$

$Q' = 1.6 \times 1179 = 1886\ t$ $\quad \cot\theta = \sqrt{1 + \frac{16}{24}} = 1.87$

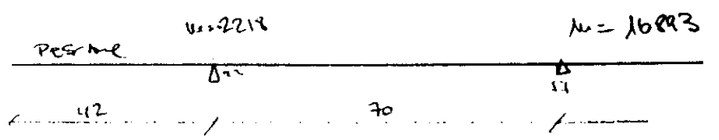
se colocarán 2 ramas de 0.60 m

$T_b = \frac{400}{1.5} 1.20 \times 4.80 = 470\ t$

$w_t = \frac{1886 - 470}{0.9 \times 4.2 \times 4.8 \times 1.87} = 42.8\ cm^2/m.$

se colocará 2 cercos 20/20 $\Rightarrow 4 \times 3.14 \times 5 = 62.8\ cm^2/m.$

b) posición localizada 17.



$Q = 13.48 \times 2.5 \times 35 + \frac{16893 - 2718}{20} \times 1179 + 210 = 1389\ t$

se considera 2 ramas de 0.60

$Q' = 1389 \times 1.6 - 2222$ lts $\phi\theta = 192$

$T_b = 470$ lts

$\omega_t = \frac{2222 - 470}{0.9 \times 4.2 \times 4.8 \times 1.92} = 53.7$ lts.

se dispone como mínimo $2\phi 20/b \rightarrow 62.8$ cm²

3) Posición localizada 7f

$Q = 1179 + \frac{1680 - 2218}{70} = 1387 < 1389$ lts.

4) Posición localizada 11:

$Q = 42 \times 2.5 + (70 - 42) \times 13.48 \times 2.5 \cdot 379 + 1.5 = 484$

$484 < 1389$ L.

5.6.- REACCIONES SOBRE PILAS Y ESTRIBOS DURANTE EL LANZAMIENTO

REACCIONES SOBRE PILAS Y ESTRIBOS DURANTE EL EMPUJE

POSIC	EST.1	PIL 1	PIL 2	PIL 3	PIL 4	PIL 5	PIL 6	PIL 7	PIL 8	PIL 9	PIL 10	PIL 11	PIL 12	PIL 13	EST 2
1						1702	2023	2083	2021	1946	2160	1917			
2					54	1579	2109	2060	2027	1944	2160	1917			
3					120	1847	2056	2073	1968	2036	2089	1956			
4					242	2037	2025	2089	1907	2121	2027	1977			
5					428	2133	2033	2081	1883	2168	1981	2011			
6					662	2170	2058	2060	1880	2192	1949	2032			
7					935	2163	2091	2031	1891	2201	1927	2041			
8					1251	2121	2100	2022	1904	2197	1914	2039			
9					1606	2049	2083	2027	1931	2172	1914	2028			
10					2010	1911	2108	1975	2015	2105	1953	1917			
11					2347	1758	2158	1913	2088	2058	1953	1964			
12				132	2131	1954	2107	1913	2105	2042	1965	1922			
13				249	2340	1907	2117	1878	2161	1991	2004				
14				423	2454	1908	2105	1870	2191	1955	2028				
15				650	2482	1956	2072	1879	2203	1931	2040				
16				907	2488	1983	2054	1892	2202	1916	2041				
17				1183	2510	1949	2066	1910	2184	1912	2032				
18				1494	2490	1936	2037	1978	2125	1949	1915				
19				1849	2400	1974	1962	2075	2062	1952	1964				
20				2246	2256	2021	1909	2144	2033	1995					
21				2460	2163	2046	1893	2165	1982	2011					
22			138	2367	2296	1997	1900	2177	1965	2022					
23			267	2552	2264	1991	1899	2195	1938	2037					
24			451	2656	2260	1980	1909	2198	1920	2041					
25			678	2714	2245	1987	1923	2185	1913	2035					
26			932	2748	2230	1969	1978	2135	1949	1911					
27			1218	2746	2245	1901	2074	2069	1961	1915					
28			1544	2693	2271	1843	2151	2010	1988						
29			1911	2590	2299	1812	2194	1967	2018						
30			2318	2436	2334	1793	2220	1936	2037						
31			2426	2389	2345	1789	2224	1930	2039						
32		170	2379	2505	2303	1807	2225	1916	2043						
33		315	2541	2477	2294	1825	2215	1907	2039						
34		512	2624	2488	2257	1879	2178	1912	2025						
35		750	2660	2513	2190	1973	2114	1919	2054						
36		1012	2681	2520	2140	2054	2045	1972							
37		1307	2672	2514	2121	2097	2000	2006							
38		1469	2650	2514	2114	2125	1930	2186							
39	23	1597	2642	2508	2118	2120	1968	2026							
40	79	1865	2597	2501	2127	2128	1946	2035							
41	199	2053	2573	2484	2150	2118	1935	2034							
42	389	2150	2577	2457	2188	2090	1936	2022							
43	626	2196	2583	2425	2241	2038	1971	1912							
44	833	2205	2583	2404	2279	2005	1967	1960							
45	668	2269	2571	2408	2278	2006	1967	1960							
MAX	833	2269	2681	2746	2510	2170	2225	2198	2203	2201	2160				

REACCIONES Y DEFORMACIONES EN EL ALEJAMIENTO.

AL LLEGAR A	E1	P1	P2	P3	P4	P5	P6
· PILA 4	—	—	—	—	$\delta = 651$	R=1581	R=1956
· PILA 3	—	—	—	$\delta = 21.13$	R=2200	R=1614	R=1995
· PILA 2	—	—	$\delta = 17.15$	R=2315	R=2234	R=1999	R=1924
· PILA 1	—	$\delta = 19.80$	R=2281	R=2254	R=2177	R=1936	R=1997
· ESTRIBO 1	$\delta^* = 1.04$	R=1370	R=2527	R=2313	R=2142	R=1997	R=1926

NOTA. REACCIONES EN TON

DEFORMACIONES EN CM

LA FLECHA $\delta = 1,04$ EN E1 ES ↑

5.7.- ESTUDIO DEL PESCANTE METÁLICO

REACCION DE APOYO DEL PESCANTE SOBRE LAS PILAS

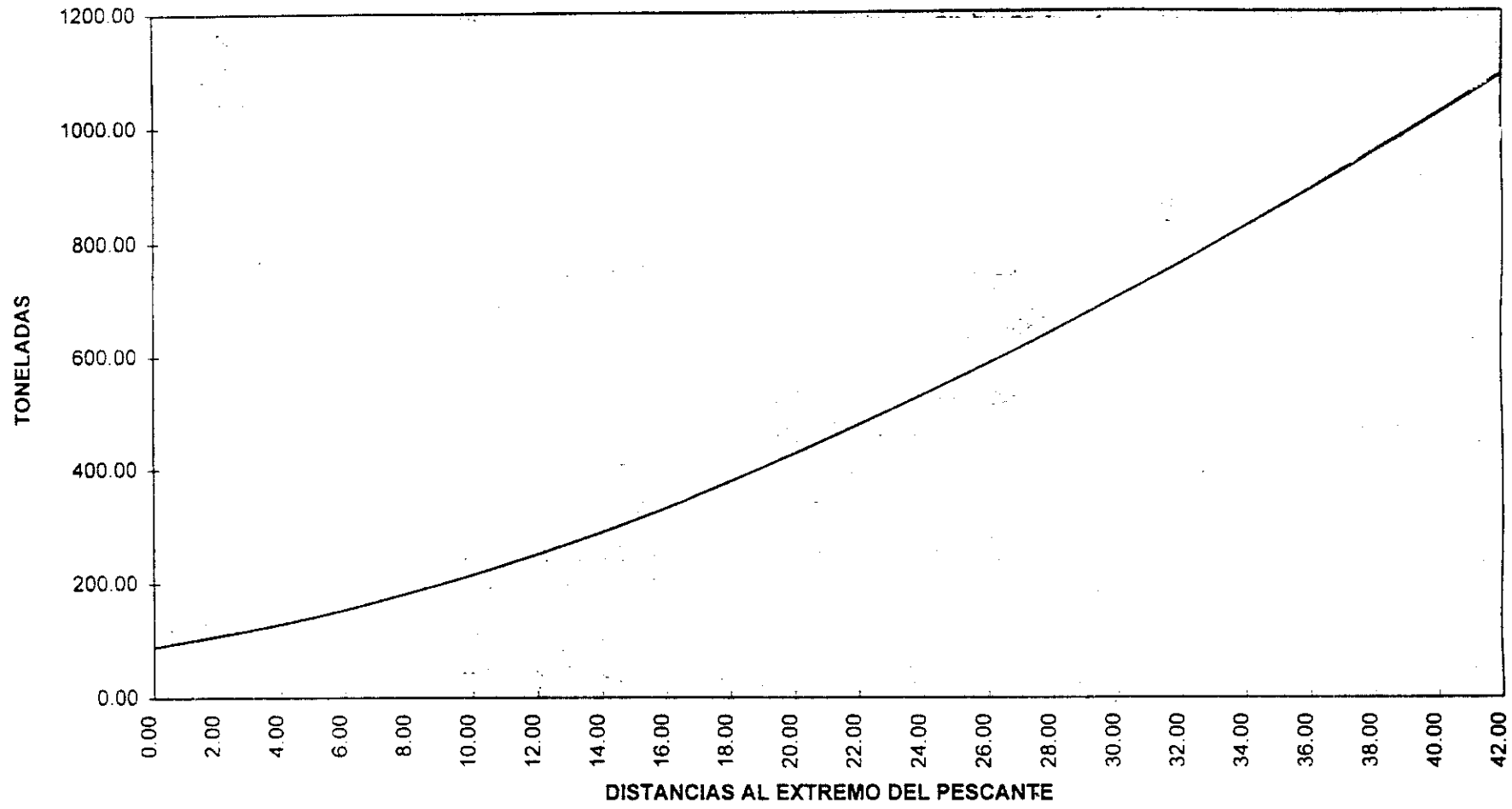
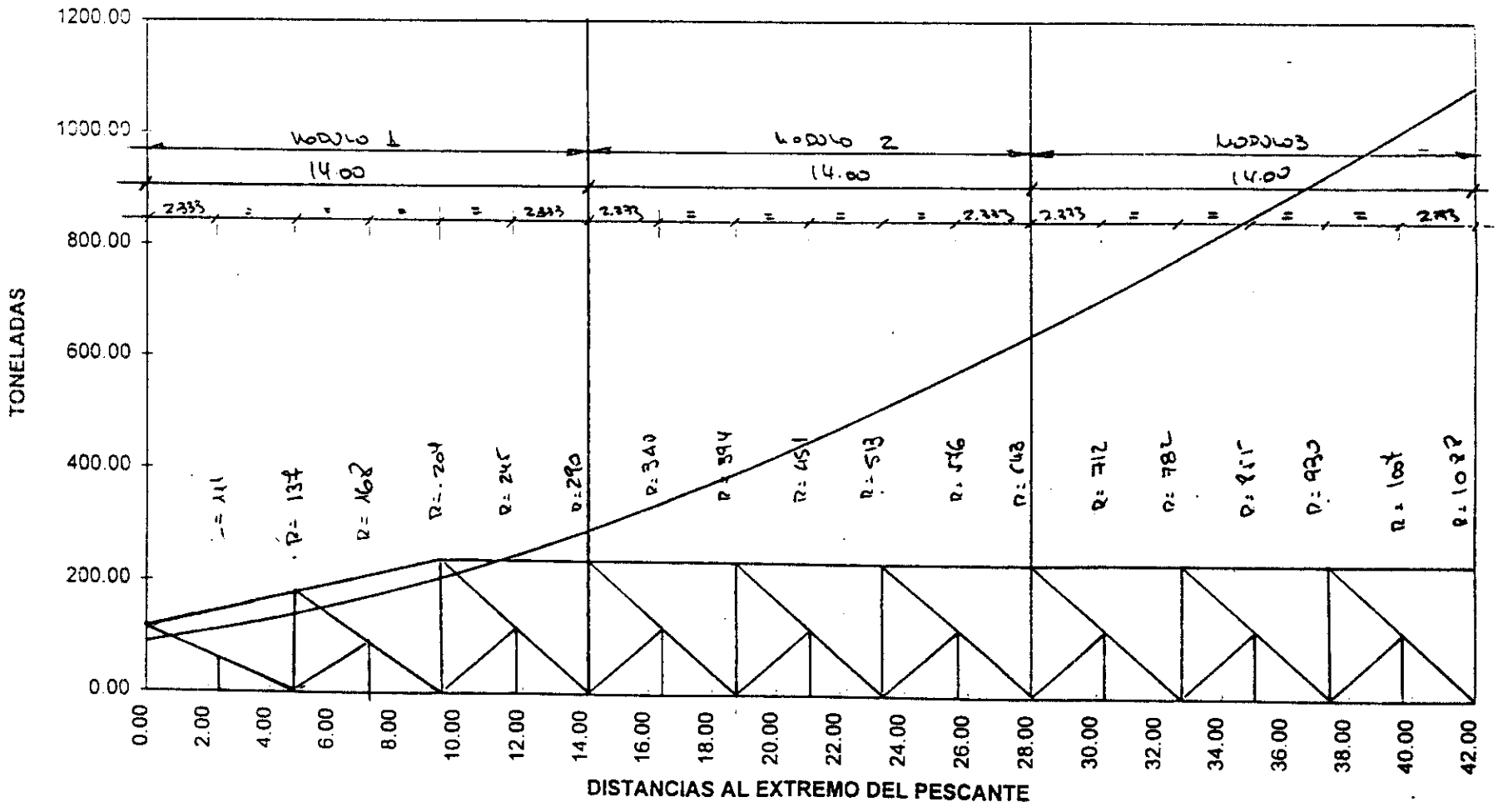


Gráfico1 25/04/97

REACCION DE APOYO DEL PESCANTE SOBRE LAS PILAS



SECCIONES ADOPTADAS EN LA BASE DEL PESCANTE

LAS SECCIONES CORRESPONDIENTES A LOS CORDONES INFERIOR Y SUPERIOR SON SECCIONES CONFORMADAS POR CHAPA SOLDADA DE CALIDAD A-42 CUYO VALOR DE TENSIÓN DE TRABAJO ADMITIDO ES

$$\sigma = \frac{2600}{1.35} = 2666 \text{ kg/cm}^2$$

LA SECCIÓN ADOPTADA ES DE LA FORMA DE LA FIGURA SUS DIMENSIONES APARECEN EN LOS CUADROS CORRESPONDIENTES.

LOS ESFUERZOS SOLICITANTES CORRESPONDEN A BARRA DEL CORDÓN INFERIOR QUE SE DIMENSIONA DE ACUERDO A LOS ESFUERZOS PROVOCADOS POR LA FLEXIÓN GENERAL DEL PESCANTE Y TAMBIÉN TENIENDO EN CUENTA LA FLEXIÓN LOCAL PRODUCIDA POR EL PESO DEL APOYO DEPOSITADO A LO LARGO DE SU LONGITUD

LA BARRA DE MONTANTES Y DIAGONALES SE RESUELVE MEDIANTE PERFILES HEB Ó UPN ATORNILLADOS POR PLANCHUELAS TODO ELLO REALIZADO EN ACERO A-42 CON LOS VALORES DE TENSIÓN ADMISIBLES

$$\sigma = \frac{2600}{1.35} = 1925 \text{ kg/cm}^2$$

LAS LONGITUDES DE PANDEO CORRESPONDIENTES A LAS GEOMETRÍAS EN TODOS LOS ELEMENTOS, CONSIDERANDO LOS DIAGONALES PRINCIPALES CON SU LONGITUD TOTAL

PARA EL CÁLCULO DEL COEFICIENTE DE PANDEO SE HAN CONSIDERADO LOS PASOS DE CÁLCULO SEGÚN EL SIGUIENTE CRITERIO

a) PARA PERFILES EN 2 [ ] O 2] [SE HA CONSIDERADO EL MAYOR DEL PERFIL SIMPLE YA QUE SE DISPONDRÁN SEPARADORES HASTA LOS $\lambda = 80$ DE SEPARACIÓN ENTRE ALAS DE CANTEOS DE CORDÓN INFERIOR Y SUPERIOR

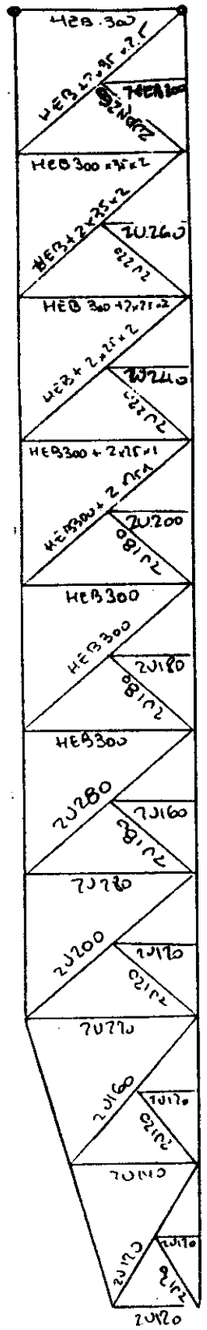
b) PARA PERFILES HEB 300 SE TOMA EL VALOR DE GIRO MAYOR YA QUE TRABAJA FUNCIONALMENTE COMO PERFIL SIMPLE

EN LOS APOYOS QUE SE INCLUYEN A CONTINUACIÓN SE MUESTRA LA TENSIÓN EN VACÍO EN CADA UNO DE LOS ELEMENTOS DEL PÓRTICO AL SER ANALIZADO Y PUNTO TANTO SOMETIDO A SU PESO PROPIO Y A UNA CARGA HACIA ARRIBA EQUIVALENTE A LA REACCIÓN CALCULADA PARA EL APOYO. EN EL MODELO SE HA SUPUESTO ARTICULACIÓN EN LOS NUDOS 19 Y 38.

SE HAN HECHO DOS PRUEBAS

a) POSICIÓN X1 CORresponde a la posición en la que el apoyo está ligada a tierra en el nudo X

b) POSICIÓN X2 CORresponde a la posición en la que el apoyo se sitúa en el centro de la barra X (PARA EL ESTUDIO LOCAL DEL COLAPSO PROGRESIVO)



PERFILES UTILIZADOS 2UNP260x75x7

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-8					POSICION 2-8					POSICION 3-8					POSICION 4-8					POSICION 5-8					POSICION 6-8				
		AREA	MOMENTO	PANDEO	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
		M2	M3		TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
1	1	0.023800	0.002806	1.07	[illegible]					0	-11	-1	-35	25	0	2	0	6	-4	0	2	0	3	-2	0	1	0	0	0	0	1	0	1	-1
	2	0.023800	0.002806	1.07	[illegible]					0	12	-27	868	-606	0	-1	4	-137	137	0	-1	3	-91	91	0	0	1	-22	22	0	0	1	-35	35
2	2	0.023800	0.002806	1.07	0	18	21	673	-668	[illegible]					0	1	-4	-137	139	0	1	-3	-91	91	0	0	-1	-22	22	0	0	-1	-35	35
	3	0.023800	0.002806	1.07	0	-17	20	-648	652	[illegible]					0	0	0	-195	199	0	0	3	-191	191	0	1	-1	30	-30	0	1	-1	33	-32
3	3	0.023800	0.002806	1.04	-63	-10	-20	-390	991	-32	-13	-23	-591	883	[illegible]					24	-7	-3	-199	6	0	2	1	38	-41	1	2	1	27	-36
	4	0.023800	0.002806	1.04	63	11	-4	388	113	32	14	-9	423	-162	[illegible]					-34	8	-15	304	-377	0	-1	2	-66	57	-1	-1	2	-66	43
4	4	0.023800	0.002806	1.04	-63	4	4	388	113	-32	7	9	423	-162	13	16	20	580	-630	[illegible]					0	3	-2	-90	57	1	2	-2	-65	43
	5	0.023800	0.002806	1.04	63	-3	4	137	364	32	-6	7	-89	351	-13	-15	17	-606	476	[illegible]					0	-2	5	-276	274	-1	-1	5	-156	144
5	5	0.030800	0.003626	1.04	-106	-3	-4	253	434	-95	-6	-7	133	486	-74	-11	-17	-174	681	-37	-13	-17	-301	845	[illegible]					27	-9	-5	-211	82
	6	0.030800	0.003626	1.04	106	4	-4	454	232	95	6	-7	488	131	74	12	-10	501	-14	37	14	-14	486	-342	[illegible]					-27	10	-17	334	-913
6	6	0.030800	0.003626	1.04	-106	5	4	454	232	-95	13	7	488	131	-74	17	10	501	-14	-37	21	14	486	-342	15	32	25	980	-982	[illegible]				
	7	0.030800	0.003626	1.04	106	-9	17	-70	770	95	-12	22	-232	883	74	-16	27	-448	936	37	-20	34	-751	995	-15	-32	50	-1316	1214	[illegible]				
7	7	0.037800	0.004304	1.02	-152	-7	-17	56	755	-155	-10	-22	-31	866	-150	-13	-27	-183	970	-131	-19	-34	-380	1067	-99	-27	-50	-774	1291	-41	-39	-47	-979	1329
	8	0.037800	0.004304	1.02	152	8	0	403	404	155	11	-2	456	370	150	16	-5	509	280	131	16	-10	549	150	86	28	-15	574	-57	41	30	-21	583	-332
8	8	0.037800	0.004304	1.02	-152	6	0	403	405	-155	9	2	456	370	-150	12	5	509	280	-131	16	10	549	150	-86	21	15	574	-57	-41	26	21	583	-332
	9	0.037800	0.004304	1.02	152	-5	13	129	662	155	-6	17	56	771	150	-11	21	-41	845	131	-15	26	-197	883	86	-20	32	-405	922	41	-25	38	-681	982
9	9	0.045800	0.005395	1.02	-185	-4	-13	213	854	-212	-5	-17	188	756	-223	-9	-21	138	894	-224	-12	-26	57	940	-211	-16	-32	-54	988	-178	-22	-36	-230	1037
	10	0.045800	0.005395	1.02	185	5	3	376	491	212	7	2	440	504	223	10	0	503	490	224	13	-4	588	438	211	18	-8	600	336	178	23	-14	623	187
10	10	0.045800	0.005395	1.02	-185	3	-3	376	491	-212	5	-2	440	504	-223	7	0	503	490	-224	10	4	588	438	-211	13	8	600	336	-178	18	14	623	187
	[illegible]	[illegible]	0.005395	1.02	185	-2	8	282	575	212	-3	11	284	660	223	-6	14	255	738	224	-9	18	196	880	211	-12	22	99	837	178	-17	26	-37	894
11	11	0.053600	0.006933	1.00	-231	0	-9	317	943	-263	-2	-11	338	844	-291	-4	-14	347	740	-311	-9	-18	336	827	-320	-9	-22	286	899	-312	-13	-26	226	949
	12	0.053600	0.006933	1.00	231	1	7	342	920	263	3	6	411	571	291	5	5	481	605	311	7	2	548	614	320	10	-1	607	588	312	14	-5	660	818
12	12	0.053600	0.006933	1.00	-231	2	-7	342	920	-263	4	-6	411	571	-291	7	-5	481	605	-311	10	-2	548	614	-320	14	1	607	588	-312	19	5	660	818
	13	0.053600	0.006933	1.00	231	-1	10	291	974	263	-3	15	284	668	291	-6	19	281	805	311	-9	25	246	917	320	-13	31	181	1014	312	-17	37	79	1088
13	13	0.059800	0.007930	1.00	-258	2	-10	319	956	-303	3	-15	349	679	-347	-2	-19	389	808	-386	-5	-25	374	936	-417	-8	-31	358	1066	-433	-12	-37	312	1164
	14	0.059800	0.007930	1.00	258	0	13	291	984	303	1	13	364	663	347	4	13	442	735	386	8	12	521	799	417	10	10	566	817	433	14	6	662	894
14	14	0.059800	0.007930	1.00	-258	-1	-13	291	984	-303	0	-13	364	663	-347	2	-13	442	735	-386	5	-12	521	799	-417	8	-10	566	817	-433	12	-6	662	894
	15	0.059800	0.007930	1.00	258	3	8	346	929	303	1	12	378	649	347	-1	17	401	776	386	-3	22	405	901	417	-7	27	366	1017	433	-11	33	364	1152
15	15	0.070800	0.008908	1.00	-278	4	-8	321	467	-337	3	-12	386	586	-387	1	-17	414	713	-456	-1	-22	450	843	-508	-3	-27	472	998	-546	-7	-33	474	1089
	16	0.070800	0.008908	1.00	278	-3	16	249	539	337	-1	17	322	833	387	0	18	480	727	456	2	18	481	812	508	5	18	561	988	546	8	16	634	999
16	16	0.070800	0.008908	1.00	-278	-4	-16	249	539	-337	-3	-17	322	833	-387	-1	-18	480	727	-456	1	-18	481	811	-508	3	-18	561	988	-546	6	-16	634	999
	17	0.070800	0.008908	1.00	278	5	5	346	442	337	4	9	386	550	387	3	13	444	683	456	1	18	484	888	508	-2	23	519	931	546	-5	20	516	1089
17	17	0.070800	0.011373	1.00	-287	6	-5	335	419	-388	5	-8	401	542	-435	4	-13	488	679	-511	2	-18	551	814	-564	0	-23	588	961	-646	-3	-29	699	1077
	18	0.070800	0.011373	1.00	287	-5	18	236	518	356	-4	19	318	626	435	-3	21	406	737	511	-1	22	500	845	564	1	22	564	942	646	4	21	663	1017
18	18	0.070800	0.011373	1.00	-287	-7	-18	236	518	-356	-8	-19	318	626	-435	-8	-21	406	737	-511	-9	-22	500	845	-564	-8	-22	564	942	-646	-8	-21	663	1017
	19	0.076000	0.011373	1.00	287	8	0	377	377	356	9	0	472	472	435	10	0	572	572	511	10	0	672	672	564	10	0	788	788	646	10	0	880	880

CINCAPE1.XLS 8/05/97

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

POSICION 7-8					POSICION 8-8					POSICION 9-8					POSICION 10-8					POSICION 11-8					POSICION 12-8					POSICION 13-8				
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	2	0	1	0	0	0	0	1	0	0	0
0	0	1	-31	31	0	0	1	-32	32	0	0	1	-32	32	0	0	1	-31	31	0	0	1	-32	34	0	0	1	-31	31	0	0	1	-31	31
0	0	-1	-31	31	0	0	-1	-31	31	0	0	-1	-32	32	0	0	-1	-31	31	0	0	-1	-32	34	0	0	-1	-31	31	0	0	-1	-31	31
0	1	-1	22	-22	0	1	-1	21	-20	0	1	-1	20	-20	0	1	-1	21	-20	0	1	-1	24	-22	0	1	-1	21	-21	0	1	-1	21	-21
3	1	1	11	-33	3	1	1	10	-32	3	1	1	10	-31	3	1	1	10	-31	3	1	1	10	-36	3	1	1	10	-31	3	1	1	10	-31
-3	0	1	-47	25	-3	0	1	-50	28	-3	0	1	-51	30	-3	0	1	-51	30	-3	0	1	-55	39	-3	0	1	-51	30	-3	0	1	-52	30
3	0	-1	-47	25	3	0	-1	-50	28	3	0	-1	-51	30	3	0	-1	-51	30	3	0	-1	-55	39	3	0	-1	-51	30	3	0	-1	-52	30
-3	1	-1	13	-35	-3	1	-1	12	-33	-3	1	-1	7	-29	-3	1	-1	7	-28	-3	1	-1	7	-33	-3	1	-1	6	-30	-3	1	-1	6	-29
9	2	1	-7	-44	9	2	1	-11	-46	9	1	1	-18	-45	9	1	1	-17	-45	10	1	1	-19	-50	9	1	1	-16	-46	9	1	1	-16	-45
-9	-1	2	-64	34	-9	-1	2	-77	20	-9	0	2	-73	12	-9	-1	2	-74	14	-10	-1	2	-80	12	-9	-1	2	-76	14	-9	-1	2	-76	14
9	1	-2	-64	34	9	-1	-2	-77	20	9	-2	-2	-73	12	9	-2	-2	-74	14	10	-2	-2	-80	12	9	-2	-2	-76	14	9	-2	-2	-76	14
-9	0	3	-82	42	-9	2	-1	-4	-54	-9	3	-4	74	-136	-9	3	-4	84	-139	-10	3	-4	82	-138	-9	3	-4	81	-121	-9	3	-4	82	-122
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	53	-6	1	-122	-163	13	-4	4	51	-131	17	-3	4	35	-136	21	-3	4	22	-138	18	-3	4	25	-127	18	-3	4	24	-127
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-52	7	-17	213	-495	-13	-2	3	-89	26	-17	-2	2	-86	4	-21	-2	2	-101	-14	-18	-2	2	-88	-6	-18	-2	2	-88	-6
38	34	26	469	-488	[illegible]					13	8	3	-89	26	17	3	-2	-86	4	21	-3	-2	-101	-14	18	-3	-2	-88	-6	18	-2	-2	-88	-6
-38	-33	49	-1155	821	[illegible]					-13	-8	23	-613	442	-17	-1	6	-183	72	-21	4	-6	72	-188	-18	4	-5	34	-188	-18	3	-4	36	-141
-134	-39	-48	-889	1680	-44	-38	-44	-889	889	[illegible]					79	-11	-6	-272	-69	30	6	6	36	-171	33	4	6	19	-169	35	3	4	-16	-153
134	31	-31	629	-69	44	32	-39	576	-579	[illegible]					-79	13	-23	261	-669	-36	-4	3	-139	-13	-33	-3	3	-139	-31	-36	-3	3	-132	-41
-134	35	31	653	-69	-44	28	28	576	-579	62	39	39	313	-789	[illegible]					30	12	-3	-169	-43	33	3	-3	-139	-31	36	-3	-3	-132	-41
124	-31	31	-591	765	44	-27	35	-469	884	-62	-36	51	-868	766	[illegible]					-36	-11	39	-471	686	-33	-1	7	-139	89	-36	4	-6	15	-178
-266	-17	-51	116	947	-266	-22	-56	-44	916	-184	-33	-51	-388	977	-49	-36	-56	-601	686	[illegible]					-266	-14	-7	-469	-169	66	4	-6	-65	-178
266	16	11	675	389	266	23	-16	677	186	184	34	-27	882	-73	49	36	-56	686	-469	[illegible]					-66	-16	-40	-46	-469	-66	-5	3	-142	-61
-266	24	11	675	389	-266	30	16	677	186	-184	37	27	882	-73	-49	44	36	686	-469	67	46	47	481	-469	[illegible]					66	5	-6	-142	-61
266	-25	44	-66	1139	266	-29	51	-258	1151	185	-36	56	-469	1075	49	-43	66	-780	974	-67	-57	67	-1046	1116	[illegible]					-66	-5	66	-269	89
-432	-18	-44	289	1552	-416	-33	-91	114	1277	362	-30	-66	-43	1271	-287	-36	-46	-251	1284	-181	-52	-67	-402	1388	-44	-51	-61	-1	1	[illegible]				
432	18	1	717	748	416	25	-5	788	835	362	31	-14	771	457	287	39	-25	788	286	181	64	-89	789	-187	44	62	-82	89	-436	[illegible]				
-432	17	-1	717	748	-416	23	5	788	884	-362	30	14	771	457	-287	36	25	788	286	-181	44	36	789	-187	-44	55	62	89	-436	66	36	66	386	-482
432	-16	46	279	1168	416	-22	47	164	1236	362	-29	54	4	1284	287	-36	61	-387	1188	181	-43	86	-439	1288	44	-55	74	-788	917	-66	-46	64	-1391	884
-574	-11	-40	451	1177	-561	-16	-47	388	1249	-564	-22	-54	311	1288	-422	-29	-61	186	1289	-447	-35	-89	36	1291	-344	-44	-34	-149	1148	-66	-46	-64	-882	1147
574	12	13	788	888	561	17	8	788	886	564	23	1	788	811	422	30	-7	888	670	447	35	-17	788	888	344	46	-31	788	388	366	31	-47	746	-138
-574	10	-13	788	888	-561	15	-8	788	886	-564	21	-1	788	811	-422	27	7	886	670	-447	34	17	788	888	-344	43	31	788	388	-366	32	47	746	-138
574	-9	35	488	1130	561	-13	41	461	1197	564	-19	47	369	1230	422	-26	54	249	1253	447	-32	69	92	1139	344	-41	67	-139	1188	366	-41	73	-951	957
-687	-8	-36	643	1182	-731	-10	-41	687	1287	-743	-15	-47	662	1302	-723	-21	-54	535	1282	-688	-27	-60	434	1239	-621	-36	-47	286	1284	-588	-44	-72	188	1288
687	7	19	787	1088	731	12	16	888	1086	743	17	18	886	1089	723	23	3	836	980	688	29	-5	846	888	621	37	-17	681	886	588	46	-56	881	442
-687	-7	-19	787	1088	-731	-9	-19	888	1086	-743	-4	-18	883	1089	-723	-1	-3	836	980	-688	3	5	846	888	-621	8	17	681	886	-588	14	39	881	442
687	8	0	917	817	731	7	0	862	862	743	5	0	977	977	723	3	0	864	964	688	-1	6	888	888	621	-6	0	918	818	588	-12	0	881	881

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

POSICION 14-B					POSICION 15-B					POSICION 16-B					POSICION 17-B					POSICION 18-B					POSICION 19-N					TENSIONES MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	T.SUP+	T.SUP-	T.INF+	T.INF-		
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2		
0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	5	-39	39	-4	1	1
0	0	1	-31	31	0	0	1	-31	31	0	0	1	-31	31	0	0	1	-31	31	0	0	1	-31	31	0	0	1	-32	34	883	-137	137	-886		2
0	0	-1	-31	31	0	0	-1	-31	31	0	0	-1	-31	31	0	0	-1	-31	31	0	0	-1	-31	31	0	0	-1	-32	34	883	-137	138	-886	2	2
0	1	-1	21	-21	0	1	-1	21	-21	0	1	-1	21	-21	0	1	-1	21	-21	0	1	-1	21	-21	0	1	-1	25	-23	39	-726	725	-39		3
3	1	1	10	-31	3	1	1	10	-32	3	1	1	10	-32	3	1	1	10	-32	3	1	1	10	-32	3	1	1	11	-37	36	-681	681	-41	3	3
-3	0	1	-52	30	-3	0	1	-52	31	-3	0	1	-52	31	-3	0	1	-52	31	-3	0	1	-52	31	-3	0	1	-57	30	880	-60	113	-880		4
3	0	-1	-52	30	3	0	-1	-52	31	3	0	-1	-52	31	3	0	-1	-52	31	3	0	-1	-52	31	3	0	-1	-57	30	880	-60	113	-880	4	4
-3	1	-1	8	-29	-3	1	-1	8	-30	-3	1	-1	8	-30	-3	1	-1	8	-30	-3	1	-1	8	-30	-3	1	-1	7	-34	137	-633	476	-35		5
9	1	1	-16	-45	9	1	1	-16	-46	9	1	1	-16	-46	9	1	1	-16	-46	9	1	1	-16	-46	10	1	1	-18	-51	253	-301	881	-51	5	5
-9	-1	2	75	14	-9	-1	2	-75	14	-9	-1	2	-75	15	-9	-1	2	-75	15	-9	-1	2	-75	15	-10	-1	2	-80	13	880	-84	252	-892		6
9	-2	-2	-75	14	9	-2	-2	-75	14	9	-2	-2	-75	15	9	-2	-2	-75	15	9	-2	-2	-75	15	10	-2	-2	-80	13	880	-84	252	-892	6	6
-9	3	-4	82	-123	-9	3	-4	82	-123	-9	3	-4	83	-123	-9	3	-4	83	-123	-9	3	-4	83	-123	-10	3	-4	84	-132	74	-1316	1314	-136		7
19	3	4	25	-127	19	3	4	25	-127	19	3	4	25	-127	19	3	4	25	-128	19	3	4	25	-128	21	3	4	24	-136	56	-879	1291	-183	7	7
-19	-2	2	-98	-6	-19	-2	2	-98	-6	-19	-2	2	-98	-6	-19	-2	2	-98	-6	-19	-2	2	-98	-6	-21	-2	2	102	-11	874	-102	488	-898		8
19	-2	-2	-97	-6	19	-2	-2	-98	-6	19	-2	-2	-98	-6	19	-2	-2	-98	-6	19	-2	-2	-98	-6	21	-2	-2	102	11	874	-102	488	-898	8	8
-19	3	4	37	-140	-19	3	-4	38	-141	19	3	-4	38	-142	-19	3	-4	38	-141	-19	3	-4	38	-141	-21	3	-4	39	-148	129	-1138	882	-186		9
36	3	4	10	-151	36	4	4	-9	-152	36	4	4	-9	-152	36	4	4	-9	-152	36	4	4	-9	-152	38	4	4	-12	-159	213	-829	1880	-171	9	9
-36	-2	3	-124	-38	-36	-2	3	-124	-38	36	-2	3	-124	-38	-36	-2	3	-124	-38	-36	-2	3	-124	-38	-36	-2	3	-128	-43	823	-128	884	-788		10
36	-3	-3	-124	-38	36	-2	-3	-124	-38	36	-2	-3	-124	-38	36	-3	-3	-124	-38	36	-3	-3	-124	-38	38	-3	-3	-128	-43	823	-128	884	-788	10	10
-36	4	-5	[illegible]	-147	-36	4	-5	-5	-157	-36	4	-5	-5	-156	-36	4	-5	-4	-155	-36	4	-5	-3	-156	-38	4	-5	-6	-165	292	-1085	837	-178		11
56	4	5	-36	-178	56	4	5	-51	-174	60	4	5	-50	-174	60	4	5	-48	-174	60	4	5	-48	-175	62	4	5	-52	-181	347	-821	977	-181	11	11
-56	-3	2	-142	-75	-60	-2	2	-144	-81	-60	-2	2	-145	-79	-60	-2	2	-145	-79	-60	-2	2	-144	-79	-62	-2	2	-148	-85	877	-148	914	-908		12
56	-3	-2	-142	-75	60	-5	-2	-144	-81	60	-5	2	-145	-79	60	-4	-2	-145	-79	60	-4	-2	-144	-79	62	-4	-2	-148	-85	877	-148	914	-908	12	12
-58	7	0	-104	-113	-60	6	-10	28	-253	60	5	-10	18	-242	-60	5	-9	8	-231	-60	5	-9	7	-230	-62	5	-9	4	-237	294	-1438	1131	-253		13
194	-16	0	-256	-284	78	7	10	-17	-252	86	6	10	-37	-254	90	5	9	-53	-253	90	5	9	-53	-251	93	5	9	-56	-258	374	-898	1295	-284	13	13
-194	18	-40	186	-718	-79	-5	4	-174	-94	-86	-4	2	-171	-120	-90	-4	2	-173	-133	-90	-4	2	-175	-129	-93	-4	2	-179	-136	771	-179	817	-882		14
-194	-163	-40	[illegible]	-718	79	15	-4	-174	-94	86	3	-2	-171	-120	90	-3	-2	-173	-133	90	-5	-2	-175	-129	93	-4	-2	-179	-136	771	-179	817	-882	14	14
-194	-308	80	-1169	-648	-79	-14	37	-557	288	-86	-2	7	-230	-61	-90	7	-13	-10	-295	-90	6	-11	-23	-281	-93	6	-10	-41	-274	406	-1291	1236	-295		15
-35	-60	-80	-672	777	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	204	-23	-7	-357	-221	116	8	13	-50	-278	124	7	11	-72	-279	133	6	10	-95	-281	474	-678	1096	-381	15	15
35	62	-62	616	-517	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-204	25	-48	148	-727	-116	-6	4	-201	-127	-124	-5	2	-195	-156	-133	-4	1	-197	-179	806	-201	926	-907		16
-35	61	62	616	-517	171	81	83	513	-907	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	116	19	-4	-201	-127	124	5	-2	-195	-156	133	-5	-1	-197	-179	806	-201	926	-907	16	16
35	-60	79	-665	766	-171	-79	103	-1179	894	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-116	-18	47	-584	266	-124	-4	13	-291	-60	-133	6	-12	-62	-295	516	-1178	1353	-296		17
-378	-53	-79	-129	1123	-203	-71	-103	-548	1083	6	-75	-83	-744	730	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	289	-32	-13	-481	-280	179	6	12	-143	-339	643	-744	1382	-338	17	17
378	54	-46	862	132	203	73	-65	780	-245	-6	77	-84	654	-669	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-289	34	-65	132	-693	-179	-5	1	-244	-227	951	-244	1085	-1189		18
-378	21	46	862	132	-203	28	65	780	-245	6	37	84	654	-669	254	47	109	526	-1195	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	179	0	-1	-244	-227	951	-244	1085	-1189	18	18
378	-19	0	497	497	203	-27	0	266	266	-6	-35	0	-7	-7	-254	-46	0	-335	-335	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-179	1	0	-235	-235	977	-381	977	-381		19

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

BARRA	NUDO	CARACTERISTICAS SECCIONES			POSICION 1-S					POSICION 2-S					POSICION 3-S					POSICION 4-S					POSICION 5-S					POSICION 6-S						
		AREA	MOD.RES.	RAND	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF		
		M2	M3		TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2		
19	29	0.014000	0.001400	1.00	53	1	1	-336	-461	17	0	0	-122	-126	-3	0	0	25	21	-3	0	0	19	22	-2	1	0	19	14	-2	1	0	21	14		
	30	0.014000	0.001400	1.00	-53	0	1	-485	-338	-16	1	-3	52	-281	4	2	-5	318	-387	3	1	-3	194	-146	3	1	0	4	53	3	0	0	-7	47		
29	30	0.014000	0.001400	1.00	101	0	-1	-814	-599	67	1	3	-464	-621	59	1	5	-152	-715	15	0	3	44	-366	-6	-1	0	46	75	-6	-1	0	38	66		
	31	0.014000	0.001400	1.00	-100	1	-2	-999	-999	-81	0	-2	-846	-753	-56	0	-2	-397	-961	-19	1	-6	382	-849	0	3	-19	844	-816	9	2	-6	416	-990		
21	31	0.014000	0.001400	1.00	144	2	2	-959	-1224	144	2	2	-878	-1184	136	3	2	-983	-1187	111	4	8	-446	-1081	66	5	19	92	-1068	19	2	6	366	-427		
	32	0.014000	0.001400	[illegible]	-144	-1	5	-1401	-756	-144	-1	5	-1413	-718	-136	-1	7	-1447	-574	-111	-2	9	-1469	-397	-66	-7	9	-1080	66	19	-1	2	-469	37		
22	32	0.014000	[illegible]	[illegible]	190	0	-5	-1469	-981	205	0	-6	-1586	-1046	214	0	-7	-1704	-1065	211	-1	-9	-1785	-838	163	-1	-9	-1667	-838	165	1	-3	-1666	-838		
	33	0.014000	0.001400	[illegible]	-190	2	2	-1309	-1142	-205	2	2	-1410	-1233	-214	2	2	-1498	-1284	-211	3	1	-1415	-1082	-163	3	1	-1287	-1165	-156	1	2	-1488	-910		
23	33	0.014000	0.001400	[illegible]	239	1	-2	-1586	-1389	254	[illegible]	-2	-1751	-1574	264	1	-2	-1907	-1745	261	1	-1	-1882	-1661	204	2	-1	-1813	-1585	250	1	-2	-1656	-1660		
	34	0.014000	0.001400	[illegible]	-239	1	3	-1612	-1334	-256	1	3	-1817	-1508	-264	0	4	-1936	-1686	-261	0	4	-2117	-1795	-204	0	4	-2146	-1782	-250	1	3	-2004	-1745		
24	34	0.020000	0.002671	[illegible]	256	1	-3	-1245	-1089	[illegible]	2	-3	-1446	-1274	343	2	-4	-1645	1484	376	2	-3	[illegible]	-1642	406	2	-4	-1826	-1782	417	3	-3	-1997	-1668		
	35	0.020000	0.002671	[illegible]	-256	0	5	-1363	1329	-261	0	7	-1833	-1190	-343	0	6	-1756	-342	-379	-3	9	-1468	-1479	-406	-1	11	-2114	-1668	-417	-1	12	-2166	-1572		
25	35	0.020000	0.002671	[illegible]	300	1	-5	-1669	-886	336	1	-7	-1291	-1340	397	1	-8	-1849	-1257	453	1	-9	-1787	-1084	501	1	-11	-1882	-1668	535	1	-12	-1977	-1668		
	36	0.020000	0.002671	[illegible]	-300	1	5	-1662	-884	-336	1	8	-1277	-1044	-397	1	7	-1487	-1297	-453	1	8	-1785	-1487	-499	2	8	-1887	-1668	-493	2	8	-2007	-1668		
26	36	0.020000	0.002697	1.02	382	2	-6	-911	-748	384	2	-9	-1128	-884	448	2	-7	-1357	-1134	515	2	-8	-1888	-1668	557	3	-9	-1788	-1668	548	3	-9	-1891	-1668		
	37	0.020000	0.002697	1.02	-382	1	7	-937	-719	-384	1	9	-1174	-886	-448	0	12	-1438	-1668	-515	0	14	-1668	-1342	-557	-1	17	-1918	-1448	-548	-1	16	-2128	-1644		
27	37	0.042000	0.007564	1.02	297	0	-7	-612	-629	384	-1	-9	-1052	-812	478	-1	-12	-1312	-1014	575	-2	-14	-1668	-1215	671	-2	-17	-1845	-1416	768	-3	-19	-2085	-1668		
	38	0.042000	0.007564	1.02	-297	3	0	-714	-714	-384	3	0	-824	-824	-478	4	0	-1150	-1150	-575	4	0	-1384	-1384	-671	5	0	-1615	-1615	-758	5	0	-1886	-1886		

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

POSICION 7-S					POSICION 8-S					POSICION 9-S					POSICION 10-S					POSICION 11-S					POSICION 12-S					POSICION 13-S				
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
-2	1	0	19	15	-2	1	0	17	16	-2	0	0	17	16	-2	0	0	17	16	-3	0	0	19	2*	-2	0	0	17	16	-2	0	0	17	16
3	-1	0	23	15	3	1	0	42	-6	3	-1	-1	49	-11	3	1	0	46	-9	3	1	-1	52	-7	3	1	0	47	-10	3	1	0	47	-10
-8	0	0	60	51	-8	1	0	82	33	-8	1	1	88	28	-8	1	0	86	30	-5	1	1	95	35	-8	1	0	87	29	-8	1	0	87	29
8	1	-1	147	-30	8	1	0	82	56	8	0	0	43	71	8	0	0	53	87	8	0	0	95	78	8	0	0	46	72	8	0	0	48	71
-16	0	1	219	39	-17	0	0	128	121	-17	0	0	107	141	-17	0	0	117	132	-15	0	0	125	147	-17	0	0	112	136	-17	0	0	113	135
18	1	-5	421	-156	17	1	-4	366	-111	17	1	-1	209	38	17	1	-1	190	60	16	1	-2	231	36	17	1	-2	222	26	17	1	-1	214	34
84	2	5	-383	-824	11	0	4	113	-254	-36	-2	1	292	163	-34	-1	1	262	184	35	1	2	294	149	-24	1	2	265	136	-34	1	1	278	142
-94	0	0	-810	-595	-11	2	-9	325	-487	36	4	-15	931	-469	34	2	-8	584	-152	35	0	1	192	45	34	0	1	165	256	34	1	0	221	199
261	1	0	-1686	-1673	203	3	9	-914	-1703	116	4	15	-42	-1449	1	0	8	351	-382	-62	-4	-1	36*	416	-57	-2	-1	306	480	-56	0	0	382	340
-261	0	3	-1807	-1551	-203	-2	3	-1467	-1151	-116	-3	1	-769	-721	-3	2	-13	582	-822	62	6	-23	1444	-854	57	4	-10	850	-231	56	1	-2	453	249
411	3	-3	-1931	-1786	383	3	-7	-1820	-1641	329	4	-7	-1495	-1467	244	7	13	-763	-1443	122	5	23	63	-1145	-21	3	1	427	-244	-67	-3	2	440	324
-411	-1	13	-2185	-1522	-383	1	12	-2071	-1389	-329	-2	14	-1843	-1116	-244	-6	17	-1552	-854	-122	-7	14	-924	-174	21	-1	-5	228	-46	67	5	-19	898	-112
561	0	-13	-2162	-1668	562	0	-13	-2170	-1690	535	0	-14	-2104	-1595	490	-1	-17	-1999	-1366	404	-1	-14	-1657	-1129	295	0	5	-915	-1110	144	5	19	-137	-849
-561	2	9	-2093	-1758	-562	2	9	-2031	-1789	-535	-1	8	-1990	-1709	-490	4	5	-1781	-1586	406	3	4	-1459	-1345	-295	-1	5	-1103	-922	-144	-3	-1	-1**	-815
696	4	-8	-2113	-1833	727	4	-9	-2195	-1826	736	5	-8	-2199	-1964	720	5	-5	-2121	-1858	669	6	-4	-1956	-1835	590	5	-5	-1764	-1613	486	6	1	-1355	-1382
-696	-1	21	-2295	-1652	-727	-2	23	-2406	-1715	-736	-2	24	-2444	-1719	-720	-3	25	-2413	-1665	-669	-3	24	-2281	-1528	-590	-2	22	-2030	-1348	-485	-4	21	-1898	-1849
857	-3	-21	-2301	-1783	899	-4	-23	-2473	-1894	945	-4	-24	-2585	-1678	860	-4	-25	-2648	-2019	944	-4	-24	-2900	-1987	811	-4	-22	-2497	-1826	838	-3	-21	-2307	-1765
-857	6	0	-2013	-2013	-899	6	0	-2163	-2163	-945	6	0	-2260	-2260	-860	6	0	-2310	-2310	-944	6	0	-2272	-2272	-811	6	0	-2191	-2191	-838	6	0	-2017	-2017

CINCAPE1.XLS 8/05/97

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

POSICION 14-S					POSICION 15-S					POSICION 16-S					POSICION 17-S					POSICION 18-S					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	TMAX-	TSUP-	TMAX-	TINF-		
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2		
-2	0	0	17	16	-2	0	0	17	16	-2	0	0	17	16	-2	0	0	17	16	-2	0	0	17	16	-3	0	0	19	21	35	-356	32	-491	19	29
3	1	0	47	-9	3	1	0	47	-9	3	1	0	47	-9	3	1	0	47	-9	3	1	0	47	-9	3	1	-1	52	-7	319	-452	47	-328		30
-8	1	0	86	29	-8	1	0	86	29	-8	1	0	86	29	-8	1	0	86	29	-8	1	0	86	29	-9	1	1	86	36	86	-614	86	-631	30	30
8	0	0	50	69	8	0	0	50	69	8	0	0	49	70	8	0	0	50	69	8	0	0	50	69	9	0	0	55	78	844	-486	79	-469		31
-17	0	0	115	134	-17	0	0	115	134	-17	0	0	114	135	-17	0	0	115	134	-17	0	0	115	134	-19	0	0	125	148	285	-975	147	-1354	21	31
17	1	-1	211	39	17	1	-1	211	38	17	1	-1	212	37	17	1	-1	211	38	17	1	-1	211	38	19	1	-1	232	44	431	-1447	88	-786		32
-33	1	1	374	144	-33	1	1	275	144	-34	1	1	275	143	-34	1	1	275	144	-33	1	1	275	147	-36	1	1	330	184	284	-1788	184	-1644	22	32
33	1	-1	343	178	33	1	-1	236	180	34	1	-1	237	181	34	1	-1	237	181	33	1	-1	269	186	36	1	-1	285	191	181	-1405	289	-1388		33
-57	1	1	388	321	-57	1	1	364	327	-57	1	1	380	328	-57	1	1	382	328	-57	1	1	384	324	-59	1	1	401	340	401	-1813	419	-1686	23	33
57	1	0	376	288	57	1	-1	360	316	57	1	-1	400	296	57	1	-1	400	300	57	1	-1	382	315	59	1	1	411	321	1044	-2140	389	-1702		34
-73	-2	1	366	358	-88	1	1	387	-34	-87	1	1	404	346	-86	1	1	403	351	-86	0	1	389	354	-89	0	1	413	357	449	-1497	357	-1559	24	34
86	3	-12	906	55	88	1	-2	488	315	88	1	-1	412	343	86	1	-3	443	370	86	1	-3	486	384	89	1	-3	439	384	888	-2188	388	-1838		36
-34	-1	12	837	-110	-127	-7	2	486	381	134	-4	1	457	388	-128	1	3	458	388	-128	1	3	473	401	-138	1	3	489	388	489	-2178	389	-1988	25	36
34	0	-24	801	-884	127	9	-49	1166	-288	134	8	-24	848	-5	134	2	-5	499	325	135	1	-2	449	389	138	1	-3	496	391	1166	-2888	391	-1788		38
336	11	24	-484	-1318	147	13	48	386	-1888	-46	-7	21	553	-170	-180	-5	8	572	426	-178	-3	2	514	488	-177	0	4	553	481	572	-2188	481	-1884	26	38
-336	-8	22	-1288	-898	-147	-11	15	-882	-181	66	-1	-13	386	-2	180	8	-35	1028	-18	178	8	-22	814	188	177	2	-7	882	388	1088	-2844	388	-1718		37
729	-4	-22	-2857	-1486	585	-2	-15	-1617	-1223	402	4	13	-812	-1139	178	9	35	18	-878	-87	6	22	482	-82	361	3	-7	889	481	889	-2846	484	-2018	27	37
-729	6	0	-1755	-1755	-585	4	0	-1487	-1487	-402	-2	0	-986	-986	-178	-6	0	-428	-428	87	-3	0	306	306	361	0	0	570	570	570	-2219	570	-2219		39

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-8					POSICION 2-8					POSICION 3-8					POSICION 4-8					POSICION 5-8					POSICION 6-8				
		AREA M2	MOD.RES M3	PAND.	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
29	1	0.003980	1.000000	1.10	36	0	0	-1174	-1174	11	0	1	-371	-371	-2	0	0	66	66	-2	0	0	66	66	-1	0	0	22	22	-1	0	0	33	33
	29	0.003400	1.000000	1.10	-36	0	-1	-1189	-1189	-11	0	0	-366	-366	2	0	0	73	73	2	0	0	54	54	1	0	0	28	28	1	0	0	28	28
26	2	0.003400	1.000000	1.19	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6
	26	0.003400	1.000000	1.19	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-7	-7	0	0	0	-6	-6	0	0	0	-7	-7	0	0	0	-7	-7
30	3	0.004980	1.000000	1.20	43	0	0	-1281	-1281	65	0	0	-1903	-1903	58	0	0	-1719	-1719	20	0	0	-592	-592	-6	0	0	139	139	-6	0	0	118	118
	30	0.004980	1.000000	1.20	-43	0	0	-1254	-1254	-64	0	0	-1896	-1896	-58	0	0	-1712	-1712	-20	0	0	-575	-575	6	0	0	145	145	5	0	0	124	124
31	4	0.003400	1.000000	1.51	-15	0	0	435	435	-21	0	0	630	630	14	0	0	-644	-644	29	0	0	-1281	-1281	-2	0	0	72	72	-1	0	0	34	34
	21	0.003400	1.000000	1.51	15	0	0	437	437	21	0	0	632	632	-14	0	0	-640	-640	-29	0	0	-1278	-1278	3	0	0	75	75	1	0	0	36	36
32	5	0.007480	1.000000	1.15	23	0	0	-350	-350	36	0	0	-573	-573	60	0	0	-609	-609	67	0	0	-1316	-1316	79	0	0	-1185	-1185	22	0	0	-336	-336
	31	0.007480	1.000000	1.15	-23	0	0	-345	-345	-36	0	0	-569	-569	-60	0	0	-604	-604	-67	0	0	-1312	-1312	-79	0	0	-1181	-1181	-22	0	0	-333	-333
33	6	0.003400	1.000000	1.10	-13	0	0	391	391	-19	0	0	563	563	-28	0	0	836	836	-35	0	0	1030	1030	14	0	0	-452	-452	35	0	0	-1139	-1139
	22	0.003400	1.000000	1.10	13	0	0	394	394	19	0	0	566	566	29	0	0	841	841	35	0	0	1033	1033	-14	0	0	-448	-448	-35	0	0	-1135	-1135
34	7	0.010980	1.000000	1.07	42	0	0	-422	-422	55	0	0	-[illegible]	-555	71	0	0	-709	-709	86	0	0	-991	-991	110	0	0	-1101	-1101	133	0	0	-1334	-1334
	32	0.010980	1.000000	1.07	-42	0	0	-419	-419	-55	0	0	-552	-552	-70	0	0	-706	-706	-87	0	0	-978	-978	-109	0	0	-1098	-1098	-133	0	0	-1331	-1331
35	8	0.004800	1.000000	1.05	-14	0	0	290	290	-20	0	0	408	408	-27	0	0	594	594	-35	0	0	737	737	-49	0	0	1023	1023	-66	0	0	1364	1364
	23	0.004800	1.000000	1.05	14	0	0	295	295	20	0	0	413	413	27	0	0	599	599	36	0	0	741	742	49	0	0	1026	1022	74	[illegible]	0	1170	1170
36	9	0.014810	1.000000	1.16	39	0	0	-307	-307	52	0	0	-417	-417	68	0	0	-640	-640	87	0	0	-823	-999	106	0	0	-854	-854	[illegible]	0	0	-1021	-1021
	33	0.014810	1.000000	1.13	-38	0	0	-301	-307	-51	0	0	-407	-407	-67	0	0	-634	-634	-86	[illegible]	[illegible]	-833	-993	-107	0	0	-849	-849	[illegible]	[illegible]	0	-1015	-1015
37	10	0.008800	1.000000	1.04	5	0	0	134	134	-12	0	0	275	209	-17	0	0	302	302	-23	0	[illegible]	417	417	-31	0	0	555	555	-40	0	0	722	722
	24	0.008800	1.000000	1.04	8	0	0	139	139	12	0	0	211	213	17	0	0	306	306	24	0	0	421	421	31	0	0	560	560	41	0	0	726	726
38	11	0.014810	1.000000	1.16	30	0	0	-236	-239	42	0	0	-31	-336	56	0	0	-455	-455	75	[illegible]	0	-592	-593	96	0	0	-752	-752	[illegible]	0	[illegible]	-939	-939
	34	0.014810	1.000000	1.16	-29	0	0	-230	-230	-42	[illegible]	0	-332	-330	-57	[illegible]	0	-449	-449	-74	0	0	-587	-587	-94	0	0	-746	-746	-111	0	0	-923	-923
39	12	0.009440	1.000000	1.03	[illegible]	[illegible]	0	56	56	7	[illegible]	0	111	111	-12	[illegible]	0	182	182	-17	0	0	271	271	-24	[illegible]	0	379	379	-33	0	0	505	505
	25	0.009440	1.000000	1.03	4	0	0	54	59	[illegible]	[illegible]	0	114	115	12	0	0	186	186	16	0	[illegible]	275	275	25	0	0	383	383	33	0	0	510	510
40	13	0.019810	1.000000	1.18	27	0	0	-137	-137	36	[illegible]	0	213	[illegible]	51	0	0	-304	-304	68	0	[illegible]	-406	-409	89	0	0	-529	-529	111	0	0	-681	-681
	35	0.019810	1.000000	1.18	-23	0	0	-132	-132	-35	0	0	-206	-208	-50	0	0	-299	-299	-68	0	0	-402	-405	-89	0	0	-525	-525	-111	0	0	-688	-688
41	14	0.008460	1.000000	1.03	2	0	0	-20	-20	-2	0	0	19	19	-6	0	0	89	89	-11	0	0	133	133	-15	0	0	213	213	-20	0	0	311	311
	26	0.008460	1.000000	1.03	-1	0	0	-15	-15	3	0	0	24	24	5	0	0	74	74	12	0	0	138	138	18	0	0	218	218	27	0	0	316	316
42	15	0.024810	1.000000	1.18	15	0	0	-71	-71	28	0	0	-134	-134	44	0	0	-208	-208	62	0	0	-294	-294	83	0	0	-382	-382	109	0	0	-500	-500
	36	0.024810	1.000000	1.18	-14	0	0	-66	-66	-27	0	0	-128	-128	-43	0	0	-202	-202	-61	0	0	-289	-289	-82	0	0	-387	-387	-104	0	0	-495	-495
43	16	0.008880	1.000000	1.02	6	0	0	-88	-88	4	0	0	-45	-45	1	0	0	-13	-13	-3	0	0	29	29	-8	0	0	84	84	-15	0	0	192	192
	27	0.008880	1.000000	1.02	-6	0	0	-84	-84	-4	0	0	-41	-41	-1	0	0	-8	-8	3	0	0	34	34	9	0	0	88	88	15	0	0	186	186
44	17	0.028810	1.000000	1.18	5	0	0	-24	-24	20	0	0	-80	-80	38	0	0	-145	-145	54	0	0	-221	-221	76	0	0	-308	-308	99	0	0	-405	-405
	37	0.028810	1.000000	1.18	-5	0	0	-20	-20	-18	0	0	-75	-75	-34	0	0	-141	-141	-53	0	0	-217	-217	-74	0	0	-303	-303	-96	0	0	-399	-399
45	18	0.014910	1.000000	1.00	12	0	0	-77	-77	11	0	0	-76	-76	11	0	0	-72	-72	10	0	0	-64	-64	7	0	0	-50	-50	4	0	0	-29	-29
	28	0.014910	1.000000	1.00	-11	0	0	-74	-74	-11	0	0	-74	-74	-10	0	0	-70	-70	-9	0	0	-61	-61	-7	0	0	-47	-47	-4	0	0	-26	-26
46	19	0.011600	1.000000	1.16	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6
	38	0.011600	1.000000	1.16	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

POSICION 7-8					POSICION 8-8					POSICION 9-8					POSICION 10-8					POSICION 11-8					POSICION 12-8					POSICION 13-8				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
-1	0	0	35	35	-1	0	0	35	35	-1	0	0	35	35	-1	0	0	35	35	-1	0	0	35	35	-1	0	0	35	35	-1	0	0	35	35
1	0	0	30	30	1	0	0	30	30	1	0	0	30	30	1	0	0	30	30	1	0	0	41	41	1	0	0	30	30	1	0	0	30	30
0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-10	-10	0	0	0	-6	-6	0	0	0	-6	-6
0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-8	-8	0	0	0	-7	-7	0	0	0	-7	-7
-3	0	0	86	86	-3	0	0	84	84	-3	0	0	85	85	-3	0	0	85	85	-4	0	0	94	94	-3	0	0	84	84	-3	0	0	86	86
4	0	0	91	91	4	0	0	90	90	4	0	0	90	90	4	0	0	90	90	4	0	0	100	100	4	0	0	90	90	4	0	0	88	88
-1	0	0	-31	-31	1	0	0	-32	-32	1	0	0	-31	-31	1	0	0	-31	-31	1	0	0	-36	-36	1	0	0	-32	-32	1	0	0	-32	-32
-1	0	0	-27	-27	-1	0	0	-29	-29	-1	0	0	-28	-28	-1	0	0	-27	-27	-1	0	0	-33	-33	-1	0	0	-29	-29	-1	0	0	-29	-29
-7	0	0	86	86	-6	0	0	82	82	-5	0	0	73	73	-5	0	0	73	73	-6	0	0	78	78	-6	0	0	75	75	-6	0	0	74	74
7	0	0	82	82	6	0	0	86	86	6	0	0	77	77	6	0	0	78	78	6	0	0	82	82	6	0	0	79	79	6	0	0	78	78
0	0	0	-6	-6	1	0	0	-47	-47	3	0	0	-61	-61	2	0	0	-79	-79	2	0	0	-81	-81	2	0	0	-76	-76	2	0	0	-77	-77
0	0	0	-6	-6	-1	0	0	-43	-43	-2	0	0	-76	-76	-2	0	0	-76	-76	-2	0	0	-77	-77	-2	0	0	-72	-72	-2	0	0	-73	-73
-186	0	0	-1002	-1002	28	0	0	391	391	-18	0	0	169	169	-14	0	0	134	134	-12	0	0	113	113	-12	0	0	111	111	-12	0	0	113	113
-186	0	0	-1000	-1000	-28	0	0	-279	-278	18	0	0	171	171	15	0	0	137	137	12	0	0	116	116	12	0	0	114	114	12	0	0	116	116
37	0	0	-816	-816	66	0	0	-1412	-1412	-7	0	0	139	139	0	0	0	-2	-2	5	0	0	-106	-106	4	0	0	-86	-86	4	0	0	-89	-89
-37	0	0	-812	-812	-64	0	0	-1407	-1407	7	0	0	143	143	0	0	0	3	3	-5	0	0	-101	-101	-4	0	0	-81	-81	-4	0	0	-84	-84
184	0	0	-1222	-1222	181	0	[illegible]	-1435	-1435	148	0	0	-1169	-1169	37	0	0	-304	-304	-27	0	0	181	181	-22	[illegible]	[illegible]	145	145	-18	0	0	123	123
-184	0	0	-1218	-1218	-181	0	0	-1429	-1429	-147	0	0	-1163	-1163	-36	0	0	-304	-306	29	0	0	186	186	22	[illegible]	0	150	150	18	0	0	139	139
63	0	0	949	949	-69	0	0	1667	1667	47	0	0	-867	-867	63	0	0	-1538	-1538	-8	0	0	152	152	0	0	0	-2	-2	5	0	0	-88	-87
63	0	0	964	964	60	0	[illegible]	1671	1671	-46	0	0	-862	-862	-63	0	[illegible]	-1533	-1533	9	0	0	167	167	0	[illegible]	0	3	3	-5	0	0	-91	-91
612	[illegible]	0	-1139	-1139	166	0	0	[illegible]314	-1314	146	0	0	-1547	[illegible]547	226	0	0	-1919	-1619	181	0	[illegible]	-1488	[illegible]118	42	[illegible]	0	-138	-388	-58	0	0	165	165
-161	0	0	-1114	-1114	-146	0	0	[illegible]	-1388	[illegible]82	0	0	-1641	-1641	-329	0	[illegible]	-1613	-1613	-180	0	0	-1484	[illegible]134	-46	0	0	-314	-314	39	0	0	189	189
42	0	0	886	886	-54	0	0	891	891	-71	0	0	1666	1666	-53	0	0	1385	1385	62	0	0	-836	-887	84	0	0	-1087	-1087	-2	0	0	89	89
42	0	0	889	889	54	0	[illegible]	888	836	71	0	[illegible]	1160	1160	53	0	0	1389	1389	-62	0	0	835	886	-84	0	0	-1088	-1088	2	0	0	94	94
-39	0	0	-888	-888	169	0	[illegible]	-889	-889	191	0	0	-1133	-1133	218	0	0	-1388	-1388	249	0	0	-1488	-1488	291	0	0	-1738	-1738	341	0	0	-1918	-1918
-188	0	0	-888	-888	-169	0	0	-884	-884	-190	0	0	-1138	-1138	-218	0	0	-1388	-1388	-247	0	0	-1483	-1483	-288	[illegible]	0	-1731	-1731	-338	0	0	-1888	-1888
89	0	0	839	839	46	[illegible]	0	886	888	61	0	0	724	724	77	0	0	907	907	96	0	0	1161	1161	117	0	0	1388	1388	78	0	0	972	972
87	0	0	884	884	46	0	0	873	873	62	0	0	728	728	77	0	0	912	912	99	0	0	1168	1168	117	0	0	1388	1388	71	0	0	887	887
131	0	0	-888	-888	139	0	0	-749	-749	167	0	0	-987	-987	226	0	0	-1349	-1349	249	0	0	-1174	-1174	288	0	0	-1388	-1388	316	0	0	-1488	-1488
-139	0	0	-815	-815	-137	0	0	-744	-744	-166	0	0	-981	-981	-216	0	0	-1336	-1336	-247	0	0	-1169	-1169	-276	0	0	-1388	-1388	-314	0	0	-1488	-1488
85	0	0	386	386	-32	0	0	886	886	-44	0	0	483	483	-57	0	0	888	888	-70	0	0	722	722	-89	0	0	974	974	-113	0	0	1178	1178
89	0	0	340	340	33	0	0	340	340	44	0	0	488	488	57	0	0	886	886	70	0	0	727	727	89	0	0	972	972	113	0	0	1174	1174
135	0	0	-809	-809	153	0	0	-823	-823	182	0	0	-743	-743	214	0	0	-973	-973	244	0	0	-1166	-1166	288	0	0	-1388	-1388	317	0	0	-1388	-1388
-134	0	0	-804	-804	-151	0	0	-818	-818	-181	0	0	-736	-736	-213	0	0	-988	-988	-243	0	0	-1161	-1161	-288	0	0	-1140	-1140	-315	0	0	-1388	-1388
9	0	0	0	0	-4	0	0	38	38	-13	0	0	87	87	-22	0	0	147	147	-31	0	0	216	216	-46	0	0	304	304	-49	0	0	384	384
9	0	0	3	3	9	0	0	41	41	13	0	0	90	90	22	0	0	149	149	32	0	0	213	213	46	0	0	305	305	69	0	0	387	387
1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6
1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

POSICION 14-S					POSICION 15-S					POSICION 16-S					POSICION 17-S					POSICION 18-S					POSICION 19-N					TENS. MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TSUP+ K/CM2	TSUP- K/CM2	TINF+ K/CM2	TINF- K/CM2		
-1	0	0	25	25	-1	0	0	25	25	-1	0	0	25	25	-1	0	0	25	25	-1	0	0	25	25	-1	0	0	36	36	60	-1174	60	-1174	28	1
1	0	0	30	30	1	0	0	30	30	1	0	0	30	30	1	0	0	30	30	1	0	0	30	30	1	0	0	41	41	73	-1168	73	-1168		29
0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-6	-6	0	0	0	-11	-11	0	-11	0	-11	29	2
0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-7	-7	0	0	0	-9	-9	0	-9	0	-9		30
-3	0	0	84	84	-3	0	0	84	84	-3	0	0	84	84	-3	0	0	84	84	-3	0	0	84	84	-4	0	0	94	94	139	-1883	139	-1883	30	3
4	0	0	90	90	4	0	0	90	90	4	0	0	90	90	4	0	0	90	90	4	0	0	90	90	4	0	0	100	100	145	-1886	145	-1886		30
1	0	0	-32	-32	1	0	0	-33	-33	1	0	0	-33	-33	1	0	0	-33	-33	1	0	0	-33	-33	1	0	0	-36	-36	630	-1281	630	-1281	31	4
-1	0	0	-29	-29	-1	0	0	-29	-29	-1	0	0	-30	-30	-1	0	0	-30	-30	-1	0	0	-30	-30	-1	0	0	-35	-35	632	-1278	632	-1278		31
-6	0	0	74	74	-6	0	0	74	74	-6	0	0	74	74	-6	0	0	74	74	-6	0	0	74	74	-6	0	0	78	78	88	-1316	88	-1316	32	5
6	0	0	78	78	6	0	0	78	78	6	0	0	78	78	6	0	0	78	78	6	0	0	78	78	6	0	0	82	82	92	-1312	92	-1312		31
2	0	0	-77	-77	2	0	0	-77	-77	2	0	0	-78	-78	2	0	0	-78	-78	2	0	0	-78	-78	3	0	0	-82	-83	1030	-1136	1030	-1136	33	6
-2	0	0	-74	-74	-2	0	0	-74	-74	-2	0	0	-74	-74	-2	0	0	-74	-74	-2	0	0	-75	-75	-2	0	0	-80	-80	1033	-1135	1033	-1135		32
-12	0	0	114	114	-12	0	0	113	113	-12	0	0	113	113	-12	0	0	113	11	-12	0	0	113	113	-12	0	0	117	117	169	-1334	169	-1334	34	7
12	0	0	116	116	12	0	0	116	116	12	0	0	116	116	12	0	0	116	116	12	0	0	116	116	13	0	0	120	120	171	-1331	171	-1331		32
4	0	0	-89	-89	4	0	0	-89	-89	4	0	0	-90	-90	4	0	0	-90	-90	4	0	0	-90	-90	4	0	0	-92	-92	1164	-1412	1164	-1412	35	8
-4	0	0	-83	-83	-4	0	0	84	-84	-4	0	0	-84	-84	-4	0	0	-84	-84	-4	0	0	-84	-84	-4	0	0	-87	-87	1170	-1407	1170	-1407		33
-18	0	0	123	123	-19	0	0	124	124	-19	0	0	125	125	-19	0	0	124	124	-19	0	0	124	124	-19	0	0	127	127	181	-1435	181	-1435	36	9
19	0	0	128	128	19	0	0	129	129	19	0	0	130	130	19	0	0	129	129	19	0	0	129	129	20	0	0	132	132	186	-1429	186	-1429		33
5	0	0	-84	-84	5	0	0	-90	-90	5	0	0	-89	-89	5	0	0	-90	-90	5	0	0	-91	-91	5	0	0	-92	-92	1067	-1536	1067	-1536	37	10
-5	0	0	-86	-86	-5	0	0	-85	-85	-5	0	0	-85	-85	-5	0	0	-86	-86	-5	0	0	-86	-86	-5	0	0	-87	-87	1071	-1533	1071	-1533		34
-26	0	0	176	176	-34	0	0	159	159	-2	0	0	160	160	-24	0	0	162	162	21	0	0	162	162	-25	0	0	165	165	193	-1819	193	-1819	38	11
27	0	0	181	181	25	0	0	165	165	27	0	0	165	165	25	0	0	167	167	25	0	0	167	167	25	0	0	170	170	198	-1813	198	-1813		34
3	0	0	-82	-82	7	0	0	-115	-115	7	0	0	-111	-111	7	0	0	-106	-106	7	0	0	-106	-106	7	0	0	-107	-107	1285	-1507	1285	-1507	39	12
-3	0	0	-48	-48	-7	0	0	-111	-111	-7	0	0	-107	-107	-6	0	0	-102	-102	-6	0	0	-102	-102	-6	0	0	-103	-103	1289	-1503	1289	-1503		35
51	0	0	-290	-290	-42	0	0	213	213	50	0	0	181	181	-31	0	0	157	157	-31	0	0	156	156	-32	0	0	160	160	213	-1725	213	-1725	40	13
-50	0	0	-296	-296	43	0	0	216	216	37	0	0	185	185	32	0	0	161	161	32	0	0	161	161	33	0	0	164	164	216	-1721	216	-1721		35
126	0	0	-1525	-1525	-10	0	0	118	118	0	0	0	-16	-16	9	0	0	-112	-112	9	0	0	-107	-107	8	0	0	-101	-101	1381	-1525	1381	-1525	41	14
-125	0	0	-1520	-1520	10	0	0	123	123	-7	0	0	-11	-11	-9	0	0	-107	-107	-8	0	0	-102	-102	-8	0	0	-96	-96	1386	-1520	1386	-1520		36
353	0	0	-1671	-1671	274	0	0	-1296	-1296	62	0	0	-292	-292	-53	0	0	214	214	-46	0	0	187	187	-41	0	0	166	166	214	-1671	214	-1671	42	15
-352	0	0	-1666	-1666	-273	0	0	-1291	-1291	-61	0	0	-287	-287	55	0	0	219	216	48	0	0	191	191	43	0	0	171	171	219	-1666	219	-1666		36
-123	0	0	1275	1275	61	0	0	-854	-854	147	0	0	-1547	-1547	-13	0	0	134	134	0	0	0	2	2	9	0	0	-93	-93	1275	-1547	1275	-1547	43	16
124	0	0	1279	1279	-60	0	0	-849	-849	-146	0	0	-1543	-1543	13	0	0	136	136	1	0	0	7	7	-8	0	0	-88	-88	1279	-1543	1279	-1543		37
348	0	0	-1420	-1420	386	0	0	-1582	-1582	432	0	0	-1785	-1785	344	0	0	-1404	-1404	93	0	0	-378	-378	-52	0	0	180	180	180	-1788	180	-1788	44	17
-347	0	0	-1415	-1415	-386	0	0	-1577	-1577	-431	0	0	-1780	-1780	-343	0	0	-1399	-1399	-92	0	0	-374	-374	53	0	0	184	184	184	-1780	184	-1780		37
-75	0	0	803	803	-101	0	0	678	678	-113	0	0	758	758	137	0	0	-917	-917	210	0	0	-1405	-1405	4	0	0	-30	-30	758	-1405	758	-1405	45	18
75	0	0	506	506	102	0	0	681	681	114	0	0	761	761	-136	0	0	-914	-914	-209	0	0	-1402	-1402	-4	0	0	-27	-27	761	-1402	761	-1402		39
1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	0	-6	0	-6	46	19
1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	5	0	5	0		38

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-S					POSICION 2-S					POSICION 3-S					POSICION 4-S					POSICION 5-S					POSICION 6-S				
		AREA M2	MOD.RES. M3	PAND	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
47	39	0.003460	1.000000	2.32	-56	0	0	1652	1652	-18	0	0	535	535	3	0	0	-235	-235	3	0	0	-356	-356	3	0	0	-176	-176	3	0	0	-186	-186
	20	0.003460	1.000000	2.32	56	0	0	1650	1650	18	0	0	533	533	-4	0	0	-341	-341	-3	0	0	-214	-214	-3	0	0	-184	-184	-3	0	0	-184	-184
48	20	0.003460	1.000000	2.32	-56	0	0	1652	1652	-18	0	0	535	535	3	0	0	-235	-235	3	0	0	-356	-356	3	0	0	-176	-176	3	0	0	-186	-186
	3	0.003460	1.000000	2.32	56	0	0	1650	1650	18	0	0	533	533	-4	0	0	-341	-341	-3	0	0	-214	-214	-3	0	0	-184	-184	-3	0	0	-184	-184
49	20	0.004600	1.000000	1.88	-57	0	0	1176	1176	-63	0	0	1739	1739	-74	0	0	1535	1535	-25	0	0	511	511	7	0	0	-254	-254	6	0	0	-227	-227
	21	0.004600	1.000000	1.88	56	0	0	1176	1176	63	0	0	1739	1739	74	0	0	1533	1533	24	0	0	509	509	-7	0	0	-236	-236	-7	0	0	-231	-231
50	21	0.004600	1.000000	1.88	-43	0	0	899	899	-64	0	0	1327	1327	-66	0	0	1786	1786	-50	0	0	1694	1694	8	0	0	-352	-352	8	0	0	-274	-274
	5	0.004600	1.000000	1.88	43	0	0	895	895	64	0	0	1325	1325	66	0	0	1784	1784	50	0	0	1692	1692	-9	0	0	-350	-350	-8	0	0	-277	-277
51	31	0.008440	1.000000	1.33	-82	0	0	959	959	-81	0	0	1251	125	-104	0	0	1616	1616	-127	0	0	1979	1979	-103	0	0	1686	1686	-96	0	0	371	371
	32	0.008440	1.000000	1.33	82	0	0	956	956	80	0	0	1248	1248	104	0	0	1614	1614	127	0	0	1987	1987	103	0	0	1684	1684	94	0	0	368	368
52	32	0.008440	1.000000	1.33	-82	0	0	991	991	-96	0	0	1039	1039	-83	0	0	1298	1298	-101	0	0	1661	1661	-114	0	0	1782	1782	-98	0	0	771	771
	7	0.008440	1.000000	1.33	81	0	0	796	796	98	0	0	1023	1023	83	0	0	1283	1283	100	0	0	1660	1660	113	0	0	1780	1780	99	0	0	768	768
53	32	0.010560	1.000000	1.19	-82	0	0	982	982	-83	0	0	777	778	-107	0	0	1002	1002	-132	0	0	1367	1367	-109	0	0	1662	1662	-107	0	0	1046	1046
	33	0.010560	1.000000	1.19	82	0	0	980	980	83	0	0	775	775	106	0	0	986	986	135	0	0	1365	1365	108	0	0	1679	1679	108	0	0	1042	1042
54	33	0.010560	1.000000	1.19	-82	0	0	486	486	-86	0	0	834	834	-86	0	0	810	810	-108	0	0	1214	1214	-131	0	0	1333	1333	-104	0	0	1448	1448
	9	0.010560	1.000000	1.19	82	0	0	485	485	87	0	0	833	833	86	0	0	808	808	106	0	0	1012	1012	131	0	0	1330	1330	104	0	0	1446	1446
55	33	0.014010	1.000000	1.55	-82	0	0	350	350	-72	0	0	461	461	-86	0	0	837	837	-132	0	0	916	916	-103	0	0	1684	1684	-107	0	0	1388	1388
	34	0.014010	1.000000	1.55	82	0	0	347	347	71	0	0	458	458	85	0	0	835	835	127	0	0	914	914	102	0	0	1682	1682	107	0	0	1384	1384
56	34	0.014010	1.000000	1.55	-46	0	0	366	366	-62	0	0	418	418	-62	0	0	648	648	-104	0	0	887	887	-139	0	0	885	886	-107	0	0	1669	1669
	11	0.014010	1.000000	1.55	46	0	0	365	365	62	0	0	416	416	61	0	0	646	646	103	0	0	884	884	139	0	0	882	882	108	0	0	1647	1647
57	34	0.010560	1.000000	1.33	-46	0	0	356	356	-56	0	0	264	26	-61	0	0	486	486	-108	0	0	535	535	-135	0	0	683	683	-109	0	0	644	644
	35	0.010560	1.000000	1.33	46	0	0	188	188	56	0	0	272	272	60	0	0	483	485	106	0	0	533	533	135	0	0	680	680	108	0	0	642	642
58	35	0.010560	1.000000	1.33	-56	0	0	183	183	-52	0	0	260	260	-71	0	0	388	388	-88	0	0	488	488	-117	0	0	686	686	-108	0	0	716	716
	13	0.010560	1.000000	1.33	36	0	0	181	181	52	0	0	261	261	71	0	0	386	386	92	0	0	484	484	117	0	0	685	685	105	0	0	716	716
59	35	0.004600	1.000000	1.33	-30	0	0	122	122	-50	0	0	201	201	-73	0	0	284	284	-100	0	0	482	482	-131	0	0	680	680	-105	0	0	682	682
	36	0.004600	1.000000	1.33	30	0	0	120	120	48	0	0	199	199	73	0	0	282	282	100	0	0	480	480	130	0	0	554	554	104	0	0	680	680
60	36	0.004600	1.000000	1.33	-50	0	0	122	122	-46	0	0	191	191	-66	0	0	272	272	-91	0	0	554	554	-116	0	0	407	407	-104	0	0	356	576
	16	0.004600	1.000000	1.33	30	0	0	120	120	47	0	0	189	189	67	0	0	270	270	90	0	0	552	552	116	0	0	405	405	103	0	0	576	576
61	36	0.000000	1.000000	1.33	-16	0	0	86	86	-36	0	0	122	122	-56	0	0	201	201	-84	0	0	288	288	-114	0	0	356	356	-107	0	0	516	516
	37	0.000000	1.000000	1.33	16	0	0	84	84	36	0	0	120	120	57	0	0	199	199	84	0	0	286	286	114	0	0	355	355	107	0	0	516	516
62	37	0.000000	1.000000	1.33	-20	0	0	69	69	-37	0	0	139	139	-56	0	0	280	280	-81	0	0	356	356	-107	0	0	371	371	-105	0	0	486	486
	17	0.000000	1.000000	1.33	19	0	0	67	67	37	0	0	137	137	57	0	0	199	199	80	0	0	276	276	107	0	0	369	369	105	0	0	486	486
63	37	0.000410	1.000000	1.33	-4	0	0	16	16	-27	0	0	84	84	-53	0	0	162	162	-82	0	0	282	282	-114	0	0	353	356	-102	0	0	484	484
	38	0.000410	1.000000	1.33	6	0	0	17	17	27	0	0	83	83	52	0	0	160	160	81	0	0	280	280	114	0	0	351	351	105	0	0	482	482
64	38	0.000410	1.000000	1.33	-14	0	0	42	42	-38	0	0	107	107	-59	0	0	183	183	-87	0	0	276	276	-110	0	0	357	357	-102	0	0	478	478
	19	0.000410	1.000000	1.33	13	0	0	40	40	34	0	0	105	105	59	0	0	181	181	87	0	0	274	274	110	0	0	355	355	102	0	0	476	476

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

POSICION 7-8					POSICION 8-8					POSICION 9-8					POSICION 10-8					POSICION 11-8					POSICION 12-8					POSICION 13-8				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
3	0	0	-184	-184	3	0	0	-175	-175	3	0	0	-173	-173	3	0	0	-174	-174	3	0	0	-212	-212	3	0	0	-174	-174	3	0	0	-174	-174
-3	0	0	-188	-188	-3	0	0	-181	-181	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-217	-217	-3	0	0	-179	-179	-3	0	0	-179	-179
3	0	0	-184	-184	3	0	0	-175	-175	3	0	0	-173	-173	3	0	0	-174	-174	3	0	0	-229	-229	3	0	0	-174	-174	3	0	0	-174	-174
-3	0	0	-188	-188	-3	0	0	-181	-181	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-235	-235	-3	0	0	-179	-179	-3	0	0	-179	-179
6	0	0	-219	-219	7	0	0	-237	-237	7	0	0	-243	-243	7	0	0	-242	-242	7	0	0	-261	-261	7	0	0	-242	-242	7	0	0	-242	-242
-6	0	0	-223	-223	-7	0	0	-242	-242	-7	0	0	-248	-248	-7	0	0	-245	-245	-8	0	0	-265	-265	-7	0	0	-246	-246	-7	0	0	-246	-246
6	0	0	-208	-208	6	0	0	-226	-226	7	0	0	-233	-233	7	0	0	-231	-231	7	0	0	-247	-247	7	0	0	-231	-231	7	0	0	-230	-230
-6	0	0	-212	-212	-7	0	0	-230	-230	-7	0	0	-237	-237	-7	0	0	-235	-235	-7	0	0	-251	-251	-7	0	0	-233	-233	-7	0	0	-234	-234
14	0	0	-334	-334	13	0	0	-302	-302	13	0	0	-294	-294	13	0	0	-301	-300	13	0	0	-315	-315	13	0	0	-297	-297	13	0	0	-298	-298
-14	0	0	-337	-337	-13	0	0	-305	-305	-13	0	0	-298	-298	-13	0	0	-303	-303	-13	0	0	-318	-318	-13	0	0	-301	-301	-13	0	0	-302	-302
14	0	0	-336	-336	12	0	0	-283	-283	11	0	0	-257	-257	11	0	0	-264	-264	12	0	0	-278	-278	11	0	0	-263	-263	11	0	0	-263	-263
-14	0	0	-340	-340	-12	0	0	-287	-287	-11	0	0	-261	-261	-11	0	0	-267	-267	-12	0	0	-281	-281	-11	0	0	-267	-267	-11	0	0	-267	-267
152	0	0	1422	1422	36	0	0	365	365	26	0	0	-286	-286	22	0	0	-248	-248	22	0	0	-247	-247	22	0	0	-244	-244	22	0	0	-242	-242
151	0	0	1418	1418	38	0	0	361	361	-26	0	0	-291	-291	-23	0	0	-253	-253	-23	0	0	-252	-251	-22	0	0	-248	-248	-22	0	0	-246	-246
179	0	0	1675	1675	46	0	0	907	8[illegible]	31	0	0	-350	-350	23	0	0	-286	-256	19	0	0	-215	-215	19	0	0	-218	-218	19	0	0	-217	-217
179	0	0	1672	1672	86	0	0	904	904	-32	0	0	-354	-354	-23	0	0	-26[illegible]	761	-20	0	0	-219	-219	-20	0	0	-220	-220	-20	0	0	-221	-221
226	0	0	1516	1516	-260	0	0	1744	1744	-206	0	0	1381	1381	-61	0	0	336	336	36	0	0	-374	-374	31	0	0	-321	-321	30	0	0	-315	-315
226	0	0	1514	1514	260	0	0	1742	1742	2[illegible]	0	0	137[illegible]	1379	40	0	0	33[illegible]	33[illegible]	36	0	0	-375	-37[illegible]	-31	0	0	-323	-325	-31	0	0	-319	-319
186	0	0	1247	1247	-215	0	0	1442	1442	-240	0	0	1609	1609	-11	0	0	746	746	-1[illegible]	0	0	-44[illegible]	-[illegible]	32	0	0	-326	326	27	0	0	-283	-283
186	0	0	1244	1244	215	0	0	1439	1439	239	0	0	1606	1606	111	0	0	744	744	-43	0	0	-43[illegible]	-44[illegible]	-32	0	0	-332	-332	-28	0	0	-287	-287
-204	0	0	1024	1024	-243	0	0	1222	1222	-29[illegible]	0	0	1443	1443	-326	0	0	1639	1639	247	-2	0	1241	1241	-49	0	0	247	247	42	0	0	-325	-325
203	0	0	1022	1022	243	0	0	1221	1221	297	0	0	1441	1441	325	0	0	1637	1637	247	2	-6	1240	1239	45	0	0	245	245	-42	0	0	-326	-326
-172	0	0	883	883	-203	0	0	1019	1019	23[illegible]	0	0	1178	1178	-264	0	0	1326	1326	-294	2	6	1430	1479	-118	0	0	595	595	44	0	0	-342	-342
171	0	0	881	881	202	0	0	1017	1017	234	0	0	1174	1174	264	0	0	1324	1324	294	-2	0	1428	1478	118	0	0	593	593	-44	0	0	-345	-345
-202	0	0	812	812	-243	0	0	975	975	-286	0	0	1147	1147	-333	0	0	1339	1339	-382	-3	0	1534	1534	-427	0	0	1715	1715	-312	0	0	1256	1255
202	0	0	810	810	242	0	0	972	972	285	0	0	1144	1144	333	0	0	1338	1338	381	3	-9	1532	1530	426	0	0	1712	1712	312	0	0	1252	1252
-174	0	0	699	699	-206	0	0	827	827	-239	0	0	959	959	-275	0	0	1105	1105	-307	3	9	1235	1233	-339	0	0	1381	1381	-364	0	0	1464	1464
174	0	0	697	697	205	0	0	824	824	238	0	0	957	957	276	0	0	1103	1103	307	-3	0	1232	1232	338	0	0	1358	1358	364	0	0	1461	1461
-184	0	0	836	836	-224	0	0	774	774	-265	0	0	918	918	-311	0	0	1075	1075	-354	-1	0	1227	1227	-406	0	0	1411	1411	-462	0	0	1596	1596
183	0	0	834	834	223	0	0	772	772	265	0	0	916	916	310	0	0	1073	1073	354	2	-5	1225	1224	407	0	0	1408	1408	461	0	0	1595	1595
-186	0	0	574	574	-196	0	0	686	686	-232	0	0	802	802	-267	0	0	924	924	-301	2	5	1043	1042	-341	0	0	1175	1179	-377	0	0	1304	1304
185	0	0	572	572	198	0	0	684	684	231	0	0	800	800	267	0	0	922	922	301	-1	0	1040	1040	340	0	0	1177	1177	376	0	0	1302	1302
-190	0	0	586	586	-233	0	0	716	716	-277	0	0	856	856	-326	0	0	1005	1005	-372	-1	0	1146	1148	-426	0	0	1314	1314	-478	0	0	1477	1477
189	0	0	585	585	232	0	0	716	716	277	0	0	854	854	325	0	0	1004	1004	372	2	-4	1147	1146	425	0	0	1312	1312	478	0	0	1475	1475
-189	0	0	583	583	-227	0	0	701	701	-267	0	0	823	823	-308	0	0	952	952	-347	2	4	1073	1072	-391	0	0	1206	1206	-434	0	0	1338	1338
188	0	0	581	581	227	0	0	699	699	266	0	0	821	821	308	0	0	950	950	347	-1	0	1070	1070	391	0	0	1208	1208	433	0	0	1337	1337

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

POSICION 14-8					POSICION 15-8					POSICION 16-8					POSICION 17-8					POSICION 18-8					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TSUP+ K/CM2	TSUP- K/CM2	TINF+ K/CM2	TINF- K/CM2		
3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-173	-173	3	0	0	-212	-212	[illegible]	[illegible]	[illegible]	-[illegible]	47	39
-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-217	-217	[illegible]	-341	[illegible]	-341		39
3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-174	-174	3	0	0	-172	-172	3	0	0	-226	-226	[illegible]	-336	[illegible]	-336	46	39
-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-179	-179	-3	0	0	-223	-223	[illegible]	-341	[illegible]	-341		3
7	0	0	-242	-242	7	0	0	-242	-242	7	0	0	-242	-242	7	0	0	-242	-242	7	0	0	-242	-242	7	0	0	-261	-261	[illegible]	-351	[illegible]	-351	48	39
-7	0	0	-246	-246	-7	0	0	-246	-246	-7	0	0	-246	-246	-7	0	0	-246	-246	-7	0	0	-246	-246	-8	0	0	-265	-265	[illegible]	-362	[illegible]	-359		21
7	0	0	-230	-230	7	0	0	-230	-230	7	0	0	-229	-229	7	0	0	-229	-229	7	0	0	-229	-229	7	0	0	-246	-245	[illegible]	-362	[illegible]	-362	50	21
-7	0	0	-234	-234	-7	0	0	-233	-233	-7	0	0	-233	-233	-7	0	0	-233	-233	7	0	0	-233	-233	-7	0	0	-246	-249	[illegible]	-364	[illegible]	-364		6
13	0	0	-299	-299	13	0	0	-299	-299	13	[illegible]	0	-294	-299	13	0	0	-298	-298	13	0	0	-298	-298	13	0	0	-315	-315	[illegible]	-394	[illegible]	-394	51	21
-13	0	0	-302	-302	-12	0	0	-302	-302	-13	0	[illegible]	-302	-302	-13	0	0	-302	-302	-1[illegible]	0	0	-302	-302	-13	0	0	-316	-317	[illegible]	-397	[illegible]	-397		22
11	0	0	-304	-304	11	0	0	-303	-303	11	0	0	-303	-303	11	0	0	-303	-303	12	0	0	-303	-303	12	0	0	-277	-277	[illegible]	-388	[illegible]	-388	52	22
-11	0	0	-307	-307	-11	0	0	-307	-307	-11	0	0	-307	-307	-11	0	0	-307	-307	-12	0	0	-307	-307	-12	0	0	-291	-291	[illegible]	-368	[illegible]	-368		7
22	0	0	-341	-341	22	0	0	-341	-341	22	0	0	-341	-341	22	0	0	-341	-341	22	0	0	-341	-341	22	0	0	-340	-340	[illegible]	-388	[illegible]	-388	53	22
-22	0	[illegible]	-245	-211	-22	[illegible]	0	-246	-245	-22	[illegible]	[illegible]	-245	-245	-22	0	0	-245	-24[illegible]	22	0	0	-245	-245	-23	3	0	-250	-253	[illegible]	-391	[illegible]	-391		23
19	0	0	[illegible]	-215	19	0	0	-215	-215	[illegible]	[illegible]	[illegible]	-215	-21[illegible]	19	0	0	-215	-215	19	[illegible]	0	-215	-215	20	0	0	222	-22[illegible]	[illegible]	-389	[illegible]	-389	54	23
-20	0	0	-218	-218	-20	0	0	-219	-219	-20	[illegible]	0	-220	-220	-20	0	0	-218	-219	-2[illegible]	0	0	-219	-219	-20	0	0	-226	-22[illegible]	[illegible]	-384	[illegible]	-384		9
31	0	0	-324	-324	31	0	0	-325	-325	[illegible]	[illegible]	0	-323	-323	31	0	0	-324	-324	3[illegible]	0	0	-324	-324	32	0	0	-332	-332	[illegible]	-374	[illegible]	-374	55	23
-32	0	0	-[illegible]	-3[illegible]	-3[illegible]	0	0	-329	-329	-3[illegible]	[illegible]	0	327	-327	-32	0	0	-328	-328	-3[illegible]	0	0	-328	-328	-32	0	0	-338	-338	[illegible]	-378	[illegible]	-378		24
28	[illegible]	0	-293	-293	28	0	0	-293	-293	29	0	[illegible]	-294	-29[illegible]	28	0	0	-294	-294	28	0	0	-[illegible]	-294	29	0	0	-291	-291	[illegible]	-447	[illegible]	-447	56	24
-29	0	0	-[illegible]	-297	-28	0	0	-299	-299	-29	0	[illegible]	-299	-299	-29	0	0	-299	-299	-29	0	0	-299	-[illegible]	-29	0	0	-[illegible]	-[illegible]	[illegible]	-451	[illegible]	-451		11
30	0	0	-[illegible]	-335	30	[illegible]	0	-[illegible]	-[illegible]	40	[illegible]	[illegible]	-309	-[illegible]	29	[illegible]	[illegible]	-[illegible]	-[illegible]	[illegible]	0	[illegible]	-[illegible]	-[illegible]	[illegible]	0	0	-310	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]	57	24
-39	0	0	-[illegible]	-[illegible]	-39	0	0	-[illegible]	-[illegible]	-40	[illegible]	[illegible]	-311	-311	-40	[illegible]	0	-310	-311	-40	0	0	-[illegible]	-[illegible]	-42	0	[illegible]	-313	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]		25
37	0	0	-[illegible]	-[illegible]	34	0	0	-[illegible]	-[illegible]	35	[illegible]	[illegible]	-274	-274	35	0	0	-274	-274	3[illegible]	0	0	-[illegible]	-[illegible]	39	0	0	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]	58	25
-38	0	[illegible]	-[illegible]	-[illegible]	-35	0	0	-[illegible]	-[illegible]	-3[illegible]	0	[illegible]	-277	-277	-36	0	0	-277	-[illegible]	-3[illegible]	0	0	-[illegible]	-[illegible]	-[illegible]	0	0	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]		13
-71	0	0	359	364	66	0	0	-[illegible]	-[illegible]	51	0	[illegible]	-317	-317	51	0	0	-316	-316	52	0	0	-[illegible]	-[illegible]	53	1	0	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]	59	26
70	0	0	361	361	-66	0	0	-361	-361	-52	0	0	-321	-321	-51	0	0	-320	-320	-53	0	0	-320	-320	-54	0	1	-305	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]		26
-162	0	0	662	662	64	0	0	-491	-491	51	0	0	-319	-319	45	0	0	-391	-391	47	0	0	-392	-392	46	0	-1	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-[illegible]	60	26
165	0	0	664	666	-65	0	0	-486	-486	-52	0	0	-322	-322	-46	0	0	-395	-395	-48	0	0	-[illegible]	-[illegible]	-46	1	0	-394	-394	[illegible]	-[illegible]	[illegible]	-[illegible]		15
-[illegible]	0	0	1[illegible]	1[illegible]	-371	0	0	1394	1394	-75	0	0	391	391	76	0	0	-469	-469	66	0	0	-394	-394	65	0	0	-469	-469	[illegible]	-[illegible]	[illegible]	-[illegible]	61	26
469	0	0	1727	1727	371	0	0	1392	1392	75	0	0	388	388	-77	0	0	-411	-411	-66	0	0	-397	-397	-66	0	0	-463	-463	[illegible]	-411	[illegible]	-411		27
-467	0	0	1469	1469	-450	0	0	1466	1466	-163	0	0	634	634	87	0	0	-465	-466	66	0	0	-371	-371	65	0	0	-321	-321	[illegible]	-466	[illegible]	-466	62	27
467	0	0	1467	1467	429	0	0	1466	1466	163	0	0	632	632	-87	0	0	-466	-466	-76	0	0	-374	-374	-66	0	0	-394	-394	[illegible]	-466	[illegible]	-466		17
-[illegible]	0	0	1644	1644	-662	0	0	1[illegible]	1[illegible]	-436	0	0	1962	1962	-486	0	0	1486	1486	-119	0	0	387	387	67	1	0	-414	-414	[illegible]	-414	[illegible]	-414	63	27
833	0	0	1642	1642	662	0	0	1[illegible]	1[illegible]	836	0	0	1961	1961	484	0	0	1484	1484	118	0	0	385	385	-67	0	1	-417	-417	[illegible]	-417	[illegible]	-417		28
-476	0	0	1488	1488	-518	0	0	1[illegible]	1[illegible]	-561	0	0	1780	1780	-585	0	0	1805	1805	-273	0	0	844	844	84	0	-1	-484	-484	[illegible]	-484	[illegible]	-484	64	28
475	0	0	1487	1487	516	0	0	1[illegible]	1[illegible]	550	0	0	1698	1698	585	0	0	1804	1804	273	0	0	842	842	-85	1	0	-487	-487	[illegible]	-487	[illegible]	-487		19

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-8					POSICION 2-8					POSICION 3-8					POSICION 4-8					POSICION 5-8					POSICION 6-8				
		AREA M2	MOD RES M3	PANO	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
65	3	0.003400	1.800000	1.20	13	0	0	-474	-474	19	0	0	-682	-682	-13	0	0	368	368	-25	0	0	742	742	3	0	0	-89	-89	1	0	0	-48	-48
	21	0.003400	1.800000	1.20	-13	0	0	-472	-472	-19	0	0	-675	-675	13	0	0	371	371	25	0	0	744	744	-2	0	0	-88	-88	-1	0	0	-48	-48
66	5	0.003400	1.800000	1.30	10	0	0	-391	-391	15	0	0	-556	-556	21	0	0	-822	-822	26	0	0	-1007	-1007	-10	0	0	295	295	-26	0	0	758	758
	22	0.003400	1.800000	1.30	-10	0	0	-387	-387	-14	0	0	-552	-552	-21	0	0	-818	-818	-26	0	0	-1003	-1003	10	0	0	299	299	26	0	0	761	761
67	7	0.003400	1.800000	1.30	11	0	0	-266	-266	15	0	0	-357	-357	21	0	0	-478	-478	27	0	0	-630	-630	37	0	0	-866	-866	42	0	0	-983	-983
	23	0.003400	1.800000	1.30	-11	0	0	-264	-264	-15	0	0	-351	-351	-20	0	0	-472	-472	-27	0	0	-624	-624	-37	0	0	-860	-860	-42	0	0	-977	-977
68	9	0.003400	1.800000	1.10	6	0	0	-127	-127	10	0	0	-167	-167	13	0	0	-263	-263	18	0	0	-357	-357	24	0	0	-470	-470	31	0	0	-606	-606
	24	0.003400	1.800000	1.10	-6	0	0	-122	-122	-9	0	0	-162	-162	-13	0	0	-258	-258	-18	0	0	-352	-352	-24	0	0	-465	-465	-31	0	0	-601	-601
69	11	0.003400	1.800000	1.10	4	0	0	-89	-89	6	0	0	-121	-121	10	0	0	-187	-188	14	0	0	-271	-271	19	0	0	-372	-372	25	0	0	-492	-492
	25	0.003400	1.800000	1.10	-3	0	0	-84	-84	-6	0	0	-116	-116	-9	0	0	-183	-183	-14	0	0	-268	-268	-19	0	0	-368	-368	-25	0	0	-487	-487
70	13	0.007480	1.800000	1.00	0	0	0	-3	-3	3	0	0	-36	-36	6	0	0	-80	-80	10	0	0	-135	-135	15	0	0	-200	-200	21	0	0	-286	-286
	26	0.007480	1.800000	1.00	0	0	0	3	3	-2	0	0	-30	-30	-5	0	0	-75	-75	-9	0	0	-132	-132	-14	0	0	-203	-203	-20	0	0	-290	-290
71	15	0.007480	1.800000	1.00	-3	0	0	45	45	-2	0	0	24	24	0	0	0	-7	-7	3	0	0	-49	-49	7	0	0	-103	-103	12	0	0	-172	-172
	27	0.007480	1.800000	1.00	4	0	0	51	51	2	0	0	29	29	0	0	0	-1	-1	-3	0	0	-42	-43	-7	0	0	-98	-98	-12	0	0	-166	-166
72	17	0.008660	1.800000	1.30	-7	0	0	74	74	-7	0	0	73	73	-7	0	0	69	69	-6	0	0	56	59	-4	0	0	43	43	-2	0	0	19	19
	28	0.008660	1.800000	1.30	8	0	0	78	78	7	0	0	78	78	7	0	0	73	73	6	0	0	64	64	5	0	0	48	48	2	0	0	23	23

CINCAPE1.XLS 8/05/97

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

POSICION 7-8					POSICION 8-8					POSICION 9-8					POSICION 10-8					POSICION 11-8					POSICION 12-8					POSICION 13-8				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
0	0	0	8	8	0	0	0	8	8	0	0	0	8	8	0	0	0	8	8	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
0	0	0	10	10	1	0	0	11	11	0	0	0	10	10	0	0	0	10	10	0	0	0	13	13	0	0	0	11	11	0	0	0	11	11
0	0	0	-6	-6	-1	0	0	21	21	-2	0	0	44	44	-1	0	0	43	43	-1	0	0	44	44	-1	0	0	41	41	-1	0	0	41	41
0	0	0	-2	-2	1	0	0	24	24	2	0	0	47	47	2	0	0	46	46	2	0	0	47	47	1	0	0	44	44	2	0	0	44	44
-27	0	0	461	461	-47	0	0	841	841	-4	0	0	-135	-135	1	0	0	-19	19	-3	0	0	52	52	-2	0	0	43	43	-2	0	0	38	38
27	0	0	465	465	47	0	0	845	845	-6	0	0	-129	-129	-1	0	0	-13	-13	3	0	0	56	56	3	0	0	47	47	2	0	0	43	43
40	0	0	-782	-782	45	0	0	-887	-887	-5	0	0	904	904	-61	0	0	1082	1083	7	0	0	-135	-135	1	0	0	-15	-15	-3	0	0	53	53
-40	0	0	-787	-787	-45	0	0	-883	-883	5	0	0	909	909	61	0	0	1087	1087	-7	0	0	-130	-130	-1	0	0	-11	-11	3	0	0	57	57
32	0	0	-632	-632	41	0	0	-796	-796	-3	0	0	-1045	-1045	62	0	0	-1223	-1223	-34	0	0	883	885	-49	0	0	1234	1234	2	0	0	-45	-45
-32	0	0	-627	-627	-40	0	0	-791	-791	-3	0	0	-1040	-1040	-62	0	0	-1218	-1218	34	0	0	888	888	49	0	0	1239	1239	-2	0	0	-46	-46
26	0	0	-491	-491	37	0	0	-684	-684	47	0	0	-863	-863	58	0	0	-826	-826	50	0	0	-1135	-1135	56	0	0	-1246	-1246	-52	0	0	884	884
-26	0	0	-486	-486	-37	0	0	-679	-679	-46	0	0	-857	-857	-58	0	0	-821	-821	-50	0	0	-1130	-1130	-56	0	0	-1241	-1241	52	0	0	889	889
16	0	0	-366	-366	35	0	0	-367	-367	34	0	0	-475	-475	44	0	0	-613	-613	56	0	0	-762	-762	67	0	0	-903	-903	68	0	0	-1160	-1160
-16	0	0	-366	-366	-25	0	0	-351	-351	-33	0	0	-469	-469	-43	0	0	-607	-637	-56	0	0	-766	-766	-67	0	0	-907	-907	-68	0	0	-1160	-1160
1	0	0	-16	-16	8	0	0	-75	-75	11	0	0	-147	-147	18	0	0	-236	-236	27	0	0	-366	-366	35	0	0	-484	-485	45	0	0	-694	-694
-1	0	0	-13	-13	-5	0	0	-70	-70	-11	0	0	-141	-141	-17	0	0	-230	-230	-27	0	0	-362	-362	-34	0	0	-480	-480	-44	0	0	-690	-690

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

POSICION 14-S					POSICION 15-S					POSICION 16-S					POSICION 17-S					POSICION 18-S					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TSUP+ K/CM2	TSUP- K/CM2	TINF+ K/CM2	TINF- K/CM2		
0	0	0	9	9	0	0	0	9	9	0	0	0	9	9	0	0	0	9	9	0	0	0	8	8	0	0	0	12	12	742	-662	742	-662	65	3
0	0	0	11	11	0	0	0	11	11	0	0	0	11	11	0	0	0	11	11	0	0	0	11	11	0	0	0	14	14	744	-679	744	-679		21
-1	0	0	42	42	-1	0	0	42	42	-1	0	0	42	42	-1	0	0	42	42	-1	0	0	42	42	-2	0	0	45	45	756	-1007	756	-1007	66	5
2	0	0	45	45	2	0	0	45	45	2	0	0	45	45	2	0	0	45	45	2	0	0	45	45	2	0	0	48	48	761	-1003	761	-1003		22
-2	0	0	38	38	-2	0	0	38	38	-2	0	0	38	38	-2	0	0	38	38	-2	0	0	39	39	-2	0	0	43	43	841	-983	841	-983	67	7
2	0	0	43	43	2	0	0	43	43	2	0	0	43	43	2	0	0	43	43	2	0	0	43	43	2	0	0	48	48	845	-977	845	-977		23
-3	0	0	51	51	-3	0	0	48	48	-3	0	0	48	48	-3	0	0	48	48	-3	0	0	49	49	-3	0	0	52	52	1083	-887	1083	-887	68	9
3	0	0	56	56	3	0	0	53	53	3	0	0	53	53	3	0	0	53	53	3	0	0	53	53	3	0	0	56	56	1087	-883	1087	-883		24
-2	0	0	28	28	-4	0	0	80	80	-4	0	0	77	77	-4	0	0	73	73	-4	0	0	72	72	-4	0	0	75	75	1234	-1223	1234	-1223	69	11
2	0	0	32	32	4	0	0	84	84	4	0	0	81	81	4	0	0	77	77	4	0	0	76	76	4	0	0	79	79	1239	-1219	1239	-1219		25
-92	0	0	1225	1225	9	0	0	-125	-125	0	0	0	-6	-6	-5	0	0	72	72	-5	0	0	68	66	-5	0	0	65	69	1225	-1249	1225	-1249	70	13
92	0	0	1231	1231	-8	0	0	-119	-119	0	0	0	0	0	6	0	0	78	78	6	0	0	74	74	6	0	0	74	74	1231	-1242	1231	-1242		26
93	0	0	-1302	-1302	-59	0	0	786	786	-107	0	0	1437	1437	11	0	0	-155	-155	2	0	0	-22	-22	1	0	0	71	71	1437	-1302	1437	-1302	71	15
-92	0	0	-1286	-1286	59	0	0	781	781	108	0	0	1442	1442	-11	0	0	-149	-149	-1	0	0	-16	-16	6	0	0	77	77	1442	-1286	1442	-1286		27
57	0	0	-766	-766	76	0	0	-1028	-1028	85	0	0	-1147	-1147	-100	0	0	1038	1038	-154	0	0	1567	1597	-2	0	0	23	23	1597	-1147	1597	-1147	72	17
-57	0	0	-760	-760	-76	0	0	-1022	-1022	-85	0	0	-1141	-1141	101	0	0	1043	1043	155	0	0	1601	1601	3	0	0	28	28	1601	-1141	1601	-1141		29

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-N					POSICION 3-N					POSICION 3-N					POSICION 4-N					POSICION 5-N					POSICION 6-N					BARRA	NUDO
		AREA M2	MOD.ELAS. M3	PANDEO	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2		
1	1	0.000000	0.000000	1.87	-17	-3	1	185	30	20	-13	8	-77	-86	4	0	0	-14	-19	-3	1	0	10	15	-1	1	0	2	3	8	1	0	0	-1	
	1	0.000000	0.000000	1.87	17	4	-10	386	-342	-20	14	-31	926	-1006	-4	1	-1	7	-40	3	0	2	-41	67	1	0	1	-32	37	8	0	1	-32	32	
2	2	0.000000	0.000000	1.87	-17	10	10	386	-342	20	22	31	926	-1006	4	-6	1	7	-40	-3	3	-3	-41	67	-1	0	-1	-32	37	9	-1	-1	-32	32	
	3	0.000000	0.000000	1.87	17	-8	12	-303	446	-20	-21	18	-655	486	-4	6	-13	414	-447	3	-2	7	-299	338	1	1	0	0	5	9	1	-1	46	-46	
3	3	0.000000	0.000000	1.84	-60	-6	-12	-135	618	-43	-10	-18	-387	741	-9	2	15	488	-365	27	-25	-7	-334	115	8	8	0	-37	-32	1	2	1	42	-49	
	4	0.000000	0.000000	1.84	60	6	-2	297	186	43	10	-6	356	-1	9	-1	-11	385	-312	-27	23	-47	1301	-1019	-8	1	-2	18	-84	-1	-1	2	-88	61	
4	4	0.000000	0.000000	1.84	-60	2	2	297	186	-43	5	6	356	-1	-9	9	11	385	-312	27	-29	47	1301	-1019	8	-9	2	18	-84	1	3	-2	-88	61	
	5	0.000000	0.000000	1.84	60	-1	2	181	302	43	-4	5	26	319	8	-8	10	-271	344	-37	-28	19	-729	664	-8	10	-23	704	-771	-1	-3	9	-396	397	
5	5	0.000000	0.000000	1.84	-88	-1	-6	238	335	-60	-4	-5	178	467	-78	-7	-19	1	491	-50	-13	-19	-317	649	-9	4	23	619	-686	31	-31	-9	-536	139	
	6	0.000000	0.000000	1.84	88	2	-2	348	225	60	4	-5	412	170	78	8	-7	436	57	50	13	-11	437	-186	9	-3	-15	412	-361	-31	32	9	1021	-1729	
6	6	0.000000	0.000000	1.84	-88	6	2	348	225	-60	10	5	412	170	-78	13	7	436	57	-50	17	11	437	-186	-9	22	15	412	-361	31	50	9	1021	-1729	
	7	0.000000	0.000000	1.84	88	-6	11	5	560	60	-6	17	-120	714	78	-12	21	-291	784	50	-19	27	-539	882	9	-21	28	-691	953	-31	-49	50	-1432	1214	
7	7	0.007680	0.000000	1.82	-135	-4	-11	88	881	-136	-7	-17	15	788	-136	-10	-21	-79	811	-128	-14	-27	-221	682	-183	-19	-35	-479	1031	-49	-69	-50	-886	1347	
	8	0.007680	0.000000	1.82	135	8	1	284	347	136	8	8	371	384	136	11	-3	419	306	128	15	-8	462	212	183	21	-10	469	57	69	50	-50	886	-165	
8	8	0.007680	0.000000	1.82	-135	4	-1	284	347	-136	8	8	371	384	-136	9	3	419	306	-128	12	8	462	212	-183	16	10	469	57	-69	21	50	886	-165	
	9	0.007680	0.000000	1.82	135	-5	6	157	504	136	-5	13	86	629	136	-8	16	15	706	128	-11	21	-60	726	183	-15	28	-351	697	69	-19	31	-467	888	
9	9	0.007680	0.000000	1.82	-146	-2	-6	183	475	-176	-4	-13	183	686	-183	-6	-19	152	701	-196	-9	-31	9	786	-196	-13	-38	0	688	-176	-49	-31	-111	851	
	10	0.000000	0.000000	1.82	146	3	-4	388	382	176	5	3	349	442	192	7	1	486	445	196	10	-1	484	421	196	13	-5	511	588	176	16	-6	849	257	
10	10	0.000000	0.000000	1.82	-146	-1	-4	386	382	-176	3	-3	349	442	-192	5	-1	486	445	-196	7	1	484	421	-196	10	6	511	588	-176	14	6	849	257	
	11	0.000000	0.000000	1.82	146	0	0	361	417	176	-2	8	256	633	192	-4	11	244	888	196	-6	14	288	677	196	-9	18	149	737	176	-12	21	38	788	
11	11	0.000000	0.000000	1.80	-166	1	-6	344	386	-214	6	-8	268	511	-242	-2	-11	385	880	-266	-4	-14	388	687	-251	-6	-18	387	764	-266	-16	-21	241	823	
	12	0.000000	0.000000	1.80	166	0	0	255	388	214	2	6	310	478	242	3	8	384	530	266	5	4	440	584	266	8	1	588	841	266	11	-4	591	888	
12	12	0.000000	0.000000	1.80	-166	0	-6	253	388	-214	2	-8	310	478	-242	5	-5	384	530	-266	7	-4	440	584	-266	10	-1	588	841	-266	14	3	591	888	
	13	0.000000	0.000000	1.80	166	1	6	337	364	214	-1	10	282	537	242	-3	14	280	644	266	-6	18	341	788	251	-9	24	188	888	266	-19	30	186	889	
13	13	0.000000	0.007680	1.80	-161	3	-6	342	373	-240	1	-10	282	522	-251	0	-14	316	638	-266	-2	-18	321	788	-251	-5	-24	338	870	-251	-9	-24	386	887	
	14	0.000000	0.007680	1.80	161	-1	11	188	429	240	0	12	273	540	251	2	12	343	911	266	4	11	416	684	251	7	16	488	748	251	16	3	589	724	
14	14	0.000000	0.007680	1.80	-161	-3	-11	188	429	-240	-1	-12	273	540	-251	1	-12	343	911	-266	3	-11	416	684	-266	6	-16	488	748	-251	9	-4	589	724	
	15	0.000000	0.007680	1.80	161	4	4	388	350	240	2	8	317	488	251	1	12	344	918	266	-1	16	382	788	266	-4	21	386	844	251	-7	25	344	848	
15	15	0.000000	0.000000	1.80	-166	5	-4	339	296	-266	4	-6	295	439	-314	2	-13	339	862	-371	1	-16	378	872	-476	-1	-21	419	788	-476	-1	-26	427	911	
	16	0.000000	0.000000	1.80	166	-3	13	146	379	266	-3	15	234	580	314	-1	16	383	888	371	1	16	376	878	476	3	25	488	748	476	6	32	588	887	
16	16	0.000000	0.000000	1.80	-166	-4	-13	146	379	-266	-5	-15	234	580	-314	-2	-16	383	888	-371	-1	-16	376	878	-476	-1	-25	488	748	-476	-4	-32	588	887	
	17	0.000000	0.000000	1.80	166	6	1	381	278	266	5	5	319	418	314	4	9	388	838	371	2	13	488	888	484	6	15	442	788	476	-9	35	482	876	
17	17	0.000000	0.011373	1.80	-161	6	-1	327	348	-267	6	-5	318	383	-336	5	-9	372	811	-405	3	-13	484	888	-476	2	-18	484	788	-476	-1	-35	888	888	
	18	0.000000	0.011373	1.80	161	-6	14	127	349	267	-4	16	221	462	336	-3	18	380	883	405	-2	19	386	887	476	0	28	474	787	541	2	38	888	875	
18	18	0.000000	0.011373	1.80	-161	-6	-14	127	349	-267	-6	-16	221	462	-336	-7	-18	380	883	-407	-7	-19	386	887	-476	-5	-30	474	787	-541	-6	-48	888	875	
	19	0.000000	0.011373	1.80	161	7	6	238	238	267	8	6	352	352	336	8	6	441	441	407	6	6	538	538	476	8	6	688	688	557	8	8	718	718	

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

POSICION 7-N					POSICION 8-N					POSICION 9-N					POSICION 10-N					POSICION 11-N					POSICION 12-N					POSICION 13-N				
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
0	1	0	1	1	0	1	0	1	1	0	-1	0	0	2	0	1	0	0	2	0	1	0	0	2	0	1	0	0	2	0	1	0	0	2
0	0	1	-33	34	0	0	1	-32	34	0	0	1	-31	33	0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34
0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-31	33	0	0	-1	-31	33	0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-32	34
0	1	-1	25	-33	0	1	-1	25	-33	0	1	-1	24	-32	0	1	-1	24	-32	0	1	-1	24	-32	0	1	-1	24	-32	0	1	-1	24	-32
3	1	1	17	-41	3	1	1	11	-37	3	1	1	10	-36	3	1	1	10	-36	3	1	1	11	-37	3	1	1	10	-36	3	1	1	11	-37
-3	0	1	-53	28	-3	0	1	-53	26	-3	0	1	-55	29	-3	0	1	-55	29	-3	0	1	-55	29	-3	0	1	-56	30	-3	0	1	-56	29
3	0	-1	-53	26	3	0	-1	-53	26	3	0	-1	-55	29	3	0	-1	-55	29	3	0	-1	-55	28	3	0	-1	-56	30	3	0	-1	-56	30
-3	1	1	-29	4	-3	1	-1	14	-41	-3	1	-1	7	-33	-3	1	-1	6	-32	-3	1	-1	6	-32	-3	1	-1	7	-33	-3	1	-1	7	-33
14	0	-1	-50	-33	9	2	1	-8	-52	10	1	1	-18	-50	10	1	1	-20	-49	10	1	1	-18	-49	10	1	1	-19	-50	10	1	1	-19	-50
-14	1	0	-34	-57	-9	-1	2	-68	29	-10	-1	2	-79	12	-10	-1	2	-79	11	-10	-1	2	-80	12	-10	-1	2	-80	12	-10	-1	2	-80	12
14	-10	0	-34	-57	9	0	-2	-68	29	10	-2	-2	-79	12	10	-2	-2	-79	11	10	-2	-2	-80	12	10	-2	-2	-80	12	10	-2	-2	-80	12
-14	11	-26	617	-707	-9	0	2	-69	30	-10	3	-3	55	-122	-10	3	-4	74	-142	-10	3	-4	85	-132	-10	3	-4	82	-129	-10	3	-4	83	-130
-2	3	26	847	-836	69	-34	-2	-212	-116	26	2	3	2	-144	16	4	4	45	-132	20	3	4	26	-136	21	3	4	22	-135	21	3	4	23	-135
2	-2	-19	412	-402	-60	36	-79	1496	-1822	-26	-1	0	-77	-66	-16	-2	3	-101	14	-20	-2	2	-100	-11	-21	-2	2	-102	-12	-21	-2	2	-102	-11
-2	25	18	412	-402	69	55	79	1496	-1822	26	-14	0	-77	-66	16	7	-3	-101	14	20	-2	-2	-100	-11	21	-3	-2	-102	-12	21	-2	-2	-102	-11
2	-24	36	-787	796	-60	-54	46	-1177	852	-26	15	-34	834	-776	-16	-6	17	-396	312	-20	3	-3	10	-121	-21	4	-6	66	-179	-21	3	-5	60	-182
-137	-22	-36	-321	936	-77	-30	-48	-832	980	9	3	34	542	-582	81	-52	-17	-490	81	45	2	3	-51	-184	32	4	6	26	-176	37	-4	5	-6	-181
137	23	-15	588	53	77	31	-22	846	-196	-9	-2	-26	440	-481	81	53	-106	1571	-1988	-45	-1	0	-101	-104	-32	-3	3	-125	-21	-37	-2	2	-126	-46
-137	18	15	588	53	-77	25	22	846	-196	9	26	26	440	-481	81	70	106	1571	-1988	45	-18	0	-101	-104	32	9	-3	-125	-21	37	-2	-2	-126	-45
137	-17	25	-113	730	77	-22	29	-316	983	-9	27	37	-437	597	-81	-69	56	-1137	728	-45	19	-44	834	-836	-32	-8	23	-449	304	-37	9	-3	-39	-131
-271	-13	-25	160	852	-237	-17	-29	43	842	-179	-24	-37	-168	835	-94	-36	-56	-561	933	20	4	44	559	-635	124	-67	-23	-558	73	71	8	3	-85	-170
271	14	-7	585	417	237	18	-12	611	274	179	25	-20	804	84	94	37	-29	969	-217	-20	-3	-38	438	-514	-124	68	-135	1564	-2699	-71	0	0	-128	-137
271	19	7	585	417	-237	24	12	611	-274	-179	30	20	804	84	-94	37	29	969	-217	20	45	35	438	-514	124	100	135	1564	-2699	71	-33	0	-128	-137
271	-18	36	14	999	237	-23	43	-140	1026	179	-29	50	-342	1003	94	-36	58	-561	932	-20	-43	67	-952	877	-124	-98	97	-1643	1678	-71	34	-56	626	-881
-381	-13	-36	252	1075	-345	-16	-43	184	1140	-356	-24	-50	35	1168	-301	-30	-56	-123	1143	-218	-40	-67	-395	1135	-106	-58	-97	-618	1276	40	3	56	567	-701
381	15	4	617	710	345	20	-1	664	641	356	25	-6	693	514	301	32	-17	699	320	218	42	-26	687	53	106	60	-41		-297	-40	-2	-50	496	-632
-391	13	-4	617	710	-345	18	1	664	641	-356	24	8	693	514	-301	30	17	699	320	-218	38	26	687	53	-106	46	41	845	-297	40	54	50	496	-632
381	-11	33	295	1032	345	-16	39	212	1092	356	-22	45	89	1118	301	-29	52	-79	1099	218	-36	59	-295	1035	106	-44	64	-549	887	-40	-53	75	-815	780
-585	-6	-33	422	1012	-525	-12	-39	393	1097	-525	-17	-45	333	1157	-501	-22	-52	236	1182	-452	-29	-58	109	1173	-370	-36	-64	-67	1108	-258	-46	-75	-313	1044
505	9	13	588	836	525	13	10	857	833	525	18	5	702	788	501	24	-2	729	691	452	31	-11	739	643	370	38	-22	723	328	256	48	-34	685	46
-505	7	-13	588	836	-525	11	-10	857	833	-525	16	-5	702	788	-501	21	2	729	691	-452	28	11	739	643	-370	35	22	723	328	-256	44	35	685	46
585	-8	28	461	873	525	-10	34	436	1054	525	-14	40	361	1109	501	-20	46	291	1130	452	-26	53	183	1119	370	-34	58	-9	1060	258	-42	66	-223	964
-603	-3	-28	576	1017	-645	-7	-34	583	1122	-675	-11	-40	571	1206	-679	-16	-46	526	1260	-662	-22	-53	454	1287	-612	-29	-59	340	1271	-536	-38	-65	180	1216
603	5	18	647	940	645	8	16	724	981	675	13	12	780	986	679	18	7	839	948	662	23	0	873	868	612	30	-10	881	731	536	37	-21	888	536
-603	-7	-18	647	940	-645	-6	-16	724	981	-675	-5	-12	780	986	-679	-2	-7	839	948	-662	1	0	873	868	-612	5	10	881	731	-535	10	21	888	536
603	9	0	794	794	645	8	0	853	853	675	6	0	868	868	679	4	0	894	894	662	1	0	870	870	612	-3	0	806	806	535	-8	0	703	703

CINCAPE2.XLS 7/05/97

CONTROL DE TENSIONES EN EL PESCANTE (CORDON INFERIOR)

POSICION 14-N					POSICION 15-N					POSICION 16-N					POSICION 17-N					POSICION 18-N					POSICION 19-N					TIROS SUPERIORES Y MEDIANOS				BARRA	NUDO
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	T1SUP	T2SUP	T3SUP	T4SUP		
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2		
0	1	0	0	2	0	1	0	0	2	0	1	0	0	2	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	169	-77	39	-46	1	1
0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34	0	0	1	-32	34	888	-41	67	-1688		2
0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-32	34	0	0	-1	-32	34	888	-41	67	-1688	2	2
0	1	-1	24	-33	0	1	-1	25	-33	0	1	-1	25	-33	0	1	-1	25	-33	0	1	-1	25	-33	0	1	-1	25	-33	414	-484	486	-447		3
3	1	1	11	-37	3	1	1	11	-37	3	1	1	11	-37	3	1	1	11	-37	3	1	1	11	-37	3	1	1	11	-37	486	-567	741	-683	3	3
-3	0	1	-56	30	-3	0	1	-56	30	-3	0	1	-56	30	-3	0	1	-56	30	-3	0	1	-57	30	-3	0	1	-57	30	1391	-46	186	-1610		4
3	0	-1	-56	30	3	0	-1	-56	30	3	0	-1	-56	30	3	0	-1	-56	30	3	0	-1	-57	30	3	0	-1	-57	30	1391	-46	186	-1610	4	4
-3	1	-1	7	-33	-3	1	-1	7	-33	-3	1	-1	7	-34	-3	1	-1	7	-34	-3	1	-1	7	-34	-3	1	-1	7	-34	784	-788	884	-771		5
18	1	1	-19	-50	18	1	1	-19	-50	18	1	1	-18	-51	18	1	1	-18	-51	18	1	1	-18	-51	18	1	1	-18	-51	818	-886	849	-886	5	5
-18	-1	2	-80	12	-18	-1	2	-80	13	-18	-1	2	-80	13	-18	-1	2	-80	13	-18	-1	2	-80	13	-18	-1	2	-80	13	1521	-46	286	-1729		6
18	-2	-2	-80	12	18	-2	-2	-80	13	18	-2	-2	-80	13	18	-2	-2	-80	13	18	-2	-2	-80	13	18	-2	-2	-80	13	1521	-46	286	-1729	6	6
-18	3	-4	84	-131	-18	3	-4	84	-131	-18	3	-4	84	-131	-18	3	-4	84	-132	-18	3	-4	84	-132	-18	3	-4	84	-132	617	-1439	1214	-787		7
21	3	4	24	-136	21	3	4	24	-136	21	3	4	24	-136	21	3	4	24	-136	21	3	4	24	-136	21	3	4	24	-136	847	-886	1367	-888	7	7
-21	-2	2	-102	-11	-21	-2	2	-102	-11	-21	-2	2	-102	-11	-21	-2	2	-102	-11	-21	-2	2	-102	-11	-21	-2	2	-102	-11	1466	-486	884	-1688		8
21	-2	-2	-102	-11	21	-2	-2	-102	-11	21	-2	-2	-102	-11	21	-2	-2	-102	-11	21	-2	-2	-102	-11	21	-2	-2	-102	-11	1466	-486	884	-1688	8	8
-21	3	-4	36	-147	-21	3	-4	36	-147	-21	3	-4	36	-148	-21	3	-4	36	-148	-21	3	-4	36	-148	-21	3	-4	36	-148	884	-1377	882	-778		9
36	4	4	-14	-158	36	4	4	-12	-158	36	4	4	-12	-158	36	4	4	-12	-159	36	4	4	-12	-159	36	4	4	-12	-159	842	-482	885	-882	9	9
-36	-2	3	-127	-45	-36	-2	3	-128	-43	-36	-2	3	-128	-43	-36	-2	3	-128	-43	-36	-2	3	-128	-43	-36	-2	3	-128	-43	1571	-486	845	-1688		10
36	-2	-2	-127	-45	36	-2	-3	-128	-43	36	-2	-3	-128	-43	36	-2	-3	-128	-43	36	-2	-3	-128	-43	36	-2	-3	-128	-43	1571	-486	845	-1688	10	10
36	4	-5	11	-161	-36	4	-5	-4	-166	-36	4	-5	-6	-162	-36	4	-5	-6	-164	-36	4	-5	7	-166	-36	4	-5	-6	-166	894	-1137	788	-886		11
63	-4	6	-31	-187	63	-4	6	-33	-182	63	-4	6	-55	-180	63	-4	6	-53	-180	63	-4	6	-52	-181	63	-4	6	-52	-181	888	-491	886	-886	11	11
63	-4	3	-146	-72	-63	-4	3	-147	-66	-63	-4	3	-149	-66	-63	-4	3	-148	-66	63	-4	3	-148	-66	63	-4	3	-148	-66	1564	-169	884	-1688		12
63	-4	-3	-146	-72	63	-4	-3	-147	-66	63	-4	-3	-149	-66	63	-4	-3	-148	-66	63	-4	-3	-148	-66	63	-4	-3	-148	-66	1564	-169	884	-1688	12	12
63	-4	6	-29	32	-63	4	6	-10	-123	63	6	-10	25	-357	63	6	-9	8	-362	63	6	-9	3	-362	63	6	-9	4	-357	888	-1688	1688	-891		13
63	7	-10	-488	-172	63	9	-7	-367	-366	63	8	-10	-57	-361	63	8	-9	-62	-361	63	8	-9	-66	-364	63	8	-9	-66	-364	887	-484	1688	-781	13	13
-63	6	-13	1883	-2073	-63	-7	9	-148	-512	-63	-6	9	-176	-112	-63	-6	9	-176	-136	-63	-6	9	-176	-136	-63	-6	9	-176	-136	1883	-484	884	-4878		14
63	14	18	1883	-2073	63	-9	9	-148	-512	63	12	-9	-176	-112	63	-9	-9	-176	-136	63	-9	-9	-176	-136	63	-9	-9	-176	-136	1883	-484	884	-4878	14	14
-135	-118	68	-1887	787	-188	31	-79	668	-1010	-68	-16	38	-467	178	-63	5	-7	-79	-340	-68	7	-12	-47	-340	-68	8	-10	-41	-334	880	-1680	1184	-1688		15
-135	88	-68	-782	1688	68	-8	79	571	-364	288	-188	-38	-676	62	146	2	7	-136	-272	68	7	12	-61	-340	135	8	10	-88	-681	871	-1680	1182	-364	15	15
-135	88	-61	618	-888	-68	-8	61	468	-481	-288	188	211	1688	-2888	-146	-3	4	-170	-340	-135	11	-8	-88	-340	-135	11	-8	-107	-170	1883	-484	884	-4888		16
-135	88	61	618	-888	68	61	61	468	-481	288	188	211	1688	-2888	146	-34	4	-170	-340	-135	11	-8	-88	-340	-135	11	-8	-107	-170	1883	-484	884	-4888	16	16
-135	-61	78	-474	784	-68	-48	61	-488	888	-288	-188	188	-1388	888	-146	38	-88	576	-488	-135	-14	38	-488	188	-135	-14	38	-488	188	888	-1888	1188	-488		17
-135	-84	-78	3	1188	-274	-48	-61	-278	888	-88	-78	188	-788	881	127	3	88	814	-648	218	-188	-88	-217	-188	178	8	18	-148	-888	888	-1888	1887	-488	17	17
-135	88	-84	888	888	274	87	-61	781	-48	88	77	-88	888	-488	-127	-1	-88	678	-613	-218	137	-288	1888	-1888	-178	-8	1	-841	-887	1888	-484	888	-1888		18
-135	88	84	888	888	-274	88	61	781	-48	-88	38	88	888	-488	127	38	88	678	-613	218	111	288	1888	-1888	178	8	-1	-841	-887	1888	-484	888	-1888	18	18
888	-14	-8	888	888	274	-31	8	388	388	88	-88	8	122	122	-127	-34	8	-187	-187	-218	-118	88	-418	-418	178	7	8	-338	-338	884	-488	884	-418		19

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-N					POSICION 2-N					POSICION 3-N					POSICION 4-N					POSICION 5-N					POSICION 6-N				
		AREA	MOD.RES	PAND.	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
		M2	M3		TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
19	29	0.014800	0.001483	1.05	56	1	1	-331	-504	33	1	1	-193	-389	2	0	0	-5	-27	-4	0	0	22	40	-3	0	0	26	20	-3	1	0	23	18
	30	0.014800	0.001483	1.05	-55	0	2	-516	-316	-33	0	0	-240	-249	-2	1	-4	206	-237	5	1	-4	287	-220	3	1	-1	-75	-30	3	0	0	-5	51
20	30	0.014800	0.001483	1.05	83	0	-2	-739	-535	84	0	0	-624	-633	66	1	4	-273	-716	34	1	4	9	-512	-2	-1	1	79	-39	-10	-1	0	43	100
	31	0.014800	0.001483	1.05	-85	1	-2	-509	-767	-84	1	-2	-505	-749	-66	0	-2	-397	-590	-34	0	-3	-45	-488	2	2	-6	485	-450	10	2	-9	543	-393
21	31	0.014800	0.001483	1.05	115	2	2	-730	-999	127	2	2	-832	-1076	124	2	2	-633	-1026	110	3	3	-816	-1087	81	4	8	-131	-1000	34	3	8	229	-722
	32	0.014800	0.001483	1.05	-115	-1	4	-1096	-823	-127	-1	5	-1253	-835	-124	-1	6	-1272	-587	-110	-2	7	-1263	-381	-81	-3	9	-1148	-71	-34	-2	8	-882	99
22	32	0.018800	0.001963	1.03	145	0	-4	-1114	-757	173	0	-5	-1341	-889	185	0	-6	-1447	-930	189	0	-7	-1544	-966	181	-1	-8	-1573	-759	156	0	-6	-1271	-764
	33	0.018800	0.001963	1.03	-145	1	1	-997	-874	-173	2	2	-1188	-1042	-185	2	2	-1263	-1115	-189	2	1	-1275	-1195	-181	3	1	-1201	-1131	-156	2	1	-1067	-982
23	33	0.018800	0.001963	1.03	188	1	-1	-1144	-1021	211	1	-2	-1431	-1286	237	1	-3	-1660	-1451	256	1	-1	-1722	-1502	270	1	-1	-1779	-1706	270	1	-1	-1789	-1685
	34	0.018800	0.001963	1.03	-188	1	2	-1185	-881	-211	1	3	-1486	-1232	-237	1	3	-1667	-1384	-256	0	3	-1618	-1588	-270	0	4	-1602	-1580	-270	0	3	-1683	-1891
24	34	0.022800	0.003471	1.03	183	1	2	-883	-764	240	1	-3	-1155	-1012	280	2	-3	-1343	-1183	317	2	-3	-1520	-1345	348	2	-4	-1688	-1483	370	2	-3	-1752	-1587
	35	0.022800	0.003471	1.03	-183	1	3	-912	-739	-240	0	5	-1213	-955	-280	0	6	-1423	-1107	-317	0	8	-1627	-1237	-348	0	9	-1803	-1345	-370	-1	10	-1933	-1406
25	35	0.026800	0.004933	1.03	190	1	-3	-712	-590	262	1	-5	-966	-806	318	1	-6	-1167	-971	370	1	-8	-1409	-1135	422	1	-9	-1606	-1287	466	1	-10	-1784	-1413
	36	0.026800	0.004933	1.03	-190	1	4	-720	-562	-262	1	5	-990	-805	-316	1	8	-1182	-976	-370	1	7	-1285	-1148	-422	1	8	-1585	-1311	-466	2	8	-1745	-1452
26	36	0.036800	0.006907	1.02	186	1	-4	-585	-470	273	2	-5	-850	-667	341	2	-6	-1058	-876	412	2	-7	-1272	-1065	483	2	-8	-1464	-1255	549	3	-8	-1679	-1434
	37	0.036800	0.006907	1.02	-186	1	4	-586	-466	-273	1	7	-875	-671	-341	1	8	-1100	-832	-412	0	11	-1338	-999	-483	0	14	-1575	-1194	-549	-1	16	-1786	-1318
27	37	0.042000	0.007054	1.02	174	0	-4	-473	-376	277	0	-7	-757	-586	360	-1	-9	-987	-782	450	-1	-11	-1235	-952	543	-2	-14	-1490	-1143	633	-2	-16	-1739	-1335
	38	0.042400	0.007054	1.02	-174	2	0	-418	-418	-277	3	0	-665	-665	-360	3	0	-867	-867	-450	4	0	-1083	-1083	-543	4	0	-1305	-1305	-633	5	0	-1522	-1522

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

POSICION 7-N					POSICION 8-N					POSICION 9-N					POSICION 10-N					POSICION 11-N					POSICION 12-N					POSICION 13-N				
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2
-3	1	0	22	20	-3	1	0	21	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21
3	1	0	17	20	3	1	0	42	3	3	1	-1	53	-8	3	1	-1	62	-7	3	1	0	52	-6	3	1	-1	62	-7	3	1	-1	53	-7
-5	0	0	67	99	-5	1	0	83	44	-5	1	1	96	34	-5	1	1	95	35	-5	1	0	95	36	-5	1	1	86	36	-5	1	1	86	36
9	1	-3	231	-88	8	1	0	56	56	8	0	0	51	83	9	0	0	58	78	9	0	0	57	77	9	0	0	54	88	8	0	0	54	86
-13	1	3	391	-65	-20	0	0	168	110	-19	0	0	116	150	-19	0	0	124	146	-19	0	0	125	146	-19	0	0	121	146	-19	0	0	128	147
13	1	-3	392	-67	20	2	-4	437	-161	19	1	-2	280	-2	19	1	-1	282	68	19	1	-1	216	52	19	1	-3	237	39	19	1	-2	252	34
113	2	3	-665	-656	86	1	0	-71	-62	-39	-1	2	271	51	-34	-2	1	287	166	-34	1	1	264	166	-39	2	2	269	146	-43	1	2	287	169
-113	0	2	-665	-667	-20	1	-9	-159	-494	39	3	-13	744	-416	36	3	-12	699	-369	34	1	-3	336	114	39	0	1	166	359	39	0	0	213	359
361	1	-2	-1669	-1646	262	2	3	-1331	-1007	146	4	13	-360	-1524	51	3	12	253	-952	-46	-2	2	382	166	-61	-3	-1	327	641	-46	0	8	297	377
-361	1	3	-1736	-1601	-262	0	3	-1466	-1239	-146	-2	3	-1070	-815	-51	-1	-5	-116	-443	46	5	-16	1179	-886	61	5	-18	1288	-476	66	3	-6	662	111
376	0	-3	-1799	-1627	263	3	-3	1788	-1368	339	3	3	-1549	-1462	353	5	5	-1666	-1310	1**	9	16	-366	-1375	46	6	19	366	-664	-76	-1	6	474	166
-376	-1	11	-1669	-1469	-263	-1	12	-1843	-1389	-339	-1	12	-1788	-1161	-353	-3	14	-1855	-883	-170	-7	16	-1186	-942	-46	-4	8	-946	-36	76	3	-16	788	-62
466	1	-11	-1669	-1468	311	8	-12	-1870	-1537	506	0	-12	-1964	-1513	474	-1	-14	-1966	-1369	417	-6	16	-1738	-1139	387	1	-8	-1588	-1062	366	0	16	-462	-975
-466	2	8	-1669	-1669	-311	2	8	-1862	-1666	-506	2	8	-1873	-1584	-474	3	8	-1737	-1517	-417	4	24	-1691	-1388	-387	2	7	-1188	-1061	-366	-5	2	-701	-634
664	3	-6	-1669	-1665	666	4	-8	-1866	-1706	666	4	-8	-2013	-1700	666	5	-8	-1966	-1664	648	8	-24	-1667	-1178	666	5	-6	-1188	-1066	666	5	-8	-1483	-1377
-664	-1	16	-1669	-1439	-666	-1	20	-2131	-1629	-666	-2	21	-2220	-1574	-666	-3	22	-2223	-1569	-648	-2	22	-2178	-1469	-666	-2	20	-2068	-1346	-666	-2	20	-1784	-1186
714	-3	-16	-1669	-1585	740	-3	-20	-2189	-1656	640	-3	-21	-2311	-1770	673	-4	-22	-2402	-1657	666	-4	-23	-2436	-1561	666	-3	-22	-2336	-1486	676	-3	-20	-2066	-1731
-714	3	0	-1717	-1717	-740	3	0	-1888	-1888	-640	6	0	-2021	-2021	-673	6	0	-2100	-2100	-666	6	0	-2139	-2139	-666	6	0	-2082	-2082	-676	5	0	-1967	-1967

CONTROL DE TENSIONES EN EL PESCANTE (CORDON SUPERIOR)

POSICION 14-N					POSICION 15-N					POSICION 16-N					POSICION 17-N					POSICION 18-N					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	TSUP+	TSUP-	TINF+	TINF-		
TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2	K/CM2		
-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	-3	0	0	19	21	23	-331	40	-564	19	29
3	1	-1	52	-7	3	1	-1	52	-7	3	1	-1	52	-7	3	1	-1	52	-7	3	1	-1	52	-7	3	1	-1	52	-7	267	-516	51	-318		30
-6	1	1	95	35	-9	1	1	95	35	-9	1	1	95	35	-9	1	1	95	35	-9	1	1	95	35	-9	1	1	95	35	96	-739	100	-716	20	30
9	0	0	55	78	9	0	0	55	78	9	0	0	55	78	9	0	0	55	78	9	0	0	55	78	9	0	0	55	78	543	-588	83	-787		31
-19	0	0	123	146	-19	0	0	124	146	-19	0	0	123	146	-19	0	0	123	146	-19	0	0	123	146	-19	0	0	123	146	261	-853	150	-1086	21	31
19	1	-2	226	44	19	1	-1	225	45	19	1	-2	226	44	19	1	-2	226	44	19	1	-1	225	44	19	1	-1	225	44	437	-1272	99	-856		32
-36	1	2	291	15	-36	1	1	290	154	-36	1	2	291	153	-36	1	2	291	153	-36	1	1	291	154	-36	1	1	290	154	300	-1573	166	-830	22	32
36	1	-1	252	18	36	1	-1	254	188	36	1	-1	250	194	36	1	-1	250	194	36	1	-1	252	192	36	1	-1	253	191	809	-1275	390	-1156		33
-59	1	1	399	340	-59	1	1	405	337	-59	1	1	398	342	-59	1	1	398	342	-59	1	1	401	340	-59	1	1	401	340	405	-1788	441	-1706	23	33
59	-	-1	401	338	59	1	-1	397	345	59	1	-1	425	318	59	1	-1	423	319	59	1	-1	413	329	59	1	-1	411	331	1296	-1902	945	-1891		34
-70	-3	[illegible]	[illegible]	378	-69	0	1	402	374	-69	[illegible]	1	421	360	-69	1	1	420	361	-69	0	1	414	366	-69	0	1	413	367	474	-1798	278	-1627	24	34
80	4	-17	845	-42	84	2	-8	540	231	89	1	-1	424	357	89	1	-2	446	338	88	1	-3	471	319	88	1	3	476	304	845	-1885	357	-1406		35
44	3	-7	170	-486	-109	-5	8	480	24	-130	-6	1	458	411	-127	-1	2	462	385	-128	1	3	483	370	-129	1	4	489	363	486	-1970	411	-1537	25	35
-44	0	-10	40	-327	106	7	-34	983	-266	130	8	-34	1051	-170	127	3	-11	626	222	129	1	-2	466	386	-28	1	-2	486	381	1051	-1933	391	-1606		36
394	8	10	-832	-1243	234	13	34	-110	-1161	27	9	34	440	-582	-156	-2	11	561	281	-193	-5	2	543	474	-177	0	2	521	481	599	-2013	474	-1684	26	36
-394	-9	20	-1385	-780	-224	-10	20	-937	-334	27	-7	3	-127	-26	155	5	-27	946	14	183	7	-31	978	38	177	2	-7	982	382	978	-2233	382	-1574		37
736	-3	-20	-2044	-1526	617	-3	-20	-1751	-1246	463	0	-3	-1186	-1061	269	-7	27	-303	-1052	35	8	31	310	-479	-241	3	7	859	491	869	-2435	491	-1881	27	37
-736	5	0	-1770	-1770	-617	5	0	-1485	-1485	-463	2	0	-1113	-1113	-269	-5	0	-847	-847	-35	-5	0	-84	-84	241	0	0	570	570	570	-2129	570	-2129		38

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-N					POSICION 2-N					POSICION 3-N					POSICION 4-N					POSICION 5-N					POSICION 6-N					
		AREA	MOD.RES.	PAND	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	AXIL	CORT	FLEC	T.SUP	T.INF	
		M2	M3		TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	TON	TON	MTON	K/CM2	K/CM2	
26	1	0.083480	1.000000	1.10	36	-1	-1	-1220	-1220	22	-1	0	-721	-721	1	0	0	-48	-48	-3	0	0	84	84	-1	0	0	41	41	-1	0	0	32	32	
	29	0.083480	1.000000	1.10	-36	1	-1	-1214	-1215	-22	1	-1	-716	-716	-1	0	0	-41	-41	3	0	0	86	86	2	0	0	46	46	1	0	0	36	36	
29	2	0.083480	1.000000	1.10	-14	9	0	486	486	20	0	0	-706	-706	4	0	0	-150	-150	-2	0	0	72	72	0	0	0	0	0	1	0	0	-51	-51	
	20	0.083480	1.000000	1.10	14	8	0	488	486	-20	0	0	-706	-706	-4	0	0	-148	-148	2	0	0	73	73	0	0	0	1	1	-1	0	0	-49	-49	
30	3	0.084480	1.000000	1.20	27	0	0	-780	-780	46	0	0	-1356	-1356	56	0	0	-1737	-1737	36	0	0	-1071	-1071	1	0	0	-35	-35	-6	0	0	186	183	
	30	0.084480	1.000000	1.20	-26	0	0	-773	-773	-46	0	0	-1351	-1351	-55	0	0	-1731	-1731	-36	0	0	-1064	-1064	-1	0	0	-39	-39	6	0	0	189	189	
31	4	0.083480	1.000000	1.51	-6	0	0	241	241	-15	0	0	449	449	-9	0	0	283	283	32	0	0	-1418	-1418	5	0	0	-337	-337	-2	0	0	72	72	
	21	0.083480	1.000000	1.51	6	0	0	244	244	15	0	0	451	451	9	0	0	286	286	-32	0	0	-1415	-1415	-4	0	0	-333	-333	3	0	0	74	74	
32	5	0.087480	1.000000	1.13	13	0	0	-302	-302	26	0	0	-396	-396	42	0	0	-640	-640	86	0	0	-886	-886	83	0	0	-1347	-1347	47	0	0	-716	-716	
	31	0.087480	1.000000	1.13	-13	0	0	-197	-197	-26	0	0	-382	-382	-42	0	0	-635	-635	-86	0	0	-882	-882	-82	0	0	-1343	-1343	-47	0	0	-716	-716	
33	6	0.083480	1.000000	1.10	-9	0	0	286	286	-14	0	0	411	411	-21	0	0	604	604	-36	0	0	879	879	-19	0	0	878	879	41	0	0	-1351	-1351	
	22	0.083480	1.000000	1.10	9	0	0	289	289	14	0	0	414	414	21	0	0	607	607	36	0	0	881	881	19	0	0	879	879	-41	0	0	-1357	-1357	
34	7	0.010480	1.000000	1.07	26	0	0	-281	-281	41	0	0	-415	-415	54	0	0	-645	-645	79	0	0	-884	-884	66	0	0	-886	-886	166	0	0	-1689	-1689	
	32	0.010480	1.000000	1.07	-26	0	0	-277	-277	-41	0	0	-412	-412	-54	0	0	-642	-642	-69	0	0	-880	-880	-65	0	0	-886	-886	-166	0	0	-1689	-1689	
35	8	0.084480	1.000000	1.05	-9	0	0	182	182	-14	0	0	283	283	-20	0	0	411	411	-27	0	0	557	557	-22	0	0	705	705	-49	0	0	1044	1044	
	23	0.084480	1.000000	1.05	9	0	0	186	186	14	0	0	286	286	20	0	0	416	416	27	0	0	562	562	37	0	0	705	705	50	0	0	1050	1046	
36	9	0.014480	1.000000	1.18	24	0	0	-193	-193	38	0	0	-302	-302	51	0	0	-497	-497	67	0	0	-694	-694	66	0	0	-691	-691	166	0	0	-497	-497	
	33	0.014480	1.000000	1.18	-24	0	0	-197	-197	-37	0	0	-296	-296	-51	0	0	-501	-501	-67	0	0	-529	-529	-65	0	0	-978	-978	-166	0	0	-691	-691	
37	10	0.008480	1.000000	1.84	-4	0	0	71	71	-8	0	0	139	139	-12	0	0	213	213	-17	0	0	307	307	-24	0	0	431	431	-31	0	0	599	599	
	24	0.008480	1.000000	1.84	4	0	0	75	75	8	0	0	143	143	12	0	0	216	216	17	0	0	311	311	24	0	0	429	429	32	0	0	595	595	
38	11	0.014480	1.000000	1.18	18	0	0	-129	-129	28	0	0	-332	-332	42	0	0	-332	-332	57	0	0	-489	-489	74	0	0	-687	-687	94	0	0	-748	-748	
	34	0.014480	1.000000	1.18	-18	0	0	-123	-123	-28	0	0	-326	-326	-41	0	0	-326	-326	-56	0	0	-484	-484	-73	0	0	-681	-681	-94	0	0	-748	-748	
39	12	0.008480	1.000000	1.84	-1	0	0	11	11	-4	0	0	82	82	-9	0	0	118	118	-12	0	0	161	161	-16	0	0	209	209	-25	0	0	339	339	
	25	0.008480	1.000000	1.84	1	0	0	15	15	4	0	0	86	86	8	0	0	122	122	13	0	0	165	165	16	0	0	204	205	26	0	0	339	339	
40	13	0.010480	1.000000	1.18	10	0	0	-87	-87	23	0	0	-136	-136	36	0	0	-211	-211	51	0	0	-301	-301	66	0	0	-400	-400	86	0	0	-554	-554	
	35	0.010480	1.000000	1.18	-9	0	0	-82	-82	-22	0	0	-131	-131	-35	0	0	-207	-207	-50	0	0	-300	-307	-65	0	0	-400	-400	-86	0	0	-559	-559	
41	14	0.008480	1.000000	1.88	4	0	0	-44	-44	1	0	0	-10	-10	-5	0	0	29	29	-7	0	0	99	99	-10	0	0	140	140	-13	0	0	200	200	
	26	0.008480	1.000000	1.88	-3	0	0	-36	-36	0	0	0	-5	-5	3	0	0	34	34	7	0	0	86	86	10	0	0	139	139	18	0	0	201	201	
42	15	0.014480	1.000000	1.18	1	0	0	-7	-7	15	0	0	-72	-72	28	0	0	-134	-134	44	0	0	-300	-300	62	0	0	-398	-398	81	0	0	-551	-551	
	36	0.014480	1.000000	1.18	0	0	0	-1	-1	-14	0	0	-66	-66	-27	0	0	-126	-126	-43	0	0	-292	-292	-61	0	0	-398	-398	-81	0	0	-558	-558	
43	16	0.008480	1.000000	1.82	7	0	0	-76	-76	5	0	0	-88	-88	3	0	0	-53	-53	0	0	0	0	0	-4	0	0	44	44	-10	0	0	88	88	
	27	0.008480	1.000000	1.82	-7	0	0	-72	-72	-5	0	0	-83	-83	-3	0	0	-29	-29	0	0	0	5	5	8	0	0	46	46	10	0	0	184	184	
44	17	0.008480	1.000000	1.18	-6	0	0	27	27	6	0	0	-35	-35	20	0	0	-80	-80	36	0	0	-148	-148	54	0	0	-298	-298	72	0	0	-456	-456	
	37	0.008480	1.000000	1.18	0	0	0	31	31	-5	0	0	-21	-21	-19	0	0	-76	-76	-36	0	0	-141	-141	-55	0	0	-297	-297	-74	0	0	-456	-456	
45	18	0.014480	1.000000	1.88	10	0	0	-67	-67	18	0	0	-88	-88	18	0	0	-88	-88	8	0	0	-88	-88	0	0	0	-88	-88	0	0	0	-88	-88	
	28	0.014480	1.000000	1.88	-10	0	0	-64	-64	-18	0	0	-87	-87	-18	0	0	-85	-85	-8	0	0	-89	-89	-7	0	0	-88	-89	-8	0	0	-88	-85	
46	19	0.011080	1.000000	1.18	1	0	0	-4	-4	1	0	0	-6	-4	1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	
	38	0.011080	1.000000	1.18	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

POSICION 7-N					POSICION 8-N					POSICION 9-N					POSICION 10-N					POSICION 11-N					POSICION 12-N					POSICION 13-N				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36
1	0	0	40	40	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41
0	0	0	-14	-14	0	0	0	-11	-11	0	0	0	-10	-10	0	0	0	-10	-10	0	0	0	-10	-10	0	0	0	-10	-10	0	0	0	-10	-10
0	0	0	-12	-12	0	0	0	-9	-9	0	0	0	-8	-8	0	0	0	-8	-8	0	0	0	-8	-8	0	0	0	-8	-8	0	0	0	-8	-8
-4	0	0	103	103	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94
4	0	0	109	109	4	0	0	99	99	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100
0	0	0	-16	-16	1	0	0	-36	-36	1	0	0	-36	-36	1	0	0	-35	-35	1	0	0	-36	-36	1	0	0	-36	-36	1	0	0	-37	-37
0	0	0	-13	-13	-1	0	0	-35	-35	-1	0	0	-33	-33	-1	0	0	-32	-32	-1	0	0	-32	-32	-1	0	0	-33	-33	-1	0	0	-33	-33
0	0	0	3	3	-7	0	0	84	84	-6	0	0	79	79	-6	0	0	77	77	-6	0	0	78	78	-6	0	0	78	78	-6	0	0	78	78
1	0	0	7	7	7	0	0	86	86	6	0	0	83	83	6	0	0	81	81	6	0	0	82	82	6	0	0	82	82	6	0	0	82	82
10	0	0	-311	-311	8	0	0	-16	-16	2	0	0	-77	-77	3	0	0	-86	-86	3	0	0	-82	-82	2	0	0	-81	-81	3	0	0	-81	-81
-10	0	0	-309	-309	0	0	0	11	-11	-2	0	0	-73	-73	-3	0	0	-83	-83	-2	0	0	-79	-79	-2	0	0	-77	-77	-2	0	0	-78	-78
116	0	0	-1167	-1167	61	0	0	-614	-614	-6	0	0	58	58	-17	0	0	160	160	-13	0	0	120	120	-12	0	0	114	114	-12	0	0	116	116
-116	0	0	-1164	-1164	-61	0	0	-610	-610	6	0	0	60	60	17	0	0	163	163	13	0	0	123	123	12	0	0	118	118	13	0	0	119	119
-23	0	0	479	479	79	0	0	-1731	-1731	15	0	0	-328	-328	-4	0	0	90	90	4	0	0	-79	79	5	0	0	-104	-104	4	0	0	-83	-83
23	0	0	484	484	-79	0	0	-1726	-1726	-15	0	0	-322	-322	5	0	0	95	95	-3	0	0	-74	-74	-5	0	0	-99	-99	-4	0	0	-88	-88
127	0	0	-1004	-1004	153	0	0	-1215	-1215	161	0	0	-1293	-1293	86	0	0	-681	-681	-10	0	0	82	84	-25	0	0	171	171	-20	0	0	132	132
-126	0	0	-999	-999	-153	0	0	-1209	-1209	-163	0	0	-1287	-1287	-85	0	0	-675	-675	11	0	0	73	73	26	0	0	176	176	20	0	0	137	137
-41	0	0	738	738	-54	0	0	960	960	-26	0	0	469	469	102	0	0	-1894	-1894	19	0	0	-34	-351	-6	0	0	101	101	4	0	0	-78	-78
42	0	0	742	742	54	0	0	964	964	26	0	0	473	473	-102	0	0	-1890	-1890	-19	0	0	-34	-347	6	0	0	105	105	-4	0	0	-76	-76
116	0	0	-820	-820	136	0	0	-103	-103	164	0	0	1299	-1299	-37	0	0	-1557	1557	209	0	0	-185	-185	105	0	0	-828	-828	-13	0	0	88	88
-116	0	0	-814	-814	-135	0	0	-1097	-1097	-163	0	0	-1293	-1293	-196	0	0	-1551	-1551	-208	0	0	-1645	-1645	-104	0	0	-822	-822	14	0	0	93	93
-33	0	0	516	516	-43	0	0	865	865	55	0	0	864	864	-74	0	0	1148	1148	-41	0	0	647	647	120	0	0	-1925	-1925	24	0	0	-376	-376
33	0	0	520	520	43	0	0	869	869	55	0	0	864	864	74	0	0	1150	1150	42	0	0	645	645	-120	0	0	-1921	-1921	-23	0	0	-375	-375
110	0	0	-653	-653	135	0	0	-799	-799	161	0	0	-955	-955	187	0	0	-1107	-1107	214	0	0	-1271	-1271	252	0	0	-1496	-1496	257	0	0	-1525	-1525
-109	0	0	-648	-648	-134	0	0	-794	-794	-160	0	0	-951	-951	-186	0	0	-1103	-1103	-214	0	0	-1267	-1267	-252	0	0	-1492	-1492	-257	0	0	-1520	-1520
27	0	0	324	324	37	0	0	442	442	49	0	0	579	579	62	0	0	732	732	79	0	0	939	939	106	0	0	1246	1246	52	0	0	617	617
29	0	0	329	329	38	0	0	447	447	49	0	0	584	584	62	0	0	737	737	80	0	0	944	944	106	0	0	1253	1253	53	0	0	622	622
105	0	0	-498	-498	130	0	0	-816	-816	157	0	0	-743	-743	186	0	0	-880	-880	217	0	0	-1029	-1029	246	0	0	-1164	-1164	275	0	0	-1302	-1302
-104	0	0	-493	-493	-129	0	0	-811	-811	-156	0	0	-738	-738	-185	0	0	-875	-875	-216	0	0	-1024	-1024	-245	0	0	-1159	-1159	-274	0	0	-1297	-1297
-16	0	0	188	188	-24	0	0	252	252	-34	0	0	353	353	-45	0	0	469	469	-58	0	0	605	605	-73	0	0	754	754	-91	0	0	947	947
17	0	0	172	172	25	0	0	257	257	35	0	0	357	357	46	0	0	474	474	59	0	0	609	609	73	0	0	758	758	92	0	0	951	951
96	0	0	-402	-402	124	0	0	-806	-506	152	0	0	-619	-619	180	0	0	-736	-736	212	0	0	-884	-884	244	0	0	-998	-998	279	0	0	-1130	-1130
-97	0	0	-397	-397	-123	0	0	-501	-501	-150	0	0	-614	-614	-179	0	0	-731	-731	-210	0	0	-859	-859	-243	0	0	-991	-991	-277	0	0	-1131	-1131
2	0	0	-15	-15	-2	0	0	15	15	-8	0	0	84	84	-15	0	0	103	103	-24	0	0	163	163	-35	0	0	234	234	-47	0	0	316	316
-2	0	0	-13	-13	3	0	0	18	18	8	0	0	57	57	16	0	0	106	106	25	0	0	166	166	35	0	0	237	237	48	0	0	319	319
1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6	1	0	0	-6	-6
1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5

CONTROL DE TENSIONES EN EL PESCANTE (MONTANTES)

POSICION 14-N					POSICION 15-N					POSICION 16-N					POSICION 17-N					POSICION 18-N					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TSUP+ K/CM2	TSUP- K/CM2	TINF+ K/CM2	TINF- K/CM2		
-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	-1	0	0	36	36	36	-1000	36	-1000	28	1
1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	1	0	0	41	41	89	-1214	96	-1215		29
0	0	0	-11	-11	0	0	0	-11	-11	0	0	0	-11	-11	0	0	0	-11	-11	0	0	0	-11	-11	0	0	0	-11	-11	486	-709	488	-709	28	2
0	0	0	-9	-9	0	0	0	-9	-9	0	0	0	-9	-9	0	0	0	-9	-9	0	0	0	-9	-9	0	0	0	-9	-9	486	-709	488	-709		30
-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	-4	0	0	94	94	183	-1727	189	-1727	28	3
4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	4	0	0	100	100	189	-1731	189	-1731		30
-1	0	0	-34	-34	-1	0	0	-34	-34	-1	0	0	-34	-34	-1	0	0	-35	-35	-1	0	0	-35	-35	-1	0	0	-35	-35	449	-1418	449	-1418	31	4
-6	0	0	78	78	-6	0	0	78	78	-6	0	0	78	78	-6	0	0	78	78	-6	0	0	78	78	-6	0	0	78	78	451	-1418	451	-1418		31
6	0	0	82	82	6	0	0	82	82	6	0	0	82	82	6	0	0	82	82	6	0	0	82	82	6	0	0	82	82	94	-1367	94	-1367	32	5
-3	0	0	-82	-82	3	0	0	-82	-82	3	0	0	-83	-83	3	0	0	-83	-83	3	0	0	-83	-83	3	0	0	-83	-83	95	-1391	95	-1391		31
-5	0	0	-78	-78	-5	0	0	-79	-79	-5	0	0	-79	-79	-5	0	0	-79	-79	-5	0	0	-80	-80	-5	0	0	-80	-80	95	-1391	95	-1391	33	6
-12	0	0	117	117	-12	0	0	117	117	-12	0	0	117	117	-12	0	0	117	117	-12	0	0	117	117	-12	0	0	117	117	95	-1357	95	-1357		32
13	0	0	120	120	13	0	0	120	120	13	0	0	120	120	13	0	0	120	120	13	0	0	120	120	13	0	0	120	120	95	-1357	95	-1357	34	7
-4	0	0	-91	-91	4	0	0	-91	-91	4	0	0	-92	-92	4	0	0	-92	-92	4	0	0	-92	-92	4	0	0	-92	-92	1044	-1731	1045	-1731	35	8
-4	0	0	-88	-88	-4	0	0	-88	-88	-4	0	0	-88	-88	-4	0	0	-87	-87	-4	0	0	-87	-87	-4	0	0	-87	-87	1044	-1699	1045	-1700		33
-19	0	0	123	129	-19	0	0	127	127	-19	0	0	127	127	-19	0	0	127	127	-19	0	0	127	127	-19	0	0	127	127	171	-1666	171	-1666	36	9
36	0	0	131	131	36	0	0	132	132	20	0	0	133	133	20	0	0	133	133	20	0	0	132	132	36	0	0	132	132	176	-1667	176	-1667		35
-5	0	0	-88	-88	-5	0	0	-82	-82	-5	0	0	-80	-80	-5	0	0	-81	-81	-5	0	0	-81	-81	-5	0	0	-82	-82	1044	-1664	1045	-1664	37	10
-6	0	0	-88	-88	-6	0	0	-87	-87	-6	0	0	-85	-85	-6	0	0	-86	-86	-6	0	0	-87	-87	-6	0	0	-87	-87	1044	-1666	1045	-1666		34
39	0	0	165	165	-29	0	0	167	167	24	0	0	162	162	-24	0	0	164	164	25	0	0	165	165	39	0	0	165	165	185	-1681	185	-1681	38	11
39	0	0	169	169	29	0	0	172	172	25	0	0	167	167	25	0	0	166	164	25	0	0	170	170	39	0	0	170	170	185	-1665	185	-1665		34
-7	0	0	13	13	-8	0	0	-99	-99	7	0	0	-115	-115	-7	0	0	-109	-109	-7	0	0	-109	-107	-7	0	0	107	-107	1185	-1665	1185	-1665	39	12
6	0	0	17	17	-6	0	0	-86	-86	-7	0	0	-111	-111	-7	0	0	-109	-109	-6	0	0	-109	-109	-6	0	0	-109	-109	1185	-1665	1185	-1665		35
196	0	0	-245	-245	-16	0	0	91	91	-41	0	0	264	264	-33	0	0	166	165	-31	0	0	159	159	-45	0	0	159	159	185	-1665	185	-1665	40	13
-196	0	0	-738	-738	16	0	0	86	86	41	0	0	259	259	34	0	0	160	160	32	0	0	162	162	45	0	0	164	164	185	-1665	185	-1665		36
166	0	0	-1013	-1013	31	0	0	-573	-573	-7	0	0	81	81	-7	0	0	-85	-85	-6	0	0	-111	-111	-6	0	0	-101	-101	1185	-1665	1185	-1665	41	14
-166	0	0	-1008	-1008	-30	0	0	-568	-568	7	0	0	86	86	-7	0	0	-85	-85	-6	0	0	-109	-109	-6	0	0	-99	-99	1185	-1665	1185	-1665		35
344	0	0	-1408	-1408	317	0	0	-1093	-1093	169	0	0	-741	-741	-28	0	0	93	93	-42	0	0	288	288	-41	0	0	168	168	185	-1665	185	-1665	42	15
-313	0	0	-1403	-1403	-316	0	0	-1087	-1087	-165	0	0	-736	-736	24	0	0	88	88	53	0	0	213	213	43	0	0	171	171	185	-1667	215	-1667		36
-116	0	0	1184	1184	-57	0	0	889	888	167	0	0	-1073	-1073	32	0	0	-371	-371	-16	0	0	169	169	8	0	0	-86	-86	1184	-1665	1185	-1665	43	16
116	0	0	1189	1189	52	0	0	889	888	-166	0	0	-1068	-1068	-32	0	0	-367	-367	16	0	0	164	164	4	0	0	-88	-88	1184	-1665	1185	-1665		37
316	0	0	-1388	-1388	301	0	0	-1388	-1388	306	0	0	-1576	-1576	302	0	0	-1668	-1668	307	0	0	-648	-648	42	0	0	168	168	185	-1665	185	-1665	44	17
-316	0	0	-1388	-1388	-346	0	0	-1388	-1388	-306	0	0	-1572	-1573	-301	0	0	-1666	-1666	-306	0	0	-641	-641	32	0	0	164	164	184	-1665	185	-1665		37
-51	0	0	489	489	-79	0	0	833	833	-107	0	0	719	719	-32	0	0	232	232	206	0	0	-1776	-1776	4	0	0	-89	-89	716	-1776	716	-1776	45	18
51	0	0	412	412	80	0	0	836	836	107	0	0	721	721	32	0	0	236	236	-204	0	0	-1772	-1772	-4	0	0	-87	-87	721	-1772	721	-1772		38
1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	1	0	0	-4	-4	0	-4	0	-4	46	19
1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	1	0	0	5	5	5	0	5	0		39

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-N					POSICION 2-N					POSICION 3-N					POSICION 4-N					POSICION 5-N					POSICION 6-N				
		AREA M2	MOD.RES M3	PAND.	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
47	29	0.008480	1.000000	2.32	-66	0	0	1705	1705	-34	0	0	1007	1007	-2	0	0	65	65	4	0	0	-356	-356	3	0	0	-335	-335	3	0	0	-321	-321
	20	0.008480	1.000000	2.32	56	0	0	1703	1703	34	0	-1	1005	1006	2	0	0	62	62	-4	0	0	-360	-360	-3	0	0	-339	-339	-3	0	0	-327	-327
48	20	0.008480	1.000000	2.32	-40	0	0	1191	1191	-56	0	1	1685	1685	-7	0	0	197	197	8	0	0	-538	-538	4	0	0	-362	-362	3	0	0	-214	-214
	5	0.008480	1.000000	2.32	40	0	0	1189	1189	56	0	0	1683	1683	7	0	0	195	195	-8	0	0	-544	-544	-4	0	0	-267	-267	-3	0	0	-220	-220
49	30	0.008800	1.000000	1.69	-35	0	0	735	735	-60	0	0	1257	1257	-75	0	0	1585	1585	-45	0	0	943	943	-1	0	0	29	29	6	0	0	-275	-275
	21	0.008800	1.000000	1.69	35	0	0	733	733	60	0	0	1255	1255	75	0	0	1583	1583	45	0	-1	940	940	1	0	0	26	26	-6	0	0	-278	-278
50	21	0.008800	1.000000	1.69	-28	0	0	576	576	-46	0	0	988	987	-57	0	0	1398	1398	-73	0	1	1522	1522	-6	0	0	181	181	10	0	0	-362	-362
	5	0.008800	1.000000	1.69	28	0	0	574	574	46	0	0	985	985	57	0	0	1395	1395	73	0	0	1519	1519	8	0	0	159	159	-10	0	0	-365	-365
51	31	0.008440	1.000000	1.53	-43	0	0	661	661	-62	0	0	955	955	-81	0	0	1254	1254	-104	0	0	1614	1614	-112	0	0	1745	1745	-56	0	0	984	984
	22	0.008440	1.000000	1.53	42	0	0	659	659	61	0	0	953	953	81	0	0	1252	1252	104	0	0	1611	1611	112	0	-1	1742	1742	58	0	-1	982	981
52	22	0.008440	1.000000	1.53	-38	0	0	556	556	-51	0	0	789	789	-65	0	0	1012	1012	-81	0	0	1284	1284	-96	0	1	1516	1516	-88	0	1	1373	1373
	7	0.008440	1.000000	1.53	38	0	0	554	554	51	0	0	787	787	65	0	0	1010	1010	81	0	0	1282	1282	97	0	0	1514	1514	88	0	0	1370	1370
53	32	0.010960	1.000000	1.19	-42	0	0	390	390	-62	0	0	583	583	-82	0	0	764	764	-106	0	0	992	992	-134	-1	0	1291	1291	-107	-1	0	1664	1664
	23	0.010960	1.000000	1.19	41	0	-1	387	387	62	1	-1	579	579	82	1	-2	765	765	105	1	-2	989	988	134	1	-3	1257	1257	106	1	-4	1660	1660
54	23	0.010960	1.000000	1.19	-34	0	1	322	322	-51	1	1	477	477	-66	1	2	623	623	-85	1	2	798	798	-106	1	3	1021	986	-129	1	4	1306	1305
	8	0.010960	1.000000	1.19	34	0	0	318	318	51	0	0	474	474	66	0	0	620	620	85	0	0	794	794	106	-1	0	984	984	128	-1	0	1302	1302
55	33	0.014810	1.000000	1.55	-31	0	0	209	209	-51	0	0	344	344	-71	0	0	475	475	-94	0	0	630	630	-121	0	0	809	809	-152	0	0	1017	1017
	24	0.014810	1.000000	1.55	31	0	0	206	206	51	0	0	342	342	70	0	0	472	472	94	0	-1	627	627	120	1	-1	807	807	151	1	-2	1014	1014
56	24	0.0[illegible]	1.000000	1.55	-27	0	0	184	184	45	0	0	300	300	-61	0	0	410	410	-80	0	1	537	536	-102	1	1	685	685	-127	1	2	865	865
	11	0.014810	1.000000	1.55	27	0	0	181	181	44	0	0	298	298	61	0	0	408	408	80	0	0	536	536	102	0	0	684	684	127	0	0	862	862
57	34	0.018900	1.000000	1.55	-20	0	0	100	100	-39	0	0	197	197	-58	0	0	290	290	-80	0	0	401	401	-106	0	0	531	531	-135	0	0	677	677
	25	0.018900	1.000000	1.55	20	0	0	98	98	39	0	0	195	195	57	0	0	288	288	80	0	0	400	399	105	0	-1	529	529	134	1	-1	675	675
58	25	0.018900	1.000000	1.55	-19	0	0	94	94	-36	0	0	179	179	-51	0	0	258	258	-70	0	0	352	352	-91	0	1	459	459	-115	1	-1	599	599
	13	0.018900	1.000000	1.55	18	0	0	92	92	35	0	0	177	177	51	0	0	256	256	70	0	0	350	350	91	0	0	457	457	115	0	0	576	576
59	35	0.024800	1.000000	1.55	-10	1	0	39	39	-30	1	0	120	120	-49	0	0	198	198	-72	0	0	291	291	-99	0	0	399	399	-130	0	0	522	522
	26	0.024800	1.000000	1.55	9	0	1	36	37	29	0	1	118	118	49	0	0	196	196	72	0	0	289	289	99	0	0	397	396	129	1	-1	520	519
60	26	0.024800	1.000000	1.55	-11	0	-1	45	45	-29	0	-1	118	118	-46	0	0	186	186	-96	0	0	286	286	-89	0	0	358	357	-114	1	1	460	460
	15	0.024800	1.000000	1.55	11	1	0	43	43	29	1	0	116	116	46	0	0	184	184	86	0	0	284	284	88	0	0	355	355	114	0	0	457	457
61	36	0.028800	1.000000	1.55	4	1	0	-20	-20	-16	1	0	55	55	-35	1	0	121	121	-56	1	0	199	199	-84	1	0	290	290	-114	1	0	393	393
	27	0.028800	1.000000	1.55	-4	0	1	-24	-23	15	0	1	53	53	34	0	1	119	119	57	0	1	197	197	83	0	1	288	288	113	0	1	391	391
62	27	0.028800	1.000000	1.55	0	0	-1	1	2	-19	0	-1	85	85	-36	0	-1	125	125	-56	0	-1	195	195	-80	0	-1	275	275	-109	0	-1	385	386
	17	0.028800	1.000000	1.55	0	1	0	-1	-1	18	1	0	83	83	36	1	0	123	123	56	1	0	193	193	79	1	0	273	273	108	1	0	383	383
63	37	0.032410	1.000000	1.55	16	1	0	-79	-79	-6	1	0	18	18	-27	1	0	83	83	-52	1	0	160	160	-81	1	0	249	249	-114	1	0	360	359
	28	0.032410	1.000000	1.55	-17	0	2	-81	-81	9	0	2	16	16	29	0	2	81	81	51	0	2	158	158	80	0	1	247	248	113	0	1	358	359
64	28	0.032410	1.000000	1.55	10	0	-2	-49	-48	-12	0	-2	38	38	-33	0	-2	102	103	-58	0	-2	178	178	-86	0	-1	264	264	-117	0	-1	369	369
	19	0.032410	1.000000	1.55	-11	1	0	-51	-51	12	1	0	36	36	33	1	0	101	101	57	1	0	176	176	85	1	0	262	262	118	1	0	369	369

CINCAPE2.XLS 7/05/97

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

POSICION 7-N					POSICION 8-N					POSICION 9-N					POSICION 10-N					POSICION 11-N					POSICION 12-N					POSICION 13-N				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
3	0	0	-334	-334	3	0	0	-316	-316	3	0	0	-312	-312	3	0	0	-312	-312	3	0	0	-312	-312	3	0	0	-312	-312	3	0	0	-312	-312
-3	0	0	-339	-339	-3	0	0	-321	-321	-3	0	0	-317	-317	-3	0	0	-317	-317	-3	0	0	-317	-317	-3	0	0	-317	-317	-3	0	0	-317	-317
3	0	0	-333	-333	3	0	0	-333	-333	3	0	0	-330	-330	3	0	0	-330	-330	3	0	0	-330	-330	3	0	0	-330	-330	3	0	0	-329	-329
-3	0	0	-338	-338	-3	0	0	-337	-337	-3	0	0	-336	-336	-3	0	0	-336	-336	-3	0	0	-336	-336	-3	0	0	-336	-336	-3	0	0	-334	-334
7	0	0	-357	-357	7	0	0	-356	-356	7	0	0	-352	-352	7	0	0	-351	-351	7	0	0	-351	-351	7	0	0	-351	-351	7	0	0	-351	-351
-7	0	0	-351	-351	-7	0	0	-355	-354	-8	0	0	-355	-355	-8	0	0	-355	-355	-8	0	0	-355	-355	-8	0	0	-355	-355	-8	0	0	-355	-355
7	0	0	-337	-337	7	0	0	-354	-354	7	0	0	-347	-347	7	0	0	-348	-348	7	0	0	-347	-347	7	0	0	-347	-347	7	0	0	-346	-346
-7	0	0	-341	-341	-7	0	0	-338	-338	-7	0	0	-351	-351	-7	0	0	-352	-352	-7	0	0	-351	-351	-7	0	0	-351	-351	-7	0	0	-350	-350
6	0	0	-152	-152	14	0	0	-342	-342	13	0	0	-310	-310	13	0	0	-314	-314	13	0	0	-316	-316	13	0	0	-314	-314	13	0	0	-314	-314
-7	0	0	-156	-156	-15	0	0	-346	-346	-13	0	0	-314	-314	-13	0	0	-316	-316	-13	0	0	-319	-319	-13	0	0	-317	-317	-13	0	0	-316	-316
0	0	0	0	0	14	0	0	-341	-341	12	0	0	-275	-275	12	0	0	-274	-274	12	0	0	-276	-276	12	0	0	-277	-277	12	0	0	-277	-277
0	0	0	4	4	-15	0	0	-345	-345	-12	0	0	-279	-279	-12	0	0	-278	-278	-12	0	0	-282	-282	-12	0	0	-281	-281	-12	0	0	-281	-281
-170	1	0	1560	1556	-97	-1	0	831	831	9	0	0	-106	-105	22	0	0	-282	-282	22	0	0	-347	-347	22	0	0	-351	-351	22	0	0	-351	-351
-170	2	-3	1562	1561	97	2	-4	817	817	-10	0	0	-110	-110	26	0	1	-326	326	-23	0	0	-351	-351	-23	0	0	-352	-352	-23	0	0	-356	-356
-152	3	-4	1438	1438	-146	2	-4	1362	1362	-1	0	0	9	9	29	0	-1	-325	325	20	0	0	-329	-327	-20	0	0	-318	-318	-20	0	0	-324	-324
152	-3	4	1432	1432	146	-1	0	1360	1360	1	0	0	5	5	30	0	0	-329	-329	-21	0	0	-359	-358	-30	0	0	-354	-354	-30	0	0	-356	-356
-188	-1	0	1349	1349	-124	-1	0	1558	1556	-232	-1	0	1555	1555	-119	-1	0	799	799	14	0	0	-143	-143	35	0	0	-358	-358	31	0	0	-359	-359
188	1	2	1347	1346	223	1	-3	488	1487	232	2	-4	1553	1552	118	2	-5	797	795	-14	0	0	-141	-141	-35	0	0	-363	-363	-31	0	0	-364	-364
-188	1	-2	1559	1557	183	1	3	1557	1556	-211	2	4	1416	1418	-184	2	5	1341	1700	1	0	[illegible]	[illegible]	-6	30	0	0	-416	-416	30	0	0	-397	-397
184	-1	0	1554	1555	183	-2	0	1554	1554	211	-1	0	1419	1418	-184	-1	0	1296	1296	-1	0	[illegible]	[illegible]	-3	-46	0	0	-414	-414	-46	0	0	-391	-391
-183	2	-3	938	938	-166	2	0	918	1718	-203	-1	0	1280	1279	-209	-1	0	1437	1437	-291	-1	0	1461	1461	-136	-2	0	897	897	28	0	0	-173	-173
188	1	-1	936	936	166	1	-2	1917	1916	203	1	-3	1216	1218	209	1	-4	1436	1434	258	2	-5	1459	1458	136	2	-4	896	893	-28	0	0	-176	-176
-141	1	1	716	716	-126	1	2	894	894	-201	1	3	1099	1098	-230	1	4	1157	1156	-258	2	5	1460	1461	-157	2	6	1142	1141	6	0	0	-42	-42
141	0	0	708	708	126	0	0	892	892	200	-1	0	1097	1097	230	-1	0	1156	1156	259	-1	0	1300	1300	157	-2	0	1139	1139	-6	0	0	-45	-45
-184	0	0	887	887	-161	-1	0	883	886	-241	-1	0	987	987	-264	-2	0	1139	1139	-332	-2	0	1304	1304	-183	-3	0	1138	1138	-183	-3	0	1498	1498
183	1	-2	886	884	208	1	-4	884	883	240	2	-4	885	884	263	2	-6	1137	1136	333	3	-8	1302	1301	182	3	-10	1500	1500	182	4	-12	1497	1498
-142	1	2	878	878	-175	1	3	888	888	-203	2	4	815	815	-236	2	6	946	947	-272	3	8	1091	1089	-141	3	10	1315	1315	-141	4	12	1500	1500
141	0	0	867	867	175	-1	0	867	867	202	-1	0	813	813	236	-2	0	946	946	271	-3	8	1088	1088	141	-3	8	1313	1313	141	-4	0	1502	1502
-140	0	0	857	857	-140	0	0	853	853	-202	0	0	788	788	-264	-1	0	912	912	-308	-1	0	1057	1057	-140	-1	0	1288	1288	-140	-1	0	1498	1498
140	0	0	855	855	140	1	-1	851	851	202	1	-1	787	787	263	1	-2	911	910	308	2	-4	1055	1054	140	2	-4	1287	1286	140	2	-4	1494	1492
-139	0	0	491	491	-164	1	1	566	566	-196	1	1	677	677	-239	1	3	781	781	-284	2	4	913	913	-164	2	6	1084	1084	-164	3	8	1186	1184
139	0	0	488	488	164	0	0	564	564	196	0	0	675	675	238	-1	0	780	780	283	-1	0	910	910	163	-1	0	1084	1084	163	-2	0	1182	1182
-140	0	0	488	488	-165	0	0	562	562	-231	0	0	712	712	-276	0	0	849	849	-329	-1	0	987	987	-191	-1	0	1146	1146	-191	-2	0	1291	1291
140	0	1	488	488	165	0	0	560	560	230	1	-1	711	710	275	1	-2	847	847	332	1	-3	985	985	190	2	-4	1145	1145	191	3	-5	1289	1289
-166	0	-1	482	482	-166	0	0	573	573	-224	1	1	688	688	-262	1	2	818	818	-304	1	3	937	936	-344	2	5	1091	1089	-344	3	7	1189	1187
166	0	0	480	480	166	0	0	572	572	223	0	0	686	686	262	0	0	806	806	303	-1	0	935	935	343	-1	0	1089	1089	343	-1	0	1188	1188

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 1)

POSICION 14-N					POSICION 15-N					POSICION 16-N					POSICION 17-N					POSICION 18-N					POSICION 19-N					TENS. MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TENS+ K/CM2	TENS- K/CM2	TENS+ K/CM2	TENS- K/CM2		
3	0	0	-212	-212	3	0	0	-212	-212	3	0	0	-212	-212	3	0	0	-212	-212	3	0	0	-212	-212	3	0	0	-212	-212	1705	-388	1705	-388	47	29
-3	0	0	-217	-217	-3	0	0	-217	-217	-3	0	0	-217	-217	-3	0	0	-217	-217	-3	0	0	-217	-217	-3	0	0	-217	-217	1709	-388	1709	-388		30
3	0	0	-229	-229	3	0	0	-229	-229	3	0	0	-229	-229	3	0	0	-229	-229	3	0	0	-229	-229	3	0	0	-229	-229	1695	-388	1695	-388	46	30
-3	0	0	-234	-234	-3	0	0	-234	-234	-3	0	0	-233	-233	-3	0	0	-233	-233	-3	0	0	-233	-233	-3	0	0	-233	-233	1693	-344	1695	-344		3
7	0	0	-261	-261	7	0	0	-261	-261	7	0	0	-261	-261	7	0	0	-261	-261	7	0	0	-261	-261	7	0	0	-261	-261	1695	-275	1699	-275	48	30
-6	0	0	-265	-265	-6	0	0	-265	-265	-6	0	0	-265	-265	-6	0	0	-265	-265	-6	0	0	-265	-265	-6	0	0	-265	-265	1680	-278	1683	-278		21
7	0	0	-246	-246	7	0	0	-246	-246	7	0	0	-245	-245	7	0	0	-245	-245	7	0	0	-245	-245	7	0	0	-245	-245	1522	-362	1522	-362	50	21
-7	0	0	-250	-250	-7	0	0	-250	-250	-7	0	0	-250	-250	-7	0	0	-249	-249	-7	0	0	-249	-249	-7	0	0	-249	-249	1519	-386	1519	-386		5
13	0	0	-315	-315	13	0	0	-315	-315	13	0	0	-315	-315	13	0	0	-315	-315	13	0	0	-315	-315	13	0	0	-315	-315	1745	-342	1745	-342	51	31
-13	0	0	-318	-318	-13	0	0	-319	-319	-13	0	0	-318	-318	-13	0	0	-318	-318	-13	0	0	-319	-319	-13	0	0	-319	-319	1742	-346	1742	-346		22
12	0	0	-277	-277	12	0	0	-277	-277	12	0	0	-277	-277	12	0	0	-277	-277	12	0	0	-277	-277	12	0	0	-277	-277	1516	-341	1516	-341	52	22
-12	0	0	-281	-281	-12	0	0	-281	-281	-12	0	0	-281	-281	-12	0	0	-281	-281	-12	0	0	-281	-281	-12	0	0	-281	-281	1514	-345	1514	-345		7
22	0	0	-248	-248	22	0	0	-248	-248	22	0	0	-248	-248	22	0	0	-249	-249	22	0	0	-249	-249	22	0	0	-249	-249	1505	-352	1505	-352	53	32
-23	0	0	-253	-253	-23	0	0	-253	-253	-23	0	0	-253	-253	-23	0	0	-253	-253	-23	0	0	-253	-253	-23	0	0	-253	-253	1502	-356	1501	-356		23
20	0	0	-223	-223	20	0	0	-222	-222	20	0	0	-222	-222	20	0	0	-222	-222	20	0	0	-222	-222	20	0	0	-222	-222	1439	-325	1435	-325	54	23
-20	0	0	-227	-227	-20	0	0	-226	-226	-20	0	0	-226	-226	-20	0	0	-226	-226	-20	0	0	-226	-226	-20	0	0	-226	-226	1432	-329	1432	-329		9
32	0	0	-329	-329	32	0	0	-332	-332	32	0	0	-331	-331	32	0	0	-331	-331	32	0	0	-331	-331	32	0	0	-332	-332	1545	-349	1539	-349	55	33
-32	0	0	-323	-323	-32	0	0	-336	-336	-32	0	0	-335	-335	-32	0	0	-335	-335	-32	0	0	-335	-335	-32	0	0	-336	-336	1502	-363	1502	-363		24
29	0	0	-296	-296	29	0	0	-302	-302	29	0	0	-301	-301	29	0	0	-301	-301	29	0	0	-301	-301	29	0	0	-301	-301	1418	-410	1418	-410	56	24
-29	0	0	-300	-300	-29	0	0	-306	-306	-29	0	0	-305	-305	-29	0	0	-305	-305	-29	0	0	-305	-305	-29	0	0	-305	-305	1415	-414	1415	-414		11
40	0	0	-325	-325	39	0	0	-308	-308	40	0	0	-312	-312	40	0	0	-313	-313	40	0	0	-311	-311	40	0	0	-310	310	1481	-325	1481	-325	57	34
-41	0	0	-328	-328	-40	0	0	-309	-309	-40	0	0	-315	-315	-41	0	0	-316	-316	-40	0	0	-314	-314	-40	0	0	-313	-313	1459	-326	1459	-326		25
35	0	0	-335	-335	35	0	0	-276	-276	35	0	0	-276	-276	36	0	0	-279	-279	36	0	0	-278	-278	36	0	0	-277	-277	1382	-335	1381	-335	58	25
-36	0	0	-296	-296	-36	0	0	-279	-279	-36	0	0	-278	-278	-36	0	0	-282	-282	-35	0	0	-281	-281	-36	0	0	-280	-280	1380	-338	1380	-338		13
24	-4	0	716	716	24	0	0	-148	-148	55	1	0	-343	-343	51	1	0	-318	-318	52	0	0	-326	-326	53	1	0	-332	-332	1535	-343	1534	-343	59	35
176	4	-12	715	712	-24	1	-1	-151	-151	-56	0	1	-347	-348	-52	0	1	-321	-321	-53	0	1	-330	-330	-54	0	1	-335	-335	1535	-347	1533	-348		29
-266	4	12	1185	1183	2	1	1	-14	-14	61	0	-1	-361	-361	47	0	-1	-293	-292	47	0	-1	-292	-292	48	0	-1	-300	-300	1336	-361	1333	-361	60	26
290	-4	6	1182	1182	-3	0	0	-17	-17	-62	1	0	-365	-365	-48	1	0	-296	-296	-47	0	0	-295	-295	-49	1	0	-304	-304	1332	-366	1332	-366		15
-451	-3	0	1581	1581	-444	-4	0	1535	1536	-299	-4	0	724	724	37	0	0	-200	-200	74	1	0	-365	-365	65	0	0	-366	-366	1691	-395	1691	-395	61	35
466	3	-10	1580	1579	443	4	-13	1534	1532	299	5	-13	723	720	-36	1	-1	-203	-204	-74	0	1	-396	-396	-66	0	0	-353	-353	1580	-396	1579	-396		27
-376	3	10	1280	1279	-396	4	13	1383	1381	-346	5	13	1186	1186	13	1	1	-67	-67	82	0	-1	-440	-440	60	0	0	-321	-321	1385	-440	1381	-440	62	27
366	-9	6	1277	1277	366	-4	9	1380	1380	345	-4	9	1196	1196	-13	0	0	-70	-70	-65	1	0	-443	-443	-60	0	0	-324	-324	1380	-443	1380	-443		17
-474	-2	6	1462	1462	-629	-3	0	1631	1631	-586	-4	9	1807	1807	-588	-5	0	1754	1754	-290	-6	0	894	894	87	1	0	-414	-414	1807	-414	1807	-414	63	27
473	3	-8	1461	1460	528	4	-11	1630	1628	585	5	-14	1806	1804	588	6	-17	1754	1751	289	6	-19	894	891	-87	0	1	-417	-417	1806	-417	1804	-417		28
-437	3	6	1318	1316	-468	4	11	1444	1442	-594	5	14	1557	1554	-541	6	17	1670	1667	-484	6	19	1495	1492	84	0	-1	-404	-404	1670	-404	1667	-404	64	25
436	-2	0	1315	1315	467	-3	0	1441	1441	504	-4	0	1554	1554	540	-5	0	1667	1667	483	-6	0	1492	1492	-85	1	0	-407	-407	1667	-407	1667	-407		19

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

BARRA	NUDO	CARACTERISTICAS MECANICAS			POSICION 1-N					POSICION 2-N					POSICION 3-N					POSICION 4-N					POSICION 5-N					POSICION 6-N				
		AREA M2	MOD.RES. M3	PAND.	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
63	3	0.[illegible]400	1.[illegible]	1.70	8	0	0	-273	-273	-14	0	0	-497	-497	-8	0	0	-394	-394	-27	0	0	887	-887	-8	0	0	184	-184	-2	0	0	-89	-89
	31	0.[illegible]400	1.[illegible]	1.53	-8	0	0	-279	-279	-14	0	0	-494	-494	-8	0	0	-291	-291	28	0	0	510	510	-8	0	0	186	-186	-2	0	0	-46	-46
65	3	0.[illegible]400	1.[illegible]	1.30	7	0	0	-264	-264	11	0	0	-416	-416	16	0	0	-486	-486	23	0	0	-472	-472	15	0	0	-579	-579	-50	0	0	-579	-579
	32	0.[illegible]400	1.[illegible]	1.30	-7	0	0	-260	-260	-11	0	0	-412	-412	-16	0	0	-481	-481	-23	0	0	-466	-466	-15	0	0	-575	-575	36	0	0	575	575
67	7	0.[illegible]400	1.[illegible]	1.53	8	0	0	-161	-161	12	0	0	-278	-278	16	0	0	-362	-362	21	0	0	-712	-912	20	0	0	-488	-488	44	0	0	-488	-488
	33	0.[illegible]400	1.[illegible]	1.30	-8	0	0	-175	-175	-12	0	0	-272	-273	-16	0	0	-377	-377	-22	0	0	-[illegible]	-886	-19	0	0	-488	-488	40	0	0	-488	-488
69	9	0.[illegible]400	1.[illegible]	1.13	4	0	0	-75	-75	-7	0	0	-133	-133	10	0	0	-186	-186	14	0	0	-376	-376	13	0	0	-375	-375	25	0	0	-486	-486
	34	0.[illegible]400	1.[illegible]	1.13	-4	0	0	-70	-70	-7	0	0	-126	-126	-10	0	0	-191	-191	-14	0	0	-371	-371	-13	0	0	-376	-376	-25	0	0	-486	-486
88	11	0.[illegible]400	1.[illegible]	1.11	1	0	0	-24	-24	-4	0	0	-73	-73	-7	0	0	-129	-129	10	0	0	-199	-199	-10	0	0	-387	-387	-20	0	0	-384	-384
	35	0.[illegible]400	1.[illegible]	1.10	-1	0	0	-10	-11	-3	0	0	-66	-66	-6	0	0	-73	-123	-10	0	0	-144	-192	-10	0	0	-382	-382	-20	0	0	-488	-488
70	13	0.[illegible]400	1.[illegible]	1.66	-2	0	0	24	24	-0	0	0	-4	-4	3	0	0	-41	-41	6	0	0	-89	-89	11	0	0	-122	-122	16	0	0	-330	-330
	36	0.[illegible]400	1.[illegible]	1.66	2	0	0	30	30	0	0	0	2	2	-3	0	0	-35	-35	-6	0	0	-91	-89	-10	0	0	-148	-148	-20	0	0	-484	-484
71	15	0.[illegible]400	1.[illegible]	1.85	-3	0	0	61	64	-4	0	0	47	47	-2	0	0	24	24	-1	0	0	-9	-9	4	0	0	-66	-66	0	0	0	-114	-114
	37	0.[illegible]400	1.[illegible]	1.63	3	0	0	88	88	4	0	0	53	53	-2	0	0	29	29	-0	0	0	-3	-3	-3	0	0	-48	-48	-4	0	0	-108	-108
72	17	0.[illegible]400	1.[illegible]	1.30	-7	0	0	72	72	-7	0	0	76	76	-7	0	0	74	74	-7	0	0	61	67	-6	0	0	58	58	-6	0	0	36	36
	39	0.[illegible]400	1.[illegible]	1.30	7	0	0	76	76	8	0	0	80	80	8	0	0	78	78	7	0	0	72	72	6	0	0	60	60	4	0	0	40	40

CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

POSICION 7-N					POSICION 8-N					POSICION 9-N					POSICION 10-N					POSICION 11-N					POSICION 12-N					POSICION 13-N				
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2
0	0	0	-1	-1	0	0	0	12	12	0	0	0	11	11	0	0	0	10	10	0	0	0	10	10	0	0	0	11	11	0	0	0	11	11
0	0	0	1	1	0	0	0	14	14	0	0	0	13	13	0	0	0	12	12	0	0	0	13	13	0	0	0	13	13	0	0	0	13	13
-7	0	0	198	198	0	0	0	-1	-1	-1	0	0	41	41	-2	0	0	47	47	-2	0	0	45	45	-1	0	0	44	44	-2	0	0	44	44
7	0	0	201	201	0	0	0	3	3	2	0	0	44	44	-2	0	0	50	50	2	0	0	48	48	2	0	0	47	47	2	0	0	47	47
21	0	0	-485	-485	-56	0	0	984	984	-11	0	0	195	195	4	0	0	-86	-86	-2	0	0	36	36	-3	0	0	50	50	-2	0	0	44	44
-21	0	0	-483	-480	56	0	0	986	986	10	0	0	185	185	3	0	0	-80	-80	2	0	0	40	41	3	0	0	55	55	3	0	0	48	48
33	0	0	-847	-847	43	0	0	-838	838	23	0	0	-450	-450	-72	0	0	1285	1285	-13	0	0	231	231	5	0	0	-84	-84	-2	0	0	40	40
-33	0	0	-842	-842	-42	0	0	833	-833	-23	0	0	-445	-445	72	0	0	1290	1290	13	0	0	236	234	-5	0	0	-89	-88	2	0	0	44	44
26	0	0	-520	-520	34	0	0	-864	-864	44	0	0	-860	-860	56	0	0	-1140	-1140	35	0	0	-441	-441	-65	0	0	1919	1919	-16	0	0	293	293
-26	0	0	-515	-515	-34	0	0	863	-863	-44	0	0	-855	-855	56	0	0	-1135	-1135	-34	0	0	-676	-676	65	0	0	1823	1823	17	0	0	296	296
23	0	0	-325	-325	31	0	0	415	415	4	0	0	-574	-574	51	0	0	-724	-724	65	0	0	-924	-924	66	0	0	-1219	-1219	48	0	0	-681	-681
-23	0	0	-319	-319	-31	0	0	-434	-434	-40	0	0	-568	-568	-51	0	0	-718	-718	-65	0	0	-918	-918	-66	0	0	-1213	-1213	-48	0	0	-675	-675
12	0	0	-187	-187	20	0	0	-278	-278	28	0	0	-387	-387	37	0	0	-515	-515	47	0	0	-664	-664	58	0	0	-829	-829	74	0	0	-1039	-1039
-13	0	0	-181	-181	-19	0	0	-272	-272	-27	0	0	-382	-382	-36	0	0	-509	-509	-47	0	0	-658	-658	-59	0	0	-823	-823	-74	0	0	-1033	-1033
-1	0	0	7	7	3	0	0	-41	-41	8	0	0	-106	-106	14	0	0	-188	-188	21	0	0	-289	-289	30	0	0	-406	-406	41	0	0	-646	-646
1	0	0	12	12	-3	0	0	-35	-35	-7	0	0	-101	-101	-14	0	0	-183	-183	-21	0	0	-284	-284	-30	0	0	-402	-402	-40	0	0	-640	-640

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CONTROL DE TENSIONES EN EL PESCANTE (DIAGONALES 2)

POSICION 14-N					POSICION 15-N					POSICION 16-N					POSICION 17-N					POSICION 18-N					POSICION 19-N					TENS MAXIMAS Y MINIMAS				BARRA	NUDO
AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	AXIL TON	CORT TON	FLEC MTON	T.SUP K/CM2	T.INF K/CM2	TSUP+ K/CM2	TSUP- K/CM2	TINF+ K/CM2	TINF- K/CM2		
0	0	0	11	11	0	0	0	11	11	0	0	0	11	11	0	0	0	11	11	0	0	0	12	12	0	0	0	12	12	887	-887	887	-887	66	3
0	0	0	13	13	0	0	0	14	14	0	0	0	14	14	0	0	0	14	14	0	0	0	14	14	0	0	0	14	14	818	-484	818	-484		31
0	0	0	45	45	-2	0	0	45	45	-2	0	0	45	45	-2	0	0	45	45	-2	0	0	45	45	-2	0	0	46	46	875	-872	875	-872	66	6
0	0	0	48	48	2	0	0	48	48	2	0	0	48	48	2	0	0	48	48	2	0	0	48	48	2	0	0	48	48	878	-880	878	-880		22
0	0	0	43	43	-2	0	0	43	43	-2	0	0	43	43	-2	0	0	43	43	-2	0	0	43	43	-2	0	0	48	43	884	-888	884	-888	67	7
0	0	0	47	47	3	0	0	47	47	3	0	0	48	48	3	0	0	48	48	3	0	0	48	44	3	0	0	48	48	888	-888	888	-888		23
0	0	0	52	52	-3	0	0	52	52	-3	0	0	51	51	-3	0	0	51	51	-3	0	0	52	52	-3	0	0	52	52	1888	-888	1888	-888	66	9
0	0	0	56	56	3	0	0	56	56	3	0	0	56	56	3	0	0	56	56	3	0	0	56	56	3	0	0	56	56	1888	-888	1888	-888		24
0	0	0	-64	-64	-4	0	0	66	66	-4	0	0	62	62	-4	0	0	76	76	-4	0	0	76	76	-4	0	0	76	76	1818	-1148	1888	-1148	66	11
-1166	0	0	1442	1442	-31	0	0	277	277	0	0	0	-80	-80	4	0	0	86	86	4	0	0	71	71	4	0	0	79	79	1888	-1188	1888	-1188		35
1166	0	0	1466	1466	31	0	0	284	283	-5	0	0	-74	-74	5	0	0	91	91	5	0	0	82	82	5	0	0	89	89	1466	-1218	1466	-1218	70	13
-1166	0	0	-1284	-1284	-32	0	0	-724	-724	-139	0	0	1722	1722	-94	0	0	319	319	6	0	0	-189	-189	6	0	0	74	74	1888	-1888	1888	-1888		28
1166	0	0	-1282	-1282	-31	0	0	-718	-718	139	0	0	-1728	1728	94	0	0	323	325	-7	0	0	-194	-194	6	0	0	77	77	1888	-1888	1888	-1888	71	15
-1166	0	0	-1282	-1282	87	0	0	-888	-888	89	0	0	-1284	-1284	36	0	0	-511	-511	-166	0	0	1888	1888	-6	0	0	33	33	1888	-1884	1888	-1884	72	17
1166	0	0	-888	-888	-87	0	0	-891	-891	-36	0	0	-1199	-1199	-36	0	0	-505	-505	166	0	0	1903	1903	6	0	0	36	36	1888	-1199	1888	-1199		36

EFECTOS DEL PASO DEL APOYO SOBRE EL CORDON INFERIOR

	PESO PROPIO				PASO DE APOYOS				P.PROPIO+ PASO APOYOS			
BARRA	AXIL	M. IZQ.	M. CEN	M. DER	AXIL	M. IZQ.	M. CEN	M. DER	AXIL	M. IZQ.	M. CEN	M. DER
1	0.21	-0.02	-0.78	1.03	-5.46	0.36	40.67	-16.21	-5.25	0.35	39.89	-15.18
2	0.21	-1.03	-0.40	-0.74	-19.33	10.78	37.47	15.77	-19.12	9.75	37.07	15.03
3	-3.23	0.74	-0.56	1.35	-10.52	-7.86	55.51	-20.86	-13.74	-7.12	54.94	-19.52
4	-3.23	-1.35	-0.67	-0.63	-20.82	16.07	58.99	17.13	-24.04	14.72	58.32	16.49
5	-10.20	0.63	-0.84	1.80	-5.94	-9.16	80.23	-26.67	-16.15	-8.53	79.34	-24.88
6	-10.20	-1.80	0.75	-3.81	-17.67	18.17	68.22	50.92	-27.87	16.38	69.04	47.11
7	-20.77	3.81	0.48	2.18	-16.99	-6.31	110.87	-29.69	-37.76	-2.49	111.44	-27.50
8	-20.77	-2.18	0.76	-4.39	-32.22	18.58	100.52	47.42	-52.92	16.40	101.32	43.03
9	-37.97	4.39	0.67	2.55	-24.06	-27.08	138.34	-40.65	-61.83	-22.69	139.01	-38.10
10	-37.97	-2.55	0.76	-4.75	-42.31	24.66	133.66	56.62	-80.09	22.10	134.48	51.87
11	-62.48	4.75	0.96	2.32	-24.87	-34.83	175.52	-49.81	-87.36	-30.09	176.48	-47.49
12	-62.48	-2.32	2.94	-8.89	-46.92	28.84	152.38	99.20	-109.40	26.51	155.14	90.32
13	-92.86	8.89	3.23	1.87	-31.04	-22.15	230.64	-68.05	-123.90	-13.27	233.87	-66.19
14	-92.86	-1.87	3.76	-10.25	-61.33	41.06	204.29	88.74	-154.19	39.19	208.19	78.49
15	-132.71	10.25	4.20	0.99	-36.53	-47.34	266.53	-81.59	-169.24	-37.09	270.90	-80.61
16	-132.71	-0.99	4.94	-11.73	-71.79	47.95	243.71	103.11	-204.49	46.97	248.81	91.37
17	-178.93	11.73	5.09	1.02	-71.91	-58.68	317.48	-106.10	-250.85	-46.95	322.57	-105.08
18	-178.93	-1.02	-0.95	0.00	-110.03	63.77	349.26	0.00	-288.97	62.75	348.39	0.00

PESCA1.XLS 8/05/97

DIMENSIONAMIENTO CORDON INFERIOR

BARRA	ALA INF.		ALMAS (2)		ALA SUP		AREA	INERCIA	WS	WI	V(sup)	V(inf)	MOM	AXIL	T.SUP	T. INF
	B(cm)	H(cm)	B(cm)	H(cm)	B(cm)	H(cm)	cm2	cm2	cm3	cm3	cm	cm	(mt)	(tn)	kg/cm2	kg/cm2
1	60	2.0	1.0	40	50	1.0	250	75703	2806	4726	26.98	16.02	40	-5	1406	-866
2	60	2.0	1.0	40	50	1.0	250	75703	2806	4726	26.98	16.02	37	-19	1243	-859
3	60	2.0	1.2	40	50	1.0	266	78374	2944	4785	26.62	16.38	56	-13	1853	-1219
4	60	2.0	1.2	40	50	1.0	266	78374	2944	4785	26.62	16.38	58	-24	1880	-1302
5	60	2.5	1.5	45	50	1.0	335	116549	3796	6548	30.70	17.80	79	-16	2033	-1254
6	60	2.5	1.5	45	50	1.0	335	116549	3796	6548	30.70	17.80	69	-28	1734	-1137
7	60	3.0	1.5	45	50	1.2	375	135664	4304	7675	31.52	17.68	111	-38	2478	-1548
8	60	3.0	1.5	45	50	1.2	375	135664	4304	7675	31.52	17.68	101	-53	2206	-1457
9	60	3.5	1.8	50	50	1.2	450	190292	5395	9794	35.27	19.43	139	-62	2439	-1557
10	60	3.5	1.8	50	50	1.2	450	190292	5395	9794	35.27	19.43	134	-80	2306	-1546
11	60	4.0	2.2	50	50	1.5	535	232182	6633	11327	35.00	20.50	176	-87	2491	-1716
12	60	4.0	2.2	50	50	1.5	535	232182	6633	11327	35.00	20.50	155	-109	2133	-1572
13	60	4.0	2.5	55	50	1.5	590	296653	7930	12847	37.41	23.09	233	-123	2730	-2022
14	60	4.0	2.5	55	50	1.5	590	296653	7930	12847	37.41	23.09	208	-154	2362	-1880
15	60	4.5	3.0	60	50	1.5	705	402082	9908	15817	40.58	25.42	271	-169	2495	-1953
16	60	4.5	3.0	60	50	1.5	705	402082	9908	15817	40.58	25.42	249	-204	2224	-1864
17	60	5.0	3.0	60	50	2.0	760	463446	11373	17655	40.75	26.25	322	-250	2502	-2153
18	60	5.0	3.0	60	50	2.0	760	463446	11373	17655	40.75	26.25	348	-289	2680	-2351

DIAGONALES Y MONTANTES (A-42)

BARRA	TIPO	PERFIL	REFUERZO	LONGITUD	AREA	R.GIRO	ESBELTEZ	K.PANDEO
28	MONTANTE-1	2 [ ] PN-120	-	2.125	34.00	4.62	46	1.10
29	MONTANTE-2	2 [ ] PN-120	-	1.062	34.00	4.62	23	1.02
30	MONTANTE-1	2 [ ] PN-140	-	3.187	40.80	5.45	58	1.20
31	MONTANTE-2	2 [ ] PN-120	-	1.594	34.00	4.62	35	1.05
32	MONTANTE-1	2 [ ] PN-220	-	4.250	74.80	8.48	50	1.13
33	MONTANTE-2	2 [ ] PN-120	-	2.125	34.00	4.62	46	1.10
34	MONTANTE-1	2 [ ] PN-280	-	4.250	106.60	10.90	39	1.07
35	MONTANTE-2	2 [ ] PN-160	-	2.125	48.00	6.21	34	1.05
36	MONTANTE-1	HEB-300	-	4.250	149.10	7.58	56	1.18
37	MONTANTE-2	2 [ ] PN-180	-	2.125	56.00	6.95	31	1.04
38	MONTANTE-1	HEB-300	-	4.250	149.10	7.58	56	1.18
39	MONTANTE-2	2 [ ] PN-200	-	2.125	64.40	7.70	28	1.03
40	MONTANTE-1	HEB-300	2*250*10	4.250	199.10	7.48	57	1.19
41	MONTANTE-2	2 [ ] PN-240	-	2.125	84.60	9.22	23	1.02
42	MONTANTE-1	HEB-300	2*250*20	4.250	249.10	7.43	57	1.19
43	MONTANTE-2	2 [ ] PN-260	-	2.125	96.60	9.99	21	1.02
44	MONTANTE-1	HEB-300	2*350*20	4.250	289.10	8.89	48	1.12
45	MONTANTE-2	HEB-300		2.125	149.10	7.58	28	1.03
46	MONTANTE-1	HEB-300	-	4.250	149.10	7.58	56	1.18
47-48	DIAGONAL-1	2 [ ] PN-120		5.127	34.00	4.62	111	2.35
49-50	DIAGONAL-1	2 [ ] PN-160		5.650	48.00	6.21	91	1.76
51-52	DIAGONAL-1	2 [ ] PN-200	-	6.311	64.40	7.70	82	1.55
53-54	DIAGONAL-1	2 [ ] PN-280	-	6.311	106.60	10.90	58	1.20
55-56	DIAGONAL-1	HEB-300	-	6.311	149.10	7.58	83	1.57
57-58	DIAGONAL-1	HEB-300	2*250*10	6.311	199.10	7.48	84	1.60
59-60	DIAGONAL-1	HEB-300	2*250*20	6.311	249.10	7.43	85	1.62
61-62	DIAGONAL-1	HEB-300	2*350*20	6.311	289.10	8.89	71	1.36
63-64	DIAGONAL-1	HEB-300	2*350*25	6.311	324.10	9.03	70	1.34
65	DIAGONAL-2	2 [ ] PN-120	-	2.825	34.00	4.62	61	1.23
66	DIAGONAL-2	2 [ ] PN-120	-	2.562	34.00	4.62	55	1.17
67	DIAGONAL-2	2 [ ] PN-120	-	2.562	34.00	4.62	55	1.17
68	DIAGONAL-2	2 [ ] PN-180	-	2.562	56.00	6.95	37	1.06
69	DIAGONAL-2	2 [ ] PN-180	-	2.562	56.00	6.95	37	1.06
70	DIAGONAL-2	2 [ ] PN-220	-	2.562	74.80	8.48	30	1.04
71	DIAGONAL-2	2 [ ] PN-220	-	2.562	74.80	8.48	30	1.04
72	DIAGONAL-2	2 [ ] PN-260	-	2.562	96.60	9.99	26	1.03
73	DIAGONAL-2	2 [ ] PN-120	-	2.563	34.00	4.62	55	1.17

DIMENSIONAMIENTO CORDON SUPERIOR

BARRA	ALA INF.		ALMAS (2)		ALA SUP		AREA	INERCIA	WS	WI	V(sup)	V(inf)	K
	B(cm)	H(cm)	B(cm)	H(cm)	B(cm)	H(cm)	cm2	cm2	cm3	cm3	cm	cm	PANDEO
19	40	1.0	1.0	30	40	1.0	140	23727	1483	1483	16.00	16.00	1.05
20	40	1.0	1.0	30	40	1.0	140	23727	1483	1483	16.00	16.00	1.05
21	40	1.0	1.0	30	40	1.0	140	23727	1483	1483	16.00	16.00	1.05
22	45	1.0	1.0	35	45	1.0	160	36313	1963	1963	18.50	18.50	1.03
23	45	1.0	1.0	35	45	1.0	160	36313	1963	1963	18.50	18.50	1.03
24	50	1.2	1.2	45	50	1.2	228	82273	3471	3471	23.70	23.70	1.03
25	50	1.5	1.5	50	50	1.5	300	130738	4933	4933	26.50	26.50	1.03
26	50	1.8	1.8	50	50	1.8	360	158294	5907	5907	26.80	26.80	1.02
27	55	2.0	2.0	50	55	2.0	420	190460	7054	7054	27.00	27.00	1.02

COMPROBACIÓN ALBEO DE VIGAS

1) BARRA 15-16 14-13 (Δ-52)

H = 60 cm B = 3.0 cm

Q = $\frac{1088}{2 \times 2}$ = 272 ton

L = 50 + 20 x 3 = 110 cm

I = $\frac{1}{12}$ 110 x 3^3 = 247 cm^4

S = 110 x 3 = 330 cm^2

i = $\sqrt{\frac{247}{330}}$ = 0.8 cm

λ = $\frac{60}{0.8}$ = 75 ω = 1.69

σ = $\frac{1.69 \times 272 \times 10^3}{330}$ = 1392 kg/cm² (OK)

2) BARRA 13-14 (Δ-52)

H = 5 cm B = 2,5 cm

Q = $\frac{784}{2 \times 2}$ = 195 k

L = 50 + 20 x 2.5 = 100

I = $\frac{1}{12}$ 100 x 2.5^3 = 130 cm^4

S = 100 x 2.5 = 250 cm^2

i = $\sqrt{\frac{130}{250}}$ = 0.72 cm

λ = $\frac{55}{0.72}$ = 76 ω = 1.72

σ = $\frac{195 \times 10^3}{100 \times 2.5}$ x 1.72 = 1342 kg/cm²

3) BARRA 11-12 (Δ-52)

H = 50 B = 2,2 cm

Q = $\frac{643}{2 \times 2}$ = 160

L = 50 + 20 x 2.2 = 94 cm

J = $\frac{1}{12}$ 94 x 2.2^3 = 83 cm^4

S = 94 x 2.2 = 207 cm^2

i = $\sqrt{\frac{83}{207}}$ = 0.63

λ = $\frac{50}{0.63}$ = 79 ω = 1.81

σ = $\frac{1160 \times 10^3 \times 1.81}{207}$ = 1399 kg/cm²

4) BARRA 9-10 (Δ-52)

H = 50 cm B = 1.2 cm

Q = $\frac{513}{4}$ = 128 kg

$L = 50 + 20 \times 1{,}8 = 86$ cm

$J = \frac{1}{12} 86 \times 1.8^3 = 41{,}8$ cm⁴

$S = 86 \times 1.8 = 154{,}8$ cm²

$i = 0.51$

$\lambda = \frac{50}{0.51} = 98$ $\omega = 2.50$

$\sigma = \frac{128 \times 10^3 \times 2{,}50}{154.8} = 2067$ kg/cm²

) BKMS 7-8

$H = 45$ cm $B = 1.5$ cm

$Q = \frac{394}{4} = 98.5$ kN

$L = 50 + 20 \times 1.5 = 80$ cm

$J = \frac{1}{12} 80 \times 1.5^3 = 22.5$

$S = 80 \times 1.5 = 120$ cm²

$i = 0.43$ cm

$\lambda = \frac{45}{043} = 105$ $\omega = 2.81$

$\sigma = \frac{98.5 \times 2.81 \times 10^3}{120} = 2306$ kg/cm²

c) BKMS 5-6

$H = 45$ $B = 1{,}5$ cm

$Q = \frac{290}{4} = 72.5$ kN

$L = 50 + 20 \times 1.5 = 80$ cm

$J = \frac{1}{12} 80 \times 1{,}5^3 = 22{,}5$ cm⁴

$S = 80 \times 1.5 = 120$ cm²

$i = 043$

$\lambda = \frac{45}{0.43} = 104$ $\omega = 2.76$

$\sigma = \frac{72{,}5 \times 10^3 \times 276}{120} = 1664$ kg/cm²

7) BKMS 3-4

$H = 40$ cm $B = 1{,}2$ cm

$Q = 204/4 = 51$ kN

$L = 50 + 20 \times 1{,}2 = 74$ cm.

$J = \frac{1}{12} 74 \times 1{,}2^3 = 10{,}6$

$S = 74 \times 1.2 = 88.8$

$i = 0.34$

$\lambda = \frac{40}{0.34} \cdot 1.14$ $\omega = 3.39$

$\sigma = \frac{51 \times 10^3 \times 3.39}{88.8} = 1947$ kg/cm²

B) BAU λ-2

H = 40 cm B = 1.0 cm

$Q = \frac{1.13^4}{4} \cdot 34$ t

L = 50 + 20 x 1.0 = 70 cm

$J = \frac{1}{12} 70 \times 1.3 = 1.83$ cm⁴

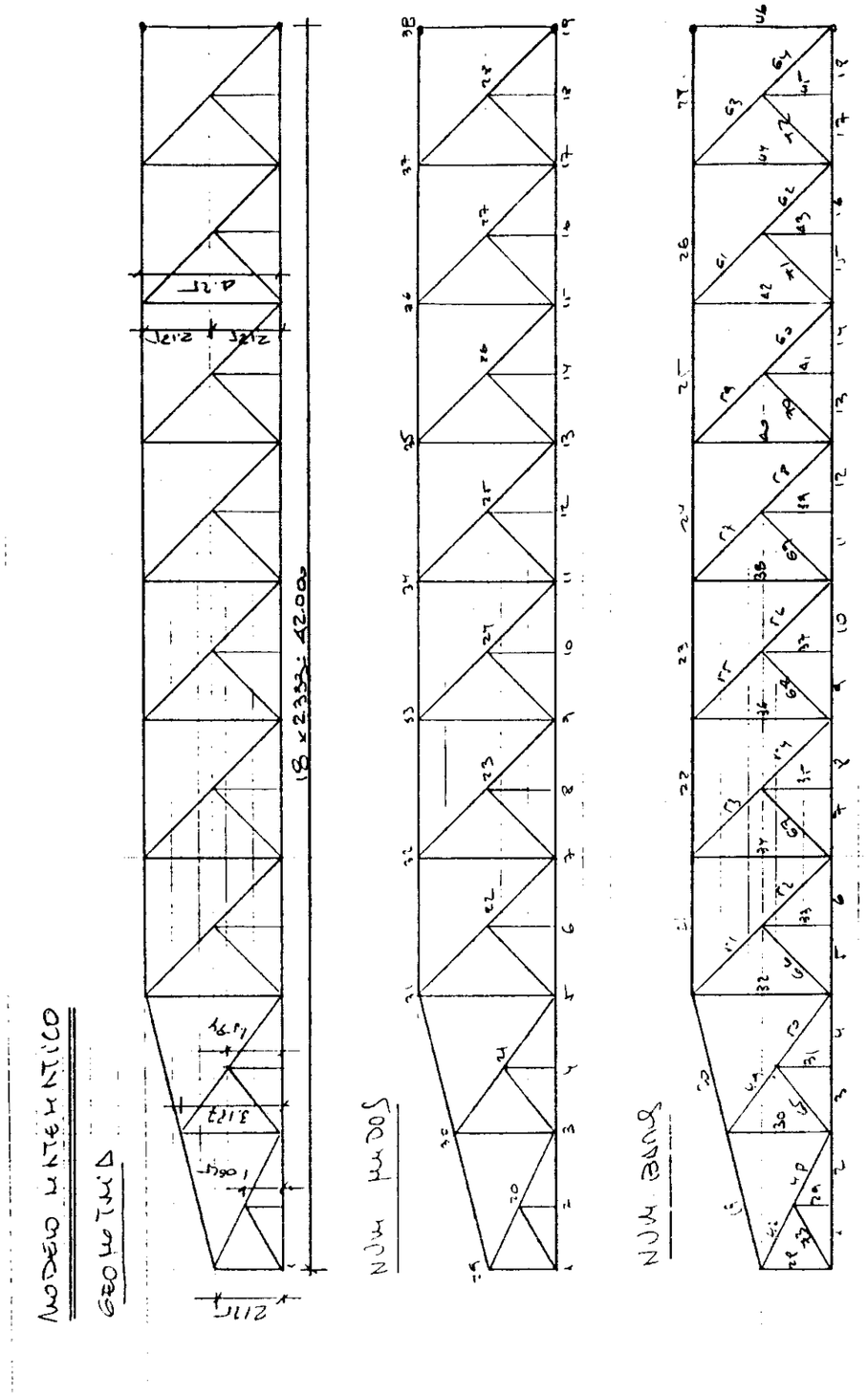
S = 10 x 1.0 = 10 cm²

λ = p.28

$\lambda = \frac{40}{0.28} = 142$ $\omega = 4.83$

$\sigma = \frac{34 \times 10^3}{70} \times 4.83 = 2346$ kg/cm² $< \frac{9600}{1.35}$

Node Watershed




```
STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE
UNIT METER MTON
JOINT COORDINATES
  1    0.000   0.000   0.000  19   42.000   0.000   0.000
 20    2.333   1.0625  0.000
 21    6.999   1.59375 0.000
 22   11.666   2.125   0.000  28   39.666   2.125   0.000
 29    0.000   2.125   0.000
 30    4.666   3.1875  0.000
 31    9.333   4.250   0.000  38   42.000   4.250   0.000
MEMBER INCIDENCES
  1    1    2
  2    2    3
  3    3    4
  4    4    5
  5    5    6
  6    6    7
  7    7    8
  8    8    9
  9    9   10
 10   10   11
 11   11   12
      12   13
 13   13   14
 14   14   15
 15   15   16
 16   16   17
 17   17   18
 18   18   19
 19   29   30
 20   30   31
 21   31   32
 22   32   33
 23   33   34
 24   34   35
 25   35   36
 26   36   37
 27   37   38
 28    1   29
 29    2   20
 30    3   30
       4   21
 32    5   31
 33    6   22
 34    7   32
 35    8   23
 36    9   33
 37   10   24
 38   11   34
 39   12   25
 40   13   35
 41   14   26
 42   15   36
 43   16   27
 44   17   37
 45   18   28
 46   19   38
 47   29   20
 48   20    3
      30   21
      21    5
 51   31   22
 52   22    7
 53   32   23
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 54   23    9
 55   33   24
 56   24   11
      34   25
 58   25   13
 59   35   26
 60   26   15
 61   36   27
 62   27   17
 63   37   28
 64   28   19
 65    3   21
 66    5   22
 67    7   23
 68    9   24
 69   11   25
 70   13   26
 71   15   27
 72   17   28
 73    1   20
MEMBER PROPERTY
*CORDON INFERIOR
     TO  6                    PR   AX  0.0420   IZ  0.00152000
   7 TO  12                   PR   AX  0.0556   IZ  0.00282000
  13 TO  18                   PR   AX  0.0710   IZ  0.00478000
*CORDON SUPERIOR
  19 TO  21                   PR   AX  0.0276   IZ  0.00058727
  22 TO  24                   PR   AX  0.0420   IZ  0.00152000
  25 TO  27                   PR   AX  0.0556   IZ  0.00282000
*MONTANTES PRINCIPALES
  28 30  32  34               PR   AX  0.0080   IZ  0.00003291
  36 38  40                   PR   AX  0.0199   IZ  0.00024289
  42 44  46                   PR   AX  0.0303   IZ  0.00059205
*MONTANTES SECUNDARIOS
  29 31  33                   PR   AX  0.0053   IZ  0.00001143
  35 37  39                   PR   AX  0.0131   IZ  0.00010620
  41 43  45                   PR   AX  0.0219   IZ  0.00031307
*DIAGONALES 1
  47 48  49  50  51  52       PR   AX  0.0080   IZ  0.00003291
  53  54 55  56  57  58       PR   AX  0.0199   IZ  0.00024289
  59  60 61  62  63  64       PR   AX  0.0303   IZ  0.00059205
   IGONALES 2
  65 66                       PR   AX  0.0053   IZ  0.00001143
  67 68  69                   PR   AX  0.0131   IZ  0.00010620
  70 71  72  73               PR   AX  0.0219   IZ  0.00031307
MEMBER RELEASES
29 TO 46 65 TO 73 START MZ
29 TO 46 65 TO 73  END   MZ
47 49 51 53 55 57 59 61 63 START MZ
48 50 52 54 56 58 60 62 64 END MZ
CONSTANTS
E   21000000.  ALL
DEN  9.02      ALL
POISSON        0.15 ALL
SUPPORTS
19  38    PINNED
LOADING 1 PESO PROPIO
SELFWEIGHT   Y  -1.0
LOADING 2 APOYO SOBRE PILA
   NT LOAD
   SICION 1N
*1   FY   84.00
*POSICION 2N
*2   FY  111.00
*POSICION 3N
*3   FY  137.00
*POSICION 4N
     FY  168.00
*POSICION 5N
*5   FY  204.00
*POSICION 6N
*6   FY  245.00
*POSICION 7N
*7   FY  290.00
*POSICION 8N
*8   FY  340.00
*POSICION 9N
*9   FY  394.00
*POSICION 10N
*10  FY  451.00
*POSICION 11N
*11  FY  513.00
*POSICION 12N
*12  FY  576.00
*POSICION 13N
*13  FY  643.00
   SICION 14N
*14  FY  712.00
*POSICION 15N
*15  FY  782.00
*POSICION 16N
*16  FY  855.00
*POSICION 17N
*17  FY  930.00
*POSICION 18N
*18  FY 1007.00
*POSICION 19N
*19  FY 1088.00
MEMBER LOAD
*POSICION 1B
*1   FY  111.00
*POSICION 2B
*2   FY  137.00
*POSICION 3B
*3   FY  168.00
     ICION 4B
*4   FY  204.00
*POSICION 5B
*5   FY  245.00
*POSICION 6B
*6   FY  290.00
*POSICION 7B
*7   FY  340.00
*POSICION 8B
*8   FY  394.00
*POSICION 9B
*9   FY  451.00
*POSICION 10B
*10  FY  513.00
*POSICION 11B
*11  FY  576.00
*POSICION 12B
*12  FY  643.00
   SICION 13B
     FY  712.00
*POSICION 14B
*14  FY  782.00
*POSICION 15B
```

```
*15  FY  855.00
*POSICION 16B
*16  FY  930.00
*POSICION 17B
*17  FY  1007.00
*POSICION 18N
*18  FY  1088.00
LOADING COMBINATION 3
1  1.0  2 0.5
PERFORM ANALISIS
LOAD LIST 3
PRINT MEMBER FORCES LIST 1 TO 72
PRINT JOI DIS ALL
PRINT REACC ALL
SECTION 0.00 0.50 1.00 MEMBER 1 TO 18
PRINT SECTION FORCES
PLOT BEND FILE
PLOT DISP FILE
FINISH
```

5.8.- ANCLAJE DEL PESCANTE SOBRE LA ESTRUCTURA DE HORMIGÓN

ESFUERZOS EN LOS NUCLEOS

EN LA BARRA 24 (COMBINACION) SE PRODUCEN LOS SIGUIENTES ESFUERZOS ULTIMOS

a) CON EL PESCANTE ENVOLADIZO (APOYO EN EL NUDO 19)

N = 241 kg (TRACCION)

b) CON EL PESCANTE EN LA POSICION 10-B (ES DECIR, APOYADO EN EL CENTRO DE LA BARRA 10) SE TIENE

N = 960 kg (COMPRESION)

c) EFECTO DEL VIENTO (envolvente)

Cordón superior $S = 0.54\ cm^2/ml$

Cordón inferior $S = 0.64\ cm^2/ml$

Montantes $S_1 = 1.25 \times 0.30/4.66 = 0.27\ cm^2/ml$

$S_2 = 2.15 \times 0.30/4.66 = 0.13\ cm^2/ml$

Diagonal $S_1 = 0.30 \times 6.30/4.66 = 0.41\ cm^2/ml$

$S_2 = 0.76\ cm^2/ml$

TOTAL $= 2.22\ cm^2/ml$

$p = 100\ kg/m^2$ (EXPUESTA A < 30 m)

$P_u = 100 \times 2.22 = 222\ kg/ml$.

POR 7 cuchillos $1.75 \times 222 = 388\ kg/ml$

Sabiendo a barlovento succión y sabiendo a sotavento succión

$p_1 = 388/2 = 194\ kg/ml$

y los nudos y aplicando un coeficiente eólico $e_0 = 1.2$

$P_u = 194 \times 1.2 \times 4.66 = 1090\ kg/nudo$

En el cálculo de los nudos $1250\ kg/nudo$

hacemos $N = \pm 13.75$ ton

los efectos b) y c) no son compatibles

por lo tanto

Máxima tracción en anclaje superior

$T_S = 241 + 43 = 284$ ton

Máxima compresión en anclaje superior

$C_S = 960$ ton

Máxima compresión en anclaje inferior

$C_I = 284$ ton

Máxima tracción en anclaje inferior

$T_I = 960$ t

Evaluación balanceada de anclaje

en anclaje superior

$P_S = 4 \times 1\ \phi 6'' = 4 \times 1 \times 20.00 : 560$ ton $\quad 425$ ton

en anclaje inferior

$P_I = 4 \times 15\ \phi 6'' = 4 \times 15 \times 20.00 : 1200$ ton

DIMENSIONAMIENTO ANCLAJE INFERIOR

$C_{MAX} = 1200 - 284 = 1484$ ton

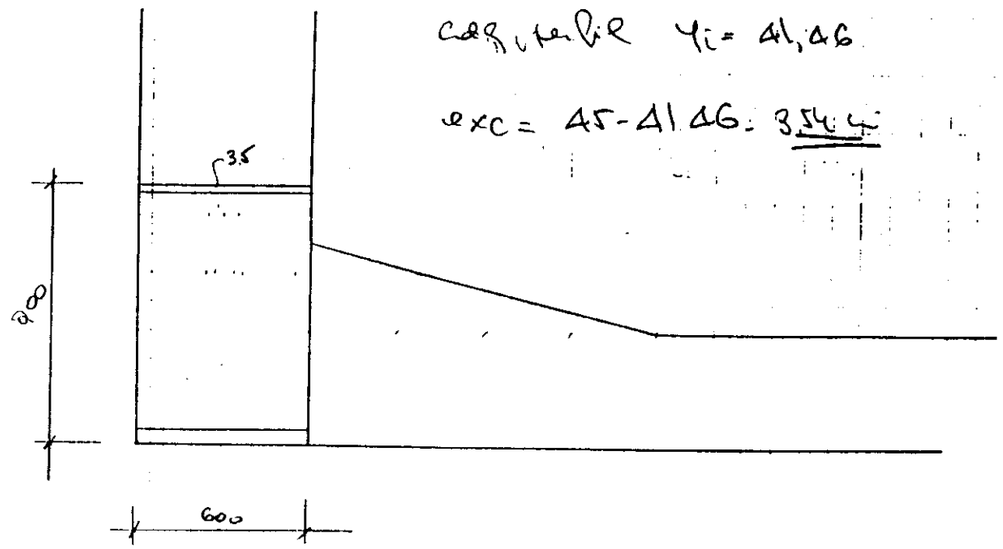
$C_{MIN} = 1200 - 960 = 240$ ton.

Se dispone una PLACA DE APOYO DE

900×600 con lo cual

$\sigma_{MAX} = \frac{1484 \times 10^3}{60 \times 90} = 275$ kg/cm² (tensión media)

$\sigma_{MIN} = \frac{240 \times 10^3}{60 \times 90} = 44$ kg/cm² (tensión media



JR TENSIONES PUNTA EN EL APOYO SUP

$$\sigma_1 = -\frac{1484\times10^3}{60\times9^2} \pm \frac{6\times284\times0.0354\times10^5}{60\times9^2} = -275 \pm 12 \begin{cases} -287\ kg/cm^2 \\ -263\ kg/cm^2 \end{cases}$$

$$\sigma_2 = -\frac{(1700-960)\times10^3}{60\times9^2} \pm \frac{6\times960\times0.0354\times10^5}{60\times9^2} = -44 \pm 42 \begin{cases} -86\ kg/cm^2 \\ -2\ kg/cm^2 \end{cases}$$

ESPESOR ENALDA DE BASE

Se considera $L_{max} = 10$ cm

$$M = 287 \times \frac{10^2}{8} = 3587\ kg.cm$$

$$h \geq \sqrt{\frac{6\times3587}{2600}\times1.35} = 35\ mm$$

DISTRIBUCION CENTRAL

$$\sigma = 287 \times 40 = 11480\ kg/cm$$

Se considera $L = 0.24\times0.8 = 0.70$

$$M = 11480 \times \frac{20^2}{2} = 2.3\times10^6\ kg.cm$$

$$h = \sqrt{\frac{6\times2.3\times10^6\times1.35}{2600\times3}} = 50\ cm$$

DISTRIBUCION ALCANCE SUPERIOR

$$C_{max} = 425 + 960 = 1385\ kg$$

$$C_{min} = 425 - 284 = 141\ kg$$

Se asume placa de 60×47

$$\sigma_{md} = \sigma_{inf} = \frac{1385\times10^3}{60\times47} = 300\ kg/cm^2$$

Espesor de la base

Se considera $L_{max} = 0.08\ m = 8$ cm

$$M = 300\times\frac{8^2}{8} = 2400\ kg/cm$$

$$h \geq \sqrt{\frac{6\times2400\times1.35}{2600}} = 27\ mm \rightarrow 30\ mm$$

DISTRIBUCION CENTRAL

$$\sigma = 300\times35 = 10500\ kg/cm$$

Se considera $L = 0.175$

$$M = 10500\times\frac{17.5^2}{2} = 1.6\times10^6\ kg.cm$$

$$h = \sqrt{\frac{6\times1.6\times10^6\times1.35}{2600\times2}} = 50\ cm$$

SOLDADURA HEB-300 A CARTELA

Sección $S = 149{,}1\ cm^2$ $\quad N_{HEB300} = 149{,}1 \times 6$

altura cabeza = altura variable 19 mm

altura garganta soldadura $a = 8$ mm.

$149{,}1 \times 6 = \frac{L \times 0{,}8 \times 6}{\sqrt{3}} \qquad L = \frac{149{,}1 \times \sqrt{3}}{0{,}8} = 322\ cm$

como son 4 soldaduras $\quad \frac{L}{4} = 80\ cm.$

SOLDADURA EN ALA CARTELA

Sección $17\ cm^2$

altura cabeza = altura cabeza 9 mm

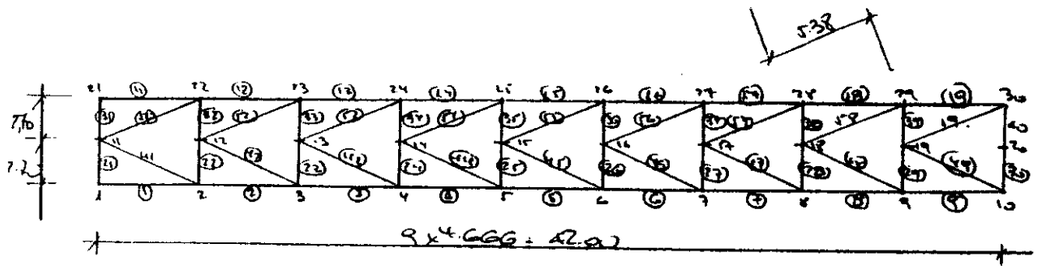
garganta Garganta 4 mm

$17 = \frac{L \times 0{,}6}{\sqrt{3}} = 73\ cm^2 \qquad \frac{L}{4} = 30\ cm$

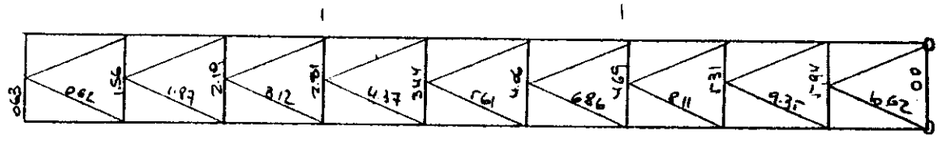
IPN	160	24	7.25
	200	32	8.00
	240	42	9.00
	280	53	11.5

ESTUDIO ARMADURA CUBIERTA

MODELO MATEMÁTICO. COMPROBACIÓN NUDOS Y BARRAS



ESFUERZOS AXILES EN BARRAS

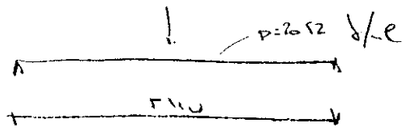


ANÁLISIS:

ARMADURA SUPERIOR $\quad \square\ 160.120.5$

$S = 76.14\ cm^2 \qquad p = 70.52\ kg/ml \qquad I_x = 948.16$

$W_x = 118.52$



$i_x = 6.02$

$Q = 70.50 \times \frac{5.38}{2} = 110\ kg$

$M = \frac{70.52}{100} \times \frac{5.38^2}{8} + 110 \times \frac{5.38}{4} = 74.24 + 147.95 = 222.19$

$\lambda = \frac{540}{6.02} = 90 \qquad \omega = 1.74$

```
*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    MAY 21, 1997        *
*          Time=     7:32:29            *
*                                       *
*****************************************
```

```
1. STAAD PLANE ARRIOSTRAMIENTO EN PESCANTE
2. UNIT METER MTON
3. JOINT COORDINATES
4.   1   0.000  0.000  0.000     10  42.000  0.000  0.000
5.   11  0.000  2.700  0.000     20  42.000  2.700  0.000
6.   21  0.000  5.400  0.000     30  42.000  5.400  0.000
7. MEMBER INCIDENCES
8.   1   1   2
9.   R   8   1   1
10.  11  21  22
11.  R   8   1   1
12.  21  1   11
13.  R   9   1   1
14.  31  11  21
15.  R   9   1   1
16.  41  2   11
17.  R   8   1   1
18.  51  11  22
19.  R   8   1   1
20. MEMBER PROPERTY
21.   1 TO 9  11 TO 19          PR   AX  0.1200   IZ  0.00040000
22.   21 TO 30 31 TO 40         PR   AX  0.1200   IZ  0.00040000
23.   41 TO 49 51 TO 59         PR   AX  0.1200   IZ  0.00040000
24. MEMBER RELEASES
25.  21 TO 29   START MZ
26.  31 TO 39   END   MZ
27.  41 TO 49   51 TO 59 START MZ
28.  41 TO 49   51 TO 59 END   MZ
29. CONSTANTS
30. E    21000000. ALL
31. SUPPORTS
32. 10 30      PINNED
33. LOADING 1 CARGA TOTAL
34. JOINT LOAD
35. 1    10   FY   0.625
36. 2  TO 9   FY   1.250
37. PERFORM ANALISIS
```


PROBLEM STATISTICS

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 30/ 56/ 2
ORIGINAL/FINAL BAND-WIDTH = 11/ 4
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 86
SIZE OF STIFFNESS MATRIX = 1290 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.10 MEGA-BYTES

```
++ PROCESSING ELEMENT STIFFNESS MATRIX.          7:32:30
++ PROCESSING GLOBAL STIFFNESS MATRIX.           7:32:30
++ PROCESSING TRIANGULAR FACTORIZATION.          7:32:30
++ CALCULATING JOINT DISPLACEMENTS.              7:32:31
++ CALCULATING MEMBER  FORCES.                   7:32:31
```

```
38. LOAD LIST 1
39. PRINT MEMBER FORCES LIST  21 TO 30
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
21	1	1	0.63	0.00	0.00	0.00	0.00	0.00
		11	-0.63	0.00	0.00	0.00	0.00	0.00
22	1	2	1.56	0.00	0.00	0.00	0.00	0.00
		12	-1.56	0.00	0.00	0.00	0.00	0.00
23	1	3	2.19	0.00	0.00	0.00	0.00	0.00
		13	-2.19	0.00	0.00	0.00	0.00	0.00
24	1	4	2.81	0.00	0.00	0.00	0.00	0.00
		14	-2.81	0.00	0.00	0.00	0.00	0.00
25	1	5	3.44	0.00	0.00	0.00	0.00	0.00
		15	-3.44	0.00	0.00	0.00	0.00	0.00
26	1	6	4.06	0.00	0.00	0.00	0.00	0.00
		16	-4.06	0.00	0.00	0.00	0.00	0.00
27	1	7	4.69	0.00	0.00	0.00	0.00	0.00
		17	-4.69	0.00	0.00	0.00	0.00	0.00
28	1	8	5.31	0.00	0.00	0.00	0.00	0.00
		18	-5.31	0.00	0.00	0.00	0.00	0.00
29	1	9	5.94	0.00	0.00	0.00	0.00	0.00
		19	-5.94	0.00	0.00	0.00	0.00	0.00
30	1	10	0.00	-0.01	0.00	0.00	0.00	-0.02
		20	0.00	0.01	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

40. PRINT MEMBER FORCES LIST 41 TO 49

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
41	1	2	-0.62	0.00	0.00	0.00	0.00	0.00
		11	0.62	0.00	0.00	0.00	0.00	0.00
42	1	3	-1.87	0.00	0.00	0.00	0.00	0.00
		12	1.87	0.00	0.00	0.00	0.00	0.00
43	1	4	-3.12	0.00	0.00	0.00	0.00	0.00
		13	3.12	0.00	0.00	0.00	0.00	0.00
44	1	5	-4.37	0.00	0.00	0.00	0.00	0.00
		14	4.37	0.00	0.00	0.00	0.00	0.00
45	1	6	-5.61	0.00	0.00	0.00	0.00	0.00
		15	5.61	0.00	0.00	0.00	0.00	0.00
46	1	7	-6.86	0.00	0.00	0.00	0.00	0.00
		16	6.86	0.00	0.00	0.00	0.00	0.00
47	1	8	-8.11	0.00	0.00	0.00	0.00	0.00
		17	8.11	0.00	0.00	0.00	0.00	0.00
48	1	9	-9.35	0.00	0.00	0.00	0.00	0.00
		18	9.35	0.00	0.00	0.00	0.00	0.00
49	1	10	-10.62	0.00	0.00	0.00	0.00	0.00
		19	10.62	0.00	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

41. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	1	-0.02040	0.24829	0.00000	0.00000	0.00000	-0.00008
2	1	-0.02040	0.21277	0.00000	0.00000	0.00000	-0.00008
3	1	-0.02030	0.17679	0.00000	0.00000	0.00000	-0.00008
4	1	-0.01990	0.14090	0.00000	0.00000	0.00000	-0.00008
5	1	-0.01900	0.10597	0.00000	0.00000	0.00000	-0.00007
6	1	-0.01740	0.07320	0.00000	0.00000	0.00000	-0.00007
7	1	-0.01490	0.04415	0.00000	0.00000	0.00000	-0.00006
8	1	-0.01130	0.02073	0.00000	0.00000	0.00000	-0.00004
9	1	-0.00640	0.00517	0.00000	0.00000	0.00000	-0.00002
10	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11	1	-0.00004	0.24822	0.00000	0.00000	0.00000	-0.00008
12	1	-0.00004	0.21260	0.00000	0.00000	0.00000	-0.00008
13	1	-0.00004	0.17655	0.00000	0.00000	0.00000	-0.00008
14	1	-0.00004	0.14060	0.00000	0.00000	0.00000	-0.00007
15	1	-0.00004	0.10560	0.00000	0.00000	0.00000	-0.00007
16	1	-0.00004	0.07277	0.00000	0.00000	0.00000	-0.00006
17	1	-0.00004	0.04365	0.00000	0.00000	0.00000	-0.00006
18	1	-0.00004	0.02016	0.00000	0.00000	0.00000	-0.00004
19	1	0.00000	0.00454	0.00000	0.00000	0.00000	-0.00002
20	1	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000
21	1	0.02040	0.24822	0.00000	0.00000	0.00000	-0.00008
22	1	0.02040	0.21263	0.00000	0.00000	0.00000	-0.00008
23	1	0.02030	0.17665	0.00000	0.00000	0.00000	-0.00008
24	1	0.01990	0.14077	0.00000	0.00000	0.00000	-0.00008
25	1	0.01900	0.10583	0.00000	0.00000	0.00000	-0.00007
26	1	0.01740	0.07307	0.00000	0.00000	0.00000	-0.00007
27	1	0.01490	0.04402	0.00000	0.00000	0.00000	-0.00006
28	1	0.01130	0.02059	0.00000	0.00000	0.00000	-0.00004
29	1	0.00640	0.00504	0.00000	0.00000	0.00000	-0.00002
30	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

********** END OF LATEST ANALYSIS RESULT **********

42. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	1	43.75	-5.94	0.00	0.00	0.00	0.00
30	1	-43.75	-5.31	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

43. PLOT BEND FILE
44. PLOT DISP FILE
45. FINISH

********** END OF STAAD-III **********

**** DATE= MAY 21,1997 TIME= 7:32:32 ****

****
* 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 *
****

$$\frac{2600}{1.35} = \frac{N \times 174}{26.14} + \frac{22219 \times 0.9}{118.52}$$

$1925 = 0066N + 168$ $N = 26612\ kg = 26.6\ tn$

EL PERFIL ES VALIDO PARA TODOS LOS ESFUERZOS

ANGULOS DE ALA IGUAL [] 2 UPN 100

$S = 27.0\ cm^2$ $p = 21.2\ kg/m$ $I_x = 412\ cm^4$

$W_x = 82.4\ cm^3$

$i_x = 3.91\ cm$

$\lambda = \frac{540}{3.91} = 138$ $\omega = 3.40$

$\frac{2600}{1.35} = \frac{N \times 3.40}{27} + \frac{22219 \times 0.9}{82.4}$

$1925 = 0.125\ N + 242$ $N = 13.46\ tn$

Valido para todos los montantes

DIAGONALES

PONER SIMETRICO A SIMETRICO ∠ 100.100.6.

$S = 21.32\ cm^2$ $p = 16.9\ kg/m$ $I_x = 303.65\ cm^4$

$W_x = 60.73\ cm^3$

$i = 3.77\ cm$

$\lambda = \frac{538}{3.77} = 142$ $\omega = 3.58$

$\mu = \frac{16.74}{100} \times \frac{5.38^2}{8} = 6.056$

$\frac{2600}{1.35} = \frac{N \times 3.58}{21.37} + \frac{0.9 \times 6.056}{60.73}$

$1925 = 0.17\ N + 90$ $N = 10,80\ tn$

con montaje ∠ 100.100.10.

$S = 19.2\ cm^2$ $p = 15\ kg/m$ $I_x = 147\ cm^4$

$W_x = 24.6\ cm^3$

$i = 3.04\ cm$

$\mu = \frac{15}{100} \times \frac{5.38^2}{8} = 5.427\ kg.m$

$\lambda = \frac{538}{3.04} = 176$ $\omega = 5.32$

$\frac{2600}{1.35} = \frac{N \times 5.32}{19.2} + \frac{0.9 \times 5.427}{24.6}$

$1925 = 0,28\ N + 198$ $N = 6.2\ tn$

Se supone este valor en todas las barras del cordón.

COMPROBAR A PANDEO DEL CORDON COMPRIMIDO.

Según MV-103

$T = \frac{N}{80}$ $\quad N_{tk} = \frac{T}{2}$ $\quad N_D = \frac{T}{\eta \chi_y} = T.$

$N = N_1 + N_2$ $\quad \lambda_y = 270/4.66 = 0.57$ $\quad \chi_y = 0.80$

Barra	N pler.	N vuelco	N_{tk}	Perfil	N_D	Perfil
19	55	0	0	⊠160.120.5 2 [IPN 100	0.69	L 100.100.10
20	85	1	0.54	"	1.07	L 100.100.10
21	177	2	0.81	"	1.62	L 100.100.10
22	189	5	1.21	"	2.42	L 100.100.10
23	270	9	1.75	"	3.42	L 100100 10
24	370	14	2.40	"	4.80	⊠ 100.100 6
25	511	19	3.31	"	6.62	⊠ 100.100.6
26	669	26	4.34	"	8.68	⊠ 100.100.6
27	885	35	5.75	"	11.50	⊠ 100100 6

4) PERFIL ⊠160.120.5 $\quad L = 2.70$ $\quad p_p = 20.52$ kg/ml

$A = 6.52$ $\quad W_y = 118.52$

$P_c = 110$ kg

$M = \frac{20.52}{100} \times \frac{270^2}{8} + 110 \times \frac{270}{4} = 22219$ kg·cm

$\lambda_y = 6.02$ $\quad \lambda = \frac{270}{6.52} = 90$ $\quad \omega = 1.74$

Sa no xina conveni que admite es

$$2600 = \frac{N' \times 1.74}{26.14} + \frac{22219 \times 0.9 \times 1.35}{118.52}$$

$N' = 35.6$ kn $\quad$ con $\gamma_s = 1.35$ $\quad N = 26.0 > N_{tk}$.

2) PERFIL 2 [IPN 100 $\quad L_p = 5.40$ $\quad p_p = 21.2$ kg/m

$\lambda_x = 3.91$ $\quad W_y = 82.4$

$\lambda = \frac{540}{3.91} = 138$ $\quad \omega = 3.40$

Sa no xina conveni que admite el perfil

$$2600 = \frac{N' \times 3.40}{27} + \frac{22219 \times 0.9 \times 1.35}{82.4}$$

$N' = 1800$ $\quad N = \frac{18.0}{1.35} = 13.4 > N_{tk}$

4°) PERFIL L 100.100.10 (Pandeo débil xx 4.4)

$p = 15$ kg/ml $\quad W_y = 246.2$ $\quad \lambda = 3.74$ m

$\lambda = \frac{538}{3.74} = 146$ $\quad \omega = 5.32$ $\quad s = 19.2$

$\mu = \frac{15}{100} \times \frac{538^2}{\chi} = 1427$

$$2600 = \frac{N' \times 5.32}{19.2} + \frac{0.9 \times 1427 \times 1.35}{24.6}$$

$N' = 8\,t$ $\qquad N = 6.2\,tm > 3,4\,tm$

5°) IPE 100 $\quad$ I 100 100 6

$s = 21.32\,cm^2 \qquad \rho = 16.74\ kg/m \qquad W_x = 60.73\,cm^3$

$i = 8.77$

$M_c = \frac{16.74}{100} \times \frac{\sigma_{ad}^2}{8} = 6056\ kg \cdot cm$

$\lambda = \frac{\sigma_{ad}}{3.77} = 142 \qquad \omega = 3.58$

$2600 = \frac{N' \times 3.58}{21.32} + \frac{0.9 \times 6056}{60.73}$

$N' = 15.00 \qquad N = 11.10\,t \simeq 11,50\,t$

6°) Si può le aniste e le verifiche nel sistema

$i_{xy} = 1.95$

$\lambda = \frac{\sigma_{ad}}{1.95} = 216 > 200$

5.9. ESTUDIO DE PRIMERAS FASES DE LANZAMIENTO

AVANCE DEL PESCANTE

PRIMERAS POSICIONES

EMPUJE DEL CAJON -- PRIMERAS POSICIONES

OBJETO DE ESTE ESTUDIO.

Se recoge en este documento el análisis de esfuerzos y deformaciones que se producen en el cajón de hormigón de la estructura del Puente sobre el Río Cinca, en sus primeras fases de avance, de acuerdo con las características y dimensiones de la playa de fabricación.

Este estudio completa el incluido en proyecto ya que aquél se hizo atendiendo a un empuje que no planteaba las ahora ya conocidas condiciones de fabricación.

Se han analizado 49 posiciones de avance:

La posición 1 corresponde al pescante apoyado en el eje de apoyos del estribo 2, en la pila, provisional y en los muros de deslizamiento. Longitudinalmente la posición está definida por el nudo 6 del pescante apoyado sobre la pila provisional. De esta forma la sección de unión pescante-cajón prácticamente coincide con el extremo de los muros de deslizamiento.

La posición final de este estudio termina en la posición 49, que coincide con la fabricación de la semi-sección superior de la dovela 6.

Entre ambas situaciones, en el cálculo, cada posición de estudio ha supuesto un avance de 2.33 ó 2.18 m. en consonancia con la disposición de barras en el modelo matemático. Estas dos dimensiones coinciden con la distancia entre nudos del pescante en el primer caso y con octavos de la longitud de una dovela en el otro.

CONCLUSIONES DEL ESTUDIO.

En el cuadro CINCA111 figuran los valores de las reacciones de apoyo, en toneladas, del conjunto cajón-prescante. También se han calculado los giros en la sección de unión pescante-cajón así como en el extremo de la parte construida hasta ese momento de la pieza de hormigón (extremo de la semisección del cajón). Estos valores están dados en milirradianes. A su vez, los desplazamientos que aparecen en el cálculo de ordenador están en centésimas de milímetro.

En ese mismo cuadro (hoja 2) se dán los esfuerzos de flexión, a lo largo del cajón, cada octavo de dovela. Estos valores están en metro-toneladas.

En el cuadro sólo figuran los valores correspondiente a posiciones alternadas.

Analizando los valores que en dicho cuadro figuran, se comprueba que los valores de estos momentos flectores son fácilmente asumibles tanto en las partes ya con sección completa, como en las zonas de sólo semi-sección inferior fabricada, a todo lo largo del cajón, a excepción de los que se producen en las posiciones 37 a 40, en la unión entre ambas secciones.

En estas posiciones, el conjunto está muy desequilibrado, prácticamente la estructura se ha despegado de las deslizaderas. En la sección de unión entre sección completa y sección solera, se producen momentos flectores de 451 mt.

Estos momentos no son asumibles por la sección de losa inferior y hacen prácticamente inviable la solución, a menos que se tomen las medidas correctoras oportunas.

La medida correctora que se propone es modificar ligeramente las fases de hormigonado de la semiseccion superior del cajón.

En efecto:

En el cuadro CINCA222 figuran los mismos valores que en el cuadro anterior, pero modificando las fases de hormigonado entre las posiciones 36 y 40.

La dovela 5 se hormigona en dos fases de 8.75 metros de longitud cada una de ellas. La primera mitad en la posición 36 y la segunda mitad en la posición 40.

Con ello se consigue que, al equilibrar más el conjunto, la parte posterior de la construcción tenga un apoyo más claro y se reduzcan sensiblemente los valores de los momentos flectores en el tramo posterior de lo construido.

Además, esta zona, cuando se produzcan estos esfuerzos de flexión estará funcionando a sección completa, con lo que el problema habrá desaparecido.

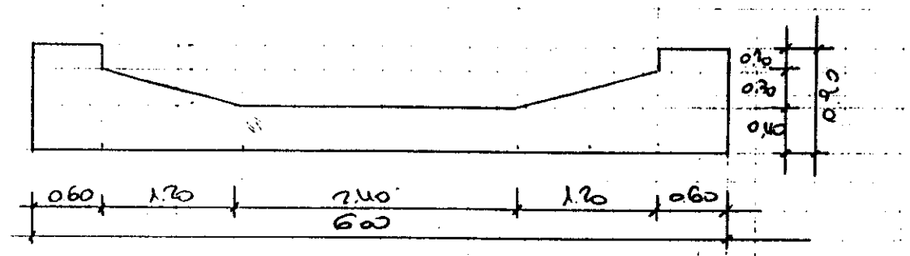
Según se aprecia en el cuadro CINCA222, el valor máximo de los esfuerzos de flexión en la sección de losa inferior alcanza los 175 mt. en la posición 38.

En esta posición de avance, y en la zona conflictiva habrá en ese momento un pretensado, sensiblemente centrado, de 48 cordones de 0.6". En el apartado correspondiente se estudia el comportamiento de dicha sección.

No obstante, como medida adicional, y a fin de evitar una fisuración por retracción a lo largo de la junta horizontal de hormigonado se recomienda disponer una armadura de 4∅16 en cada lado de la junta y en las dos almas. En total 16∅16 a lo largo de todo el cajón.

1) SECCIONES CONSIDERADAS

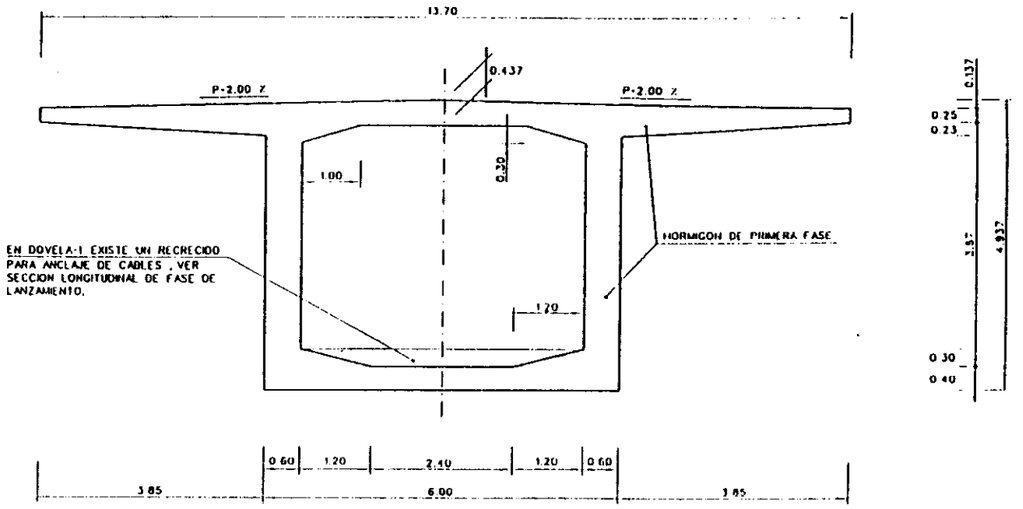
Sección 1.



S= 3360 m² V_{up}= 0.588 W_{up}= 3.726

J= 0.1577 m⁴ V_{inf}= 0.313 W_{inf}= 1.982

SECCIÓN 2

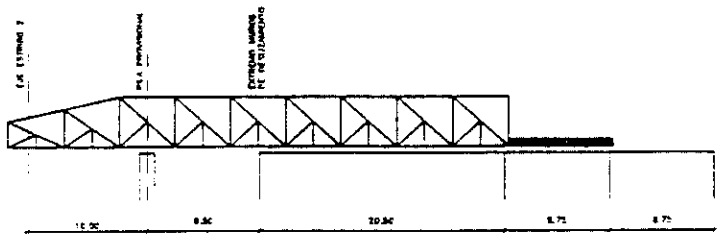


S= 13.481 m² V_{up}= 1.997 W_{up}= 6.754

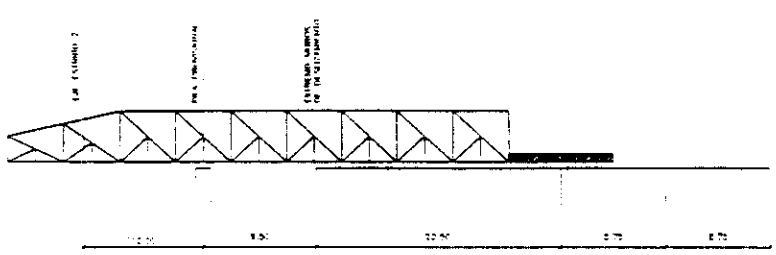
J= 45.3025 m⁴ V_{inf}= 2.943 W_{inf}= 9.085

2) POSICIONES DE AVANCE

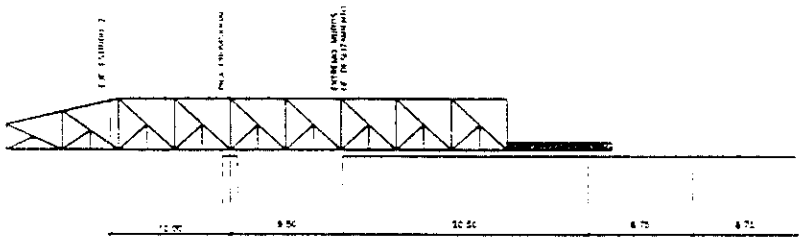
POSICION 1



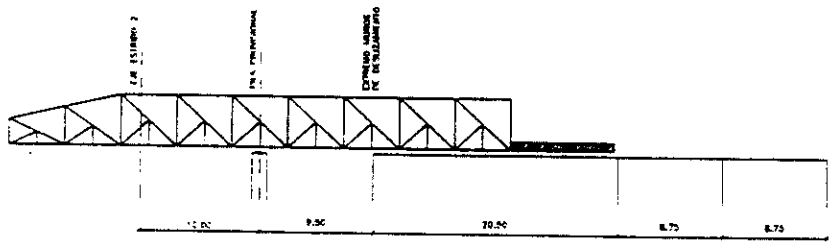
POSICION 2



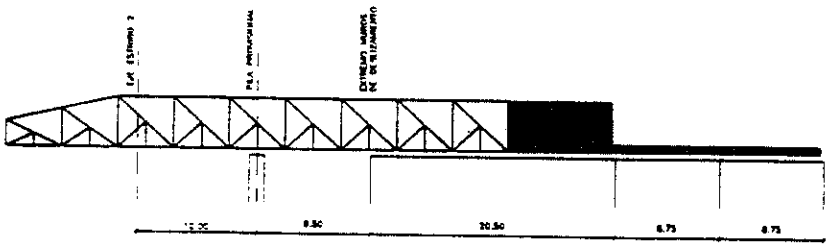
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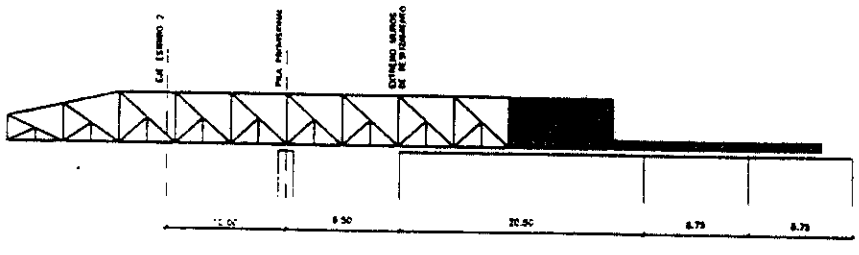
POSICION 4



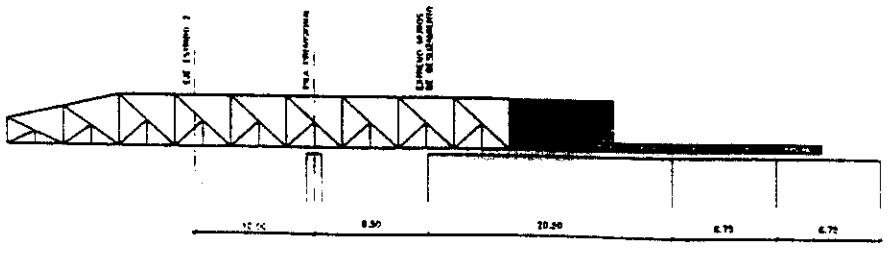
POSICION 5



POSICION 6

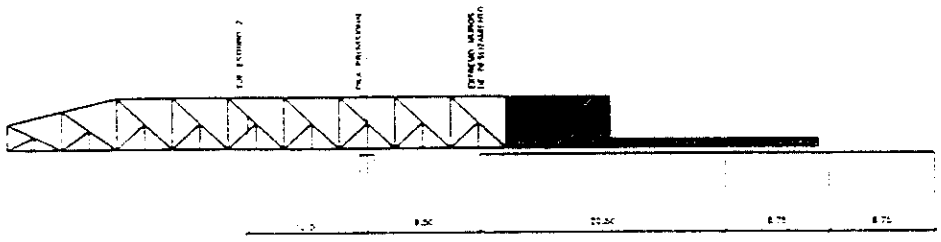


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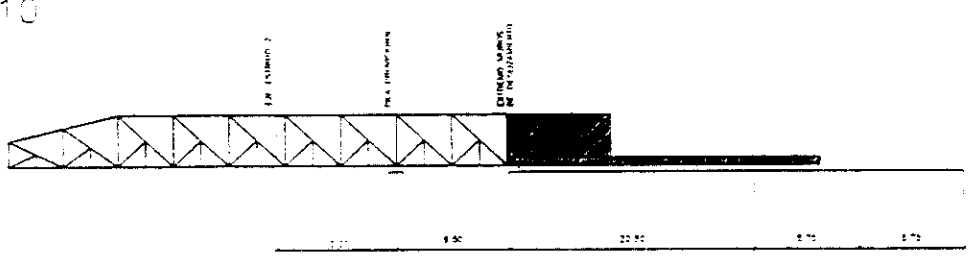


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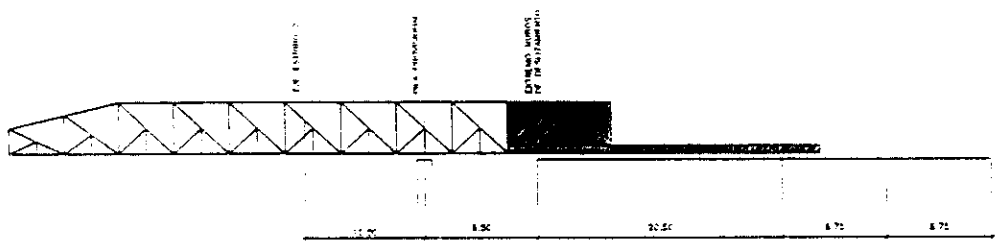
POSICION 9



POSICION 10

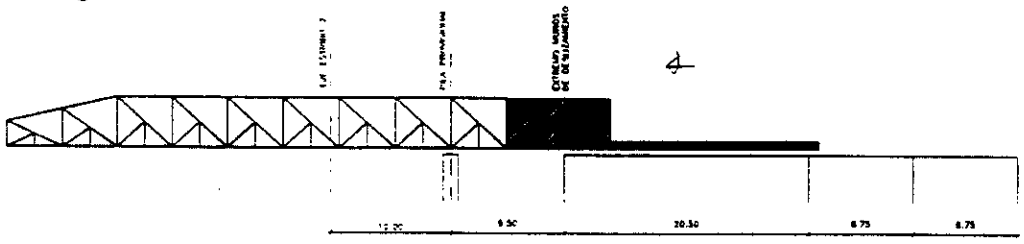


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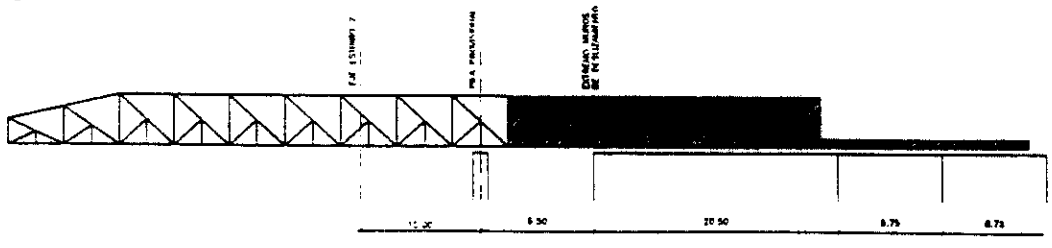


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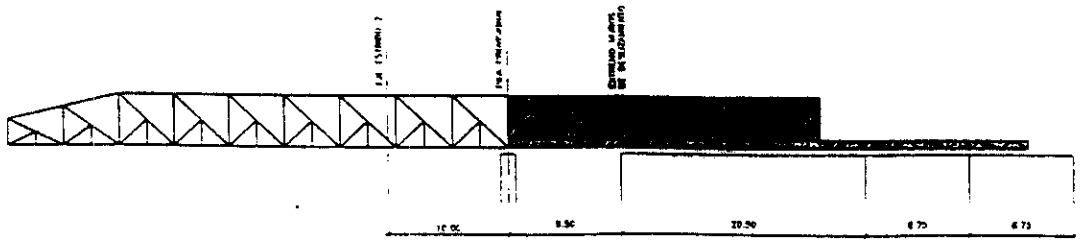
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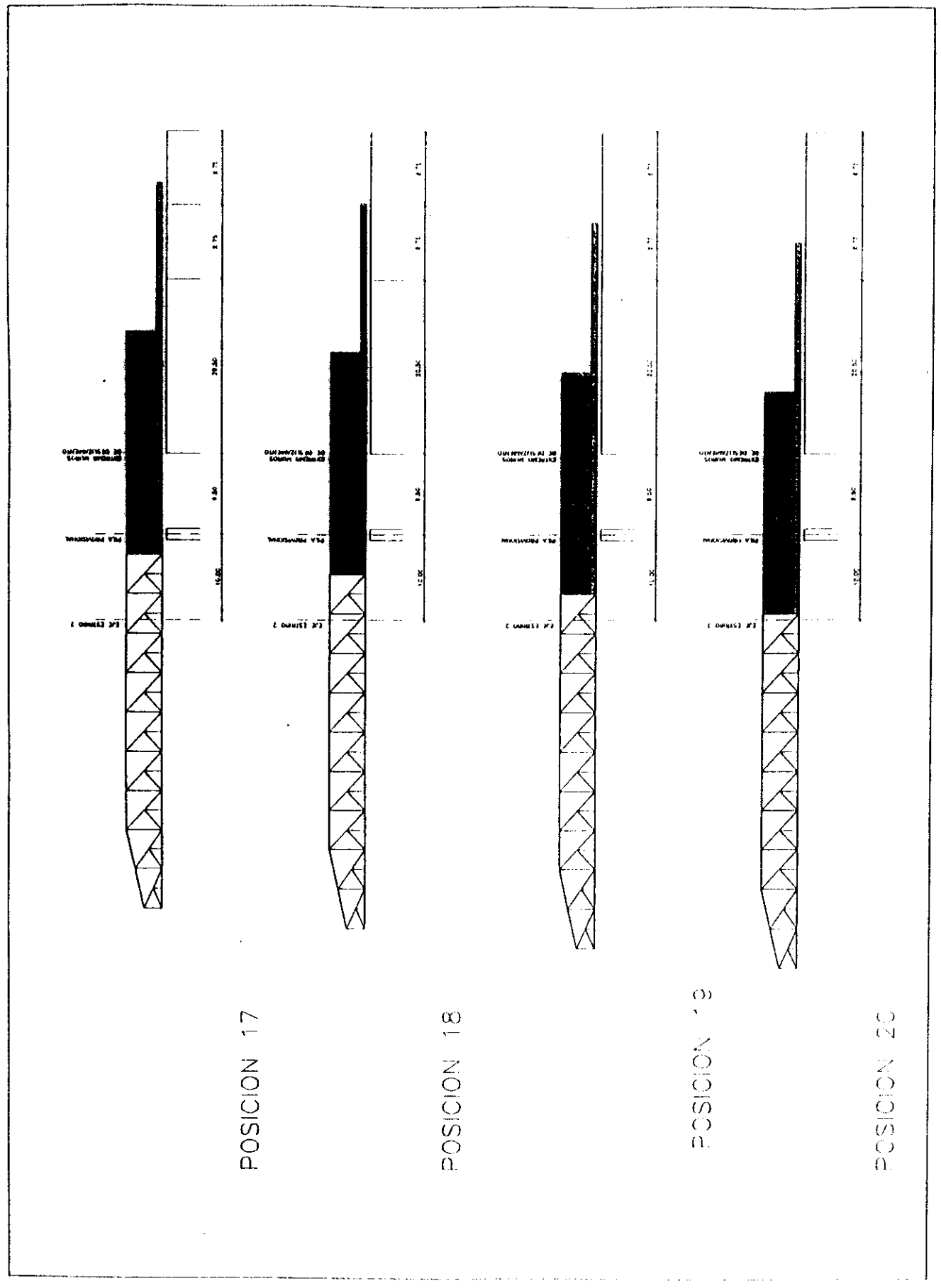
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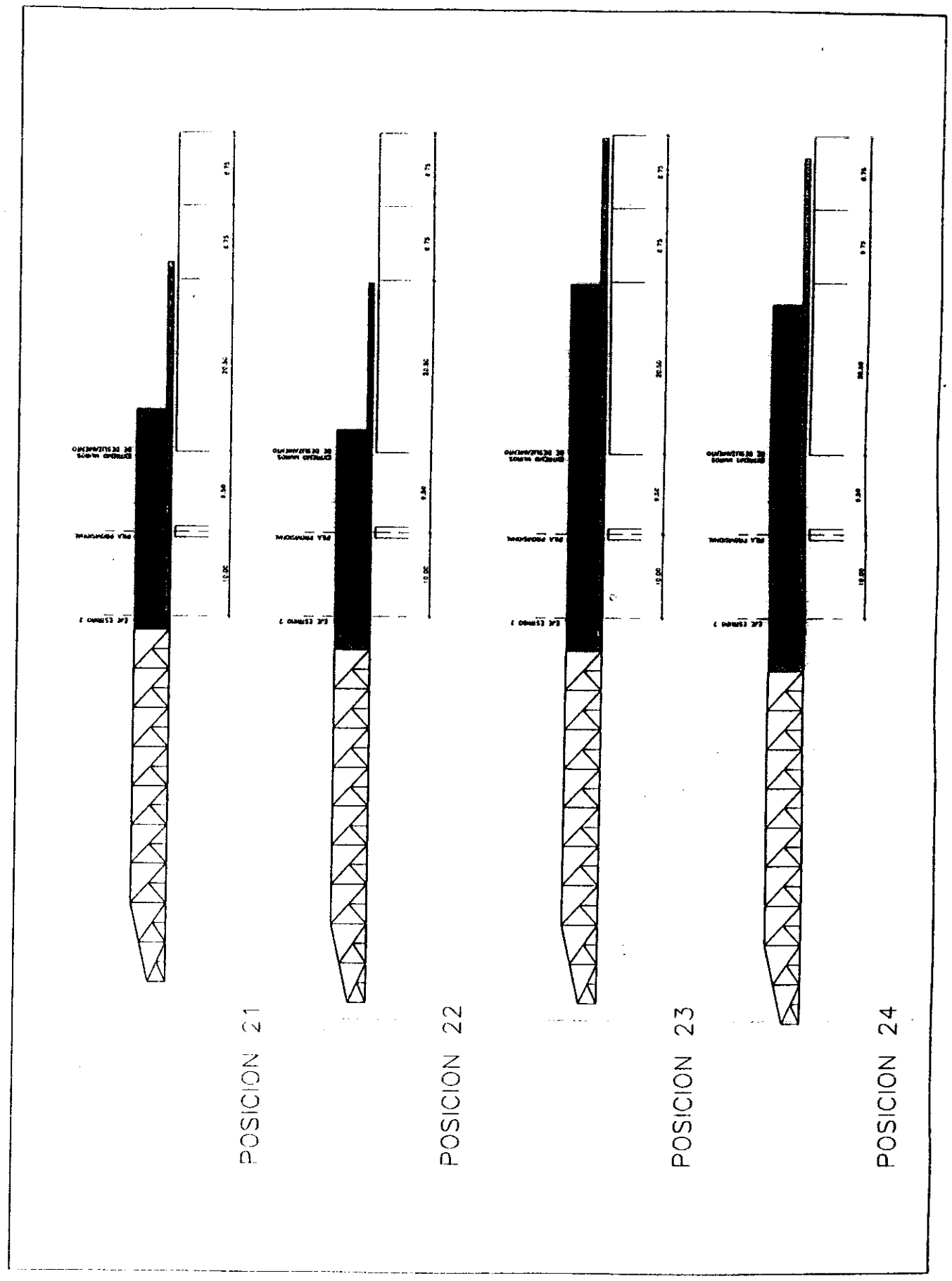


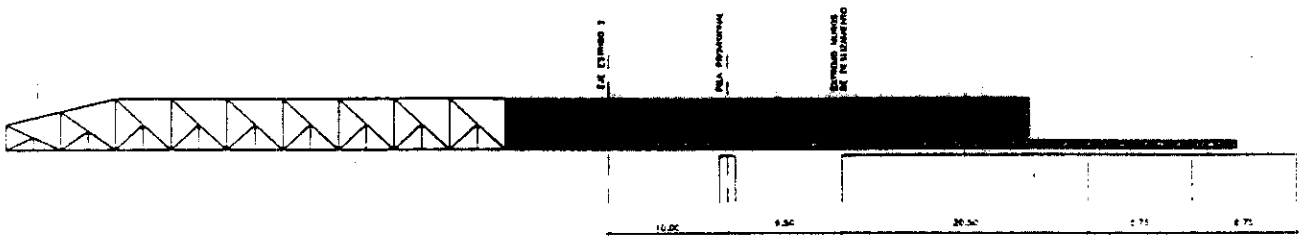
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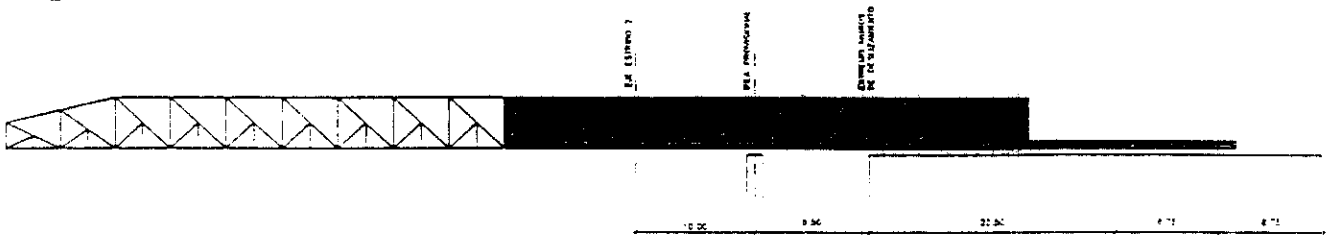
POSICION 16


POSICION 17
POSICION 18
POSICION 19
POSICION 20

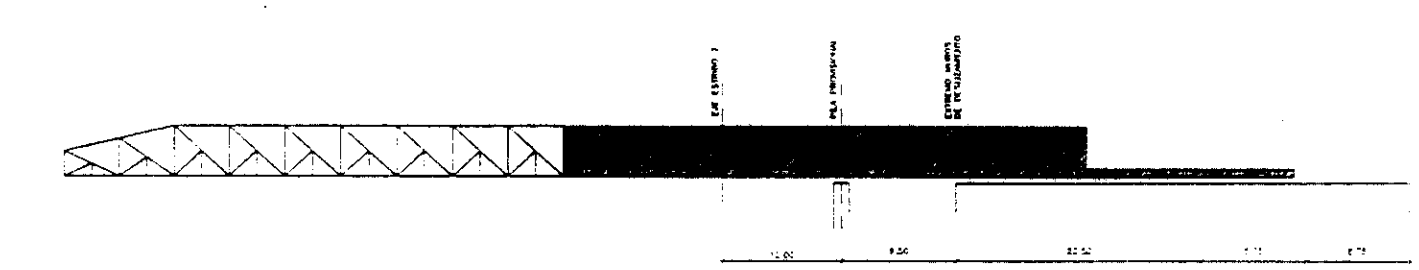

POSICION 21
POSICION 22
POSICION 23
POSICION 24



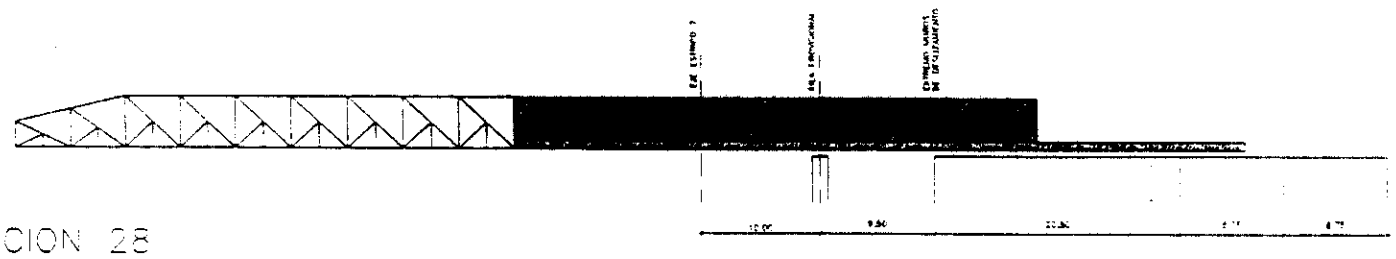
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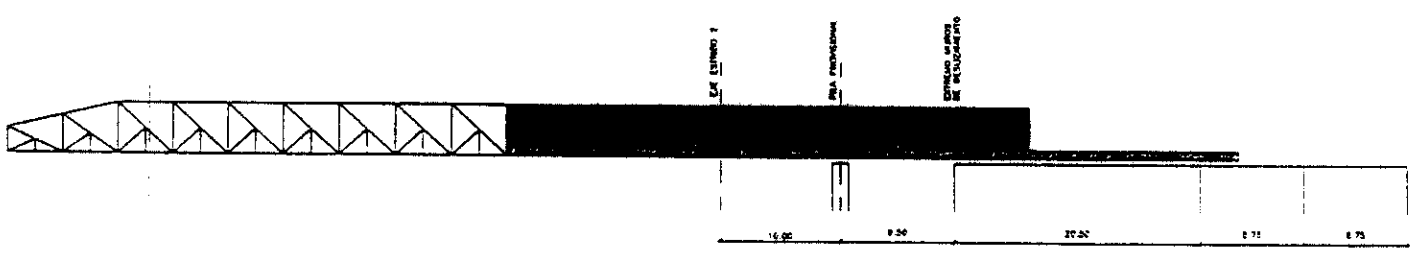
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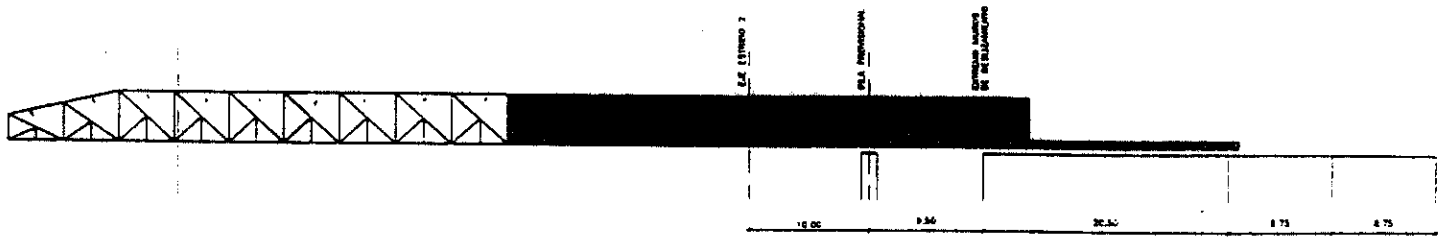
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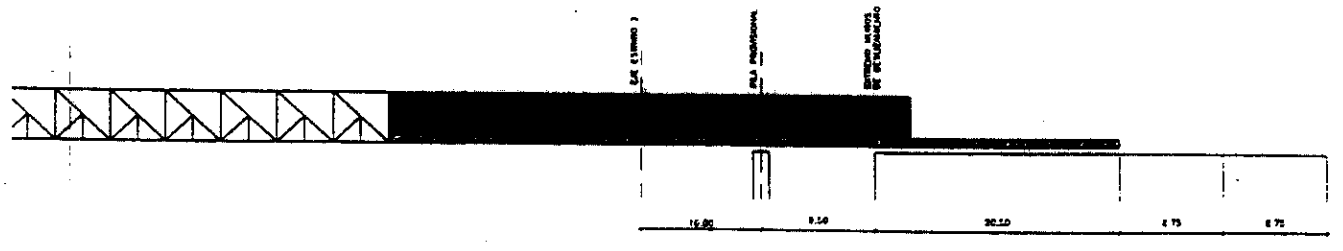
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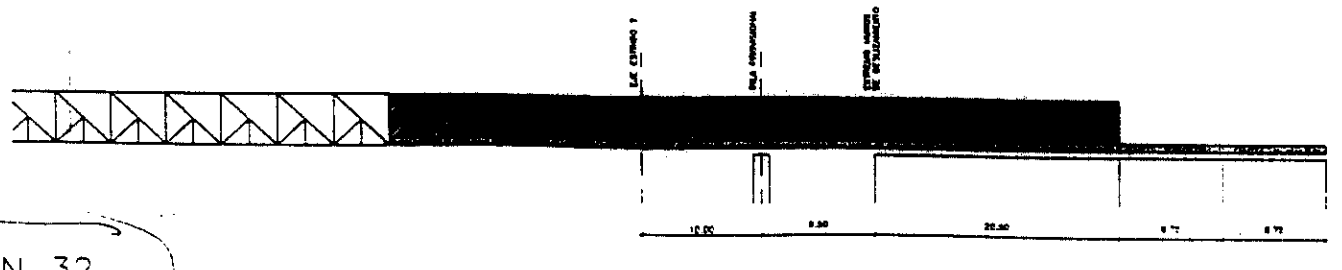
POSICION 29



POSICION 30

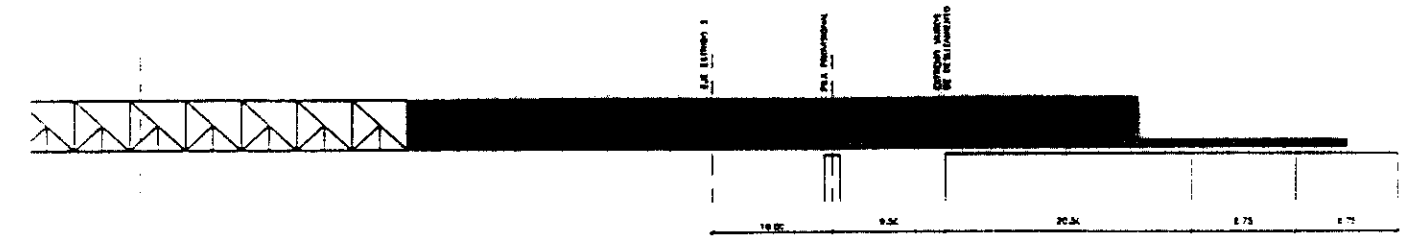


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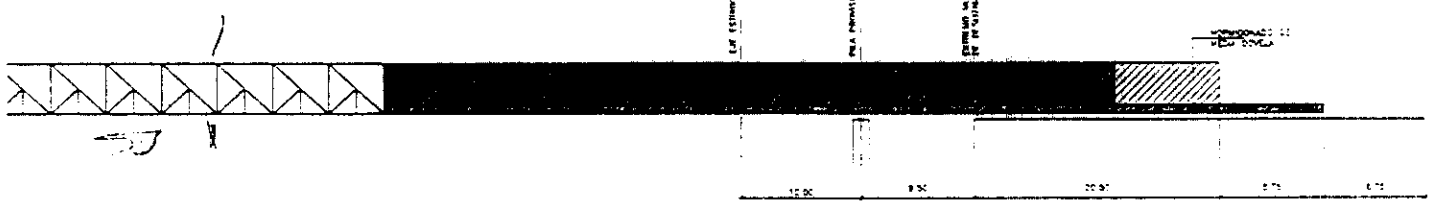


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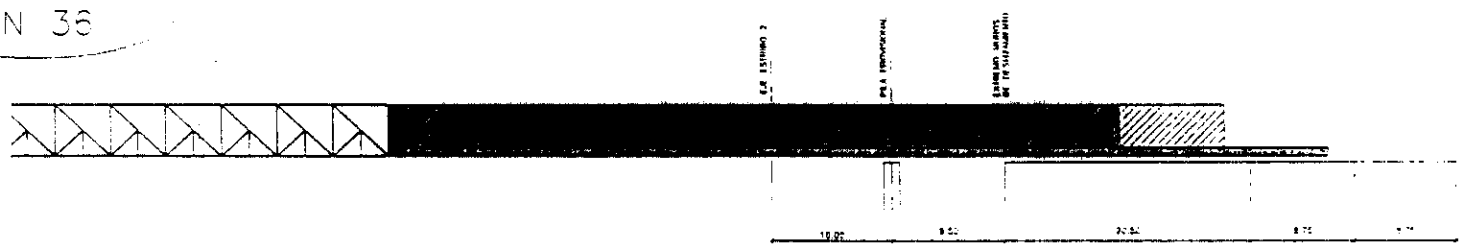
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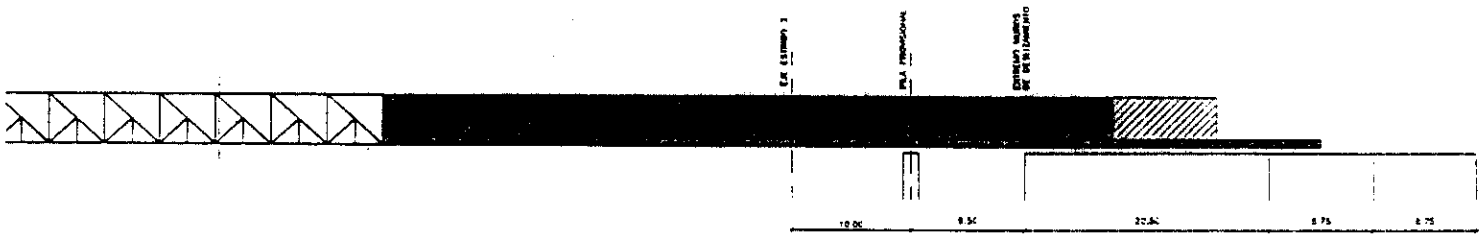
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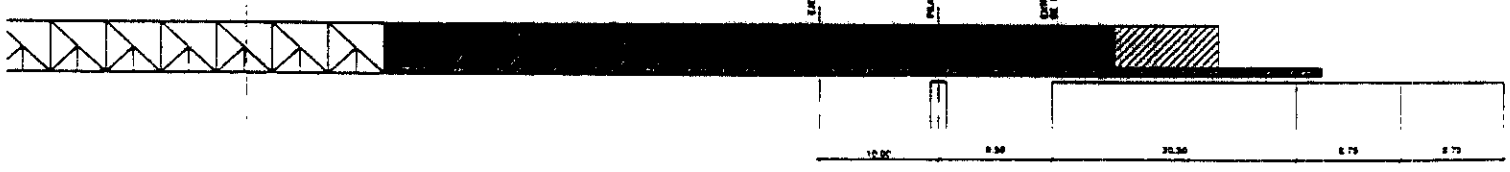
POSICION 36



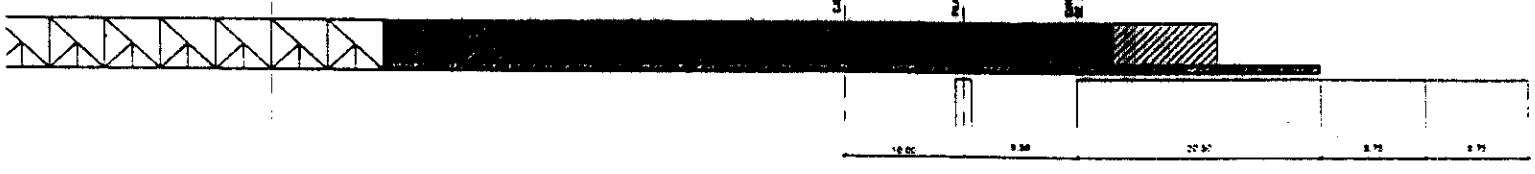
POSICION 37



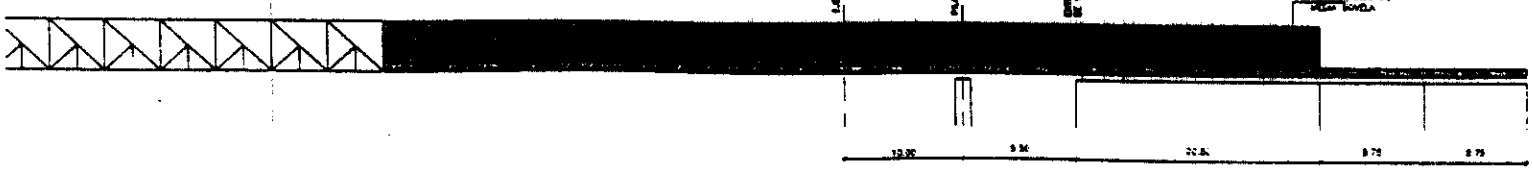
POSICION 38



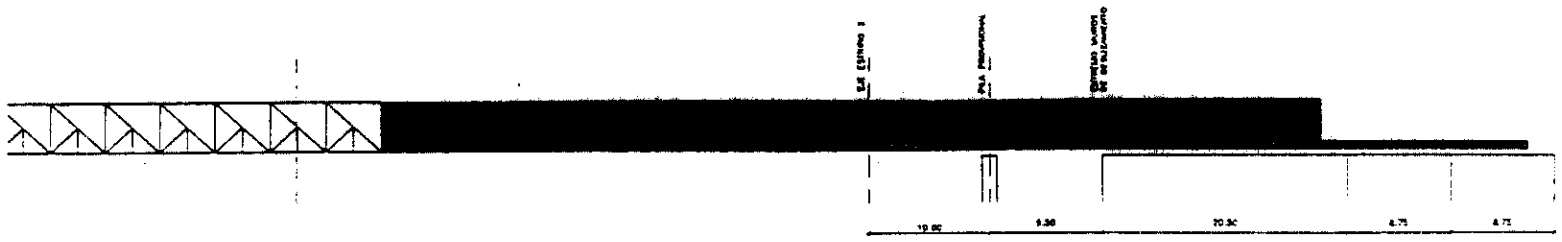
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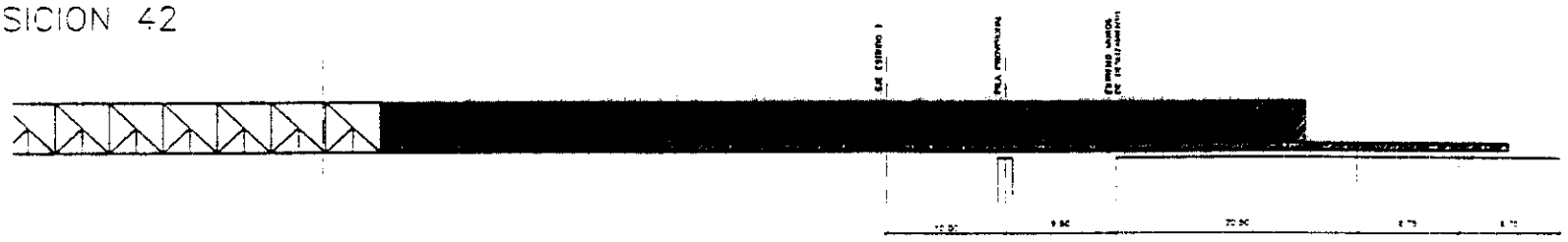
POSICION 40



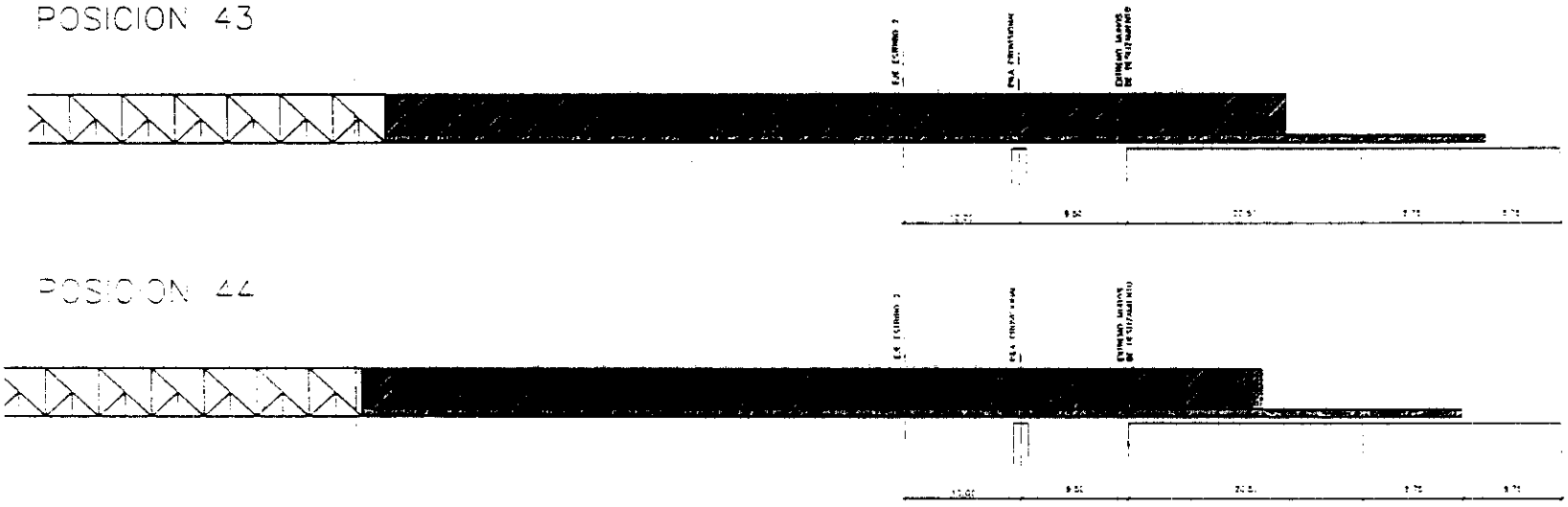
POSICION 41



POSICION 42



POSICION 43



POSICION 44

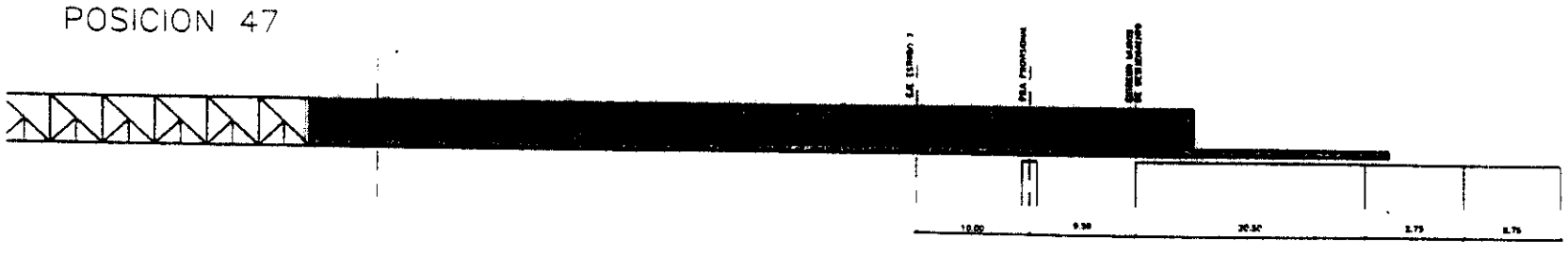
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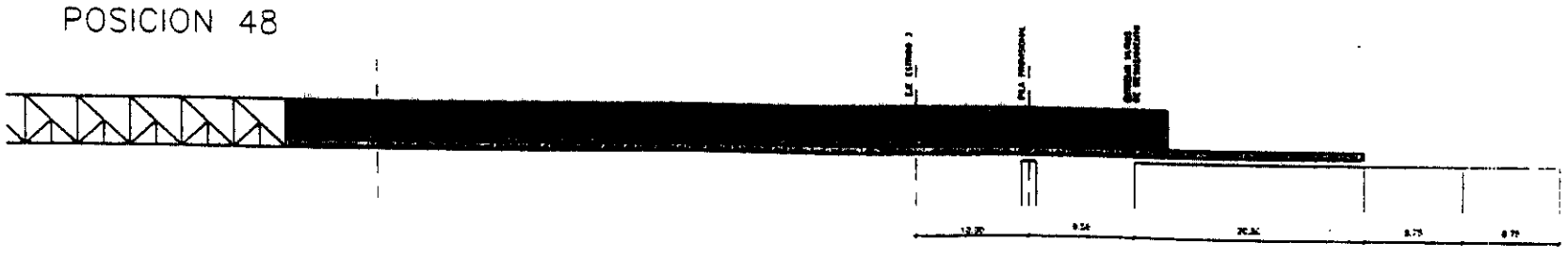
POSICION 46



POSICION 47



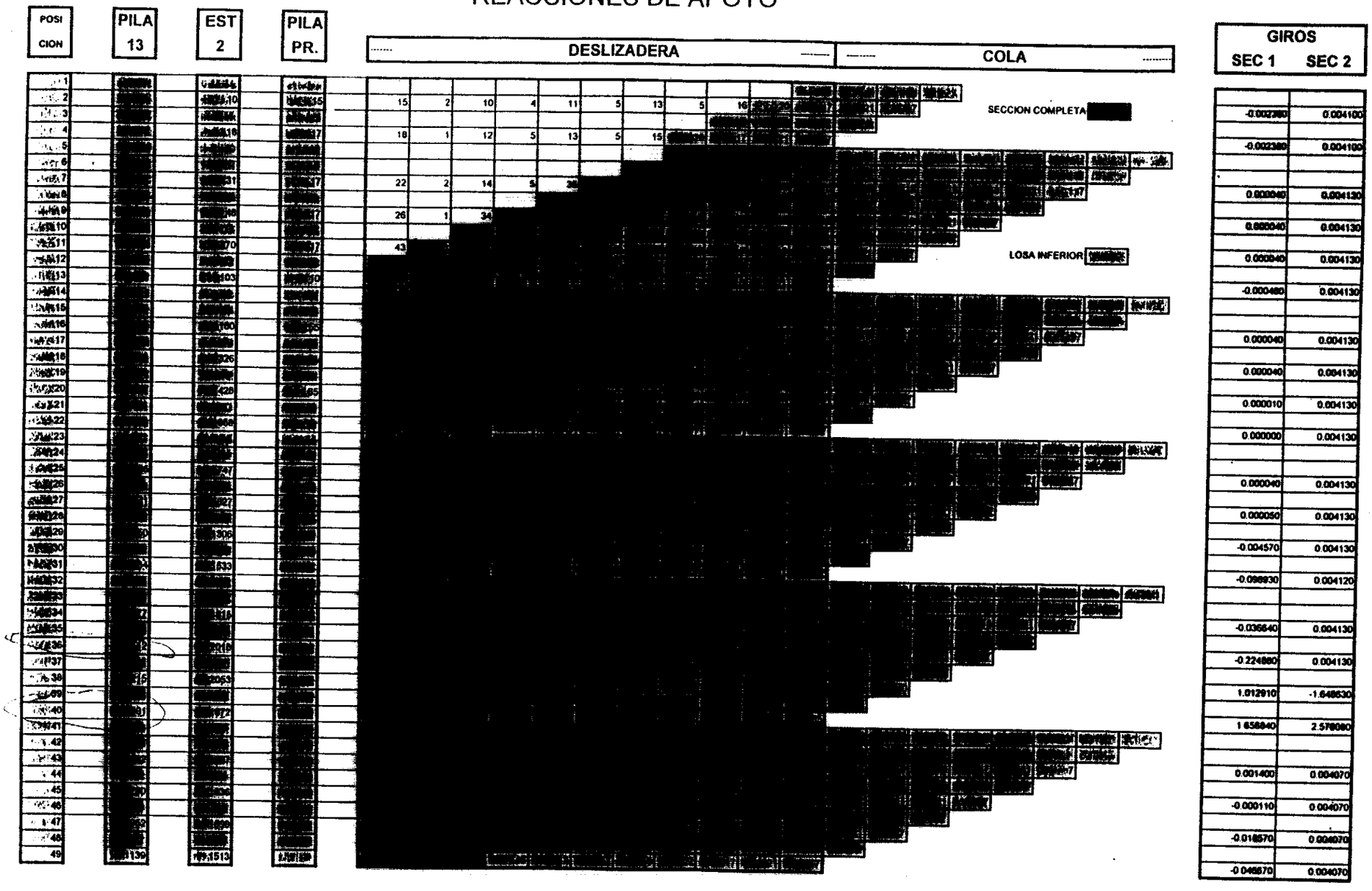
POSICION 48



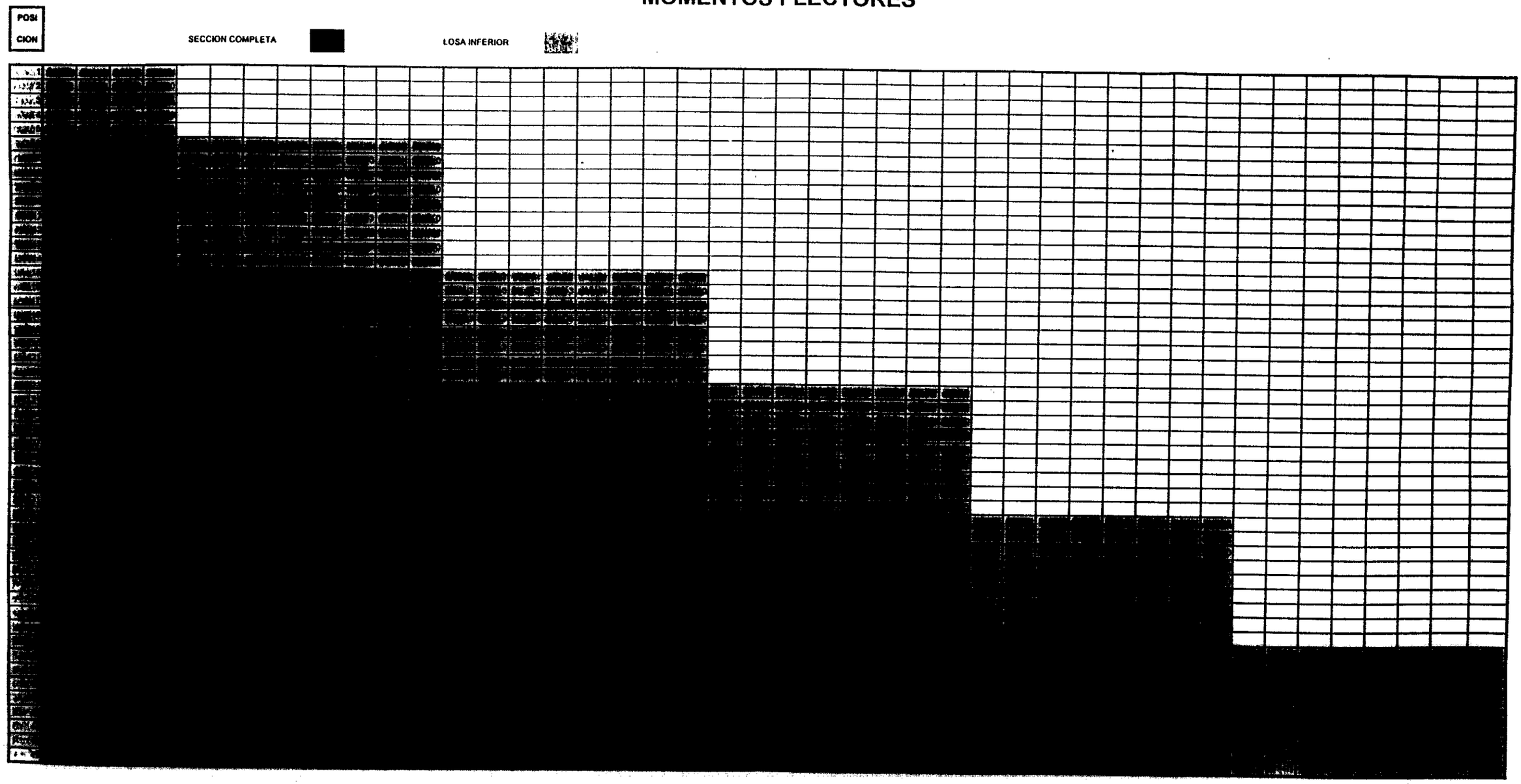
POSICION 49

3) REACCIONES Y ESFUERZOS EN EL AVANCE

REACCIONES DE APOYO



MOMENTOS FLECTORES



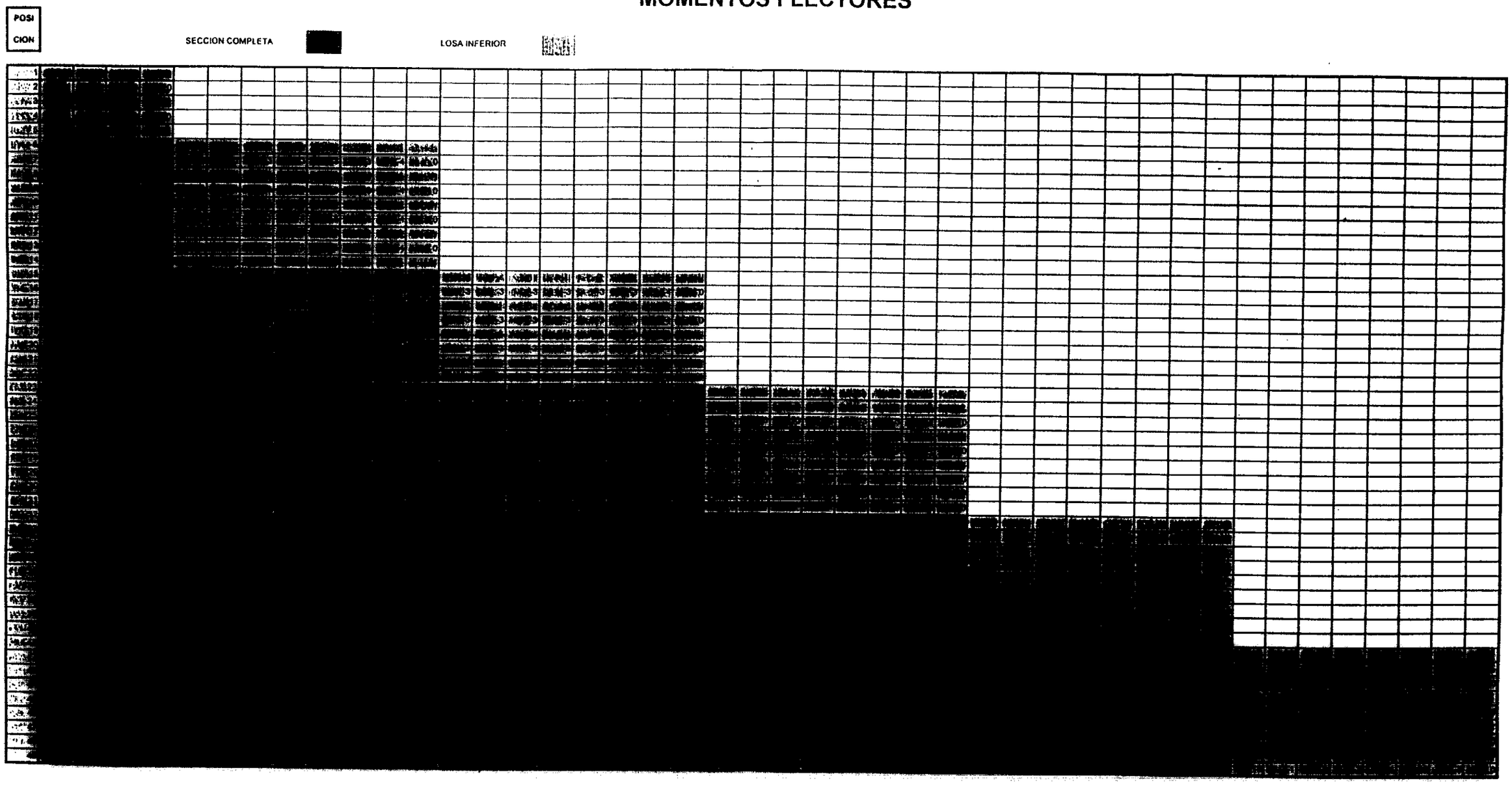
REACCIONES DE APOYO

POSICION	PILA 13	EST 2	PILA PR.	DESLIZADERA	COLA	GIROS SEC 1	GIROS SEC 2
1							
2				15 2 10 4 11 5 13 5 16		-0.002380	0.004100
3							
4				18 1 12 5 13 5 15		-0.002380	0.004100
5							
6							
7				22 2 14 5		0.000040	0.004130
8							
9				26 1 34		0.000040	0.004130
10							
11				43		0.000040	0.004130
12							
13						-0.000480	0.004130
14							
15						0.000040	0.004130
16							
17						0.000040	0.004130
18							
19						0.000010	0.004130
20							
21						0.000000	0.004130
22							
23						0.000040	0.004130
24							
25						0.000050	0.004130
26							
27						-0.004570	0.004130
28							
29						-0.098930	0.004120
30							
31							
32						-0.036840	0.004130
33							
34						-0.224880	0.004130
35							
36						-0.242160	0.005800
37							
38						-0.242360	0.005580
39							
40							
41						0.001460	0.004070
42							
43						-0.000110	0.004070
44							
45						-0.018570	0.004070
46							
47						-0.046870	0.004070
48							
49	1139	513					

SECCION COMPLETA

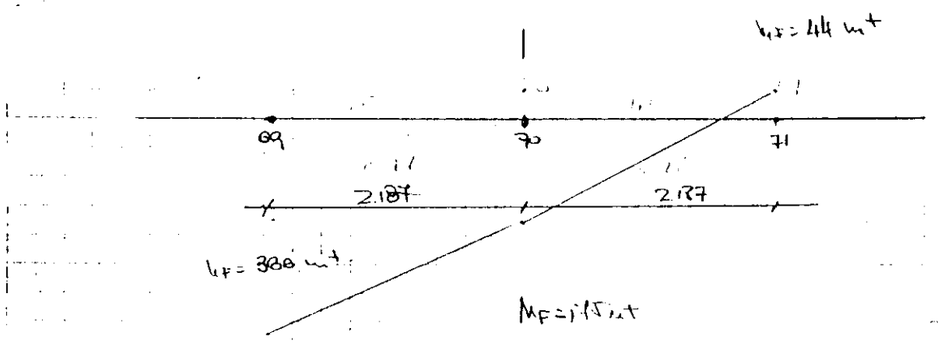
LOSA INFERIOR

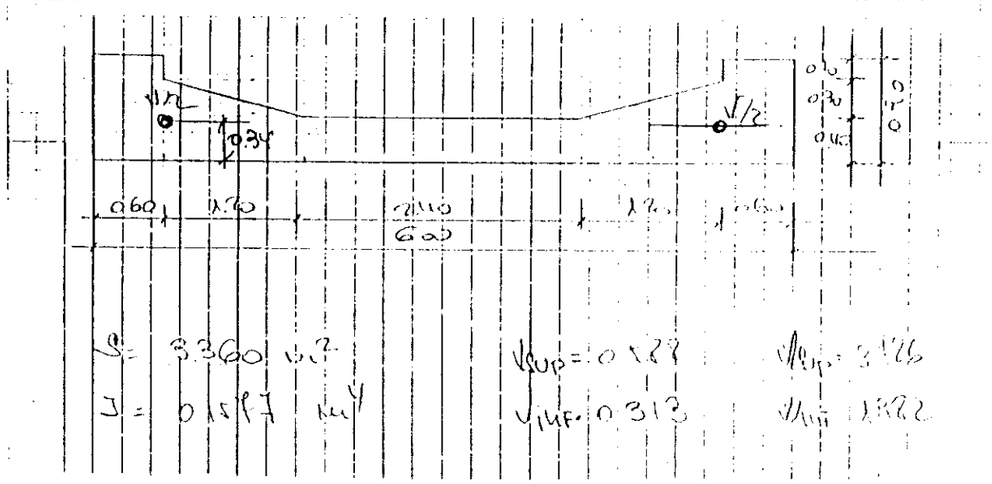
MOMENTOS FLECTORES



4.-REFUERZO EN SECCIÓN 1-1

MOMENTO EN LA SECCIÓN DE ANCLAJE DE CABLES





Se debe pretensado de

N= 2×24×10×0.9= 864 ton a 34 cm

DE LA FIBRA INFERIOR

DEFINIENDO EL MOMENTO A LA ANULACIÓN DE TRACCIÓN

$M' = 1.35 \times 175 + 864 \times 0.31 = 236 + 267 = 503$ m-t

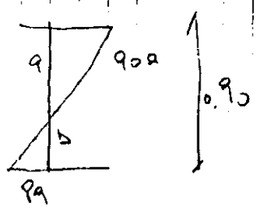
$U_1 = \frac{4000}{15} \times 0.85 \times 120 = 2720$ t

$U_2 = 2720 \left(1 - \sqrt{1 - \frac{2 \times 503}{0.85 \times 2720}}\right) - 864 = 675 - 864 < 0$

Tensiones

$\sigma_2 = -\frac{1.35 \times 3126}{3360} - \frac{864}{3360} = -452 - 257 = -89$ t/m²

$\sigma_1 = +\frac{1.35 \times 1372}{3360} - \frac{864}{3360} = +346 - 257 = 89$ t/m²



$a+b = 0.90$

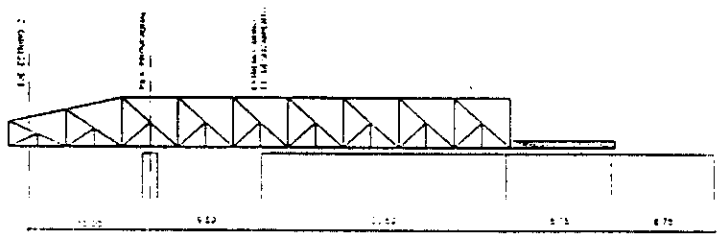
$\frac{a}{90a} = \frac{b}{89} = \frac{0.90}{90.89}$

$b = 89 \times 0.90 / 90.89 = 0.88$

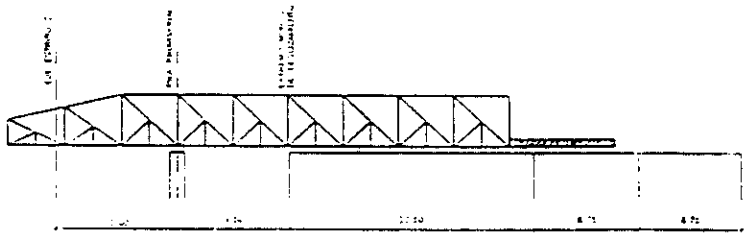
El valor de fracción a

$T = \frac{1}{2} \times 0.88 \times 200 \times 89 = 8764$ t/ml

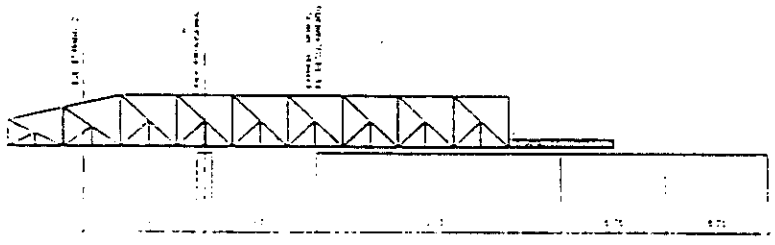
5) CÁLCULO DE ORDENADOR



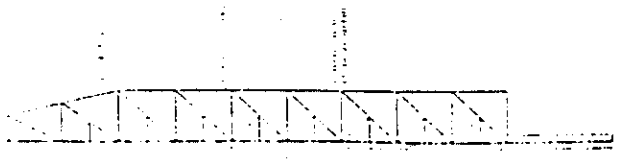
POSICION 1



POSICION 2



POSICION 3



POSICION 4

posicion 1°


```
*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUN 30, 1997            *
*          Time=    13:14:42                *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000  0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625 0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125  0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125  0.000
10. 30   4.666   3.1875 0.000
11. 31   9.333   4.250  0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000  0.000 42   50.750   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9  10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
45. 32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
 ?. 36   9  33
50. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
 8. 55  33  24
69. 56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
87. 74  19  39
 8. 75  39  40
89. 76  40  41
90. 77  41  42
91. MEMBER PROPERTY
92. *CORDON INFERIOR
93.  1                PR AX 0.0500 IZ 0.00151406
94.  2                PR AX 0.0500 IZ 0.00151406
95.  3                PR AX 0.0532 IZ 0.00156748
96.  4                PR AX 0.0532 IZ 0.00156748
97.  5                PR AX 0.0670 IZ 0.00233098
98.  6                PR AX 0.0670 IZ 0.00233098
99.  7                PR AX 0.0750 IZ 0.00271328
100. 8                PR AX 0.0750 IZ 0.00271328
101. 9                PR AX 0.0900 IZ 0.00380584
102. 10               PR AX 0.0900 IZ 0.00380584
103. 11               PR AX 0.1070 IZ 0.00464364
104. 12               PR AX 0.1070 IZ 0.00464364
105. 13               PR AX 0.1180 IZ 0.00593306
96.  14               PR AX 0.1180 IZ 0.00593306
97.  15               PR AX 0.1410 IZ 0.00804164
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   16                              PR   AX  0.1410   IZ  0.00804164
 9.    17                              PR   AX  0.1520   IZ  0.00926892
110.   18                              PR   AX  0.1520   IZ  0.00926892
111. *CORDON SUPERIOR
112.   19                              PR   AX  0.0280   IZ  0.00046454
113.   20                              PR   AX  0.0280   IZ  0.00046454
114.   21                              PR   AX  0.0280   IZ  0.00046454
115.   22                              PR   AX  0.0320   IZ  0.00072626
116.   23                              PR   AX  0.0320   IZ  0.00072626
117.   24                              PR   AX  0.0450   IZ  0.00164273
118.   25                              PR   AX  0.0600   IZ  0.00261476
119.   26                              PR   AX  0.0720   IZ  0.00316788
120.   27                              PR   AX  0.0840   IZ  0.00380920
121. *MONTANTES PRINCIPALES
122.   28                              PR   AX  0.0068   IZ  0.00000001
123.   30                              PR   AX  0.0082   IZ  0.00000001
124.   32                              PR   AX  0.0148   IZ  0.00000001
125.   34                              PR   AX  0.0212   IZ  0.00000001
126.   36                              PR   AX  0.0298   IZ  0.00000001
127.   38                              PR   AX  0.0298   IZ  0.00000001
 8.    40                              PR   AX  0.0398   IZ  0.00000001
 9.    42                              PR   AX  0.0498   IZ  0.00000001
130.   44                              PR   AX  0.0578   IZ  0.00000001
131.   46                              PR   AX  0.0578   IZ  10000.0000
132. *MONTANTES SECUNDARIOS
133.   29                              PR   AX  0.0068   IZ  0.00000001
134.   31                              PR   AX  0.0068   IZ  0.00000001
135.   33                              PR   AX  0.0068   IZ  0.00000001
136.   35                              PR   AX  0.0096   IZ  0.00000001
137.   37                              PR   AX  0.0112   IZ  0.00000001
138.   39                              PR   AX  0.0128   IZ  0.00000001
139.   41                              PR   AX  0.0168   IZ  0.00000001
140.   43                              PR   AX  0.0192   IZ  0.00000001
141.   45                              PR   AX  0.0298   IZ  0.00000001
142. *DIAGONALES 1
143.   47                              PR   AX  0.0068   IZ  0.00001456
144.   48                              PR   AX  0.0068   IZ  0.00001456
145.   49                              PR   AX  0.0096   IZ  0.00003700
146.   50                              PR   AX  0.0096   IZ  0.00003700
 7.    51                              PR   AX  0.0128   IZ  0.00007640
 8.    52                              PR   AX  0.0128   IZ  0.00007640
149.   53                              PR   AX  0.0212   IZ  0.00025120
150.   54                              PR   AX  0.0212   IZ  0.00025120
151.   55                              PR   AX  0.0298   IZ  0.00025166
152.   56                              PR   AX  0.0298   IZ  0.00025166
153.   57                              PR   AX  0.0398   IZ  0.00037183
154.   58                              PR   AX  0.0398   IZ  0.00037183
155.   59                              PR   AX  0.0498   IZ  0.00050799
156.   60                              PR   AX  0.0498   IZ  0.00050799
157.   61                              PR   AX  0.0578   IZ  0.00061053
158.   62                              PR   AX  0.0578   IZ  0.00061053
159.   63                              PR   AX  0.0648   IZ  0.00071462
160.   64                              PR   AX  0.0648   IZ  0.00071462
161. *DIAGONALES 2
162.   65                              PR   AX  0.0068   IZ  0.00000001
163.   66                              PR   AX  0.0068   IZ  0.00000001
164.   67                              PR   AX  0.0068   IZ  0.00000001
165.   68                              PR   AX  0.0056   IZ  0.00000001
 66.   69                              PR   AX  0.0056   IZ  0.00000001
 67.   70                              PR   AX  0.0150   IZ  0.00000001
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.   71                              PR   AX  0.0150   IZ  0.00000001
 9.    72                              PR   AX  0.0193   IZ  0.00000001
 0.    73                              PR   AX  0.0068   IZ  0.00000001
171. *SECCION DE HORMIGON
172.   74                              PR   AX  3.3600   IZ  0.1577
173.   75                              PR   AX  3.3600   IZ  0.1577
174.   76                              PR   AX  3.3600   IZ  0.1577
175.   77                              PR   AX  3.3600   IZ  0.1577
176. MEMBER RELEASES
177. 29 TO 46 65 TO 73 START MZ
178. 29 TO 46 65 TO 73  END   MZ
179. 47 49 51 53 55 57 59 61 63 START MZ
180. 48 50 52 54 56 58 60 62 64 END MZ
181. CONSTANTS
182. E   21000.  MEM  1  TO  73
183. DEN 10.15       MEM  1  TO  73
184. POISSON  0.15  MEM  1  TO  73
185. E    3250.  MEM  74 TO  77
186. DEN  2.50       MEM  74 TO  77
187. POISSON  0.20  MEM  74 TO  77
 8. SUPPORTS
 9. 2        PINNED
190. 6        FIXED BUT FX MZ
191. 10       FIXED BUT FX MZ
192. 11       FIXED BUT FX MZ
193. 12       FIXED BUT FX MZ
194. 13       FIXED BUT FX MZ
195. 14       FIXED BUT FX MZ
196. 15       FIXED BUT FX MZ
197. 16       FIXED BUT FX MZ
198. 17       FIXED BUT FX MZ
199. 18       FIXED BUT FX MZ
200. 19       FIXED BUT FX MZ
201. 39       FIXED BUT FX MZ
202. 40       FIXED BUT FX MZ
203. 41       FIXED BUT FX MZ
204. 42       FIXED BUT FX MZ
205. LOADING 1 PESO PROPIO
206. SELFWEIGHT   Y  -1.0
 7. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

```
NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    42/   77/   16
ORIGINAL/FINAL BAND-WIDTH =   28/    6
TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   109
SIZE OF STIFFNESS MATRIX =    2180 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.15 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              13:14:45
++ PROCESSING GLOBAL STIFFNESS MATRIX.               13:14:45
++ PROCESSING TRIANGULAR FACTORIZATION.              13:14:45
++ CALCULATING JOINT DISPLACEMENTS.                  13:14:46
++ CALCULATING MEMBER  FORCES.                       13:14:46

 08. LOAD LIST 1
```

209. PRINT MEMBER FORCES LIST 74 TO 77

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	8.02	0.00	0.00	0.00	1.38
		39	0.00	10.35	0.00	0.00	0.00	-3.94
75	1	39	0.00	9.63	0.00	0.00	0.00	3.94
		40	0.00	8.75	0.00	0.00	0.00	-2.97
76	1	40	0.00	8.59	0.00	0.00	0.00	2.97
		41	0.00	9.79	0.00	0.00	0.00	-4.28
77	1	41	0.00	11.15	0.00	0.00	0.00	4.28
		42	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

210. PRINT JOI DIS LIST 19 39 40 41 42

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.27865	0.00000	0.00000	0.00000	0.00000	-0.00238
39	1	0.27865	0.00000	0.00000	0.00000	0.00000	0.00056
40	1	0.27865	0.00000	0.00000	0.00000	0.00000	0.00012
41	1	0.27865	0.00000	0.00000	0.00000	0.00000	-0.00106
42	1	0.27865	0.00000	0.00000	0.00000	0.00000	0.00410

********** END OF LATEST ANALYSIS RESULT **********

211. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
2	1	0.00	6.85	0.00	0.00	0.00	0.00
6	1	0.00	13.25	0.00	0.00	0.00	0.00
10	1	0.00	10.38	0.00	0.00	0.00	0.00
11	1	0.00	7.43	0.00	0.00	0.00	0.00
12	1	0.00	4.38	0.00	0.00	0.00	0.00
13	1	0.00	8.79	0.00	0.00	0.00	0.00
14	1	0.00	4.08	0.00	0.00	0.00	0.00
15	1	0.00	10.96	0.00	0.00	0.00	0.00
16	1	0.00	4.97	0.00	0.00	0.00	0.00
17	1	0.00	13.19	0.00	0.00	0.00	0.00
18	1	0.00	5.40	0.00	0.00	0.00	0.00
19	1	0.00	15.38	0.00	0.00	0.00	0.00
39	1	0.00	19.98	0.00	0.00	0.00	0.00
40	1	0.00	17.34	0.00	0.00	0.00	0.00
41	1	0.00	20.93	0.00	0.00	0.00	0.00
42	1	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

212. PLOT BEND FILE
213. PLOT DISP FILE
214. FINISH

********** END OF STAAD-III **********

**** DATE= JUN 30,1997 TIME= 13:14:47 ****

****
* 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 *
****

POSICION 2 *


```
*********************************************
*                                           *
*           S T A A D - III                 *
*           Revision 17.0a                  *
*           Proprietary Program of          *
*           RESEARCH ENGINEERS, Inc.        *
*           Date=    JUN 30, 1997           *
*           Time=    13:46:13               *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 42   50.750   0.000   0.000
13. MEMBER INCIDENCES
14.   1   1   2
15.   2   2   3
16.   3   3   4
17.   4   4   5
18.   5   5   6
19.   6   6   7
20.   7   7   8
21.   8   8   9
22.   9   9  10
23.  10  10  11
24.  11  11  12
25.  12  12  13
26.  13  13  14
27.  14  14  15
28.  15  15  16
29.  16  16  17
30.  17  17  18
31.  18  18  19
32.  19  29  30
33.  20  30  31
34.  21  31  32
35.  22  32  33
36.  23  33  34
37.  24  34  35
38.  25  35  36
39.  26  36  37
40.  27  37  38
41.  28   1  29
42.  29   2  20
43.  30   3  30
44.  31   4  21
45.  32   5  31
46.  33   6  22
47.  34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.  35   8  23
49.  36   9  33
50.  37  10  24
51.  38  11  34
52.  39  12  25
53.  40  13  35
54.  41  14  26
55.  42  15  36
56.  43  16  27
57.  44  17  37
58.  45  18  28
59.  46  19  38
60.  47  29  20
61.  48  20   3
62.  49  30  21
63.  50  21   5
64.  51  31  22
65.  52  22   7
66.  53  32  23
67.  54  23   9
68.  55  33  24
69.  56  24  11
70.  57  34  25
71.  58  25  13
72.  59  35  26
73.  60  26  15
74.  61  36  27
75.  62  27  17
76.  63  37  28
77.  64  28  19
78.  65   3  21
79.  66   5  22
80.  67   7  23
81.  68   9  24
82.  69  11  25
83.  70  13  26
84.  71  15  27
85.  72  17  28
86.  73   1  20
87.  74  19  39
88.  75  39  40
89.  76  40  41
90.  77  41  42
91. MEMBER PROPERTY
92. *CORDON INFERIOR
93.   1                PR AX 0.0500 IZ 0.00151406
94.   2                PR AX 0.0500 IZ 0.00151406
95.   3                PR AX 0.0532 IZ 0.00156748
96.   4                PR AX 0.0532 IZ 0.00156748
97.   5                PR AX 0.0670 IZ 0.00233098
98.   6                PR AX 0.0670 IZ 0.00233098
99.   7                PR AX 0.0750 IZ 0.00271328
100.  8                PR AX 0.0750 IZ 0.00271328
101.  9                PR AX 0.0900 IZ 0.00380584
102.  10               PR AX 0.0900 IZ 0.00380584
103.  11               PR AX 0.1070 IZ 0.00464364
104.  12               PR AX 0.1070 IZ 0.00464364
105.  13               PR AX 0.1180 IZ 0.00593306
06.   14               PR AX 0.1180 IZ 0.00593306
07.   15               PR AX 0.1410 IZ 0.00804164
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   16                          PR   AX  0.1410   IZ  0.00804164
 99.   17                          PR   AX  0.1520   IZ  0.00926892
110.   18                          PR   AX  0.1520   IZ  0.00926892
111. *CORDON SUPERIOR
112.   19                          PR   AX  0.0280   IZ  0.00046454
113.   20                          PR   AX  0.0280   IZ  0.00046454
114.   21                          PR   AX  0.0280   IZ  0.00046454
115.   22                          PR   AX  0.0320   IZ  0.00072626
116.   23                          PR   AX  0.0320   IZ  0.00072626
117.   24                          PR   AX  0.0450   IZ  0.00164273
118.   25                          PR   AX  0.0600   IZ  0.00261476
119.   26                          PR   AX  0.0720   IZ  0.00316788
120.   27                          PR   AX  0.0840   IZ  0.00380920
121. *MONTANTES PRINCIPALES
122.   28                          PR   AX  0.0068   IZ  0.00000001
123.   30                          PR   AX  0.0082   IZ  0.00000001
124.   32                          PR   AX  0.0148   IZ  0.00000001
125.   34                          PR   AX  0.0212   IZ  0.00000001
126.   36                          PR   AX  0.0298   IZ  0.00000001
127.   38                          PR   AX  0.0298   IZ  0.00000001
128.   40                          PR   AX  0.0398   IZ  0.00000001
129.   42                          PR   AX  0.0498   IZ  0.00000001
130.   44                          PR   AX  0.0578   IZ  0.00000001
131.   46                          PR   AX  0.0578   IZ  10000.0000
132. *MONTANTES SECUNDARIOS
133.   29                          PR   AX  0.0068   IZ  0.00000001
134.   31                          PR   AX  0.0068   IZ  0.00000001
135.   33                          PR   AX  0.0068   IZ  0.00000001
136.   35                          PR   AX  0.0096   IZ  0.00000001
137.   37                          PR   AX  0.0112   IZ  0.00000001
138.   39                          PR   AX  0.0128   IZ  0.00000001
139.   41                          PR   AX  0.0168   IZ  0.00000001
140.   43                          PR   AX  0.0192   IZ  0.00000001
141.   45                          PR   AX  0.0298   IZ  0.00000001
142. *DIAGONALES 1
143.   47                          PR   AX  0.0068   IZ  0.00001456
144.   48                          PR   AX  0.0068   IZ  0.00001456
145.   49                          PR   AX  0.0096   IZ  0.00003700
146.   50                          PR   AX  0.0096   IZ  0.00003700
147.   51                          PR   AX  0.0128   IZ  0.00007640
 48.   52                          PR   AX  0.0128   IZ  0.00007640
149.   53                          PR   AX  0.0212   IZ  0.00025120
150.   54                          PR   AX  0.0212   IZ  0.00025120
151.   55                          PR   AX  0.0298   IZ  0.00025166
152.   56                          PR   AX  0.0298   IZ  0.00025166
153.   57                          PR   AX  0.0398   IZ  0.00037183
154.   58                          PR   AX  0.0398   IZ  0.00037183
155.   59                          PR   AX  0.0498   IZ  0.00050799
156.   60                          PR   AX  0.0498   IZ  0.00050799
157.   61                          PR   AX  0.0578   IZ  0.00061053
158.   62                          PR   AX  0.0578   IZ  0.00061053
159.   63                          PR   AX  0.0648   IZ  0.00071462
160.   64                          PR   AX  0.0648   IZ  0.00071462
161. *DIAGONALES 2
162.   65                          PR   AX  0.0068   IZ  0.00000001
163.   66                          PR   AX  0.0068   IZ  0.00000001
164.   67                          PR   AX  0.0068   IZ  0.00000001
165.   68                          PR   AX  0.0056   IZ  0.00000001
 66.   69                          PR   AX  0.0056   IZ  0.00000001
 67.   70                          PR   AX  0.0150   IZ  0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.   71                          PR   AX  0.0150   IZ  0.00000001
 59.   72                          PR   AX  0.0193   IZ  0.00000001
170.   73                          PR   AX  0.0068   IZ  0.00000001
171. *SECCION DE HORMIGON
172.   74                          PR   AX  3.3600   IZ  0.1577
173.   75                          PR   AX  3.3600   IZ  0.1577
174.   76                          PR   AX  3.3600   IZ  0.1577
175.   77                          PR   AX  3.3600   IZ  0.1577
176. MEMBER RELEASES
177. 29 TO 46 65 TO 73 START MZ
178. 29 TO 46 65 TO 73  END   MZ
179. 47 49 51 53 55 57 59 61 63 START MZ
180. 48 50 52 54 56 58 60 62 64 END MZ
181. CONSTANTS
182. E   21000.  MEM  1  TO  73
183. DEN 10.15       MEM  1  TO  73
184. POISSON  0.15  MEM  1  TO  73
185. E    3250.  MEM  74 TO  77
186. DEN  2.50       MEM  74 TO  77
187. POISSON  0.20  MEM  74 TO  77
188. SUPPORTS
189. 3       PINNED
190. 7       FIXED BUT FX MZ
191. 11      FIXED BUT FX MZ
192. 12      FIXED BUT FX MZ
193. 13      FIXED BUT FX MZ
194. 14      FIXED BUT FX MZ
195. 15      FIXED BUT FX MZ
196. 16      FIXED BUT FX MZ
197. 17      FIXED BUT FX MZ
198. 18      FIXED BUT FX MZ
199. 19      FIXED BUT FX MZ
200. 39      FIXED BUT FX MZ
201. 40      FIXED BUT FX MZ
202. 41      FIXED BUT FX MZ
203. 42      FIXED BUT FX MZ
204. LOADING 1 PESO PROPIO
205. SELFWEIGHT   Y  -1.0
206. PERFORM ANALISIS


                P R O B L E M   S T A T I S T I C S
                -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    42/   77/   15
  ORIGINAL/FINAL BAND-WIDTH =   28/    6
  TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   110
  SIZE OF STIFFNESS MATRIX =    2200 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.15 MEGA-BYTES


** PROCESSING ELEMENT STIFFNESS MATRIX.              13:46:16
** PROCESSING GLOBAL STIFFNESS MATRIX.               13:46:16
** PROCESSING TRIANGULAR FACTORIZATION.              13:46:16
** CALCULATING JOINT DISPLACEMENTS.                  13:46:17
** CALCULATING MEMBER  FORCES.                       13:46:17

207. LOAD LIST 1
 08. PRINT MEMBER FORCES LIST 74 TO 77
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	8.02	0.00	0.00	0.00	1.38
		39	0.00	10.35	0.00	0.00	0.00	-3.94
75	1	39	0.00	9.63	0.00	0.00	0.00	3.94
		40	0.00	8.75	0.00	0.00	0.00	-2.97
76	1	40	0.00	8.59	0.00	0.00	0.00	2.97
		41	0.00	9.79	0.00	0.00	0.00	-4.28
77	1	41	0.00	11.15	0.00	0.00	0.00	4.28
		42	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

209. PRINT JOI DIS LIST 19 39 40 41 42

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-0.25844	0.00000	0.00000	0.00000	0.00000	-0.00238
39	1	-0.25844	0.00000	0.00000	0.00000	0.00000	0.00056
40	1	-0.25844	0.00000	0.00000	0.00000	0.00000	0.00012
41	1	-0.25844	0.00000	0.00000	0.00000	0.00000	-0.00106
42	1	-0.25844	0.00000	0.00000	0.00000	0.00000	0.00410

********** END OF LATEST ANALYSIS RESULT **********

210. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
3	1	0.00	10.02	0.00	0.00	0.00	0.00
7	1	0.00	14.61	0.00	0.00	0.00	0.00
11	1	0.00	15.06	0.00	0.00	0.00	0.00
12	1	0.00	1.60	0.00	0.00	0.00	0.00
13	1	0.00	9.64	0.00	0.00	0.00	0.00
14	1	0.00	3.96	0.00	0.00	0.00	0.00
15	1	0.00	11.03	0.00	0.00	0.00	0.00
16	1	0.00	5.01	0.00	0.00	0.00	0.00
17	1	0.00	13.18	0.00	0.00	0.00	0.00
18	1	0.00	5.45	0.00	0.00	0.00	0.00
19	1	0.00	15.50	0.00	0.00	0.00	0.00
39	1	0.00	19.98	0.00	0.00	0.00	0.00
40	1	0.00	17.34	0.00	0.00	0.00	0.00
41	1	0.00	20.93	0.00	0.00	0.00	0.00
42	1	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

211. PLOT BEND FILE
212. PLOT DISP FILE
213. FINISH

********** END OF STAAD-III **********

**** DATE= JUN 30,1997 TIME= 13:46:18 ****

****
* 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 *
****

POSICION 3

****
* *
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUN 30, 1997 *
* Time= 13:47: 0 *
* *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5. 1 0.000 0.000 0.000 19 42.000 0.000 0.000
6. 20 2.333 1.0625 0.000
7. 21 6.999 1.59375 0.000
8. 22 11.666 2.125 0.000 28 39.666 2.125 0.000
9. 29 0.000 2.125 0.000
10. 30 4.666 3.1875 0.000
11. 31 9.333 4.250 0.000 38 42.000 4.250 0.000
12. 39 44.187 0.000 0.000 42 50.750 0.000 0.000
13. MEMBER INCIDENCES
14. 1 1 2
15. 2 2 3
16. 3 3 4
17. 4 4 5
18. 5 5 6
19. 6 6 7
20. 7 7 8
21. 8 8 9
22. 9 9 10
23. 10 10 11
24. 11 11 12
25. 12 12 13
26. 13 13 14
27. 14 14 15
28. 15 15 16
29. 16 16 17
30. 17 17 18
31. 18 18 19
32. 19 29 30
33. 20 30 31
34. 21 31 32
35. 22 32 33
36. 23 33 34
37. 24 34 35
38. 25 35 36
39. 26 36 37
40. 27 37 38
41. 28 1 29
42. 29 2 20
43. 30 3 30
44. 31 4 21
45. 32 5 31
46. 33 6 22
47. 34 7 32

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.  35   8   23
49.  36   9   33
50.  37  10   24
51.  38  11   34
52.  39  12   25
53.  40  13   35
54.  41  14   26
55.  42  15   36
56.  43  16   27
57.  44  17   37
58.  45  18   28
59.  46  19   38
60.  47  29   20
61.  48  20    3
62.  49  30   21
63.  50  21    5
64.  51  31   22
65.  52  22    7
66.  53  32   23
67.  54  23    9
68.  55  33   24
69.  56  24   11
70.  57  34   25
71.  58  25   13
72.  59  35   26
73.  60  26   15
74.  61  36   27
75.  62  27   17
76.  63  37   28
77.  64  28   19
78.  65   3   21
79.  66   5   22
80.  67   7   23
81.  68   9   24
82.  69  11   25
83.  70  13   26
84.  71  15   27
85.  72  17   28
86.  73   1   20
87.  74  19   39
88.  75  39   40
89.  76  40   41
90.  77  41   42
91. MEMBER PROPERTY
92. *CORDON INFERIOR
93.   1                    PR  AX  0.0500  IZ  0.00151406
94.   2                    PR  AX  0.0500  IZ  0.00151406
95.   3                    PR  AX  0.0532  IZ  0.00156748
96.   4                    PR  AX  0.0532  IZ  0.00156748
97.   5                    PR  AX  0.0670  IZ  0.00233098
98.   6                    PR  AX  0.0670  IZ  0.00233098
99.   7                    PR  AX  0.0750  IZ  0.00271328
100.  8                    PR  AX  0.0750  IZ  0.00271328
101.  9                    PR  AX  0.0900  IZ  0.00380584
102.  10                   PR  AX  0.0900  IZ  0.00380584
103.  11                   PR  AX  0.1070  IZ  0.00464364
104.  12                   PR  AX  0.1070  IZ  0.00464364
105.  13                   PR  AX  0.1180  IZ  0.00593306
106.  14                   PR  AX  0.1180  IZ  0.00593306
107.  15                   PR  AX  0.1410  IZ  0.00804164
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.  16                   PR  AX  0.1410  IZ  0.00804164
109.  17                   PR  AX  0.1520  IZ  0.00926892
110.  18                   PR  AX  0.1520  IZ  0.00926892
111. *CORDON SUPERIOR
112.  19                   PR  AX  0.0280  IZ  0.00046454
113.  20                   PR  AX  0.0280  IZ  0.00046454
114.  21                   PR  AX  0.0280  IZ  0.00046454
115.  22                   PR  AX  0.0320  IZ  0.00072626
116.  23                   PR  AX  0.0320  IZ  0.00072626
117.  24                   PR  AX  0.0450  IZ  0.00164273
118.  25                   PR  AX  0.0600  IZ  0.00261476
119.  26                   PR  AX  0.0720  IZ  0.00316788
120.  27                   PR  AX  0.0840  IZ  0.00380920
121. *MONTANTES PRINCIPALES
122.  28                   PR  AX  0.0068  IZ  0.00000001
123.  30                   PR  AX  0.0082  IZ  0.00000001
124.  32                   PR  AX  0.0148  IZ  0.00000001
125.  34                   PR  AX  0.0212  IZ  0.00000001
126.  36                   PR  AX  0.0298  IZ  0.00000001
127.  38                   PR  AX  0.0298  IZ  0.00000001
128.  40                   PR  AX  0.0398  IZ  0.00000001
129.  42                   PR  AX  0.0498  IZ  0.00000001
130.  44                   PR  AX  0.0578  IZ  0.00000001
131.  46                   PR  AX  0.0578  IZ  10000.0000
132. *MONTANTES SECUNDARIOS
133.  29                   PR  AX  0.0068  IZ  0.00000001
134.  31                   PR  AX  0.0068  IZ  0.00000001
135.  33                   PR  AX  0.0068  IZ  0.00000001
136.  35                   PR  AX  0.0096  IZ  0.00000001
137.  37                   PR  AX  0.0112  IZ  0.00000001
138.  39                   PR  AX  0.0128  IZ  0.00000001
139.  41                   PR  AX  0.0168  IZ  0.00000001
140.  43                   PR  AX  0.0192  IZ  0.00000001
141.  45                   PR  AX  0.0298  IZ  0.00000001
142. *DIAGONALES 1
143.  47                   PR  AX  0.0068  IZ  0.00001456
144.  48                   PR  AX  0.0068  IZ  0.00001456
145.  49                   PR  AX  0.0096  IZ  0.00003700
146.  50                   PR  AX  0.0096  IZ  0.00003700
147.  51                   PR  AX  0.0128  IZ  0.00007640
148.  52                   PR  AX  0.0128  IZ  0.00007640
149.  53                   PR  AX  0.0212  IZ  0.00025120
150.  54                   PR  AX  0.0212  IZ  0.00025120
151.  55                   PR  AX  0.0298  IZ  0.00025166
152.  56                   PR  AX  0.0298  IZ  0.00025166
153.  57                   PR  AX  0.0398  IZ  0.00037183
154.  58                   PR  AX  0.0398  IZ  0.00037183
155.  59                   PR  AX  0.0498  IZ  0.00050799
156.  60                   PR  AX  0.0498  IZ  0.00050799
157.  61                   PR  AX  0.0578  IZ  0.00061053
158.  62                   PR  AX  0.0578  IZ  0.00061053
159.  63                   PR  AX  0.0648  IZ  0.00071462
160.  64                   PR  AX  0.0648  IZ  0.00071462
161. *DIAGONALES 2
162.  65                   PR  AX  0.0068  IZ  0.00000001
163.  66                   PR  AX  0.0068  IZ  0.00000001
164.  67                   PR  AX  0.0068  IZ  0.00000001
165.  68                   PR  AX  0.0056  IZ  0.00000001
166.  69                   PR  AX  0.0056  IZ  0.00000001
167.  70                   PR  AX  0.0150  IZ  0.00000001
```

```
168.   71                              PR   AX  0.0150   IZ  0.00000001
169.   72                              PR   AX  0.0193   IZ  0.00000001
170.   73                              PR   AX  0.0068   IZ  0.00000001
171. *SECCION DE HORMIGON
172.   74                              PR   AX  3.3600   IZ  0.1577
173.   75                              PR   AX  3.3600   IZ  0.1577
174.   76                              PR   AX  3.3600   IZ  0.1577
175.   77                              PR   AX  3.3600   IZ  0.1577
176. MEMBER RELEASES
177. 29 TO 46 65 TO 73 START MZ
178. 29 TO 46 65 TO 73  END   MZ
179. 47 49 51 53 55 57 59 61 63 START MZ
180. 48 50 52 54 56 58 60 62 64 END MZ
181. CONSTANTS
182. E   21000.  MEM  1  TO  73
183. DEN 10.15       MEM  1  TO  73
184. POISSON  0.15  MEM  1  TO  73
185. E    3250.  MEM  74 TO  77
186. DEN  2.50       MEM  74 TO  77
187. POISSON  0.20  MEM  74 TO  77
188. SUPPORTS
189. 4        PINNED
190. 8        FIXED BUT FX MZ
191. 12       FIXED BUT FX MZ
192. 13       FIXED BUT FX MZ
193. 14       FIXED BUT FX MZ
194. 15       FIXED BUT FX MZ
195. 16       FIXED BUT FX MZ
196. 17       FIXED BUT FX MZ
197. 18       FIXED BUT FX MZ
198. 19       FIXED BUT FX MZ
199. 39       FIXED BUT FX MZ
200. 40       FIXED BUT FX MZ
201. 41       FIXED BUT FX MZ
202. 42       FIXED BUT FX MZ
203. LOADING 1 PESO PROPIO
204. SELFWEIGHT   Y  -1.0
205. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

```
  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    42/   77/   14
  ORIGINAL/FINAL BAND-WIDTH =   28/    6
  TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   111
  SIZE OF STIFFNESS MATRIX =    2220 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.15 MEGA-BYTES

** PROCESSING ELEMENT STIFFNESS MATRIX.              13:47: 3
** PROCESSING GLOBAL STIFFNESS MATRIX.               13:47: 3
** PROCESSING TRIANGULAR FACTORIZATION.              13:47: 3
** CALCULATING JOINT DISPLACEMENTS.                  13:47: 4
** CALCULATING MEMBER  FORCES.                       13:47: 4

206. LOAD LIST 1
207. PRINT MEMBER FORCES LIST 74 TO 77
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

EMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	8.02	0.00	0.00	0.00	1.38
		39	0.00	10.35	0.00	0.00	0.00	-3.94
75	1	39	0.00	9.63	0.00	0.00	0.00	3.94
		40	0.00	8.75	0.00	0.00	0.00	-2.97
76	1	40	0.00	8.59	0.00	0.00	0.00	2.97
		41	0.00	9.79	0.00	0.00	0.00	-4.28
77	1	41	0.00	11.15	0.00	0.00	0.00	4.28
		42	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

```
208. PRINT JOI DIS LIST 19 39 40 41 42
```

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-4.51020	0.00000	0.00000	0.00000	0.00000	-0.00238
39	1	-4.51020	0.00000	0.00000	0.00000	0.00000	0.00056
40	1	-4.51020	0.00000	0.00000	0.00000	0.00000	0.00012
41	1	-4.51020	0.00000	0.00000	0.00000	0.00000	-0.00106
42	1	-4.51020	0.00000	0.00000	0.00000	0.00000	0.00410

********** END OF LATEST ANALYSIS RESULT **********

209. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
4	1	0.00	13.69	0.00	0.00	0.00	0.00
8	1	0.00	15.94	0.00	0.00	0.00	0.00
12	1	0.00	11.71	0.00	0.00	0.00	0.00
13	1	0.00	10.34	0.00	0.00	0.00	0.00
14	1	0.00	4.49	0.00	0.00	0.00	0.00
15	1	0.00	10.69	0.00	0.00	0.00	0.00
16	1	0.00	4.80	0.00	0.00	0.00	0.00
17	1	0.00	13.25	0.00	0.00	0.00	0.00
18	1	0.00	5.22	0.00	0.00	0.00	0.00
19	1	0.00	14.95	0.00	0.00	0.00	0.00
39	1	0.00	19.98	0.00	0.00	0.00	0.00
40	1	0.00	17.34	0.00	0.00	0.00	0.00
41	1	0.00	20.93	0.00	0.00	0.00	0.00
42	1	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

210. PLOT BEND FILE
211. PLOT DISP FILE
212. FINISH

********** END OF STAAD-III **********

**** DATE= JUN 30,1997 TIME= 13:47: 5 ****

****
* 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 *
****

POSICION 4.


```
*********************************************
*                                           *
*           S T A A D - III                 *
*           Revision 17.0a                  *
*           Proprietary Program of          *
*           RESEARCH ENGINEERS, Inc.        *
*           Date=    JUN 30, 1997           *
*           Time=    13:48:10               *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000 42   50.750   0.000   0.000
13. MEMBER INCIDENCES
14.  1    1    2
15.  2    2    3
16.  3    3    4
17.  4    4    5
18.  5    5    6
19.  6    6    7
20.  7    7    8
21.  8    8    9
22.  9    9   10
23. 10   10   11
24. 11   11   12
25. 12   12   13
26. 13   13   14
27. 14   14   15
28. 15   15   16
29. 16   16   17
30. 17   17   18
31. 18   18   19
32. 19   29   30
33. 20   30   31
34. 21   31   32
35. 22   32   33
36. 23   33   34
37. 24   34   35
38. 25   35   36
39. 26   36   37
40. 27   37   38
41. 28    1   29
42. 29    2   20
43. 30    3   30
44. 31    4   21
45. 32    5   31
46. 33    6   22
47. 34    7   32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.  35    8   23
49.  36    9   33
50.  37   10   24
51.  38   11   34
52.  39   12   25
53.  40   13   35
54.  41   14   26
55.  42   15   36
56.  43   16   27
57.  44   17   37
58.  45   18   28
59.  46   19   38
60.  47   29   20
61.  48   20    3
62.  49   30   21
63.  50   21    5
64.  51   31   22
65.  52   22    7
66.  53   32   23
67.  54   23    9
68.  55   33   24
69.  56   24   11
70.  57   34   25
71.  58   25   13
72.  59   35   26
73.  60   26   15
74.  61   36   27
75.  62   27   17
76.  63   37   28
77.  64   28   19
78.  65    3   21
79.  66    5   22
80.  67    7   23
81.  68    9   24
82.  69   11   25
83.  70   13   26
84.  71   15   27
85.  72   17   28
86.  73    1   20
87.  74   19   39
88.  75   39   40
89.  76   40   41
90.  77   41   42
91. MEMBER PROPERTY
92. *CORDON INFERIOR
93.   1                PR AX 0.0500 IZ 0.00151406
94.   2                PR AX 0.0500 IZ 0.00151406
95.   3                PR AX 0.0532 IZ 0.00156748
96.   4                PR AX 0.0532 IZ 0.00156748
97.   5                PR AX 0.0670 IZ 0.00233098
98.   6                PR AX 0.0670 IZ 0.00233098
99.   7                PR AX 0.0750 IZ 0.00271328
100.  8                PR AX 0.0750 IZ 0.00271328
101.  9                PR AX 0.0900 IZ 0.00380584
102.  10               PR AX 0.0900 IZ 0.00380584
103.  11               PR AX 0.1070 IZ 0.00464364
104.  12               PR AX 0.1070 IZ 0.00464364
105.  13               PR AX 0.1180 IZ 0.00593306
106.  14               PR AX 0.1180 IZ 0.00593306
107.  15               PR AX 0.1410 IZ 0.00804164
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   16                          PR   AX  0.1410   IZ  0.00804164
109.   17                          PR   AX  0.1520   IZ  0.00926892
110.   18                          PR   AX  0.1520   IZ  0.00926892
111. *CORDON SUPERIOR
112.   19                          PR   AX  0.0280   IZ  0.00046454
113.   20                          PR   AX  0.0280   IZ  0.00046454
114.   21                          PR   AX  0.0280   IZ  0.00046454
115.   22                          PR   AX  0.0320   IZ  0.00072626
116.   23                          PR   AX  0.0320   IZ  0.00072626
117.   24                          PR   AX  0.0450   IZ  0.00164273
118.   25                          PR   AX  0.0600   IZ  0.00261476
119.   26                          PR   AX  0.0720   IZ  0.00316788
120.   27                          PR   AX  0.0840   IZ  0.00380920
121. *MONTANTES PRINCIPALES
122.   28                          PR   AX  0.0068   IZ  0.00000001
123.   30                          PR   AX  0.0082   IZ  0.00000001
124.   32                          PR   AX  0.0148   IZ  0.00000001
125.   34                          PR   AX  0.0212   IZ  0.00000001
126.   36                          PR   AX  0.0298   IZ  0.00000001
127.   38                          PR   AX  0.0298   IZ  0.00000001
128.   40                          PR   AX  0.0398   IZ  0.00000001
129.   42                          PR   AX  0.0498   IZ  0.00000001
130.   44                          PR   AX  0.0578   IZ  0.00000001
131.   46                          PR   AX  0.0578   IZ  10000.0000
132. *MONTANTES SECUNDARIOS
133.   29                          PR   AX  0.0068   IZ  0.00000001
134.   31                          PR   AX  0.0068   IZ  0.00000001
135.   33                          PR   AX  0.0068   IZ  0.00000001
136.   35                          PR   AX  0.0096   IZ  0.00000001
137.   37                          PR   AX  0.0112   IZ  0.00000001
138.   39                          PR   AX  0.0128   IZ  0.00000001
139.   41                          PR   AX  0.0168   IZ  0.00000001
140.   43                          PR   AX  0.0192   IZ  0.00000001
141.   45                          PR   AX  0.0298   IZ  0.00000001
142. *DIAGONALES 1
143.   47                          PR   AX  0.0068   IZ  0.00001456
144.   48                          PR   AX  0.0068   IZ  0.00001456
145.   49                          PR   AX  0.0096   IZ  0.00003700
146.   50                          PR   AX  0.0096   IZ  0.00003700
147.   51                          PR   AX  0.0128   IZ  0.00007640
148.   52                          PR   AX  0.0128   IZ  0.00007640
149.   53                          PR   AX  0.0212   IZ  0.00025120
150.   54                          PR   AX  0.0212   IZ  0.00025120
151.   55                          PR   AX  0.0298   IZ  0.00025166
152.   56                          PR   AX  0.0298   IZ  0.00025166
153.   57                          PR   AX  0.0398   IZ  0.00037183
154.   58                          PR   AX  0.0398   IZ  0.00037183
155.   59                          PR   AX  0.0498   IZ  0.00050799
156.   60                          PR   AX  0.0498   IZ  0.00050799
157.   61                          PR   AX  0.0578   IZ  0.00061053
158.   62                          PR   AX  0.0578   IZ  0.00061053
159.   63                          PR   AX  0.0648   IZ  0.00071462
160.   64                          PR   AX  0.0648   IZ  0.00071462
161. *DIAGONALES 2
162.   65                          PR   AX  0.0068   IZ  0.00000001
163.   66                          PR   AX  0.0068   IZ  0.00000001
164.   67                          PR   AX  0.0068   IZ  0.00000001
165.   68                          PR   AX  0.0056   IZ  0.00000001
 66.   69                          PR   AX  0.0056   IZ  0.00000001
167.   70                          PR   AX  0.0150   IZ  0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.   71                          PR   AX  0.0150   IZ  0.00000001
169.   72                          PR   AX  0.0193   IZ  0.00000001
170.   73                          PR   AX  0.0068   IZ  0.00000001
171. *SECCION DE HORMIGON
172.   74                          PR   AX  3.3600   IZ  0.1577
173.   75                          PR   AX  3.3600   IZ  0.1577
174.   76                          PR   AX  3.3600   IZ  0.1577
175.   77                          PR   AX  3.3600   IZ  0.1577
176. MEMBER RELEASES
177. 29 TO 46 65 TO 73 START MZ
178. 29 TO 46 65 TO 73  END   MZ
179. 47 49 51 53 55 57 59 61 63 START MZ
180. 48 50 52 54 56 58 60 62 64 END MZ
181. CONSTANTS
182. E   21000.  MEM  1  TO  73
183. DEN 10.15       MEM  1  TO  73
184. POISSON  0.15  MEM  1  TO  73
185. E    3250.  MEM  74 TO  77
186. DEN  2.50       MEM  74 TO  77
187. POISSON  0.20  MEM  74 TO  77
188. SUPPORTS
189. 5        PINNED
190. 9        FIXED BUT FX MZ
191. 13       FIXED BUT FX MZ
192. 14       FIXED BUT FX MZ
193. 15       FIXED BUT FX MZ
194. 16       FIXED BUT FX MZ
195. 17       FIXED BUT FX MZ
196. 18       FIXED BUT FX MZ
197. 19       FIXED BUT FX MZ
198. 39       FIXED BUT FX MZ
199. 40       FIXED BUT FX MZ
200. 41       FIXED BUT FX MZ
201. 42       FIXED BUT FX MZ
202. LOADING 1 PESO PROPIO
203. SELFWEIGHT   Y  -1.0
204. PERFORM ANALISIS


        P R O B L E M   S T A T I S T I C S
        -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    42/   77/   13
  ORIGINAL/FINAL BAND-WIDTH =   28/    6
  TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   112
  SIZE OF STIFFNESS MATRIX =    2240 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.15 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              13:48:13
++ PROCESSING GLOBAL STIFFNESS MATRIX.               13:48:13
++ PROCESSING TRIANGULAR FACTORIZATION.              13:48:13
++ CALCULATING JOINT DISPLACEMENTS.                  13:48:14
++ CALCULATING MEMBER  FORCES.                       13:48:14

205. LOAD LIST 1
206. PRINT MEMBER FORCES LIST 74 TO 77
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	8.02	0.00	0.00	0.00	1.38
		39	0.00	10.35	0.00	0.00	0.00	-3.93
75	1	39	0.00	9.63	0.00	0.00	0.00	3.93
		40	0.00	8.75	0.00	0.00	0.00	-2.97
76	1	40	0.00	8.59	0.00	0.00	0.00	2.97
		41	0.00	9.79	0.00	0.00	0.00	-4.28
77	1	41	0.00	11.15	0.00	0.00	0.00	4.28
		42	0.00	7.23	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

207. PRINT JOI DIS LIST 19 39 40 41 42

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-5.40839	0.00000	0.00000	0.00000	0.00000	-0.00238
39	1	-5.40839	0.00000	0.00000	0.00000	0.00000	0.00056
40	1	-5.40839	0.00000	0.00000	0.00000	0.00000	0.00012
41	1	-5.40839	0.00000	0.00000	0.00000	0.00000	-0.00106
42	1	-5.40839	0.00000	0.00000	0.00000	0.00000	0.00410

********** END OF LATEST ANALYSIS RESULT **********

208. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
5	1	0.00	18.32	0.00	0.00	0.00	0.00
9	1	0.00	17.02	0.00	0.00	0.00	0.00
13	1	0.00	18.33	0.00	0.00	0.00	0.00
14	1	0.00	1.39	0.00	0.00	0.00	0.00
15	1	0.00	11.63	0.00	0.00	0.00	0.00
16	1	0.00	4.63	0.00	0.00	0.00	0.00
17	1	0.00	13.28	0.00	0.00	0.00	0.00
18	1	0.00	5.28	0.00	0.00	0.00	0.00
19	1	0.00	15.16	0.00	0.00	0.00	0.00
39	1	0.00	19.98	0.00	0.00	0.00	0.00
40	1	0.00	17.34	0.00	0.00	0.00	0.00
41	1	0.00	20.93	0.00	0.00	0.00	0.00
42	1	0.00	7.23	0.00	0.00	0.00	0.00

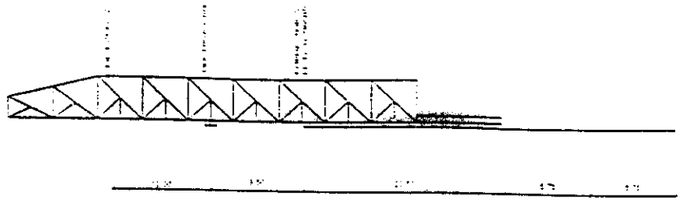
********** END OF LATEST ANALYSIS RESULT **********

209. PLOT BEND FILE
210. PLOT DISP FILE
211. FINISH

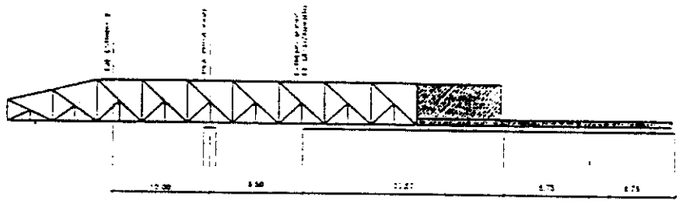
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**** DATE= JUN 30,1997 TIME= 13:48:15 ****

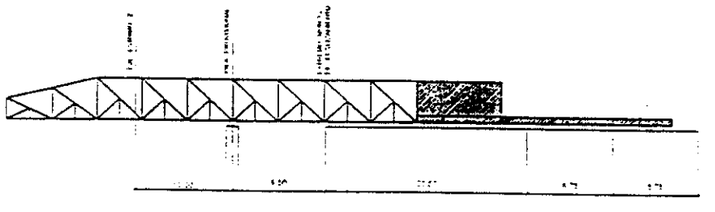
****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL:(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****



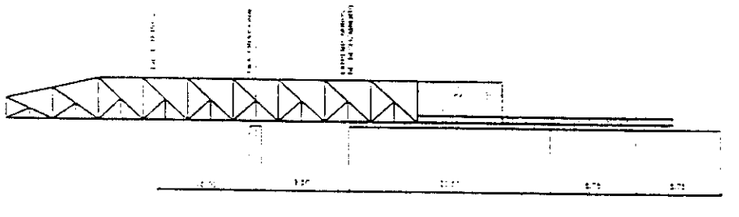
POSICION 5



POSICION 6



POSICION 7



POSICION 8

Dalicon C

```
*********************************************
*                                           *
*           S T A A D - III                 *
*           Revision 17.0a                  *
*           Proprietary Program of          *
*           RESEARCH ENGINEERS, Inc.        *
*           Date=    JUN 30, 1997           *
*           Time=    14:23: 7               *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1    1    2
15.  2    2    3
16.  3    3    4
17.  4    4    5
18.  5    5    6
19.  6    6    7
20.  7    7    8
21.  8    8    9
22.  9    9   10
23. 10   10   11
24. 11   11   12
25. 12   12   13
26. 13   13   14
27. 14   14   15
28. 15   15   16
29. 16   16   17
30. 17   17   18
31. 18   18   19
32. 19   29   30
33. 20   30   31
34. 21   31   32
35. 22   32   33
36. 23   33   34
37. 24   34   35
38. 25   35   36
39. 26   36   37
40. 27   37   38
41. 28    1   29
42. 29    2   20
43. 30    3   30
44. 31    4   21
45. 32    5   31
46. 33    6   22
47. 34    7   32
```



```
48.  35    8   23
49.  36    9   33
50.  37   10   24
51.  38   11   34
52.  39   12   25
53.  40   13   35
54.  41   14   26
55.  42   15   36
56.  43   16   27
57.  44   17   37
58.  45   18   28
59.  46   19   38
60.  47   29   20
61.  48   20    3
62.  49   30   21
63.  50   21    5
64.  51   31   22
65.  52   22    7
66.  53   32   23
67.  54   23    9
68.  55   33   24
69.  56   24   11
70.  57   34   25
71.  58   25   13
72.  59   35   26
73.  60   26   15
74.  61   36   27
75.  62   27   17
76.  63   37   28
77.  64   28   19
78.  65    3   21
79.  66    5   22
80.  67    7   23
81.  68    9   24
82.  69   11   25
83.  70   13   26
84.  71   15   27
85.  72   17   28
86.  73    1   20
87.  74   19   39
88.  75   39   40
89.  76   40   41
90.  77   41   42
91.  78   42   43
92.  79   43   44
93.  80   44   45
94.  81   45   46
95.  82   46   47
96.  83   47   48
97.  84   48   49
98.  85   49   50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1          PR  AX  0.0500  IZ  0.00151406
102.  2          PR  AX  0.0500  IZ  0.00151406
103.  3          PR  AX  0.0532  IZ  0.00156748
104.  4          PR  AX  0.0532  IZ  0.00156748
105.  5          PR  AX  0.0670  IZ  0.00233098
106.  6          PR  AX  0.0670  IZ  0.00233098
107.  7          PR  AX  0.0750  IZ  0.00271328
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR  AX  0.0750  IZ  0.00271328
109.   9                          PR  AX  0.0900  IZ  0.00380584
110.  10                          PR  AX  0.0900  IZ  0.00380584
111.  11                          PR  AX  0.1070  IZ  0.00464364
112.  12                          PR  AX  0.1070  IZ  0.00464364
113.  13                          PR  AX  0.1180  IZ  0.00593306
114.  14                          PR  AX  0.1180  IZ  0.00593306
115.  15                          PR  AX  0.1410  IZ  0.00804164
116.  16                          PR  AX  0.1410  IZ  0.00804164
117.  17                          PR  AX  0.1520  IZ  0.00926892
118.  18                          PR  AX  0.1520  IZ  0.00926892
119. *CORDON SUPERIOR
120.  19                          PR  AX  0.0280  IZ  0.00046454
121.  20                          PR  AX  0.0280  IZ  0.00046454
122.  21                          PR  AX  0.0280  IZ  0.00046454
123.  22                          PR  AX  0.0320  IZ  0.00072626
124.  23                          PR  AX  0.0320  IZ  0.00072626
125.  24                          PR  AX  0.0450  IZ  0.00164273
126.  25                          PR  AX  0.0600  IZ  0.00261476
127.  26                          PR  AX  0.0720  IZ  0.00316788
128.  27                          PR  AX  0.0840  IZ  0.00380920
129. *MONTANTES PRINCIPALES
130.  28                          PR  AX  0.0068  IZ  0.00000001
131.  30                          PR  AX  0.0082  IZ  0.00000001
132.  32                          PR  AX  0.0148  IZ  0.00000001
133.  34                          PR  AX  0.0212  IZ  0.00000001
134.  36                          PR  AX  0.0298  IZ  0.00000001
135.  38                          PR  AX  0.0298  IZ  0.00000001
136.  40                          PR  AX  0.0398  IZ  0.00000001
137.  42                          PR  AX  0.0498  IZ  0.00000001
138.  44                          PR  AX  0.0578  IZ  0.00000001
139.  46                          PR  AX  0.0578  IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.  29                          PR  AX  0.0068  IZ  0.00000001
142.  31                          PR  AX  0.0068  IZ  0.00000001
143.  33                          PR  AX  0.0068  IZ  0.00000001
144.  35                          PR  AX  0.0096  IZ  0.00000001
145.  37                          PR  AX  0.0112  IZ  0.00000001
146.  39                          PR  AX  0.0128  IZ  0.00000001
147.  41                          PR  AX  0.0168  IZ  0.00000001
148.  43                          PR  AX  0.0192  IZ  0.00000001
149.  45                          PR  AX  0.0298  IZ  0.00000001
150. *DIAGONALES 1
151.  47                          PR  AX  0.0068  IZ  0.00001456
152.  48                          PR  AX  0.0068  IZ  0.00001456
153.  49                          PR  AX  0.0096  IZ  0.00003700
154.  50                          PR  AX  0.0096  IZ  0.00003700
155.  51                          PR  AX  0.0128  IZ  0.00007640
156.  52                          PR  AX  0.0128  IZ  0.00007640
157.  53                          PR  AX  0.0212  IZ  0.00025120
158.  54                          PR  AX  0.0212  IZ  0.00025120
159.  55                          PR  AX  0.0298  IZ  0.00025166
160.  56                          PR  AX  0.0298  IZ  0.00025166
161.  57                          PR  AX  0.0398  IZ  0.00037183
162.  58                          PR  AX  0.0398  IZ  0.00037183
163.  59                          PR  AX  0.0498  IZ  0.00050799
164.  60                          PR  AX  0.0498  IZ  0.00050799
165.  61                          PR  AX  0.0578  IZ  0.00061053
 66.  62                          PR  AX  0.0578  IZ  0.00061053
 67.  63                          PR  AX  0.0648  IZ  0.00071462
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  64                          PR  AX  0.0648  IZ  0.00071462
169. *DIAGONALES 2
170.  65                          PR  AX  0.0068  IZ  0.00000001
171.  66                          PR  AX  0.0068  IZ  0.00000001
172.  67                          PR  AX  0.0068  IZ  0.00000001
173.  68                          PR  AX  0.0056  IZ  0.00000001
174.  69                          PR  AX  0.0056  IZ  0.00000001
175.  70                          PR  AX  0.0150  IZ  0.00000001
176.  71                          PR  AX  0.0150  IZ  0.00000001
177.  72                          PR  AX  0.0193  IZ  0.00000001
178.  73                          PR  AX  0.0068  IZ  0.00000001
179. *SECCION DE HORMIGON
180.  74                          PR  AX 13.4810  IZ 45.3025
181.  75                          PR  AX 13.4810  IZ 45.3025
182.  76                          PR  AX 13.4810  IZ 45.3025
183.  77                          PR  AX 13.4810  IZ 45.3025
184.  78                          PR  AX  3.3600  IZ  0.1577
185.  79                          PR  AX  3.3600  IZ  0.1577
186.  80                          PR  AX  3.3600  IZ  0.1577
187.  81                          PR  AX  3.3600  IZ  0.1577
188.  82                          PR  AX  3.3600  IZ  0.1577
189.  83                          PR  AX  3.3600  IZ  0.1577
190.  84                          PR  AX  3.3600  IZ  0.1577
191.  85                          PR  AX  3.3600  IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 6        PINNED
206. 10       FIXED BUT FX MZ
207. 14       FIXED BUT FX MZ
208. 15       FIXED BUT FX MZ
209. 16       FIXED BUT FX MZ
210. 17       FIXED BUT FX MZ
211. 18       FIXED BUT FX MZ
212. 19       FIXED BUT FX MZ
213. 39       FIXED BUT FX MZ
214. 40       FIXED BUT FX MZ
215. 41       FIXED BUT FX MZ
216. 42       FIXED BUT FX MZ
217. 43       FIXED BUT FX MZ
218. 44       FIXED BUT FX MZ
219. 45       FIXED BUT FX MZ
220. 46       FIXED BUT FX MZ
221. 47       FIXED BUT FX MZ
222. 48       FIXED BUT FX MZ
223. 49       FIXED BUT FX MZ
224. 50       FIXED BUT FX MZ
225. LOADING 1 PESO PROPIO
 26. SELFWEIGHT   Y  -1.0
 27. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 20
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 129
SIZE OF STIFFNESS MATRIX = 2709 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 14:23:10
++ PROCESSING GLOBAL STIFFNESS MATRIX. 14:23:10
++ PROCESSING TRIANGULAR FACTORIZATION. 14:23:11
++ CALCULATING JOINT DISPLACEMENTS. 14:23:11
++ CALCULATING MEMBER FORCES. 14:23:11

228. LOAD LIST 1
229. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	29.39	0.00	0.00	0.00	0.69
		39	0.00	44.32	0.00	0.00	0.00	-17.03
75	1	39	0.00	39.25	0.00	0.00	0.00	17.03
		40	0.00	34.48	0.00	0.00	0.00	-11.81
76	1	40	0.00	34.78	0.00	0.00	0.00	11.81
		41	0.00	38.94	0.00	0.00	0.00	-16.36
77	1	41	0.00	42.79	0.00	0.00	0.00	16.36
		42	0.00	30.93	0.00	0.00	0.00	-3.38
78	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
84	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

230. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00005
39	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00001
40	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-9.63482	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-9.63482	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

231. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
6	1	0.00	24.04	0.00	0.00	0.00	0.00
10	1	0.00	17.27	0.00	0.00	0.00	0.00
14	1	0.00	14.69	0.00	0.00	0.00	0.00
15	1	0.00	11.94	0.00	0.00	0.00	0.00
16	1	0.00	5.25	0.00	0.00	0.00	0.00
17	1	0.00	13.02	0.00	0.00	0.00	0.00
18	1	0.00	5.30	0.00	0.00	0.00	0.00
19	1	0.00	34.93	0.00	0.00	0.00	0.00
39	1	0.00	83.57	0.00	0.00	0.00	0.00
40	1	0.00	69.26	0.00	0.00	0.00	0.00
41	1	0.00	81.74	0.00	0.00	0.00	0.00
42	1	0.00	40.14	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

232. PLOT BEND FILE
233. PLOT DISP FILE
234. FINISH

********** END OF STAAD-III **********

**** DATE= JUN 30,1997 TIME= 14:23:13 ****

****
* 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 *
****

Dosicion 1

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  1, 1997        *
*          Time=     7:36:12            *
*                                       *
*****************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000  19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000  28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000  38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000  50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9  10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
45. 32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
 9. 36   9  33
50. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
68. 55  33  24
69. 56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
87. 74  19  39
88. 75  39  40
89. 76  40  41
90. 77  41  42
91. 78  42  43
92. 79  43  44
93. 80  44  45
94. 81  45  46
95. 82  46  47
96. 83  47  48
97. 84  48  49
98. 85  49  50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
 06.  6                PR  AX  0.0670  IZ  0.00233098
 07.  7                PR  AX  0.0750  IZ  0.00271328
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR   AX  0.0750   IZ  0.00271328
109.   9                          PR   AX  0.0900   IZ  0.00380584
110.  10                          PR   AX  0.0900   IZ  0.00380584
111.  11                          PR   AX  0.1070   IZ  0.00464364
112.  12                          PR   AX  0.1070   IZ  0.00464364
113.  13                          PR   AX  0.1180   IZ  0.00593306
114.  14                          PR   AX  0.1180   IZ  0.00593306
115.  15                          PR   AX  0.1410   IZ  0.00804164
116.  16                          PR   AX  0.1410   IZ  0.00804164
117.  17                          PR   AX  0.1520   IZ  0.00926892
118.  18                          PR   AX  0.1520   IZ  0.00926892
119. *CORDON SUPERIOR
120.  19                          PR   AX  0.0280   IZ  0.00046454
121.  20                          PR   AX  0.0280   IZ  0.00046454
122.  21                          PR   AX  0.0280   IZ  0.00046454
123.  22                          PR   AX  0.0320   IZ  0.00072626
124.  23                          PR   AX  0.0320   IZ  0.00072626
125.  24                          PR   AX  0.0450   IZ  0.00164273
126.  25                          PR   AX  0.0600   IZ  0.00261476
127.  26                          PR   AX  0.0720   IZ  0.00316788
128.  27                          PR   AX  0.0840   IZ  0.00380920
129. *MONTANTES PRINCIPALES
130.  28                          PR   AX  0.0068   IZ  0.00000001
131.  30                          PR   AX  0.0082   IZ  0.00000001
132.  32                          PR   AX  0.0148   IZ  0.00000001
133.  34                          PR   AX  0.0212   IZ  0.00000001
134.  36                          PR   AX  0.0298   IZ  0.00000001
135.  38                          PR   AX  0.0298   IZ  0.00000001
136.  40                          PR   AX  0.0398   IZ  0.00000001
137.  42                          PR   AX  0.0498   IZ  0.00000001
138.  44                          PR   AX  0.0578   IZ  0.00000001
139.  46                          PR   AX  0.0578   IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.  29                          PR   AX  0.0068   IZ  0.00000001
142.  31                          PR   AX  0.0068   IZ  0.00000001
143.  33                          PR   AX  0.0068   IZ  0.00000001
144.  35                          PR   AX  0.0096   IZ  0.00000001
145.  37                          PR   AX  0.0112   IZ  0.00000001
146.  39                          PR   AX  0.0128   IZ  0.00000001
147.  41                          PR   AX  0.0168   IZ  0.00000001
148.  43                          PR   AX  0.0192   IZ  0.00000001
149.  45                          PR   AX  0.0298   IZ  0.00000001
150. *DIAGONALES 1
151.  47                          PR   AX  0.0068   IZ  0.00001456
152.  48                          PR   AX  0.0068   IZ  0.00001456
153.  49                          PR   AX  0.0096   IZ  0.00003700
154.  50                          PR   AX  0.0096   IZ  0.00003700
155.  51                          PR   AX  0.0128   IZ  0.00007640
156.  52                          PR   AX  0.0128   IZ  0.00007640
157.  53                          PR   AX  0.0212   IZ  0.00025120
158.  54                          PR   AX  0.0212   IZ  0.00025120
159.  55                          PR   AX  0.0298   IZ  0.00025166
160.  56                          PR   AX  0.0298   IZ  0.00025166
161.  57                          PR   AX  0.0398   IZ  0.00037183
162.  58                          PR   AX  0.0398   IZ  0.00037183
163.  59                          PR   AX  0.0498   IZ  0.00050799
164.  60                          PR   AX  0.0498   IZ  0.00050799
165.  61                          PR   AX  0.0578   IZ  0.00061053
 66.  62                          PR   AX  0.0578   IZ  0.00061053
 67.  63                          PR   AX  0.0648   IZ  0.00071462
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  64                          PR   AX  0.0648   IZ  0.00071462
 9. *DIAGONALES 2
170.  65                          PR   AX  0.0068   IZ  0.00000001
171.  66                          PR   AX  0.0068   IZ  0.00000001
172.  67                          PR   AX  0.0068   IZ  0.00000001
173.  68                          PR   AX  0.0056   IZ  0.00000001
174.  69                          PR   AX  0.0056   IZ  0.00000001
175.  70                          PR   AX  0.0150   IZ  0.00000001
176.  71                          PR   AX  0.0150   IZ  0.00000001
177.  72                          PR   AX  0.0193   IZ  0.00000001
178.  73                          PR   AX  0.0068   IZ  0.00000001
179. *SECCION DE HORMIGON
180.  74                          PR   AX 13.4810   IZ 45.3025
181.  75                          PR   AX 13.4810   IZ 45.3025
182.  76                          PR   AX 13.4810   IZ 45.3025
183.  77                          PR   AX 13.4810   IZ 45.3025
184.  78                          PR   AX  3.3600   IZ  0.1577
185.  79                          PR   AX  3.3600   IZ  0.1577
186.  80                          PR   AX  3.3600   IZ  0.1577
187.  81                          PR   AX  3.3600   IZ  0.1577
 88.  82                          PR   AX  3.3600   IZ  0.1577
 89.  83                          PR   AX  3.3600   IZ  0.1577
190.  84                          PR   AX  3.3600   IZ  0.1577
191.  85                          PR   AX  3.3600   IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 7        PINNED
206. 11       FIXED BUT FX MZ
207. 15       FIXED BUT FX MZ
 08. 16       FIXED BUT FX MZ
209. 17       FIXED BUT FX MZ
210. 18       FIXED BUT FX MZ
211. 19       FIXED BUT FX MZ
212. 39       FIXED BUT FX MZ
213. 40       FIXED BUT FX MZ
214. 41       FIXED BUT FX MZ
215. 42       FIXED BUT FX MZ
216. 43       FIXED BUT FX MZ
217. 44       FIXED BUT FX MZ
218. 45       FIXED BUT FX MZ
219. 46       FIXED BUT FX MZ
220. 47       FIXED BUT FX MZ
221. 48       FIXED BUT FX MZ
222. 49       FIXED BUT FX MZ
223. 50       FIXED BUT FX MZ
224. LOADING 1 PESO PROPIO
225. SELFWEIGHT   Y  -1.0
 26. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 19
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 130
SIZE OF STIFFNESS MATRIX = 2600 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:36:15
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:36:16
++ PROCESSING TRIANGULAR FACTORIZATION. 7:36:16
++ CALCULATING JOINT DISPLACEMENTS. 7:36:16
++ CALCULATING MEMBER FORCES. 7:36:16

227. LOAD LIST 1
228. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	29.42	0.00	0.00	0.00	0.76
		39	0.00	44.29	0.00	0.00	0.00	-17.01
75	1	39	0.00	39.24	0.00	0.00	0.00	17.01
		40	0.00	34.49	0.00	0.00	0.00	-11.82
76	1	40	0.00	34.79	0.00	0.00	0.00	11.82
		41	0.00	38.94	0.00	0.00	0.00	-16.36
77	1	41	0.00	42.79	0.00	0.00	0.00	16.36
		42	0.00	30.93	0.00	0.00	0.00	-3.38
78	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
84	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

229. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00005
39	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00001
40	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-11.49850	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-11.49850	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

230. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
7	1	0.00	31.11	0.00	0.00	0.00	0.00
11	1	0.00	17.00	0.00	0.00	0.00	0.00
15	1	0.00	22.23	0.00	0.00	0.00	0.00
16	1	0.00	1.60	0.00	0.00	0.00	0.00
17	1	0.00	14.02	0.00	0.00	0.00	0.00
18	1	0.00	5.13	0.00	0.00	0.00	0.00
19	1	0.00	35.38	0.00	0.00	0.00	0.00
39	1	0.00	83.52	0.00	0.00	0.00	0.00
40	1	0.00	69.28	0.00	0.00	0.00	0.00
41	1	0.00	81.73	0.00	0.00	0.00	0.00
42	1	0.00	40.14	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

231. PLOT BEND FILE
232. PLOT DISP FILE
233. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 7:36:18 ****

****
* 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 *
****

porción 8

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  1, 1997        *
*          Time=     7:37: 2             *
*                                       *
*****************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1    1    2
15.  2    2    3
16.  3    3    4
17.  4    4    5
18.  5    5    6
19.  6    6    7
20.  7    7    8
21.  8    8    9
22.  9    9   10
23. 10   10   11
24. 11   11   12
25. 12   12   13
26. 13   13   14
27. 14   14   15
28. 15   15   16
29. 16   16   17
30. 17   17   18
31. 18   18   19
32. 19   29   30
33. 20   30   31
34. 21   31   32
35. 22   32   33
36. 23   33   34
37. 24   34   35
38. 25   35   36
39. 26   36   37
40. 27   37   38
41. 28    1   29
42. 29    2   20
43. 30    3   30
44. 31    4   21
45. 32    5   31
46. 33    6   22
47. 34    7   32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8   23
49. 36   9   33
50. 37  10   24
51. 38  11   34
52. 39  12   25
53. 40  13   35
54. 41  14   26
55. 42  15   36
56. 43  16   27
57. 44  17   37
58. 45  18   28
59. 46  19   38
60. 47  29   20
61. 48  20    3
62. 49  30   21
63. 50  21    5
64. 51  31   22
65. 52  22    7
66. 53  32   23
67. 54  23    9
68. 55  33   24
69. 56  24   11
70. 57  34   25
71. 58  25   13
72. 59  35   26
73. 60  26   15
74. 61  36   27
75. 62  27   17
76. 63  37   28
77. 64  28   19
78. 65   3   21
79. 66   5   22
80. 67   7   23
81. 68   9   24
82. 69  11   25
83. 70  13   26
84. 71  15   27
85. 72  17   28
86. 73   1   20
87. 74  19   39
88. 75  39   40
89. 76  40   41
90. 77  41   42
91. 78  42   43
92. 79  43   44
93. 80  44   45
94. 81  45   46
95. 82  46   47
96. 83  47   48
97. 84  48   49
98. 85  49   50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
 06.  6                PR  AX  0.0670  IZ  0.00233098
 07.  7                PR  AX  0.0750  IZ  0.00271328
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR   AX  0.0750   IZ  0.00271328
109.   9                          PR   AX  0.0900   IZ  0.00380584
110.  10                          PR   AX  0.0900   IZ  0.00380584
111.  11                          PR   AX  0.1070   IZ  0.00464364
112.  12                          PR   AX  0.1070   IZ  0.00464364
113.  13                          PR   AX  0.1180   IZ  0.00593306
114.  14                          PR   AX  0.1180   IZ  0.00593306
115.  15                          PR   AX  0.1410   IZ  0.00804164
116.  16                          PR   AX  0.1410   IZ  0.00804164
117.  17                          PR   AX  0.1520   IZ  0.00926892
118.  18                          PR   AX  0.1520   IZ  0.00926892
119. *CORDON SUPERIOR
120.  19                          PR   AX  0.0280   IZ  0.00046454
121.  20                          PR   AX  0.0280   IZ  0.00046454
122.  21                          PR   AX  0.0280   IZ  0.00046454
123.  22                          PR   AX  0.0320   IZ  0.00072626
124.  23                          PR   AX  0.0320   IZ  0.00072626
125.  24                          PR   AX  0.0450   IZ  0.00164273
126.  25                          PR   AX  0.0600   IZ  0.00261476
127.  26                          PR   AX  0.0720   IZ  0.00316788
128.  27                          PR   AX  0.0840   IZ  0.00380920
129. *MONTANTES PRINCIPALES
130.  28                          PR   AX  0.0068   IZ  0.00000001
131.  30                          PR   AX  0.0082   IZ  0.00000001
132.  32                          PR   AX  0.0148   IZ  0.00000001
133.  34                          PR   AX  0.0212   IZ  0.00000001
134.  36                          PR   AX  0.0298   IZ  0.00000001
135.  38                          PR   AX  0.0298   IZ  0.00000001
136.  40                          PR   AX  0.0398   IZ  0.00000001
137.  42                          PR   AX  0.0498   IZ  0.00000001
138.  44                          PR   AX  0.0578   IZ  0.00000001
139.  46                          PR   AX  0.0578   IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.  29                          PR   AX  0.0068   IZ  0.00000001
142.  31                          PR   AX  0.0068   IZ  0.00000001
143.  33                          PR   AX  0.0068   IZ  0.00000001
144.  35                          PR   AX  0.0096   IZ  0.00000001
145.  37                          PR   AX  0.0112   IZ  0.00000001
146.  39                          PR   AX  0.0128   IZ  0.00000001
147.  41                          PR   AX  0.0168   IZ  0.00000001
148.  43                          PR   AX  0.0192   IZ  0.00000001
149.  45                          PR   AX  0.0298   IZ  0.00000001
150. *DIAGONALES 1
151.  47                          PR   AX  0.0068   IZ  0.00001456
152.  48                          PR   AX  0.0068   IZ  0.00001456
153.  49                          PR   AX  0.0096   IZ  0.00003700
154.  50                          PR   AX  0.0096   IZ  0.00003700
155.  51                          PR   AX  0.0128   IZ  0.00007640
156.  52                          PR   AX  0.0128   IZ  0.00007640
157.  53                          PR   AX  0.0212   IZ  0.00025120
158.  54                          PR   AX  0.0212   IZ  0.00025120
159.  55                          PR   AX  0.0298   IZ  0.00025166
160.  56                          PR   AX  0.0298   IZ  0.00025166
161.  57                          PR   AX  0.0398   IZ  0.00037183
162.  58                          PR   AX  0.0398   IZ  0.00037183
163.  59                          PR   AX  0.0498   IZ  0.00050799
164.  60                          PR   AX  0.0498   IZ  0.00050799
165.  61                          PR   AX  0.0578   IZ  0.00061053
166.  62                          PR   AX  0.0578   IZ  0.00061053
167.  63                          PR   AX  0.0648   IZ  0.00071462
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  64                          PR   AX  0.0648   IZ  0.00071462
169. *DIAGONALES 2
170.  65                          PR   AX  0.0068   IZ  0.00000001
171.  66                          PR   AX  0.0068   IZ  0.00000001
172.  67                          PR   AX  0.0068   IZ  0.00000001
173.  68                          PR   AX  0.0056   IZ  0.00000001
174.  69                          PR   AX  0.0056   IZ  0.00000001
175.  70                          PR   AX  0.0150   IZ  0.00000001
176.  71                          PR   AX  0.0150   IZ  0.00000001
177.  72                          PR   AX  0.0193   IZ  0.00000001
178.  73                          PR   AX  0.0068   IZ  0.00000001
179. *SECCION DE HORMIGON
180.  74                          PR   AX 13.4810   IZ 45.3025
181.  75                          PR   AX 13.4810   IZ 45.3025
182.  76                          PR   AX 13.4810   IZ 45.3025
183.  77                          PR   AX 13.4810   IZ 45.3025
184.  78                          PR   AX  3.3600   IZ  0.1577
185.  79                          PR   AX  3.3600   IZ  0.1577
186.  80                          PR   AX  3.3600   IZ  0.1577
187.  81                          PR   AX  3.3600   IZ  0.1577
188.  82                          PR   AX  3.3600   IZ  0.1577
189.  83                          PR   AX  3.3600   IZ  0.1577
190.  84                          PR   AX  3.3600   IZ  0.1577
191.  85                          PR   AX  3.3600   IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 8       PINNED
206. 12      FIXED BUT FX MZ
207. 16      FIXED BUT FX MZ
208. 17      FIXED BUT FX MZ
209. 18      FIXED BUT FX MZ
210. 19      FIXED BUT FX MZ
211. 39      FIXED BUT FX MZ
212. 40      FIXED BUT FX MZ
213. 41      FIXED BUT FX MZ
214. 42      FIXED BUT FX MZ
215. 43      FIXED BUT FX MZ
216. 44      FIXED BUT FX MZ
217. 45      FIXED BUT FX MZ
218. 46      FIXED BUT FX MZ
219. 47      FIXED BUT FX MZ
220. 48      FIXED BUT FX MZ
221. 49      FIXED BUT FX MZ
222. 50      FIXED BUT FX MZ
223. LOADING 1 PESO PROPIO
224. SELFWEIGHT   Y  -1.0
225. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 18
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 131
SIZE OF STIFFNESS MATRIX = 2751 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:37: 6
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:37: 6
++ PROCESSING TRIANGULAR FACTORIZATION. 7:37: 6
++ CALCULATING JOINT DISPLACEMENTS. 7:37: 7
++ CALCULATING MEMBER FORCES. 7:37: 7

226. LOAD LIST 1
227. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	29.24	0.00	0.00	0.00	0.45
		39	0.00	44.46	0.00	0.00	0.00	-17.09
75	1	39	0.00	39.28	0.00	0.00	0.00	17.09
		40	0.00	34.44	0.00	0.00	0.00	-11.80
76	1	40	0.00	34.78	0.00	0.00	0.00	11.80
		41	0.00	38.95	0.00	0.00	0.00	-16.36
77	1	41	0.00	42.80	0.00	0.00	0.00	16.36
		42	0.00	30.93	0.00	0.00	0.00	-3.38
78	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
84	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

228. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00006
39	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00001
40	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-16.63833	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-16.63833	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

229. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
8	1	0.00	38.01	0.00	0.00	0.00	0.00
12	1	0.00	18.82	0.00	0.00	0.00	0.00
16	1	0.00	17.28	0.00	0.00	0.00	0.00
17	1	0.00	14.51	0.00	0.00	0.00	0.00
18	1	0.00	5.57	0.00	0.00	0.00	0.00
19	1	0.00	32.10	0.00	0.00	0.00	0.00
39	1	0.00	83.75	0.00	0.00	0.00	0.00
40	1	0.00	69.22	0.00	0.00	0.00	0.00
41	1	0.00	81.75	0.00	0.00	0.00	0.00
42	1	0.00	40.14	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

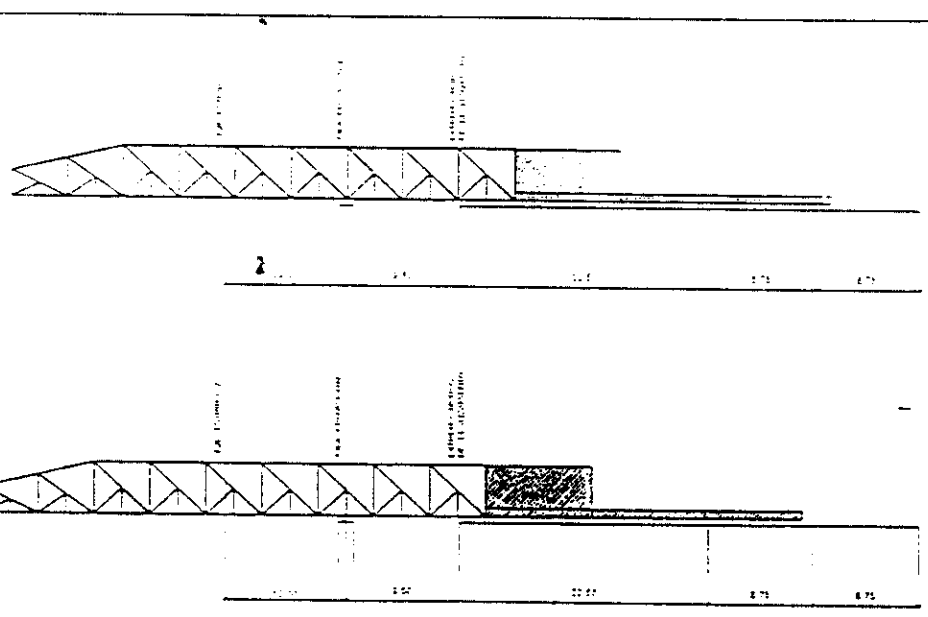
********** END OF LATEST ANALYSIS RESULT **********

230. PLOT BEND FILE
231. PLOT DISP FILE
232. FINISH

********** END OF STAAD-III **********

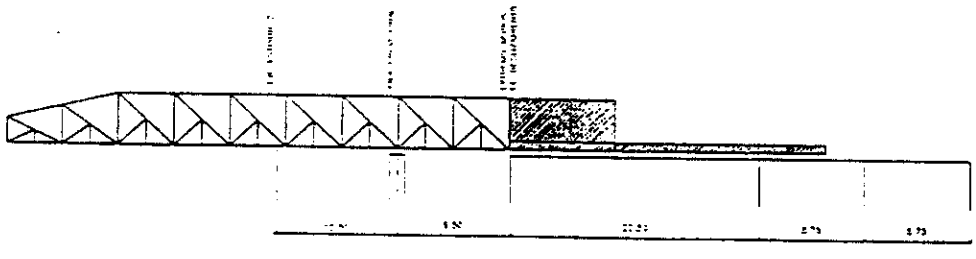
**** DATE= JUL 1,1997 TIME= 7:37: 9 ****

****
* 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 *
****

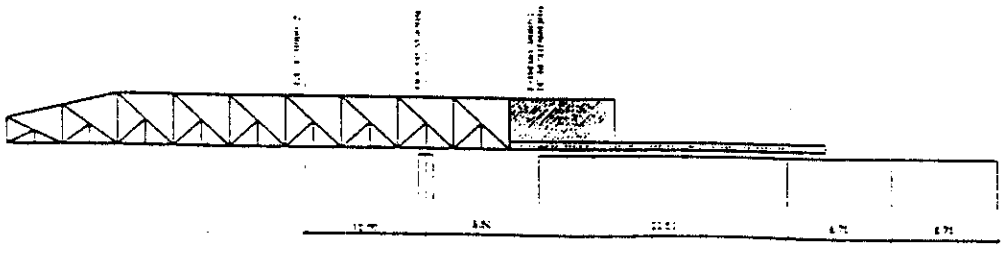


POSICION 9

POSICION 10



POSICION 11



POSICION 12

Portico 9

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*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  1, 1997            *
*          Time=     7:57:43                 *
*                                           *
*********************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9  10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
45. 32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
49. 36   9  33
50. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
68. 55  33  24
69. 56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
87. 74  19  39
88. 75  39  40
89. 76  40  41
90. 77  41  42
91. 78  42  43
92. 79  43  44
93. 80  44  45
94. 81  45  46
95. 82  46  47
96. 83  47  48
97. 84  48  49
98. 85  49  50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1   PR  AX  0.0500  IZ  0.00151406
102.  2   PR  AX  0.0500  IZ  0.00151406
103.  3   PR  AX  0.0532  IZ  0.00156748
104.  4   PR  AX  0.0532  IZ  0.00156748
105.  5   PR  AX  0.0670  IZ  0.00233098
106.  6   PR  AX  0.0670  IZ  0.00233098
107.  7   PR  AX  0.0750  IZ  0.00271328
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 17
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 132
SIZE OF STIFFNESS MATRIX = 2640 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:57:46
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:57:46
++ PROCESSING TRIANGULAR FACTORIZATION. 7:57:46
++ CALCULATING JOINT DISPLACEMENTS. 7:57:47
++ CALCULATING MEMBER FORCES. 7:57:47

225. LOAD LIST 1
226. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	29.79	0.00	0.00	0.00	1.39
		39	0.00	43.92	0.00	0.00	0.00	-16.84
75	1	39	0.00	39.14	0.00	0.00	0.00	16.84
		40	0.00	34.59	0.00	0.00	0.00	-11.86
76	1	40	0.00	34.81	0.00	0.00	0.00	11.86
		41	0.00	38.91	0.00	0.00	0.00	-16.35
77	1	41	0.00	42.79	0.00	0.00	0.00	16.35
		42	0.00	30.94	0.00	0.00	0.00	-3.38
[illegible]	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

227. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00005
39	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00001
40	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-18.58295	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-18.58295	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

228. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
9	1	0.00	48.01	0.00	0.00	0.00	0.00
13	1	0.00	17.00	0.00	0.00	0.00	0.00
17	1	0.00	26.40	0.00	0.00	0.00	0.00
18	1	0.00	0.99	0.00	0.00	0.00	0.00
19	1	0.00	34.43	0.00	0.00	0.00	0.00
39	1	0.00	83.05	0.00	0.00	0.00	0.00
40	1	0.00	69.40	0.00	0.00	0.00	0.00
41	1	0.00	81.70	0.00	0.00	0.00	0.00
42	1	0.00	40.14	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

229. PLOT BEND FILE
230. PLOT DISP FILE
231. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 7:57:49 ****

****
* 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 *
****

```
*****************************************
*                                       *
*           S T A A D - III             *
*           Revision 17.0a              *
*           Proprietary Program of      *
*           RESEARCH ENGINEERS, Inc.    *
*           Date=    JUL  1, 1997       *
*           Time=     7:58:55           *
*                                       *
*****************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9  10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
45. 32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
49. 36   9  33
50. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
68. 55  33  24
69. 56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
87. 74  19  39
88. 75  39  40
89. 76  40  41
90. 77  41  42
91. 78  42  43
92. 79  43  44
93. 80  44  45
94. 81  45  46
95. 82  46  47
96. 83  47  48
97. 84  48  49
98. 85  49  50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
106.  6                PR  AX  0.0670  IZ  0.00233098
107.  7                PR  AX  0.0750  IZ  0.00271328
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR   AX  0.0750   IZ  0.00271328
       9                          PR   AX  0.0900   IZ  0.00380584
       10                         PR   AX  0.0900   IZ  0.00380584
111.   11                         PR   AX  0.1070   IZ  0.00464364
112.   12                         PR   AX  0.1070   IZ  0.00464364
113.   13                         PR   AX  0.1180   IZ  0.00593306
114.   14                         PR   AX  0.1180   IZ  0.00593306
115.   15                         PR   AX  0.1410   IZ  0.00804164
116.   16                         PR   AX  0.1410   IZ  0.00804164
117.   17                         PR   AX  0.1520   IZ  0.00926892
118.   18                         PR   AX  0.1520   IZ  0.00926892
119. *CORDON SUPERIOR
120.   19                         PR   AX  0.0280   IZ  0.00046454
121.   20                         PR   AX  0.0280   IZ  0.00046454
122.   21                         PR   AX  0.0280   IZ  0.00046454
123.   22                         PR   AX  0.0320   IZ  0.00072626
124.   23                         PR   AX  0.0320   IZ  0.00072626
125.   24                         PR   AX  0.0450   IZ  0.00164273
126.   25                         PR   AX  0.0600   IZ  0.00261476
127.   26                         PR   AX  0.0720   IZ  0.00316788
       27                         PR   AX  0.0840   IZ  0.00380920
     *MONTANTES PRINCIPALES
130.   28                         PR   AX  0.0068   IZ  0.00000001
131.   30                         PR   AX  0.0082   IZ  0.00000001
132.   32                         PR   AX  0.0148   IZ  0.00000001
133.   34                         PR   AX  0.0212   IZ  0.00000001
134.   36                         PR   AX  0.0298   IZ  0.00000001
135.   38                         PR   AX  0.0298   IZ  0.00000001
136.   40                         PR   AX  0.0398   IZ  0.00000001
137.   42                         PR   AX  0.0498   IZ  0.00000001
138.   44                         PR   AX  0.0578   IZ  0.00000001
139.   46                         PR   AX  0.0578   IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.   29                         PR   AX  0.0068   IZ  0.00000001
142.   31                         PR   AX  0.0068   IZ  0.00000001
143.   33                         PR   AX  0.0068   IZ  0.00000001
144.   35                         PR   AX  0.0096   IZ  0.00000001
145.   37                         PR   AX  0.0112   IZ  0.00000001
146.   39                         PR   AX  0.0128   IZ  0.00000001
       41                         PR   AX  0.0168   IZ  0.00000001
       43                         PR   AX  0.0192   IZ  0.00000001
149.   45                         PR   AX  0.0298   IZ  0.00000001
150. *DIAGONALES 1
151.   47                         PR   AX  0.0068   IZ  0.00001456
152.   48                         PR   AX  0.0068   IZ  0.00001456
153.   49                         PR   AX  0.0096   IZ  0.00003700
154.   50                         PR   AX  0.0096   IZ  0.00003700
155.   51                         PR   AX  0.0128   IZ  0.00007640
156.   52                         PR   AX  0.0128   IZ  0.00007640
157.   53                         PR   AX  0.0212   IZ  0.00025120
158.   54                         PR   AX  0.0212   IZ  0.00025120
159.   55                         PR   AX  0.0298   IZ  0.00025166
160.   56                         PR   AX  0.0298   IZ  0.00025166
161.   57                         PR   AX  0.0398   IZ  0.00037183
162.   58                         PR   AX  0.0398   IZ  0.00037183
163.   59                         PR   AX  0.0498   IZ  0.00050799
164.   60                         PR   AX  0.0498   IZ  0.00050799
165.   61                         PR   AX  0.0578   IZ  0.00061053
       62                         PR   AX  0.0578   IZ  0.00061053
       63                         PR   AX  0.0648   IZ  0.00071462
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.   64                         PR   AX  0.0648   IZ  0.00071462
     *DIAGONALES 2
       65                         PR   AX  0.0068   IZ  0.00000001
171.   66                         PR   AX  0.0068   IZ  0.00000001
172.   67                         PR   AX  0.0068   IZ  0.00000001
173.   68                         PR   AX  0.0056   IZ  0.00000001
174.   69                         PR   AX  0.0056   IZ  0.00000001
175.   70                         PR   AX  0.0150   IZ  0.00000001
176.   71                         PR   AX  0.0150   IZ  0.00000001
177.   72                         PR   AX  0.0193   IZ  0.00000001
178.   73                         PR   AX  0.0068   IZ  0.00000001
179. *SECCION DE HORMIGON
180.   74                         PR   AX 13.4810   IZ 45.3025
181.   75                         PR   AX 13.4810   IZ 45.3025
182.   76                         PR   AX 13.4810   IZ 45.3025
183.   77                         PR   AX 13.4810   IZ 45.3025
184.   78                         PR   AX  3.3600   IZ  0.1577
185.   79                         PR   AX  3.3600   IZ  0.1577
186.   80                         PR   AX  3.3600   IZ  0.1577
187.   81                         PR   AX  3.3600   IZ  0.1577
       82                         PR   AX  3.3600   IZ  0.1577
       83                         PR   AX  3.3600   IZ  0.1577
190.   84                         PR   AX  3.3600   IZ  0.1577
191.   85                         PR   AX  3.3600   IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 10       PINNED
206. 14       FIXED BUT FX MZ
       18       FIXED BUT FX MZ
       19       FIXED BUT FX MZ
209. 39       FIXED BUT FX MZ
210. 40       FIXED BUT FX MZ
211. 41       FIXED BUT FX MZ
212. 42       FIXED BUT FX MZ
213. 43       FIXED BUT FX MZ
214. 44       FIXED BUT FX MZ
215. 45       FIXED BUT FX MZ
216. 46       FIXED BUT FX MZ
217. 47       FIXED BUT FX MZ
218. 48       FIXED BUT FX MZ
219. 49       FIXED BUT FX MZ
220. 50       FIXED BUT FX MZ
221. LOADING 1 PESO PROPIO
222. SELFWEIGHT   Y  -1.0
223. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 16
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 133
SIZE OF STIFFNESS MATRIX = 2793 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:58:58
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:58:59
++ PROCESSING TRIANGULAR FACTORIZATION. 7:58:59
++ CALCULATING JOINT DISPLACEMENTS. 7:58:59
++ CALCULATING MEMBER FORCES. 7:58:59

224. LOAD LIST 1
225. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	27.10	0.00	0.00	0.00	-3.26
		39	0.00	46.61	0.00	0.00	0.00	-18.09
75	1	39	0.00	39.86	0.00	0.00	0.00	18.09
		40	0.00	33.87	0.00	0.00	0.00	-11.53
76	1	40	0.00	34.62	0.00	0.00	0.00	11.53
		41	0.00	39.10	0.00	0.00	0.00	-16.43
77	1	41	0.00	42.83	0.00	0.00	0.00	16.43
		42	0.00	30.90	0.00	0.00	0.00	-3.38
	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

226. PRINT JOI DIS LIST 19 39 TO 50

..NT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00007
39	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00002
40	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-24.24077	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-24.24077	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

227. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
10	1	0.00	56.53	0.00	0.00	0.00	0.00
14	1	0.00	21.55	0.00	0.00	0.00	0.00
18	1	0.00	21.41	0.00	0.00	0.00	0.00
19	1	0.00	24.65	0.00	0.00	0.00	0.00
39	1	0.00	86.47	0.00	0.00	0.00	0.00
40	1	0.00	68.49	0.00	0.00	0.00	0.00
41	1	0.00	81.93	0.00	0.00	0.00	0.00
42	1	0.00	40.11	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
[illegible]	1	0.00	17.72	0.00	0.00	0.00	0.00
[illegible]	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

228. PLOT BEND FILE
229. PLOT DISP FILE
230. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 7:59: 1 ****

****
* 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 *
****

Dorcir 11

```
*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  1, 1997        *
*          Time=     7:39:38            *
*                                       *
*****************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187.  0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9   10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
    32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
 9. 36   9  33
 0. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
 8. 55  33  24
 9. 56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
 7. 74  19  39
 8. 75  39  40
89. 76  40  41
90. 77  41  42
91. 78  42  43
92. 79  43  44
93. 80  44  45
94. 81  45  46
95. 82  46  47
96. 83  47  48
97. 84  48  49
98. 85  49  50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
 6.  6                PR  AX  0.0670  IZ  0.00233098
 7.  7                PR  AX  0.0750  IZ  0.00271328
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR  AX  0.0750  IZ  0.00271328
 ?.    9                          PR  AX  0.0900  IZ  0.00380584
 ?.   10                          PR  AX  0.0900  IZ  0.00380584
111.  11                          PR  AX  0.1070  IZ  0.00464364
112.  12                          PR  AX  0.1070  IZ  0.00464364
113.  13                          PR  AX  0.1180  IZ  0.00593306
114.  14                          PR  AX  0.1180  IZ  0.00593306
115.  15                          PR  AX  0.1410  IZ  0.00804164
116.  16                          PR  AX  0.1410  IZ  0.00804164
117.  17                          PR  AX  0.1520  IZ  0.00926892
118.  18                          PR  AX  0.1520  IZ  0.00926892
119. *CORDON SUPERIOR
120.  19                          PR  AX  0.0280  IZ  0.00046454
121.  20                          PR  AX  0.0280  IZ  0.00046454
122.  21                          PR  AX  0.0280  IZ  0.00046454
123.  22                          PR  AX  0.0320  IZ  0.00072626
124.  23                          PR  AX  0.0320  IZ  0.00072626
125.  24                          PR  AX  0.0450  IZ  0.00164273
126.  25                          PR  AX  0.0600  IZ  0.00261476
127.  26                          PR  AX  0.0720  IZ  0.00316788
 ?.   27                          PR  AX  0.0840  IZ  0.00380920
 ?. *MONTANTES PRINCIPALES
130.  28                          PR  AX  0.0068  IZ  0.00000001
131.  30                          PR  AX  0.0082  IZ  0.00000001
132.  32                          PR  AX  0.0148  IZ  0.00000001
133.  34                          PR  AX  0.0212  IZ  0.00000001
134.  36                          PR  AX  0.0298  IZ  0.00000001
135.  38                          PR  AX  0.0298  IZ  0.00000001
136.  40                          PR  AX  0.0398  IZ  0.00000001
137.  42                          PR  AX  0.0498  IZ  0.00000001
138.  44                          PR  AX  0.0578  IZ  0.00000001
139.  46                          PR  AX  0.0578  IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.  29                          PR  AX  0.0068  IZ  0.00000001
142.  31                          PR  AX  0.0068  IZ  0.00000001
143.  33                          PR  AX  0.0068  IZ  0.00000001
144.  35                          PR  AX  0.0096  IZ  0.00000001
145.  37                          PR  AX  0.0112  IZ  0.00000001
146.  39                          PR  AX  0.0128  IZ  0.00000001
 ?.   41                          PR  AX  0.0168  IZ  0.00000001
 ?.   43                          PR  AX  0.0192  IZ  0.00000001
149.  45                          PR  AX  0.0298  IZ  0.00000001
150. *DIAGONALES 1
151.  47                          PR  AX  0.0068  IZ  0.00001456
152.  48                          PR  AX  0.0068  IZ  0.00001456
153.  49                          PR  AX  0.0096  IZ  0.00003700
154.  50                          PR  AX  0.0096  IZ  0.00003700
155.  51                          PR  AX  0.0128  IZ  0.00007640
156.  52                          PR  AX  0.0128  IZ  0.00007640
157.  53                          PR  AX  0.0212  IZ  0.00025120
158.  54                          PR  AX  0.0212  IZ  0.00025120
159.  55                          PR  AX  0.0298  IZ  0.00025166
160.  56                          PR  AX  0.0298  IZ  0.00025166
161.  57                          PR  AX  0.0398  IZ  0.00037183
162.  58                          PR  AX  0.0398  IZ  0.00037183
163.  59                          PR  AX  0.0498  IZ  0.00050799
164.  60                          PR  AX  0.0498  IZ  0.00050799
165.  61                          PR  AX  0.0578  IZ  0.00061053
 ?.   62                          PR  AX  0.0578  IZ  0.00061053
 ?.   63                          PR  AX  0.0648  IZ  0.00071462
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  64                          PR  AX  0.0648  IZ  0.00071462
 ?. *DIAGONALES 2
 ?.   65                          PR  AX  0.0068  IZ  0.00000001
171.  66                          PR  AX  0.0068  IZ  0.00000001
172.  67                          PR  AX  0.0068  IZ  0.00000001
173.  68                          PR  AX  0.0056  IZ  0.00000001
174.  69                          PR  AX  0.0056  IZ  0.00000001
175.  70                          PR  AX  0.0150  IZ  0.00000001
176.  71                          PR  AX  0.0150  IZ  0.00000001
177.  72                          PR  AX  0.0193  IZ  0.00000001
178.  73                          PR  AX  0.0068  IZ  0.00000001
179. *SECCION DE HORMIGON
180.  74                          PR  AX 13.4810  IZ 45.3025
181.  75                          PR  AX 13.4810  IZ 45.3025
182.  76                          PR  AX 13.4810  IZ 45.3025
183.  77                          PR  AX 13.4810  IZ 45.3025
184.  78                          PR  AX  3.3600  IZ  0.1577
185.  79                          PR  AX  3.3600  IZ  0.1577
186.  80                          PR  AX  3.3600  IZ  0.1577
187.  81                          PR  AX  3.3600  IZ  0.1577
 ?.   82                          PR  AX  3.3600  IZ  0.1577
 ?.   83                          PR  AX  3.3600  IZ  0.1577
190.  84                          PR  AX  3.3600  IZ  0.1577
191.  85                          PR  AX  3.3600  IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END  MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 11        PINNED
206. 15        FIXED BUT FX MZ
 ?. 19         FIXED BUT FX MZ
 ?. 39         FIXED BUT FX MZ
209. 40        FIXED BUT FX MZ
210. 41        FIXED BUT FX MZ
211. 42        FIXED BUT FX MZ
212. 43        FIXED BUT FX MZ
213. 44        FIXED BUT FX MZ
214. 45        FIXED BUT FX MZ
215. 46        FIXED BUT FX MZ
216. 47        FIXED BUT FX MZ
217. 48        FIXED BUT FX MZ
218. 49        FIXED BUT FX MZ
219. 50        FIXED BUT FX MZ
220. LOADING 1 PESO PROPIO
221. SELFWEIGHT   Y  -1.0
222. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 15
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 134
SIZE OF STIFFNESS MATRIX = 2680 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:39:41
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:39:42
++ PROCESSING TRIANGULAR FACTORIZATION. 7:39:42
++ CALCULATING JOINT DISPLACEMENTS. 7:39:42
++ CALCULATING MEMBER FORCES. 7:39:42

223. LOAD LIST 1
224. PRINT MEMBER FORCES LIST 74 TO 85

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	33.88	0.00	0.00	0.00	8.44
		39	0.00	39.83	0.00	0.00	0.00	-14.95
75	1	39	0.00	38.04	0.00	0.00	0.00	14.95
		40	0.00	35.68	0.00	0.00	0.00	-12.37
76	1	40	0.00	35.10	0.00	0.00	0.00	12.37
		41	0.00	38.63	0.00	0.00	0.00	-16.22
77	1	41	0.00	42.73	0.00	0.00	0.00	16.22
		42	0.00	30.99	0.00	0.00	0.00	-3.38
	1	42	0.00	9.21	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

225. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00002
39	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00000
40	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00000
41	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00001
42	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00004
43	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-26.05765	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-26.05765	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

226. PRINT REACC ALL

PORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
11	1	0.00	70.46	0.00	0.00	0.00	0.00
15	1	0.00	17.31	0.00	0.00	0.00	0.00
19	1	0.00	43.15	0.00	0.00	0.00	0.00
39	1	0.00	77.87	0.00	0.00	0.00	0.00
40	1	0.00	70.78	0.00	0.00	0.00	0.00
41	1	0.00	81.36	0.00	0.00	0.00	0.00
42	1	0.00	40.20	0.00	0.00	0.00	0.00
43	1	0.00	18.35	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
,	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

227. PLOT BEND FILE
228. PLOT DISP FILE
229. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 7:39:44 ****

****
* 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 *
****

DOBLON 12

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**********************************************
*                                            *
*          S T A A D - III                   *
*          Revision 17.0a                    *
*          Proprietary Program of            *
*          RESEARCH ENGINEERS, Inc.          *
*          Date=    JUL  1, 1997             *
*          Time=     7:41:25                  *
*                                            *
**********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1   1   2
15.  2   2   3
16.  3   3   4
17.  4   4   5
18.  5   5   6
19.  6   6   7
20.  7   7   8
21.  8   8   9
22.  9   9  10
23. 10  10  11
24. 11  11  12
25. 12  12  13
26. 13  13  14
27. 14  14  15
28. 15  15  16
29. 16  16  17
30. 17  17  18
31. 18  18  19
32. 19  29  30
33. 20  30  31
34. 21  31  32
35. 22  32  33
36. 23  33  34
37. 24  34  35
38. 25  35  36
39. 26  36  37
40. 27  37  38
41. 28   1  29
42. 29   2  20
43. 30   3  30
44. 31   4  21
45. 32   5  31
46. 33   6  22
47. 34   7  32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35   8  23
    36   9  33
50. 37  10  24
51. 38  11  34
52. 39  12  25
53. 40  13  35
54. 41  14  26
55. 42  15  36
56. 43  16  27
57. 44  17  37
58. 45  18  28
59. 46  19  38
60. 47  29  20
61. 48  20   3
62. 49  30  21
63. 50  21   5
64. 51  31  22
65. 52  22   7
66. 53  32  23
67. 54  23   9
    55  33  24
    56  24  11
70. 57  34  25
71. 58  25  13
72. 59  35  26
73. 60  26  15
74. 61  36  27
75. 62  27  17
76. 63  37  28
77. 64  28  19
78. 65   3  21
79. 66   5  22
80. 67   7  23
81. 68   9  24
82. 69  11  25
83. 70  13  26
84. 71  15  27
85. 72  17  28
86. 73   1  20
    74  19  39
    75  39  40
89. 76  40  41
90. 77  41  42
91. 78  42  43
92. 79  43  44
93. 80  44  45
94. 81  45  46
95. 82  46  47
96. 83  47  48
97. 84  48  49
98. 85  49  50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
      6                PR  AX  0.0670  IZ  0.00233098
107.  7                PR  AX  0.0750  IZ  0.00271328
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR   AX  0.0750   IZ  0.00271328
 ?.    9                          PR   AX  0.0900   IZ  0.00380584
 ?.   10                          PR   AX  0.0900   IZ  0.00380584
111.  11                          PR   AX  0.1070   IZ  0.00464364
112.  12                          PR   AX  0.1070   IZ  0.00464364
113.  13                          PR   AX  0.1180   IZ  0.00593306
114.  14                          PR   AX  0.1180   IZ  0.00593306
115.  15                          PR   AX  0.1410   IZ  0.00804164
116.  16                          PR   AX  0.1410   IZ  0.00804164
117.  17                          PR   AX  0.1520   IZ  0.00926892
118.  18                          PR   AX  0.1520   IZ  0.00926892
119. *CORDON SUPERIOR
120.  19                          PR   AX  0.0280   IZ  0.00046454
121.  20                          PR   AX  0.0280   IZ  0.00046454
122.  21                          PR   AX  0.0280   IZ  0.00046454
123.  22                          PR   AX  0.0320   IZ  0.00072626
124.  23                          PR   AX  0.0320   IZ  0.00072626
125.  24                          PR   AX  0.0450   IZ  0.00164273
126.  25                          PR   AX  0.0600   IZ  0.00261476
127.  26                          PR   AX  0.0720   IZ  0.00316788
 ?.   27                          PR   AX  0.0840   IZ  0.00380920
 .   *MONTANTES PRINCIPALES
130.  28                          PR   AX  0.0068   IZ  0.00000001
131.  30                          PR   AX  0.0082   IZ  0.00000001
132.  32                          PR   AX  0.0148   IZ  0.00000001
133.  34                          PR   AX  0.0212   IZ  0.00000001
134.  36                          PR   AX  0.0298   IZ  0.00000001
135.  38                          PR   AX  0.0298   IZ  0.00000001
136.  40                          PR   AX  0.0398   IZ  0.00000001
137.  42                          PR   AX  0.0498   IZ  0.00000001
138.  44                          PR   AX  0.0578   IZ  0.00000001
139.  46                          PR   AX  0.0578   IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.  29                          PR   AX  0.0068   IZ  0.00000001
142.  31                          PR   AX  0.0068   IZ  0.00000001
143.  33                          PR   AX  0.0068   IZ  0.00000001
144.  35                          PR   AX  0.0096   IZ  0.00000001
145.  37                          PR   AX  0.0112   IZ  0.00000001
146.  39                          PR   AX  0.0128   IZ  0.00000001
 47.  41                          PR   AX  0.0168   IZ  0.00000001
 ).   43                          PR   AX  0.0192   IZ  0.00000001
149.  45                          PR   AX  0.0298   IZ  0.00000001
150. *DIAGONALES 1
151.  47                          PR   AX  0.0068   IZ  0.00001456
152.  48                          PR   AX  0.0068   IZ  0.00001456
153.  49                          PR   AX  0.0096   IZ  0.00003700
154.  50                          PR   AX  0.0096   IZ  0.00003700
155.  51                          PR   AX  0.0128   IZ  0.00007640
156.  52                          PR   AX  0.0128   IZ  0.00007640
157.  53                          PR   AX  0.0212   IZ  0.00025120
158.  54                          PR   AX  0.0212   IZ  0.00025120
159.  55                          PR   AX  0.0298   IZ  0.00025166
160.  56                          PR   AX  0.0298   IZ  0.00025166
161.  57                          PR   AX  0.0398   IZ  0.00037183
162.  58                          PR   AX  0.0398   IZ  0.00037183
163.  59                          PR   AX  0.0498   IZ  0.00050799
164.  60                          PR   AX  0.0498   IZ  0.00050799
165.  61                          PR   AX  0.0578   IZ  0.00061053
 ?.   62                          PR   AX  0.0578   IZ  0.00061053
 .    63                          PR   AX  0.0648   IZ  0.00071462
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  64                          PR   AX  0.0648   IZ  0.00071462
 ?. *DIAGONALES 2
 .    65                          PR   AX  0.0068   IZ  0.00000001
171.  66                          PR   AX  0.0068   IZ  0.00000001
172.  67                          PR   AX  0.0068   IZ  0.00000001
173.  68                          PR   AX  0.0056   IZ  0.00000001
174.  69                          PR   AX  0.0056   IZ  0.00000001
175.  70                          PR   AX  0.0150   IZ  0.00000001
176.  71                          PR   AX  0.0150   IZ  0.00000001
177.  72                          PR   AX  0.0193   IZ  0.00000001
178.  73                          PR   AX  0.0068   IZ  0.00000001
179. *SECCION DE HORMIGON
180.  74                          PR   AX 13.4810   IZ 45.3025
181.  75                          PR   AX 13.4810   IZ 45.3025
182.  76                          PR   AX 13.4810   IZ 45.3025
183.  77                          PR   AX 13.4810   IZ 45.3025
184.  78                          PR   AX  3.3600   IZ  0.1577
185.  79                          PR   AX  3.3600   IZ  0.1577
186.  80                          PR   AX  3.3600   IZ  0.1577
187.  81                          PR   AX  3.3600   IZ  0.1577
 ?.   82                          PR   AX  3.3600   IZ  0.1577
 .    83                          PR   AX  3.3600   IZ  0.1577
190.  84                          PR   AX  3.3600   IZ  0.1577
191.  85                          PR   AX  3.3600   IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 12        PINNED
206. 16       FIXED BUT FX MZ
 ?. 39       FIXED BUT FX MZ
 .  40       FIXED BUT FX MZ
209. 41       FIXED BUT FX MZ
210. 42       FIXED BUT FX MZ
211. 43       FIXED BUT FX MZ
212. 44       FIXED BUT FX MZ
213. 45       FIXED BUT FX MZ
214. 46       FIXED BUT FX MZ
215. 47       FIXED BUT FX MZ
216. 48       FIXED BUT FX MZ
217. 49       FIXED BUT FX MZ
218. 50       FIXED BUT FX MZ
219. LOADING 1 PESO PROPIO
220. SELFWEIGHT   Y  -1.0
221. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 14
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 135
SIZE OF STIFFNESS MATRIX = 2835 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:41:29
++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:41:29
++ PROCESSING TRIANGULAR FACTORIZATION. 7:41:29
++ CALCULATING JOINT DISPLACEMENTS. 7:41:30
++ CALCULATING MEMBER FORCES. 7:41:30

222. LOAD LIST 1
223. PRINT MEMBER FORCES LIST 74 TO 85

MBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	4.43	0.00	0.00	0.00	5.42
		39	0.00	69.28	0.00	0.00	0.00	-76.33
75	1	39	0.00	73.59	0.00	0.00	0.00	76.33
		40	0.00	0.14	0.00	0.00	0.00	4.00
76	1	40	0.00	25.75	0.00	0.00	0.00	-4.00
		41	0.00	47.98	0.00	0.00	0.00	-20.32
77	1	41	0.00	44.61	0.00	0.00	0.00	20.32
		42	0.00	29.12	0.00	0.00	0.00	-3.38
	1	42	0.00	9.20	0.00	0.00	0.00	3.38
		43	0.00	9.17	0.00	0.00	0.00	-3.34
79	1	43	0.00	9.18	0.00	0.00	0.00	3.34
		44	0.00	9.19	0.00	0.00	0.00	-3.35
80	1	44	0.00	9.19	0.00	0.00	0.00	3.35
		45	0.00	9.19	0.00	0.00	0.00	-3.35
81	1	45	0.00	9.20	0.00	0.00	0.00	3.35
		46	0.00	9.18	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
4	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

224. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-31.80328	-0.12245	0.00000	0.00000	0.00000	0.00068
39	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00027
40	1	-31.80328	0.00000	0.00000	0.00000	0.00000	-0.00007
41	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00001
42	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00003
43	1	-31.80328	0.00000	0.00000	0.00000	0.00000	-0.00001
44	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00000
45	1	-31.80328	0.00000	0.00000	0.00000	0.00000	-0.00001
46	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-31.80328	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-31.80328	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-31.80328	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

225. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
12	1	0.00	82.45	0.00	0.00	0.00	0.00
16	1	0.00	19.03	0.00	0.00	0.00	0.00
39	1	0.00	142.87	0.00	0.00	0.00	0.00
40	1	0.00	25.88	0.00	0.00	0.00	0.00
41	1	0.00	92.59	0.00	0.00	0.00	0.00
42	1	0.00	38.32	0.00	0.00	0.00	0.00
43	1	0.00	18.36	0.00	0.00	0.00	0.00
44	1	0.00	18.38	0.00	0.00	0.00	0.00
45	1	0.00	18.39	0.00	0.00	0.00	0.00
46	1	0.00	18.33	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
`	1	0.00	7.25	0.00	0.00	0.00	0.00

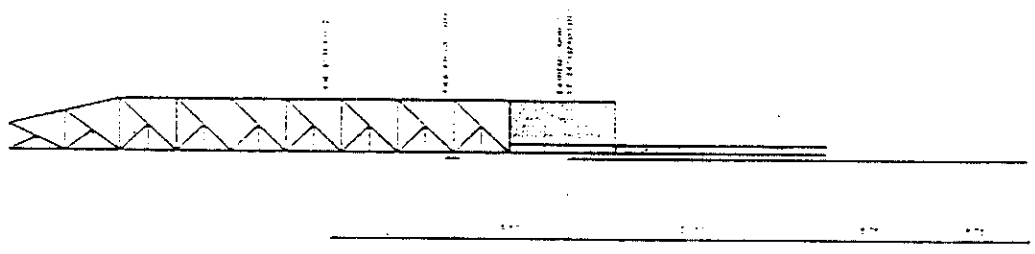
********** END OF LATEST ANALYSIS RESULT **********

226. PLOT BEND FILE
227. PLOT DISP FILE
228. FINISH

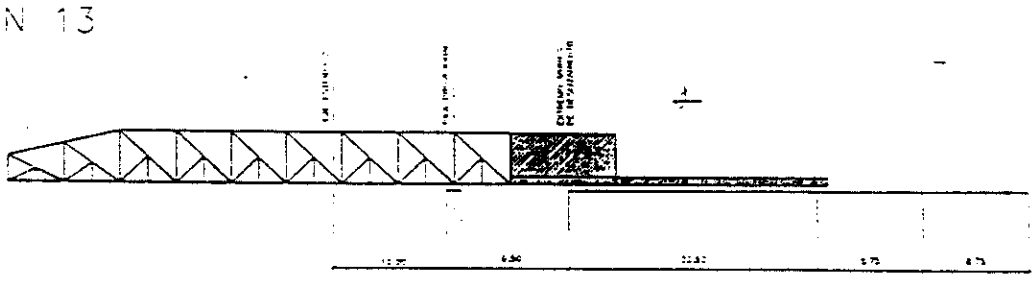
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**** DATE= JUL 1,1997 TIME= 7:41:32 ****

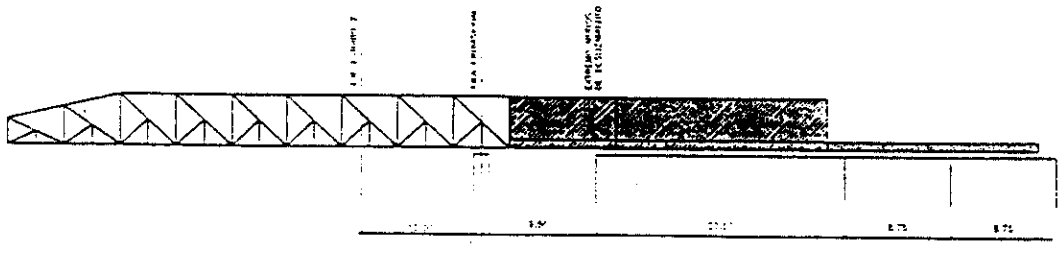
****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL:(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****



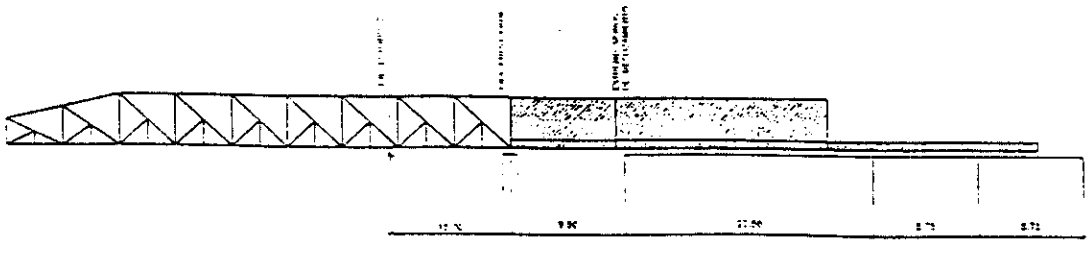
POSICION 13



POSICION 14



POSICION 15



POSICION 16

poticion 3

```
*****************************************************
*                                                   *
*           S T A A D - III                         *
*           Revision 17.0a                          *
*           Proprietary Program of                  *
*           RESEARCH ENGINEERS, Inc.                *
*           Date=    JUL  1, 1997                   *
*           Time=     8: 7: 1                       *
*                                                   *
*****************************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000  19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000  28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000  38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000  50   68.250   0.000   0.000
13. MEMBER INCIDENCES
14.  1    1    2
15.  2    2    3
16.  3    3    4
17.  4    4    5
18.  5    5    6
19.  6    6    7
20.  7    7    8
21.  8    8    9
22.  9    9   10
23. 10   10   11
24. 11   11   12
25. 12   12   13
26. 13   13   14
27. 14   14   15
28. 15   15   16
29. 16   16   17
30. 17   17   18
31. 18   18   19
32. 19   29   30
33. 20   30   31
34. 21   31   32
35. 22   32   33
36. 23   33   34
37. 24   34   35
38. 25   35   36
39. 26   36   37
40. 27   37   38
41. 28    1   29
42. 29    2   20
43. 30    3   30
44. 31    4   21
45. 32    5   31
46. 33    6   22
47. 34    7   32
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 35    8   23
49. 36    9   33
50. 37   10   24
51. 38   11   34
52. 39   12   25
53. 40   13   35
54. 41   14   26
55. 42   15   36
56. 43   16   27
57. 44   17   37
58. 45   18   28
59. 46   19   38
60. 47   29   20
61. 48   20    3
62. 49   30   21
63. 50   21    5
64. 51   31   22
65. 52   22    7
66. 53   32   23
67. 54   23    9
68. 55   33   24
69. 56   24   11
70. 57   34   25
71. 58   25   13
72. 59   35   26
73. 60   26   15
74. 61   36   27
75. 62   27   17
76. 63   37   28
77. 64   28   19
78. 65    3   21
79. 66    5   22
80. 67    7   23
81. 68    9   24
82. 69   11   25
83. 70   13   26
84. 71   15   27
85. 72   17   28
86. 73    1   20
87. 74   19   39
88. 75   39   40
89. 76   40   41
90. 77   41   42
91. 78   42   43
92. 79   43   44
93. 80   44   45
94. 81   45   46
95. 82   46   47
96. 83   47   48
97. 84   48   49
98. 85   49   50
99. MEMBER PROPERTY
100. *CORDON INFERIOR
101.  1                PR  AX  0.0500  IZ  0.00151406
102.  2                PR  AX  0.0500  IZ  0.00151406
103.  3                PR  AX  0.0532  IZ  0.00156748
104.  4                PR  AX  0.0532  IZ  0.00156748
105.  5                PR  AX  0.0670  IZ  0.00233098
106.  6                PR  AX  0.0670  IZ  0.00233098
107.  7                PR  AX  0.0750  IZ  0.00271328
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.   8                          PR   AX  0.0750   IZ  0.00271328
 ?.    9                          PR   AX  0.0900   IZ  0.00380584
.10.   10                         PR   AX  0.0900   IZ  0.00380584
111.   11                         PR   AX  0.1070   IZ  0.00464364
112.   12                         PR   AX  0.1070   IZ  0.00464364
113.   13                         PR   AX  0.1180   IZ  0.00593306
114.   14                         PR   AX  0.1180   IZ  0.00593306
115.   15                         PR   AX  0.1410   IZ  0.00804164
116.   16                         PR   AX  0.1410   IZ  0.00804164
117.   17                         PR   AX  0.1520   IZ  0.00926892
118.   18                         PR   AX  0.1520   IZ  0.00926892
119. *CORDON SUPERIOR
120.   19                         PR   AX  0.0280   IZ  0.00046454
121.   20                         PR   AX  0.0280   IZ  0.00046454
122.   21                         PR   AX  0.0280   IZ  0.00046454
123.   22                         PR   AX  0.0320   IZ  0.00072626
124.   23                         PR   AX  0.0320   IZ  0.00072626
125.   24                         PR   AX  0.0450   IZ  0.00164273
126.   25                         PR   AX  0.0600   IZ  0.00261476
127.   26                         PR   AX  0.0720   IZ  0.00316788
 ?.    27                         PR   AX  0.0840   IZ  0.00380920
 ?. *MONTANTES PRINCIPALES
130.   28                         PR   AX  0.0068   IZ  0.00000001
131.   30                         PR   AX  0.0082   IZ  0.00000001
132.   32                         PR   AX  0.0148   IZ  0.00000001
133.   34                         PR   AX  0.0212   IZ  0.00000001
134.   36                         PR   AX  0.0298   IZ  0.00000001
135.   38                         PR   AX  0.0298   IZ  0.00000001
136.   40                         PR   AX  0.0398   IZ  0.00000001
137.   42                         PR   AX  0.0498   IZ  0.00000001
138.   44                         PR   AX  0.0578   IZ  0.00000001
139.   46                         PR   AX  0.0578   IZ  10000.0000
140. *MONTANTES SECUNDARIOS
141.   29                         PR   AX  0.0068   IZ  0.00000001
142.   31                         PR   AX  0.0068   IZ  0.00000001
143.   33                         PR   AX  0.0068   IZ  0.00000001
144.   35                         PR   AX  0.0096   IZ  0.00000001
145.   37                         PR   AX  0.0112   IZ  0.00000001
146.   39                         PR   AX  0.0128   IZ  0.00000001
 ?.    41                         PR   AX  0.0168   IZ  0.00000001
 ?.    43                         PR   AX  0.0192   IZ  0.00000001
149.   45                         PR   AX  0.0298   IZ  0.00000001
150. *DIAGONALES 1
151.   47                         PR   AX  0.0068   IZ  0.00001456
152.   48                         PR   AX  0.0068   IZ  0.00001456
153.   49                         PR   AX  0.0096   IZ  0.00003700
154.   50                         PR   AX  0.0096   IZ  0.00003700
155.   51                         PR   AX  0.0128   IZ  0.00007640
156.   52                         PR   AX  0.0128   IZ  0.00007640
157.   53                         PR   AX  0.0212   IZ  0.00025120
158.   54                         PR   AX  0.0212   IZ  0.00025120
159.   55                         PR   AX  0.0298   IZ  0.00025166
160.   56                         PR   AX  0.0298   IZ  0.00025166
161.   57                         PR   AX  0.0398   IZ  0.00037183
162.   58                         PR   AX  0.0398   IZ  0.00037183
163.   59                         PR   AX  0.0498   IZ  0.00050799
164.   60                         PR   AX  0.0498   IZ  0.00050799
165.   61                         PR   AX  0.0578   IZ  0.00061053
 ?.    62                         PR   AX  0.0578   IZ  0.00061053
 ?.    63                         PR   AX  0.0648   IZ  0.00071462
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.   64                         PR   AX  0.0648   IZ  0.00071462
 ?. *DIAGONALES 2
 ?.    65                         PR   AX  0.0068   IZ  0.00000001
171.   66                         PR   AX  0.0068   IZ  0.00000001
172.   67                         PR   AX  0.0068   IZ  0.00000001
173.   68                         PR   AX  0.0056   IZ  0.00000001
174.   69                         PR   AX  0.0056   IZ  0.00000001
175.   70                         PR   AX  0.0150   IZ  0.00000001
176.   71                         PR   AX  0.0150   IZ  0.00000001
177.   72                         PR   AX  0.0193   IZ  0.00000001
178.   73                         PR   AX  0.0068   IZ  0.00000001
179. *SECCION DE HORMIGON
180.   74                         PR   AX 13.4810   IZ 45.3025
181.   75                         PR   AX 13.4810   IZ 45.3025
182.   76                         PR   AX 13.4810   IZ 45.3025
183.   77                         PR   AX 13.4810   IZ 45.3025
184.   78                         PR   AX  3.3600   IZ  0.1577
185.   79                         PR   AX  3.3600   IZ  0.1577
186.   80                         PR   AX  3.3600   IZ  0.1577
187.   81                         PR   AX  3.3600   IZ  0.1577
 ?.    82                         PR   AX  3.3600   IZ  0.1577
 ?.    83                         PR   AX  3.3600   IZ  0.1577
190.   84                         PR   AX  3.3600   IZ  0.1577
191.   85                         PR   AX  3.3600   IZ  0.1577
192. MEMBER RELEASES
193. 29 TO 46 65 TO 73 START MZ
194. 29 TO 46 65 TO 73  END   MZ
195. 47 49 51 53 55 57 59 61 63 START MZ
196. 48 50 52 54 56 58 60 62 64 END MZ
197. CONSTANTS
198. E   21000.  MEM  1  TO  73
199. DEN 10.15       MEM  1  TO  73
200. POISSON  0.15  MEM  1  TO  73
201. E    3250.  MEM  74 TO  85
202. DEN  2.50       MEM  74 TO  85
203. POISSON  0.20  MEM  74 TO  85
204. SUPPORTS
205. 13       PINNED
206. 17       FIXED BUT FX MZ
 ?. 40       FIXED BUT FX MZ
 ?. *41       FIXED BUT FX MZ
209. 42       FIXED BUT FX MZ
210. 43       FIXED BUT FX MZ
211. 44       FIXED BUT FX MZ
212. 45       FIXED BUT FX MZ
213. 46       FIXED BUT FX MZ
214. 47       FIXED BUT FX MZ
215. 48       FIXED BUT FX MZ
216. 49       FIXED BUT FX MZ
217. 50       FIXED BUT FX MZ
218. LOADING 1 PESO PROPIO
219. SELFWEIGHT   Y  -1.0
220. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 50/ 85/ 12
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 137
SIZE OF STIFFNESS MATRIX = 2877 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.17 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8: 7: 5
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8: 7: 5
++ PROCESSING TRIANGULAR FACTORIZATION. 8: 7: 5
++ CALCULATING JOINT DISPLACEMENTS. 8: 7: 5
++ CALCULATING MEMBER FORCES. 8: 7: 5

221. LOAD LIST 1
222. PRINT MEMBER FORCES LIST 74 TO 85

...MBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	15.64	0.00	0.00	0.00	-1.74
		39	0.00	58.07	0.00	0.00	0.00	-44.64
75	1	39	0.00	-58.06	0.00	0.00	0.00	44.64
		40	0.00	131.79	0.00	0.00	0.00	-252.30
76	1	40	0.00	130.72	0.00	0.00	0.00	252.30
		41	0.00	-56.99	0.00	0.00	0.00	-46.99
77	1	41	0.00	56.99	0.00	0.00	0.00	46.99
		42	0.00	16.74	0.00	0.00	0.00	-2.96
	1	42	0.00	8.96	0.00	0.00	0.00	2.96
		43	0.00	9.41	0.00	0.00	0.00	-3.45
79	1	43	0.00	9.25	0.00	0.00	0.00	3.45
		44	0.00	9.13	0.00	0.00	0.00	-3.32
80	1	44	0.00	9.17	0.00	0.00	0.00	3.32
		45	0.00	9.21	0.00	0.00	0.00	-3.36
81	1	45	0.00	9.20	0.00	0.00	0.00	3.36
		46	0.00	9.17	0.00	0.00	0.00	-3.33
82	1	46	0.00	9.15	0.00	0.00	0.00	3.33
		47	0.00	9.23	0.00	0.00	0.00	-3.41
83	1	47	0.00	9.33	0.00	0.00	0.00	3.41
		48	0.00	9.05	0.00	0.00	0.00	-3.11
	1	48	0.00	8.67	0.00	0.00	0.00	3.11
		49	0.00	9.71	0.00	0.00	0.00	-4.25
85	1	49	0.00	11.13	0.00	0.00	0.00	4.25
		50	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

223. PRINT JOI DIS LIST 19 39 TO 50

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-33.71178	-1.49022	0.00000	0.00000	0.00000	0.00384
39	1	-33.71178	-0.65082	0.00000	0.00000	0.00000	0.00372
40	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00171
41	1	-33.71178	0.09820	0.00000	0.00000	0.00000	-0.00031
42	1	-33.71178	0.00000	0.00000	0.00000	0.00000	-0.00048
43	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00013
44	1	-33.71178	0.00000	0.00000	0.00000	0.00000	-0.00003
45	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00000
46	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00002
47	1	-33.71178	0.00000	0.00000	0.00000	0.00000	-0.00008
48	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00030
49	1	-33.71178	0.00000	0.00000	0.00000	0.00000	-0.00111
50	1	-33.71178	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

224. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
13	1	0.00	102.98	0.00	0.00	0.00	0.00
17	1	0.00	9.71	0.00	0.00	0.00	0.00
40	1	0.00	262.51	0.00	0.00	0.00	0.00
42	1	0.00	25.70	0.00	0.00	0.00	0.00
43	1	0.00	18.66	0.00	0.00	0.00	0.00
44	1	0.00	18.30	0.00	0.00	0.00	0.00
45	1	0.00	18.41	0.00	0.00	0.00	0.00
46	1	0.00	18.32	0.00	0.00	0.00	0.00
47	1	0.00	18.55	0.00	0.00	0.00	0.00
48	1	0.00	17.72	0.00	0.00	0.00	0.00
49	1	0.00	20.84	0.00	0.00	0.00	0.00
50	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

225. PLOT BEND FILE
226. PLOT DISP FILE
227. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 8: 7: 8 ****

****
* 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 *
****

Posicion 14


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*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  1, 1997            *
*          Time=     8:34: 3                 *
*                                           *
*********************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5. 1 0.000 0.000 0.000 19 42.000 0.000 0.000
6. 20 2.333 1.0625 0.000
7. 21 6.999 1.59375 0.000
8. 22 11.666 2.125 0.000 28 39.666 2.125 0.000
9. 29 0.000 2.125 0.000
10. 30 4.666 3.1875 0.000
11. 31 9.333 4.250 0.000 38 42.000 4.250 0.000
12. 39 44.187 0.000 0.000 50 68.250 0.000 0.000
13. 51 70.437 0.000 0.000 58 85.75 0.000 0.000
14. MEMBER INCIDENCES
15. 1 1 2
16. 2 2 3
17. 3 3 4
18. 4 4 5
19. 5 5 6
20. 6 6 7
21. 7 7 8
22. 8 8 9
23. 9 9 10
24. 10 10 11
25. 11 11 12
26. 12 12 13
27. 13 13 14
28. 14 14 15
29. 15 15 16
30. 16 16 17
31. 17 17 18
32. 18 18 19
33. 19 29 30
34. 20 30 31
35. 21 31 32
36. 22 32 33
37. 23 33 34
38. 24 34 35
39. 25 35 36
40. 26 36 37
41. 27 37 38
42. 28 1 29
43. 29 2 20
44. 30 3 30
45. 31 4 21
46. 32 5 31
47. 33 6 22

48. 34 7 32
49. 35 8 23
50. 36 9 33
51. 37 10 24
52. 38 11 34
53. 39 12 25
54. 40 13 35
55. 41 14 26
56. 42 15 36
57. 43 16 27
58. 44 17 37
59. 45 18 28
60. 46 19 38
61. 47 29 20
62. 48 20 3
63. 49 30 21
64. 50 21 5
65. 51 31 22
66. 52 22 7
67. 53 32 23
68. 54 23 9
69. 55 33 24
70. 56 24 11
71. 57 34 25
72. 58 25 13
73. 59 35 26
74. 60 26 15
75. 61 36 27
76. 62 27 17
77. 63 37 28
78. 64 28 19
79. 65 3 21
80. 66 5 22
81. 67 7 23
82. 68 9 24
83. 69 11 25
84. 70 13 26
85. 71 15 27
86. 72 17 28
87. 73 1 20
88. 74 19 39
89. 75 39 40
90. 76 40 41
91. 77 41 42
92. 78 42 43
93. 79 43 44
94. 80 44 45
95. 81 45 46
96. 82 46 47
97. 83 47 48
98. 84 48 49
99. 85 49 50
100. 86 50 51
101. 87 51 52
102. 88 52 53
103. 89 53 54
104. 90 54 55
105. 91 55 56
106. 92 56 57
107. 93 57 58

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108. MEMBER PROPERTY
 ?9. *CORDON INFERIOR
 ?.   1                          PR  AX  0.0500  IZ  0.00151406
111.  2                          PR  AX  0.0500  IZ  0.00151406
112.  3                          PR  AX  0.0532  IZ  0.00156748
113.  4                          PR  AX  0.0532  IZ  0.00156748
114.  5                          PR  AX  0.0670  IZ  0.00233098
115.  6                          PR  AX  0.0670  IZ  0.00233098
116.  7                          PR  AX  0.0750  IZ  0.00271328
117.  8                          PR  AX  0.0750  IZ  0.00271328
118.  9                          PR  AX  0.0900  IZ  0.00380584
119.  10                         PR  AX  0.0900  IZ  0.00380584
120.  11                         PR  AX  0.1070  IZ  0.00464364
121.  12                         PR  AX  0.1070  IZ  0.00464364
122.  13                         PR  AX  0.1180  IZ  0.00593306
123.  14                         PR  AX  0.1180  IZ  0.00593306
124.  15                         PR  AX  0.1410  IZ  0.00804164
125.  16                         PR  AX  0.1410  IZ  0.00804164
126.  17                         PR  AX  0.1520  IZ  0.00926892
127.  18                         PR  AX  0.1520  IZ  0.00926892
 ?8. *CORDON SUPERIOR
 ?.   19                         PR  AX  0.0280  IZ  0.00046454
130.  20                         PR  AX  0.0280  IZ  0.00046454
131.  21                         PR  AX  0.0280  IZ  0.00046454
132.  22                         PR  AX  0.0320  IZ  0.00072626
133.  23                         PR  AX  0.0320  IZ  0.00072626
134.  24                         PR  AX  0.0450  IZ  0.00164273
135.  25                         PR  AX  0.0600  IZ  0.00261476
136.  26                         PR  AX  0.0720  IZ  0.00316788
137.  27                         PR  AX  0.0840  IZ  0.00380920
138. *MONTANTES PRINCIPALES
139.  28                         PR  AX  0.0068  IZ  0.00000001
140.  30                         PR  AX  0.0082  IZ  0.00000001
141.  32                         PR  AX  0.0148  IZ  0.00000001
142.  34                         PR  AX  0.0212  IZ  0.00000001
143.  36                         PR  AX  0.0298  IZ  0.00000001
144.  38                         PR  AX  0.0298  IZ  0.00000001
145.  40                         PR  AX  0.0398  IZ  0.00000001
146.  42                         PR  AX  0.0498  IZ  0.00000001
 47.  44                         PR  AX  0.0578  IZ  0.00000001
 ).   46                         PR  AX  0.0578  IZ  10000.0000
149. *MONTANTES SECUNDARIOS
150.  29                         PR  AX  0.0068  IZ  0.00000001
151.  31                         PR  AX  0.0068  IZ  0.00000001
152.  33                         PR  AX  0.0068  IZ  0.00000001
153.  35                         PR  AX  0.0096  IZ  0.00000001
154.  37                         PR  AX  0.0112  IZ  0.00000001
155.  39                         PR  AX  0.0128  IZ  0.00000001
156.  41                         PR  AX  0.0168  IZ  0.00000001
157.  43                         PR  AX  0.0192  IZ  0.00000001
158.  45                         PR  AX  0.0298  IZ  0.00000001
159. *DIAGONALES 1
160.  47                         PR  AX  0.0068  IZ  0.00001456
161.  48                         PR  AX  0.0068  IZ  0.00001456
162.  49                         PR  AX  0.0096  IZ  0.00003700
163.  50                         PR  AX  0.0096  IZ  0.00003700
164.  51                         PR  AX  0.0128  IZ  0.00007640
165.  52                         PR  AX  0.0128  IZ  0.00007640
 ?6.  53                         PR  AX  0.0212  IZ  0.00025120
 7.   54                         PR  AX  0.0212  IZ  0.00025120
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  55                         PR  AX  0.0298  IZ  0.00025166
 ..   56                         PR  AX  0.0298  IZ  0.00025166
 ..   57                         PR  AX  0.0398  IZ  0.00037183
171.  58                         PR  AX  0.0398  IZ  0.00037183
172.  59                         PR  AX  0.0498  IZ  0.00050799
173.  60                         PR  AX  0.0498  IZ  0.00050799
174.  61                         PR  AX  0.0578  IZ  0.00061053
175.  62                         PR  AX  0.0578  IZ  0.00061053
176.  63                         PR  AX  0.0648  IZ  0.00071462
177.  64                         PR  AX  0.0648  IZ  0.00071462
178. *DIAGONALES 2
179.  65                         PR  AX  0.0068  IZ  0.00000001
180.  66                         PR  AX  0.0068  IZ  0.00000001
181.  67                         PR  AX  0.0068  IZ  0.00000001
182.  68                         PR  AX  0.0056  IZ  0.00000001
183.  69                         PR  AX  0.0056  IZ  0.00000001
184.  70                         PR  AX  0.0150  IZ  0.00000001
185.  71                         PR  AX  0.0150  IZ  0.00000001
186.  72                         PR  AX  0.0193  IZ  0.00000001
187.  73                         PR  AX  0.0068  IZ  0.00000001
 9. *SECCION DE HORMIGON
 ..   74                         PR  AX 13.4810  IZ 45.3025
190.  75                         PR  AX 13.4810  IZ 45.3025
191.  76                         PR  AX 13.4810  IZ 45.3025
192.  77                         PR  AX 13.4810  IZ 45.3025
193.  78                         PR  AX 13.4810  IZ 45.3025
194.  79                         PR  AX 13.4810  IZ 45.3025
195.  80                         PR  AX 13.4810  IZ 45.3025
196.  81                         PR  AX 13.4810  IZ 45.3025
197.  82                         PR  AX 13.4810  IZ 45.3025
198.  83                         PR  AX 13.4810  IZ 45.3025
199.  84                         PR  AX 13.4810  IZ 45.3025
200.  85                         PR  AX 13.4810  IZ 45.3025
201.  86                         PR  AX  3.3600  IZ  0.1577
202.  87                         PR  AX  3.3600  IZ  0.1577
203.  88                         PR  AX  3.3600  IZ  0.1577
204.  89                         PR  AX  3.3600  IZ  0.1577
205.  90                         PR  AX  3.3600  IZ  0.1577
206.  91                         PR  AX  3.3600  IZ  0.1577
 ?7.  92                         PR  AX  3.3600  IZ  0.1577
 3.   93                         PR  AX  3.3600  IZ  0.1577
209. MEMBER RELEASES
210. 29 TO 46 65 TO 73 START MZ
211. 29 TO 46 65 TO 73  END   MZ
212. 47 49 51 53 55 57 59 61 63 START MZ
213. 48 50 52 54 56 58 60 62 64 END MZ
214. CONSTANTS
215. E   21000.  MEM  1  TO  73
216. DEN 10.15       MEM  1  TO  73
217. POISSON  0.15  MEM  1  TO  73
218. E    3250.  MEM  74 TO  93
219. DEN  2.50       MEM  74 TO  93
220. POISSON  0.20  MEM  74 TO  93
221. SUPPORTS
222. 14       PINNED
223. 18       FIXED BUT FX MZ
224. 41       FIXED BUT FX MZ
225. *42       FIXED BUT FX MZ
 5.  *43       FIXED BUT FX MZ
 27. 44       FIXED BUT FX MZ
```

```
228. 45      FIXED BUT FX MZ
229. 46      FIXED BUT FX MZ
230. 47      FIXED BUT FX MZ
231. 48      FIXED BUT FX MZ
232. 49      FIXED BUT FX MZ
233. 50      FIXED BUT FX MZ
234. 51      FIXED BUT FX MZ
235. 52      FIXED BUT FX MZ
236. 53      FIXED BUT FX MZ
237. 54      FIXED BUT FX MZ
238. 55      FIXED BUT FX MZ
239. 56      FIXED BUT FX MZ
240. 57      FIXED BUT FX MZ
241. 58      FIXED BUT FX MZ
242. LOADING 1 PESO PROPIO
243. SELFWEIGHT   Y  -1.0
244. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

```
 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    58/   93/   18
 ORIGINAL/FINAL BAND-WIDTH =   28/    6
 TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   155
 SIZE OF STIFFNESS MATRIX =    3255 DOUBLE PREC. WORDS
 TOTAL REQUIRED DISK SPACE =   12.19 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX.            8:34: 7
++ PROCESSING GLOBAL STIFFNESS MATRIX.             8:34: 7
++ PROCESSING TRIANGULAR FACTORIZATION.            8:34: 8
++ CALCULATING JOINT DISPLACEMENTS.                8:34: 8
++ CALCULATING MEMBER  FORCES.                     8:34: 8

245. LOAD LIST 1
246. PRINT MEMBER FORCES LIST 74 TO 93
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	45.98	0.00	0.00	0.00	-12.43
		39	0.00	27.73	0.00	0.00	0.00	32.38
75	1	39	0.00	-27.73	0.00	0.00	0.00	-32.38
		40	0.00	101.45	0.00	0.00	0.00	-108.91
76	1	40	0.00	-101.45	0.00	0.00	0.00	108.91
		41	0.00	175.18	0.00	0.00	0.00	-411.49
77	1	41	0.00	175.71	0.00	0.00	0.00	411.49
		42	0.00	-101.98	0.00	0.00	0.00	-107.77
	1	42	0.00	101.98	0.00	0.00	0.00	107.77
		43	0.00	-28.25	0.00	0.00	0.00	34.68
79	1	43	0.00	28.25	0.00	0.00	0.00	-34.68
		44	0.00	45.47	0.00	0.00	0.00	15.85
80	1	44	0.00	19.88	0.00	0.00	0.00	-15.85
		45	0.00	53.85	0.00	0.00	0.00	-21.30
81	1	45	0.00	41.44	0.00	0.00	0.00	21.30
		46	0.00	32.28	0.00	0.00	0.00	-11.29
82	1	46	0.00	35.53	0.00	0.00	0.00	11.29
		47	0.00	38.19	0.00	0.00	0.00	-14.20
83	1	47	0.00	37.61	0.00	0.00	0.00	14.20
		48	0.00	36.12	0.00	0.00	0.00	-12.57
	1	48	0.00	35.22	0.00	0.00	0.00	12.57
		49	0.00	38.51	0.00	0.00	0.00	-16.17
85	1	49	0.00	42.71	0.00	0.00	0.00	16.17
		50	0.00	31.02	0.00	0.00	0.00	-3.38
86	1	50	0.00	9.20	0.00	0.00	0.00	3.38
		51	0.00	9.17	0.00	0.00	0.00	-3.34
87	1	51	0.00	9.18	0.00	0.00	0.00	3.34
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.19	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.23	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

247. PRINT JOI DIS LIST 19 39 TO 58

INT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-36.60998	-4.34817	0.00000	0.00000	0.00000	0.00680
39	1	-36.60998	-2.80751	0.00000	0.00000	0.00000	0.00734
40	1	-36.60998	-1.20495	0.00000	0.00000	0.00000	0.00697
41	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00330
42	1	-36.60998	0.23961	0.00000	0.00000	0.00000	-0.00036
43	1	-36.60998	0.08528	0.00000	0.00000	0.00000	-0.00070
44	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00013
45	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00003
46	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00001
47	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00000
48	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00000
49	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00001
50	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00004
1	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00001
2	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00001
53	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	-36.60998	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	-36.60998	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

248. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
14	1	0.00	124.71	0.00	0.00	0.00	0.00
18	1	0.00	18.32	0.00	0.00	0.00	0.00
41	1	0.00	350.89	0.00	0.00	0.00	0.00
44	1	0.00	65.35	0.00	0.00	0.00	0.00
45	1	0.00	95.29	0.00	0.00	0.00	0.00
46	1	0.00	67.82	0.00	0.00	0.00	0.00
47	1	0.00	75.80	0.00	0.00	0.00	0.00
48	1	0.00	71.33	0.00	0.00	0.00	0.00
49	1	0.00	81.22	0.00	0.00	0.00	0.00
50	1	0.00	40.22	0.00	0.00	0.00	0.00
51	1	0.00	18.35	0.00	0.00	0.00	0.00
52	1	0.00	18.38	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

249. PLOT BEND FILE
250. PLOT DISP FILE
251. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 8:34:10 ****

****
* 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 *
****

Portico 16


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*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  1, 1997            *
*          Time=     8:59:42                 *
*                                           *
*********************************************
```

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5. 1 0.000 0.000 0.000 19 42.000 0.000 0.000
6. 20 2.333 1.0625 0.000
7. 21 6.999 1.59375 0.000
8. 22 11.666 2.125 0.000 28 39.666 2.125 0.000
9. 29 0.000 2.125 0.000
10. 30 4.666 3.1875 0.000
11. 31 9.333 4.250 0.000 38 42.000 4.250 0.000
12. 39 44.187 0.000 0.000 50 68.250 0.000 0.000
13. 51 70.437 0.000 0.000 58 85.75 0.000 0.000
14. MEMBER INCIDENCES
15. 1 1 2
16. 2 2 3
17. 3 3 4
18. 4 4 5
19. 5 5 6
20. 6 6 7
21. 7 7 8
22. 8 8 9
23. 9 9 10
24. 10 10 11
25. 11 11 12
26. 12 12 13
27. 13 13 14
28. 14 14 15
29. 15 15 16
30. 16 16 17
31. 17 17 18
32. 18 18 19
33. 19 29 30
34. 20 30 31
35. 21 31 32
36. 22 32 33
37. 23 33 34
38. 24 34 35
39. 25 35 36
40. 26 36 37
41. 27 37 38
42. 28 1 29
43. 29 2 20
44. 30 3 30
45. 31 4 21
46. 32 5 31
47. 33 6 22

48. 34 7 32
49. 35 8 23
50. 36 9 33
51. 37 10 24
52. 38 11 34
53. 39 12 25
54. 40 13 35
55. 41 14 26
56. 42 15 36
57. 43 16 27
58. 44 17 37
59. 45 18 28
60. 46 19 38
61. 47 29 20
62. 48 20 3
63. 49 30 21
64. 50 21 5
65. 51 31 22
66. 52 22 7
67. 53 32 23
68. 54 23 9
69. 55 33 24
70. 56 24 11
71. 57 34 25
72. 58 25 13
73. 59 35 26
74. 60 26 15
75. 61 36 27
76. 62 27 17
77. 63 37 28
78. 64 28 19
79. 65 3 21
80. 66 5 22
81. 67 7 23
82. 68 9 24
83. 69 11 25
84. 70 13 26
85. 71 15 27
86. 72 17 28
87. 73 1 20
88. 74 19 39
89. 75 39 40
90. 76 40 41
91. 77 41 42
92. 78 42 43
93. 79 43 44
94. 80 44 45
95. 81 45 46
96. 82 46 47
97. 83 47 48
98. 84 48 49
99. 85 49 50
100. 86 50 51
101. 87 51 52
102. 88 52 53
103. 89 53 54
104. 90 54 55
105. 91 55 56
106. 92 56 57
107. 93 57 58

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
 106. MEMBER PROPERTY
   ?. *CORDON INFERIOR
  10.   1                    PR  AX  0.0500  IZ  0.00151406
 111.   2                    PR  AX  0.0500  IZ  0.00151406
 112.   3                    PR  AX  0.0532  IZ  0.00156748
 113.   4                    PR  AX  0.0532  IZ  0.00156748
 114.   5                    PR  AX  0.0670  IZ  0.00233098
 115.   6                    PR  AX  0.0670  IZ  0.00233098
 116.   7                    PR  AX  0.0750  IZ  0.00271328
 117.   8                    PR  AX  0.0750  IZ  0.00271328
 118.   9                    PR  AX  0.0900  IZ  0.00380584
 119.  10                    PR  AX  0.0900  IZ  0.00380584
 120.  11                    PR  AX  0.1070  IZ  0.00464364
 121.  12                    PR  AX  0.1070  IZ  0.00464364
 122.  13                    PR  AX  0.1180  IZ  0.00593306
 123.  14                    PR  AX  0.1180  IZ  0.00593306
 124.  15                    PR  AX  0.1410  IZ  0.00804164
 125.  16                    PR  AX  0.1410  IZ  0.00804164
 126.  17                    PR  AX  0.1520  IZ  0.00926892
 127.  18                    PR  AX  0.1520  IZ  0.00926892
   ?. *CORDON SUPERIOR
  ?.  19                    PR  AX  0.0280  IZ  0.00046454
 130.  20                    PR  AX  0.0280  IZ  0.00046454
 131.  21                    PR  AX  0.0280  IZ  0.00046454
 132.  22                    PR  AX  0.0320  IZ  0.00072626
 133.  23                    PR  AX  0.0320  IZ  0.00072626
 134.  24                    PR  AX  0.0450  IZ  0.00164273
 135.  25                    PR  AX  0.0600  IZ  0.00261476
 136.  26                    PR  AX  0.0720  IZ  0.00316788
 137.  27                    PR  AX  0.0840  IZ  0.00380920
 138. *MONTANTES PRINCIPALES
 139.  28                    PR  AX  0.0068  IZ  0.00000001
 140.  30                    PR  AX  0.0082  IZ  0.00000001
 141.  32                    PR  AX  0.0148  IZ  0.00000001
 142.  34                    PR  AX  0.0212  IZ  0.00000001
 143.  36                    PR  AX  0.0298  IZ  0.00000001
 144.  38                    PR  AX  0.0298  IZ  0.00000001
 145.  40                    PR  AX  0.0398  IZ  0.00000001
 146.  42                    PR  AX  0.0498  IZ  0.00000001
   ?.  44                    PR  AX  0.0578  IZ  0.00000001
   J.  46                    PR  AX  0.0578  IZ  10000.0000
 149. *MONTANTES SECUNDARIOS
 150.  29                    PR  AX  0.0068  IZ  0.00000001
 151.  31                    PR  AX  0.0068  IZ  0.00000001
 152.  33                    PR  AX  0.0068  IZ  0.00000001
 153.  35                    PR  AX  0.0096  IZ  0.00000001
 154.  37                    PR  AX  0.0112  IZ  0.00000001
 155.  39                    PR  AX  0.0128  IZ  0.00000001
 156.  41                    PR  AX  0.0168  IZ  0.00000001
 157.  43                    PR  AX  0.0192  IZ  0.00000001
 158.  45                    PR  AX  0.0298  IZ  0.00000001
 159. *DIAGONALES 1
 160.  47                    PR  AX  0.0068  IZ  0.00001456
 161.  48                    PR  AX  0.0068  IZ  0.00001456
 162.  49                    PR  AX  0.0096  IZ  0.00003700
 163.  50                    PR  AX  0.0096  IZ  0.00003700
 164.  51                    PR  AX  0.0128  IZ  0.00007640
 165.  52                    PR  AX  0.0128  IZ  0.00007640
     .  53                    PR  AX  0.0212  IZ  0.00025120
 ...7.  54                    PR  AX  0.0212  IZ  0.00025120
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
 168.  55                    PR  AX  0.0298  IZ  0.00025166
   ?.  56                    PR  AX  0.0298  IZ  0.00025166
  ..0.  57                    PR  AX  0.0398  IZ  0.00037183
 171.  58                    PR  AX  0.0398  IZ  0.00037183
 172.  59                    PR  AX  0.0498  IZ  0.00050799
 173.  60                    PR  AX  0.0498  IZ  0.00050799
 174.  61                    PR  AX  0.0578  IZ  0.00061053
 175.  62                    PR  AX  0.0578  IZ  0.00061053
 176.  63                    PR  AX  0.0648  IZ  0.00071462
 177.  64                    PR  AX  0.0648  IZ  0.00071462
 178. *DIAGONALES 2
 179.  65                    PR  AX  0.0068  IZ  0.00000001
 180.  66                    PR  AX  0.0068  IZ  0.00000001
 181.  67                    PR  AX  0.0068  IZ  0.00000001
 182.  68                    PR  AX  0.0056  IZ  0.00000001
 183.  69                    PR  AX  0.0056  IZ  0.00000001
 184.  70                    PR  AX  0.0150  IZ  0.00000001
 185.  71                    PR  AX  0.0150  IZ  0.00000001
 186.  72                    PR  AX  0.0193  IZ  0.00000001
 187.  73                    PR  AX  0.0068  IZ  0.00000001
   ?. *SECCION DE HORMIGON
  ?.  74                    PR  AX 13.4810  IZ 45.3025
 190.  75                    PR  AX 13.4810  IZ 45.3025
 191.  76                    PR  AX 13.4810  IZ 45.3025
 192.  77                    PR  AX 13.4810  IZ 45.3025
 193.  78                    PR  AX 13.4810  IZ 45.3025
 194.  79                    PR  AX 13.4810  IZ 45.3025
 195.  80                    PR  AX 13.4810  IZ 45.3025
 196.  81                    PR  AX 13.4810  IZ 45.3025
 197.  82                    PR  AX 13.4810  IZ 45.3025
 198.  83                    PR  AX 13.4810  IZ 45.3025
 199.  84                    PR  AX 13.4810  IZ 45.3025
 200.  85                    PR  AX 13.4810  IZ 45.3025
 201.  86                    PR  AX  3.3600  IZ  0.1577
 202.  87                    PR  AX  3.3600  IZ  0.1577
 203.  88                    PR  AX  3.3600  IZ  0.1577
 204.  89                    PR  AX  3.3600  IZ  0.1577
 205.  90                    PR  AX  3.3600  IZ  0.1577
 206.  91                    PR  AX  3.3600  IZ  0.1577
   ?.  92                    PR  AX  3.3600  IZ  0.1577
   J.  93                    PR  AX  3.3600  IZ  0.1577
 209. MEMBER RELEASES
 210. 29 TO 46 65 TO 73 START MZ
 211. 29 TO 46 65 TO 73  END   MZ
 212. 47 49 51 53 55 57 59 61 63 START MZ
 213. 48 50 52 54 56 58 60 62 64 END MZ
 214. CONSTANTS
 215. E   21000.  MEM  1  TO  73
 216. DEN 10.15      MEM  1  TO  73
 217. POISSON  0.15  MEM  1  TO  73
 218. E    3250.  MEM  74 TO  93
 219. DEN  2.50      MEM  74 TO  93
 220. POISSON  0.20  MEM  74 TO  93
 221. SUPPORTS
 222. 15      PINNED
 223. 19      FIXED BUT FX MZ
 224. 42      FIXED BUT FX MZ
 225. *43      FIXED BUT FX MZ
   ?. 44      FIXED BUT FX MZ
 ...7. 45      FIXED BUT FX MZ
```

228. 46 FIXED BUT FX MZ
229. 47 FIXED BUT FX MZ
230. 48 FIXED BUT FX MZ
231. 49 FIXED BUT FX MZ
232. 50 FIXED BUT FX MZ
233. 51 FIXED BUT FX MZ
234. 52 FIXED BUT FX MZ
235. 53 FIXED BUT FX MZ
236. 54 FIXED BUT FX MZ
237. 55 FIXED BUT FX MZ
238. 56 FIXED BUT FX MZ
239. 57 FIXED BUT FX MZ
240. 58 FIXED BUT FX MZ
241. LOADING 1 PESO PROPIO
242. SELFWEIGHT Y -1.0
243. PERFORM ANALISIS

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 58/ 93/ 18
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 155
SIZE OF STIFFNESS MATRIX = 3255 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.19 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8:59:46
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8:59:46
++ PROCESSING TRIANGULAR FACTORIZATION. 8:59:47
++ CALCULATING JOINT DISPLACEMENTS. 8:59:47
++ CALCULATING MEMBER FORCES. 8:59:47

244. LOAD LIST 1
245. PRINT MEMBER FORCES LIST 74 TO 93

..EMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	117.89	0.00	0.00	0.00	-9.16
		39	0.00	-44.19	0.00	0.00	0.00	186.39
75	1	39	0.00	44.19	0.00	0.00	0.00	-186.39
		40	0.00	29.54	0.00	0.00	0.00	202.41
76	1	40	0.00	-29.54	0.00	0.00	0.00	-202.41
		41	0.00	103.27	0.00	0.00	0.00	57.15
77	1	41	0.00	-103.27	0.00	0.00	0.00	-57.15
		42	0.00	176.99	0.00	0.00	0.00	-249.38
78	1	42	0.00	136.83	0.00	0.00	0.00	249.38
		43	0.00	-63.10	0.00	0.00	0.00	-30.71
79	1	43	0.00	63.10	0.00	0.00	0.00	30.71
		44	0.00	10.63	0.00	0.00	0.00	26.68
80	1	44	0.00	13.60	0.00	0.00	0.00	-26.68
		45	0.00	60.12	0.00	0.00	0.00	-24.20
81	1	45	0.00	43.12	0.00	0.00	0.00	24.20
		46	0.00	30.60	0.00	0.00	0.00	-10.51
82	1	46	0.00	35.08	0.00	0.00	0.00	10.51
		47	0.00	38.65	0.00	0.00	0.00	-14.40
83	1	47	0.00	37.73	0.00	0.00	0.00	14.40
		48	0.00	36.00	0.00	0.00	0.00	-12.51
84	1	48	0.00	35.18	0.00	0.00	0.00	12.51
		49	0.00	38.54	0.00	0.00	0.00	-16.19
85	1	49	0.00	42.72	0.00	0.00	0.00	16.19
		50	0.00	31.01	0.00	0.00	0.00	-3.38
86	1	50	0.00	9.20	0.00	0.00	0.00	3.38
		51	0.00	9.17	0.00	0.00	0.00	-3.34
87	1	51	0.00	9.18	0.00	0.00	0.00	3.34
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.19	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

..EMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.23	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

246. PRINT JOI DIS LIST 19 39 TO 58

..INT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00410
39	1	-35.30633	-0.76402	0.00000	0.00000	0.00000	-0.00245
40	1	-35.30634	-0.96615	0.00000	0.00000	0.00000	0.00064
41	1	-35.30634	-0.55410	0.00000	0.00000	0.00000	0.00277
42	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00154
43	1	-35.30633	0.07175	0.00000	0.00000	0.00000	-0.00034
44	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00017
45	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00005
46	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00001
47	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00000
48	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00000
49	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00001
50	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00004
1	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00001
2	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00001
53	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	-35.30633	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	-35.30633	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

247. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
15	1	0.00	160.12	0.00	0.00	0.00	0.00
19	1	0.00	54.82	0.00	0.00	0.00	0.00
42	1	0.00	313.82	0.00	0.00	0.00	0.00
44	1	0.00	24.23	0.00	0.00	0.00	0.00
45	1	0.00	103.25	0.00	0.00	0.00	0.00
46	1	0.00	65.68	0.00	0.00	0.00	0.00
47	1	0.00	76.37	0.00	0.00	0.00	0.00
48	1	0.00	71.18	0.00	0.00	0.00	0.00
49	1	0.00	81.26	0.00	0.00	0.00	0.00
50	1	0.00	40.21	0.00	0.00	0.00	0.00
51	1	0.00	18.35	0.00	0.00	0.00	0.00
52	1	0.00	18.38	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
4	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

248. PLOT BEND FILE
249. PLOT DISP FILE
250. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 8:59:49 ****

****
* 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 *
****

ponencia


```
*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  1, 1997            *
*          Time=    13:59: 5                *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000  19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000  28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000  38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000  50   68.250   0.000   0.000
13. 51   70.437   0.000   0.000  58   85.75    0.000   0.000
14. * 59  87.937   0.000   0.000  66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1    1    2
17.  2    2    3
18.  3    3    4
19.  4    4    5
20.  5    5    6
21.  6    6    7
22.  7    7    8
23.  8    8    9
24.  9    9   10
25. 10   10   11
26. 11   11   12
27. 12   12   13
28. 13   13   14
29. 14   14   15
30. 15   15   16
31. 16   16   17
32. 17   17   18
33. 18   18   19
34. 19   29   30
35. 20   30   31
36. 21   31   32
37. 22   32   33
38. 23   33   34
39. 24   34   35
40. 25   35   36
41. 26   36   37
42. 27   37   38
43. 28    1   29
44. 29    2   20
45. 30    3   30
46. 31    4   21
47. 32    5   31
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 33   6   22
49. 34   7   32
50. 35   8   23
51. 36   9   33
52. 37  10   24
53. 38  11   34
54. 39  12   25
55. 40  13   35
56. 41  14   26
57. 42  15   36
58. 43  16   27
59. 44  17   37
60. 45  18   28
61. 46  19   38
62. 47  29   20
63. 48  20    3
64. 49  30   21
65. 50  21    5
66. 51  31   22
67. 52  22    7
68. 53  32   23
69. 54  23    9
70. 55  33   24
71. 56  24   11
72. 57  34   25
73. 58  25   13
74. 59  35   26
75. 60  26   15
76. 61  36   27
77. 62  27   17
78. 63  37   28
79. 64  28   19
80. 65   3   21
81. 66   5   22
82. 67   7   23
83. 68   9   24
84. 69  11   25
85. 70  13   26
86. 71  15   27
87. 72  17   28
88. 73   1   20
89. 74  19   39
90. 75  39   40
91. 76  40   41
92. 77  41   42
93. 78  42   43
94. 79  43   44
95. 80  44   45
96. 81  45   46
97. 82  46   47
98. 83  47   48
99. 84  48   49
100. 85  49   50
101. 86  50   51
102. 87  51   52
103. 88  52   53
104. 89  53   54
105. 90  54   55
 06. 91  55   56
107. 92  56   57
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.  93   57   58
 )9.  *94   58   59
110.  *95   59   60
111.  *96   60   61
112.  *97   61   62
113.  *98   62   63
114.  *99   63   64
115.  *100  64   65
116.  *101  65   66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR  AX  0.0500  IZ  0.00151406
120.   2                    PR  AX  0.0500  IZ  0.00151406
121.   3                    PR  AX  0.0532  IZ  0.00156748
122.   4                    PR  AX  0.0532  IZ  0.00156748
123.   5                    PR  AX  0.0670  IZ  0.00233098
124.   6                    PR  AX  0.0670  IZ  0.00233098
125.   7                    PR  AX  0.0750  IZ  0.00271328
126.   8                    PR  AX  0.0750  IZ  0.00271328
127.   9                    PR  AX  0.0900  IZ  0.00380584
 28.  10                    PR  AX  0.0900  IZ  0.00380584
129.  11                    PR  AX  0.1070  IZ  0.00464364
130.  12                    PR  AX  0.1070  IZ  0.00464364
131.  13                    PR  AX  0.1180  IZ  0.00593306
132.  14                    PR  AX  0.1180  IZ  0.00593306
133.  15                    PR  AX  0.1410  IZ  0.00804164
134.  16                    PR  AX  0.1410  IZ  0.00804164
135.  17                    PR  AX  0.1520  IZ  0.00926892
136.  18                    PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                    PR  AX  0.0280  IZ  0.00046454
139.  20                    PR  AX  0.0280  IZ  0.00046454
140.  21                    PR  AX  0.0280  IZ  0.00046454
141.  22                    PR  AX  0.0320  IZ  0.00072626
142.  23                    PR  AX  0.0320  IZ  0.00072626
143.  24                    PR  AX  0.0450  IZ  0.00164273
144.  25                    PR  AX  0.0600  IZ  0.00261476
145.  26                    PR  AX  0.0720  IZ  0.00316788
146.  27                    PR  AX  0.0840  IZ  0.00380920
 47. *MONTANTES PRINCIPALES
148.  28                    PR  AX  0.0068  IZ  0.00000001
149.  30                    PR  AX  0.0082  IZ  0.00000001
150.  32                    PR  AX  0.0148  IZ  0.00000001
151.  34                    PR  AX  0.0212  IZ  0.00000001
152.  36                    PR  AX  0.0298  IZ  0.00000001
153.  38                    PR  AX  0.0298  IZ  0.00000001
154.  40                    PR  AX  0.0398  IZ  0.00000001
155.  42                    PR  AX  0.0498  IZ  0.00000001
156.  44                    PR  AX  0.0578  IZ  0.00000001
157.  46                    PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                    PR  AX  0.0068  IZ  0.00000001
160.  31                    PR  AX  0.0068  IZ  0.00000001
161.  33                    PR  AX  0.0068  IZ  0.00000001
162.  35                    PR  AX  0.0096  IZ  0.00000001
163.  37                    PR  AX  0.0112  IZ  0.00000001
164.  39                    PR  AX  0.0128  IZ  0.00000001
165.  41                    PR  AX  0.0168  IZ  0.00000001
 66.  43                    PR  AX  0.0192  IZ  0.00000001
167.  45                    PR  AX  0.0298  IZ  0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
 59.  47                    PR  AX  0.0068  IZ  0.00001456
170.  48                    PR  AX  0.0068  IZ  0.00001456
171.  49                    PR  AX  0.0096  IZ  0.00003700
172.  50                    PR  AX  0.0096  IZ  0.00003700
173.  51                    PR  AX  0.0128  IZ  0.00007640
174.  52                    PR  AX  0.0128  IZ  0.00007640
175.  53                    PR  AX  0.0212  IZ  0.00025120
176.  54                    PR  AX  0.0212  IZ  0.00025120
177.  55                    PR  AX  0.0298  IZ  0.00025166
178.  56                    PR  AX  0.0298  IZ  0.00025166
179.  57                    PR  AX  0.0398  IZ  0.00037183
180.  58                    PR  AX  0.0398  IZ  0.00037183
181.  59                    PR  AX  0.0498  IZ  0.00050799
182.  60                    PR  AX  0.0498  IZ  0.00050799
183.  61                    PR  AX  0.0578  IZ  0.00061053
184.  62                    PR  AX  0.0578  IZ  0.00061053
185.  63                    PR  AX  0.0648  IZ  0.00071462
186.  64                    PR  AX  0.0648  IZ  0.00071462
187. *DIAGONALES 2
 98.  65                    PR  AX  0.0068  IZ  0.00000001
189.  66                    PR  AX  0.0068  IZ  0.00000001
190.  67                    PR  AX  0.0068  IZ  0.00000001
191.  68                    PR  AX  0.0056  IZ  0.00000001
192.  69                    PR  AX  0.0056  IZ  0.00000001
193.  70                    PR  AX  0.0150  IZ  0.00000001
194.  71                    PR  AX  0.0150  IZ  0.00000001
195.  72                    PR  AX  0.0193  IZ  0.00000001
196.  73                    PR  AX  0.0068  IZ  0.00000001
197. *SECCION DE HORMIGON
198.  74                    PR  AX 13.4810  IZ 45.3025
199.  75                    PR  AX 13.4810  IZ 45.3025
200.  76                    PR  AX 13.4810  IZ 45.3025
201.  77                    PR  AX 13.4810  IZ 45.3025
202.  78                    PR  AX 13.4810  IZ 45.3025
203.  79                    PR  AX 13.4810  IZ 45.3025
204.  80                    PR  AX 13.4810  IZ 45.3025
205.  81                    PR  AX 13.4810  IZ 45.3025
206.  82                    PR  AX 13.4810  IZ 45.3025
 97.  83                    PR  AX 13.4810  IZ 45.3025
208.  84                    PR  AX 13.4810  IZ 45.3025
209.  85                    PR  AX 13.4810  IZ 45.3025
210.  86                    PR  AX  3.3600  IZ  0.1577
211.  87                    PR  AX  3.3600  IZ  0.1577
212.  88                    PR  AX  3.3600  IZ  0.1577
213.  89                    PR  AX  3.3600  IZ  0.1577
214.  90                    PR  AX  3.3600  IZ  0.1577
215.  91                    PR  AX  3.3600  IZ  0.1577
216.  92                    PR  AX  3.3600  IZ  0.1577
217.  93                    PR  AX  3.3600  IZ  0.1577
218.  *94                   PR  AX  3.3600  IZ  0.1577
219.  * 95                  PR  AX  3.3600  IZ  0.1577
220.  * 96                  PR  AX  3.3600  IZ  0.1577
221.  * 97                  PR  AX  3.3600  IZ  0.1577
222.  * 98                  PR  AX  3.3600  IZ  0.1577
223.  * 99                  PR  AX  3.3600  IZ  0.1577
224.  * 100                 PR  AX  3.3600  IZ  0.1577
225.  * 101                 PR  AX  3.3600  IZ  0.1577
 26. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 29 TO 46 65 TO 73  END   MZ
 29. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  93
236. DEN  2.50       MEM  74 TO  93
237. POISSON  0.20  MEM  74 TO  93
238. SUPPORTS
239. 16      PINNED
240. 39      FIXED BUT FX MZ
241. 43      FIXED BUT FX MZ
242. *44     FIXED BUT FX MZ
243. *45      FIXED BUT FX MZ
244. 46      FIXED BUT FX MZ
245. 47      FIXED BUT FX MZ
246. 48      FIXED BUT FX MZ
247. 49      FIXED BUT FX MZ
 48. 50      FIXED BUT FX MZ
249. 51      FIXED BUT FX MZ
250. 52      FIXED BUT FX MZ
251. 53      FIXED BUT FX MZ
252. 54      FIXED BUT FX MZ
253. 55      FIXED BUT FX MZ
254. 56      FIXED BUT FX MZ
255. 57      FIXED BUT FX MZ
256. 58      FIXED BUT FX MZ
257. *59      FIXED BUT FX MZ
258. *60      FIXED BUT FX MZ
259. *61      FIXED BUT FX MZ
260. *62      FIXED BUT FX MZ
261. *63      FIXED BUT FX MZ
262. *64      FIXED BUT FX MZ
263. *65      FIXED BUT FX MZ
264. *66      FIXED BUT FX MZ
265. LOADING 1 PESO PROPIO
266. SELFWEIGHT   Y  -1.0
 57. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

```
NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    58/   93/   16
ORIGINAL/FINAL BAND-WIDTH =   28/    6
TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   157
SIZE OF STIFFNESS MATRIX =    3297 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.19 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.            13:59: 8
++ PROCESSING GLOBAL STIFFNESS MATRIX.             13:59: 9
++ PROCESSING TRIANGULAR FACTORIZATION.            13:59: 9
++ CALCULATING JOINT DISPLACEMENTS.                13:59: 9
++ CALCULATING MEMBER  FORCES.                     13:59: 9

 68. LOAD LIST 1
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
269. PRINT MEMBER FORCES LIST 74 TO 93
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	115.25	0.00	0.00	0.00	-0.87
		39	0.00	-41.55	0.00	0.00	0.00	172.33
75	1	39	0.00	92.79	0.00	0.00	0.00	-172.33
		40	0.00	-19.07	0.00	0.00	0.00	294.68
76	1	40	0.00	19.07	0.00	0.00	0.00	-294.68
		41	0.00	54.66	0.00	0.00	0.00	255.75
77	1	41	0.00	-54.66	0.00	0.00	0.00	-255.75
		42	0.00	128.38	0.00	0.00	0.00	55.55
78	1	42	0.00	-128.38	0.00	0.00	0.00	-55.55
		43	0.00	202.11	0.00	0.00	0.00	-305.94
79	1	43	0.00	153.39	0.00	0.00	0.00	305.94
		44	0.00	-79.66	0.00	0.00	0.00	-51.05
80	1	44	0.00	79.66	0.00	0.00	0.00	51.05
		45	0.00	-5.93	0.00	0.00	0.00	42.58
81	1	45	0.00	5.93	0.00	0.00	0.00	-42.58
		46	0.00	67.79	0.00	0.00	0.00	-25.08
82	1	46	0.00	43.53	0.00	0.00	0.00	25.08
		47	0.00	30.20	0.00	0.00	0.00	-10.50
83	1	47	0.00	35.47	0.00	0.00	0.00	10.50
		48	0.00	38.26	0.00	0.00	0.00	-13.55
4	1	48	0.00	35.78	0.00	0.00	0.00	13.55
		49	0.00	37.95	0.00	0.00	0.00	-15.93
85	1	49	0.00	42.60	0.00	0.00	0.00	15.93
		50	0.00	31.13	0.00	0.00	0.00	-3.38
86	1	50	0.00	9.20	0.00	0.00	0.00	3.38
		51	0.00	9.17	0.00	0.00	0.00	-3.34
87	1	51	0.00	9.18	0.00	0.00	0.00	3.34
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.19	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.23	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

270. PRINT JOI DIS LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-35.15577	1.69027	0.00000	0.00000	0.00000	-0.00826
39	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00677
40	1	-35.15577	-1.11355	0.00000	0.00000	0.00000	-0.00310
41	1	-35.15577	-1.31303	0.00000	0.00000	0.00000	0.00118
42	1	-35.15577	-0.72496	0.00000	0.00000	0.00000	0.00370
43	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00204
44	1	-35.15577	0.10815	0.00000	0.00000	0.00000	-0.00042
45	1	-35.15577	0.00672	0.00000	0.00000	0.00000	-0.00028
46	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00005
47	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00001
48	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00001
49	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00001
50	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00004
51	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00001
52	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00001
53	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	-35.15577	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	-35.15577	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

271. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
16	1	0.00	212.30	0.00	0.00	0.00	0.00
39	1	0.00	51.25	0.00	0.00	0.00	0.00
43	1	0.00	355.50	0.00	0.00	0.00	0.00
46	1	0.00	111.32	0.00	0.00	0.00	0.00
47	1	0.00	65.67	0.00	0.00	0.00	0.00
48	1	0.00	74.04	0.00	0.00	0.00	0.00
49	1	0.00	80.54	0.00	0.00	0.00	0.00
50	1	0.00	40.33	0.00	0.00	0.00	0.00
51	1	0.00	18.35	0.00	0.00	0.00	0.00
52	1	0.00	18.38	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
54	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

272. PLOT BEND FILE
273. PLOT DISP FILE
274. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 13:59:12 ****

****
* 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 *
****

Porticos 18


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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  1, 1997        *
*          Time=     9:52:36             *
*                                       *
*****************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51   70.437   0.000   0.000 58   85.75    0.000   0.000
14. MEMBER INCIDENCES
15.  1    1    2
16.  2    2    3
17.  3    3    4
18.  4    4    5
19.  5    5    6
20.  6    6    7
21.  7    7    8
22.  8    8    9
23.  9    9   10
24. 10   10   11
25. 11   11   12
26. 12   12   13
27. 13   13   14
28. 14   14   15
29. 15   15   16
30. 16   16   17
31. 17   17   18
32. 18   18   19
33. 19   29   30
34. 20   30   31
35. 21   31   32
36. 22   32   33
37. 23   33   34
38. 24   34   35
39. 25   35   36
40. 26   36   37
41. 27   37   38
42. 28    1   29
43. 29    2   20
44. 30    3   30
45. 31    4   21
46. 32    5   31
47. 33    6   22
```



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48. 34    7   32
49. 35    8   23
50. 36    9   33
51. 37   10   24
52. 38   11   34
53. 39   12   25
54. 40   13   35
55. 41   14   26
56. 42   15   36
57. 43   16   27
58. 44   17   37
59. 45   18   28
60. 46   19   38
61. 47   29   20
62. 48   20    3
63. 49   30   21
64. 50   21    5
65. 51   31   22
66. 52   22    7
67. 53   32   23
68. 54   23    9
69. 55   33   24
70. 56   24   11
71. 57   34   25
72. 58   25   13
73. 59   35   26
74. 60   26   15
75. 61   36   27
76. 62   27   17
77. 63   37   28
78. 64   28   19
79. 65    3   21
80. 66    5   22
81. 67    7   23
82. 68    9   24
83. 69   11   25
84. 70   13   26
85. 71   15   27
86. 72   17   28
97. 73    1   20
88. 74   19   39
89. 75   39   40
90. 76   40   41
91. 77   41   42
92. 78   42   43
93. 79   43   44
94. 80   44   45
95. 81   45   46
96. 82   46   47
97. 83   47   48
98. 84   48   49
99. 85   49   50
100. 86  50   51
101. 87  51   52
102. 88  52   53
103. 89  53   54
104. 90  54   55
105. 91  55   56
 06. 92  56   57
107. 93  57   58
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108. MEMBER PROPERTY
 39. *CORDON INFERIOR
110.   1                    PR  AX  0.0500  IZ  0.00151406
111.   2                    PR  AX  0.0500  IZ  0.00151406
112.   3                    PR  AX  0.0532  IZ  0.00156748
113.   4                    PR  AX  0.0532  IZ  0.00156748
114.   5                    PR  AX  0.0670  IZ  0.00233098
115.   6                    PR  AX  0.0670  IZ  0.00233098
116.   7                    PR  AX  0.0750  IZ  0.00271328
117.   8                    PR  AX  0.0750  IZ  0.00271328
118.   9                    PR  AX  0.0900  IZ  0.00380584
119.  10                    PR  AX  0.0900  IZ  0.00380584
120.  11                    PR  AX  0.1070  IZ  0.00464364
121.  12                    PR  AX  0.1070  IZ  0.00464364
122.  13                    PR  AX  0.1180  IZ  0.00593306
123.  14                    PR  AX  0.1180  IZ  0.00593306
124.  15                    PR  AX  0.1410  IZ  0.00804164
125.  16                    PR  AX  0.1410  IZ  0.00804164
126.  17                    PR  AX  0.1520  IZ  0.00926892
127.  18                    PR  AX  0.1520  IZ  0.00926892
 28. *CORDON SUPERIOR
129.  19                    PR  AX  0.0280  IZ  0.00046454
130.  20                    PR  AX  0.0280  IZ  0.00046454
131.  21                    PR  AX  0.0280  IZ  0.00046454
132.  22                    PR  AX  0.0320  IZ  0.00072626
133.  23                    PR  AX  0.0320  IZ  0.00072626
134.  24                    PR  AX  0.0450  IZ  0.00164273
135.  25                    PR  AX  0.0600  IZ  0.00261476
136.  26                    PR  AX  0.0720  IZ  0.00316788
137.  27                    PR  AX  0.0840  IZ  0.00380920
138. *MONTANTES PRINCIPALES
139.  28                    PR  AX  0.0068  IZ  0.00000001
140.  30                    PR  AX  0.0082  IZ  0.00000001
141.  32                    PR  AX  0.0148  IZ  0.00000001
142.  34                    PR  AX  0.0212  IZ  0.00000001
143.  36                    PR  AX  0.0298  IZ  0.00000001
144.  38                    PR  AX  0.0298  IZ  0.00000001
145.  40                    PR  AX  0.0398  IZ  0.00000001
146.  42                    PR  AX  0.0498  IZ  0.00000001
 47.  44                    PR  AX  0.0578  IZ  0.00000001
148.  46                    PR  AX  0.0578  IZ  10000.0000
149. *MONTANTES SECUNDARIOS
150.  29                    PR  AX  0.0068  IZ  0.00000001
151.  31                    PR  AX  0.0068  IZ  0.00000001
152.  33                    PR  AX  0.0068  IZ  0.00000001
153.  35                    PR  AX  0.0096  IZ  0.00000001
154.  37                    PR  AX  0.0112  IZ  0.00000001
155.  39                    PR  AX  0.0128  IZ  0.00000001
156.  41                    PR  AX  0.0168  IZ  0.00000001
157.  43                    PR  AX  0.0192  IZ  0.00000001
158.  45                    PR  AX  0.0298  IZ  0.00000001
159. *DIAGONALES 1
160.  47                    PR  AX  0.0068  IZ  0.00001456
161.  48                    PR  AX  0.0068  IZ  0.00001456
162.  49                    PR  AX  0.0096  IZ  0.00003700
163.  50                    PR  AX  0.0096  IZ  0.00003700
164.  51                    PR  AX  0.0128  IZ  0.00007640
165.  52                    PR  AX  0.0128  IZ  0.00007640
 66.  53                    PR  AX  0.0212  IZ  0.00025120
167.  54                    PR  AX  0.0212  IZ  0.00025120
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  55                    PR  AX  0.0298  IZ  0.00025166
 59.  56                    PR  AX  0.0298  IZ  0.00025166
170.  57                    PR  AX  0.0398  IZ  0.00037183
171.  58                    PR  AX  0.0398  IZ  0.00037183
172.  59                    PR  AX  0.0498  IZ  0.00050799
173.  60                    PR  AX  0.0498  IZ  0.00050799
174.  61                    PR  AX  0.0578  IZ  0.00061053
175.  62                    PR  AX  0.0578  IZ  0.00061053
176.  63                    PR  AX  0.0648  IZ  0.00071462
177.  64                    PR  AX  0.0648  IZ  0.00071462
178. *DIAGONALES 2
179.  65                    PR  AX  0.0068  IZ  0.00000001
180.  66                    PR  AX  0.0068  IZ  0.00000001
181.  67                    PR  AX  0.0068  IZ  0.00000001
182.  68                    PR  AX  0.0056  IZ  0.00000001
183.  69                    PR  AX  0.0056  IZ  0.00000001
184.  70                    PR  AX  0.0150  IZ  0.00000001
185.  71                    PR  AX  0.0150  IZ  0.00000001
186.  72                    PR  AX  0.0193  IZ  0.00000001
187.  73                    PR  AX  0.0068  IZ  0.00000001
 98. *SECCION DE HORMIGON
189.  74                    PR  AX 13.4810  IZ 45.3025
190.  75                    PR  AX 13.4810  IZ 45.3025
191.  76                    PR  AX 13.4810  IZ 45.3025
192.  77                    PR  AX 13.4810  IZ 45.3025
193.  78                    PR  AX 13.4810  IZ 45.3025
194.  79                    PR  AX 13.4810  IZ 45.3025
195.  80                    PR  AX 13.4810  IZ 45.3025
196.  81                    PR  AX 13.4810  IZ 45.3025
197.  82                    PR  AX 13.4810  IZ 45.3025
198.  83                    PR  AX 13.4810  IZ 45.3025
199.  84                    PR  AX 13.4810  IZ 45.3025
200.  85                    PR  AX 13.4810  IZ 45.3025
201.  86                    PR  AX  3.3600  IZ  0.1577
202.  87                    PR  AX  3.3600  IZ  0.1577
203.  88                    PR  AX  3.3600  IZ  0.1577
204.  89                    PR  AX  3.3600  IZ  0.1577
205.  90                    PR  AX  3.3600  IZ  0.1577
206.  91                    PR  AX  3.3600  IZ  0.1577
 07.  92                    PR  AX  3.3600  IZ  0.1577
208.  93                    PR  AX  3.3600  IZ  0.1577
209. MEMBER RELEASES
210. 29 TO 46 65 TO 73 START MZ
211. 29 TO 46 65 TO 73  END   MZ
212. 47 49 51 53 55 57 59 61 63 START MZ
213. 48 50 52 54 56 58 60 62 64 END MZ
214. CONSTANTS
215. E   21000.  MEM  1  TO  73
216. DEN 10.15       MEM  1  TO  73
217. POISSON  0.15  MEM  1  TO  73
218. E    3250.  MEM  74 TO  93
219. DEN  2.50       MEM  74 TO  93
220. POISSON  0.20  MEM  74 TO  93
221. SUPPORTS
222. 17      PINNED
223. *40      FIXED BUT FX MZ
224. 44      FIXED BUT FX MZ
225. 45      FIXED BUT FX MZ
 26. 46      FIXED BUT FX MZ
227. 47      FIXED BUT FX MZ
```

```
228. 48      FIXED BUT FX MZ
 29. 49      FIXED BUT FX MZ
230. 50      FIXED BUT FX MZ
231. 51      FIXED BUT FX MZ
232. 52      FIXED BUT FX MZ
233. 53      FIXED BUT FX MZ
234. 54      FIXED BUT FX MZ
235. 55      FIXED BUT FX MZ
236. 56      FIXED BUT FX MZ
237. 57      FIXED BUT FX MZ
238. 58      FIXED BUT FX MZ
239. LOADING 1 PESO PROPIO
240. SELFWEIGHT   Y  -1.0
241. PERFORM ANALISIS

      P R O B L E M   S T A T I S T I C S
      -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    58/   93/   16
  ORIGINAL/FINAL BAND-WIDTH =   28/    6
  TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   157
  SIZE OF STIFFNESS MATRIX =    3297 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.19 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              9:52:40
++ PROCESSING GLOBAL STIFFNESS MATRIX.               9:52:40
++ PROCESSING TRIANGULAR FACTORIZATION.              9:52:40
++ CALCULATING JOINT DISPLACEMENTS.                  9:52:41
++ CALCULATING MEMBER  FORCES.                       9:52:41

242. LOAD LIST 1
243. PRINT MEMBER FORCES LIST 74 TO 93
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	229.07	0.00	0.00	0.00	-36.65
		39	0.00	-155.37	0.00	0.00	0.00	457.04
75	1	39	0.00	155.36	0.00	0.00	0.00	-457.04
		40	0.00	-81.64	0.00	0.00	0.00	716.27
76	1	40	0.00	81.64	0.00	0.00	0.00	-716.28
		41	0.00	-7.91	0.00	0.00	0.00	814.23
77	1	41	0.00	7.92	0.00	0.00	0.00	-814.23
		42	0.00	65.81	0.00	0.00	0.00	750.91
78	1	42	0.00	-65.81	0.00	0.00	0.00	-750.92
		43	0.00	139.54	0.00	0.00	0.00	526.31
79	1	43	0.00	-139.54	0.00	0.00	0.00	-526.31
		44	0.00	213.26	0.00	0.00	0.00	140.44
80	1	44	0.00	-52.33	0.00	0.00	0.00	-140.44
		45	0.00	126.06	0.00	0.00	0.00	-54.69
81	1	45	0.00	60.79	0.00	0.00	0.00	54.69
		46	0.00	12.93	0.00	0.00	0.00	-2.34
82	1	46	0.00	30.35	0.00	0.00	0.00	2.34
		47	0.00	43.38	0.00	0.00	0.00	-16.59
83	1	47	0.00	38.99	0.00	0.00	0.00	16.59
		48	0.00	34.73	0.00	0.00	0.00	-11.93
4	1	48	0.00	34.85	0.00	0.00	0.00	11.93
		49	0.00	38.88	0.00	0.00	0.00	-16.33
85	1	49	0.00	42.78	0.00	0.00	0.00	16.33
		50	0.00	30.94	0.00	0.00	0.00	-3.38
86	1	50	0.00	9.20	0.00	0.00	0.00	3.38
		51	0.00	9.17	0.00	0.00	0.00	-3.34
87	1	51	0.00	9.18	0.00	0.00	0.00	3.34
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.19	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.23	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT JOI DIS LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-31.62016	35.35897	0.00000	0.00000	0.00000	-0.05168
39	1	-31.62016	24.36560	0.00000	0.00000	0.00000	-0.04781
40	1	-31.62016	14.81139	0.00000	0.00000	0.00000	-0.03890
41	1	-31.62016	7.54115	0.00000	0.00000	0.00000	-0.02733
42	1	-31.62016	2.87391	0.00000	0.00000	0.00000	-0.01550
43	1	-31.62016	0.60345	0.00000	0.00000	0.00000	-0.00581
44	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00066
45	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00018
46	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00005
47	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00001
48	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00000
49	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00001
50	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00004
51	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00001
52	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00001
53	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	-31.62016	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	-31.62016	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

245. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
17	1	0.00	326.12	0.00	0.00	0.00	0.00
44	1	0.00	160.93	0.00	0.00	0.00	0.00
45	1	0.00	186.85	0.00	0.00	0.00	0.00
46	1	0.00	43.28	0.00	0.00	0.00	0.00
47	1	0.00	82.37	0.00	0.00	0.00	0.00
48	1	0.00	69.58	0.00	0.00	0.00	0.00
49	1	0.00	81.66	0.00	0.00	0.00	0.00
50	1	0.00	40.15	0.00	0.00	0.00	0.00
51	1	0.00	18.35	0.00	0.00	0.00	0.00
52	1	0.00	18.38	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
54	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

246. PLOT BEND FILE
247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 9:52:43 ****

****
* 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 *
****

****
* *
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 1, 1997 *
* Time= 10: 0:39 *
* *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5. 1 0.000 0.000 0.000 19 42.000 0.000 0.000
6. 20 2.333 1.0625 0.000
7. 21 6.999 1.59375 0.000
8. 22 11.666 2.125 0.000 28 39.666 2.125 0.000
9. 29 0.000 2.125 0.000
10. 30 4.666 3.1875 0.000
11. 31 9.333 4.250 0.000 38 42.000 4.250 0.000
12. 39 44.187 0.000 0.000 50 68.250 0.000 0.000
13. 51 70.437 0.000 0.000 58 85.75 0.000 0.000
14. MEMBER INCIDENCES
15. 1 1 2
16. 2 2 3
17. 3 3 4
18. 4 4 5
19. 5 5 6
20. 6 6 7
21. 7 7 8
22. 8 8 9
23. 9 9 10
24. 10 10 11
25. 11 11 12
26. 12 12 13
27. 13 13 14
28. 14 14 15
29. 15 15 16
30. 16 16 17
31. 17 17 18
32. 18 18 19
33. 19 29 30
34. 20 30 31
35. 21 31 32
36. 22 32 33
37. 23 33 34
38. 24 34 35
39. 25 35 36
40. 26 36 37
41. 27 37 38
42. 28 1 29
43. 29 2 20
44. 30 3 30
45. 31 4 21
46. 32 5 31
47. 33 6 22

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
 48.  34    7    32
 49.  35    8    23
 50.  36    9    33
 51.  37   10    24
 52.  38   11    34
 53.  39   12    25
 54.  40   13    35
 55.  41   14    26
 56.  42   15    36
 57.  43   16    27
 58.  44   17    37
 59.  45   18    28
 60.  46   19    38
 61.  47   29    20
 62.  48   20     3
 63.  49   30    21
 64.  50   21     5
 65.  51   31    22
 66.  52   22     7
 67.  53   32    23
 68.  54   23     9
 69.  55   33    24
 70.  56   24    11
 71.  57   34    25
 72.  58   25    13
 73.  59   35    26
 74.  60   26    15
 75.  61   36    27
 76.  62   27    17
 77.  63   37    28
 78.  64   28    19
 79.  65    3    21
 80.  66    5    22
 81.  67    7    23
 82.  68    9    24
 83.  69   11    25
 84.  70   13    26
 85.  71   15    27
 86.  72   17    28
 87.  73    1    20
 88.  74   19    39
 89.  75   39    40
 90.  76   40    41
 91.  77   41    42
 92.  78   42    43
 93.  79   43    44
 94.  80   44    45
 95.  81   45    46
 96.  82   46    47
 97.  83   47    48
 98.  84   48    49
 99.  85   49    50
100.  86   50    51
101.  87   51    52
102.  88   52    53
103.  89   53    54
104.  90   54    55
105.  91   55    56
 06.  92   56    57
107.  93   57    58
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108. MEMBER PROPERTY
 09. *CORDON INFERIOR
110.   1          PR  AX  0.0500  IZ  0.00151406
111.   2          PR  AX  0.0500  IZ  0.00151406
112.   3          PR  AX  0.0532  IZ  0.00156748
113.   4          PR  AX  0.0532  IZ  0.00156748
114.   5          PR  AX  0.0670  IZ  0.00233098
115.   6          PR  AX  0.0670  IZ  0.00233098
116.   7          PR  AX  0.0750  IZ  0.00271328
117.   8          PR  AX  0.0750  IZ  0.00271328
118.   9          PR  AX  0.0900  IZ  0.00380584
119.  10          PR  AX  0.0900  IZ  0.00380584
120.  11          PR  AX  0.1070  IZ  0.00464364
121.  12          PR  AX  0.1070  IZ  0.00464364
122.  13          PR  AX  0.1180  IZ  0.00593306
123.  14          PR  AX  0.1180  IZ  0.00593306
124.  15          PR  AX  0.1410  IZ  0.00804164
125.  16          PR  AX  0.1410  IZ  0.00804164
126.  17          PR  AX  0.1520  IZ  0.00926892
127.  18          PR  AX  0.1520  IZ  0.00926892
 28. *CORDON SUPERIOR
129.  19          PR  AX  0.0280  IZ  0.00046454
130.  20          PR  AX  0.0280  IZ  0.00046454
131.  21          PR  AX  0.0280  IZ  0.00046454
132.  22          PR  AX  0.0320  IZ  0.00072626
133.  23          PR  AX  0.0320  IZ  0.00072626
134.  24          PR  AX  0.0450  IZ  0.00164273
135.  25          PR  AX  0.0600  IZ  0.00261476
136.  26          PR  AX  0.0720  IZ  0.00316788
137.  27          PR  AX  0.0840  IZ  0.00380920
138. *MONTANTES PRINCIPALES
139.  28          PR  AX  0.0068  IZ  0.00000001
140.  30          PR  AX  0.0082  IZ  0.00000001
141.  32          PR  AX  0.0148  IZ  0.00000001
142.  34          PR  AX  0.0212  IZ  0.00000001
143.  36          PR  AX  0.0298  IZ  0.00000001
144.  38          PR  AX  0.0298  IZ  0.00000001
145.  40          PR  AX  0.0398  IZ  0.00000001
146.  42          PR  AX  0.0498  IZ  0.00000001
 47.  44          PR  AX  0.0578  IZ  0.00000001
148.  46          PR  AX  0.0578  IZ  10000.0000
149. *MONTANTES SECUNDARIOS
150.  29          PR  AX  0.0068  IZ  0.00000001
151.  31          PR  AX  0.0068  IZ  0.00000001
152.  33          PR  AX  0.0068  IZ  0.00000001
153.  35          PR  AX  0.0096  IZ  0.00000001
154.  37          PR  AX  0.0112  IZ  0.00000001
155.  39          PR  AX  0.0128  IZ  0.00000001
156.  41          PR  AX  0.0168  IZ  0.00000001
157.  43          PR  AX  0.0192  IZ  0.00000001
158.  45          PR  AX  0.0298  IZ  0.00000001
159. *DIAGONALES 1
160.  47          PR  AX  0.0068  IZ  0.00001456
161.  48          PR  AX  0.0068  IZ  0.00001456
162.  49          PR  AX  0.0096  IZ  0.00003700
163.  50          PR  AX  0.0096  IZ  0.00003700
164.  51          PR  AX  0.0128  IZ  0.00007640
165.  52          PR  AX  0.0128  IZ  0.00007640
 66.  53          PR  AX  0.0212  IZ  0.00025120
167.  54          PR  AX  0.0212  IZ  0.00025120
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  55                          PR   AX  0.0298   IZ  0.00025166
169.  56                          PR   AX  0.0298   IZ  0.00025166
170.  57                          PR   AX  0.0398   IZ  0.00037183
171.  58                          PR   AX  0.0398   IZ  0.00037183
172.  59                          PR   AX  0.0498   IZ  0.00050799
173.  60                          PR   AX  0.0498   IZ  0.00050799
174.  61                          PR   AX  0.0578   IZ  0.00061053
175.  62                          PR   AX  0.0578   IZ  0.00061053
176.  63                          PR   AX  0.0648   IZ  0.00071462
177.  64                          PR   AX  0.0648   IZ  0.00071462
178. *DIAGONALES 2
179.  65                          PR   AX  0.0068   IZ  0.00000001
180.  66                          PR   AX  0.0068   IZ  0.00000001
181.  67                          PR   AX  0.0068   IZ  0.00000001
182.  68                          PR   AX  0.0056   IZ  0.00000001
183.  69                          PR   AX  0.0056   IZ  0.00000001
184.  70                          PR   AX  0.0150   IZ  0.00000001
185.  71                          PR   AX  0.0150   IZ  0.00000001
186.  72                          PR   AX  0.0193   IZ  0.00000001
187.  73                          PR   AX  0.0068   IZ  0.00000001
 88. *SECCION DE HORMIGON
189.  74                          PR   AX 13.4810   IZ 45.3025
190.  75                          PR   AX 13.4810   IZ 45.3025
191.  76                          PR   AX 13.4810   IZ 45.3025
192.  77                          PR   AX 13.4810   IZ 45.3025
193.  78                          PR   AX 13.4810   IZ 45.3025
194.  79                          PR   AX 13.4810   IZ 45.3025
195.  80                          PR   AX 13.4810   IZ 45.3025
196.  81                          PR   AX 13.4810   IZ 45.3025
197.  82                          PR   AX 13.4810   IZ 45.3025
198.  83                          PR   AX 13.4810   IZ 45.3025
199.  84                          PR   AX 13.4810   IZ 45.3025
200.  85                          PR   AX 13.4810   IZ 45.3025
201.  86                          PR   AX  3.3600   IZ  0.1577
202.  87                          PR   AX  3.3600   IZ  0.1577
203.  88                          PR   AX  3.3600   IZ  0.1577
204.  89                          PR   AX  3.3600   IZ  0.1577
205.  90                          PR   AX  3.3600   IZ  0.1577
206.  91                          PR   AX  3.3600   IZ  0.1577
 07.  92                          PR   AX  3.3600   IZ  0.1577
208.  93                          PR   AX  3.3600   IZ  0.1577
209. MEMBER RELEASES
210. 29 TO 46 65 TO 73 START MZ
211. 29 TO 46 65 TO 73  END   MZ
212. 47 49 51 53 55 57 59 61 63 START MZ
213. 48 50 52 54 56 58 60 62 64 END MZ
214. CONSTANTS
215. E   21000.  MEM  1  TO  73
216. DEN 10.15       MEM  1  TO  73
217. POISSON  0.15  MEM  1  TO  73
218. E    3250.  MEM  74 TO  93
219. DEN  2.50       MEM  74 TO  93
220. POISSON  0.20  MEM  74 TO  93
221. SUPPORTS
222. 18       PINNED
223. *41       FIXED BUT FX MZ
224. *45       FIXED BUT FX MZ
225. *46       FIXED BUT FX MZ
226. *47       FIXED BUT FX MZ
227. *48       FIXED BUT FX MZ
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 49       FIXED BUT FX MZ
 29. 50       FIXED BUT FX MZ
230. 51       FIXED BUT FX MZ
231. 52       FIXED BUT FX MZ
232. 53       FIXED BUT FX MZ
233. 54       FIXED BUT FX MZ
234. 55       FIXED BUT FX MZ
235. 56       FIXED BUT FX MZ
236. 57       FIXED BUT FX MZ
237. 58       FIXED BUT FX MZ
238. LOADING 1 PESO PROPIO
239. SELFWEIGHT   Y  -1.0
240. PERFORM ANALISIS

      P R O B L E M   S T A T I S T I C S
      -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    58/   93/   11
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   162
   SIZE OF STIFFNESS MATRIX =    3402 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.19 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              10: 0:43
++ PROCESSING GLOBAL STIFFNESS MATRIX.               10: 0:43
++ PROCESSING TRIANGULAR FACTORIZATION.              10: 0:43
++ CALCULATING JOINT DISPLACEMENTS.                  10: 0:43
++ CALCULATING MEMBER  FORCES.                       10: 0:44

241. LOAD LIST 1
242. PRINT MEMBER FORCES LIST 74 TO 93
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	427.23	0.00	0.00	0.00	261.60
		39	0.00	-353.53	0.00	0.00	0.00	592.18
75	1	39	0.00	353.58	0.00	0.00	0.00	-592.24
		40	0.00	-279.86	0.00	0.00	0.00	1285.07
76	1	40	0.00	279.87	0.00	0.00	0.00	-1285.06
		41	0.00	-206.14	0.00	0.00	0.00	1816.64
77	1	41	0.00	206.11	0.00	0.00	0.00	-1816.62
		42	0.00	-132.39	0.00	0.00	0.00	2186.87
78	1	42	0.00	132.42	0.00	0.00	0.00	-2186.87
		43	0.00	-58.69	0.00	0.00	0.00	2395.90
79	1	43	0.00	58.68	0.00	0.00	0.00	-2395.88
		44	0.00	15.04	0.00	0.00	0.00	2443.62
80	1	44	0.00	-15.05	0.00	0.00	0.00	-2443.61
		45	0.00	88.78	0.00	0.00	0.00	2330.04
81	1	45	0.00	-88.77	0.00	0.00	0.00	-2330.04
		46	0.00	162.50	0.00	0.00	0.00	2055.20
82	1	46	0.00	-162.50	0.00	0.00	0.00	-2055.20
		47	0.00	236.23	0.00	0.00	0.00	1619.07
83	1	47	0.00	-236.23	0.00	0.00	0.00	-1619.07
		48	0.00	309.95	0.00	0.00	0.00	1021.68
4	1	48	0.00	-309.95	0.00	0.00	0.00	-1021.68
		49	0.00	383.68	0.00	0.00	0.00	262.99
85	1	49	0.00	-85.16	0.00	0.00	0.00	-262.99
		50	0.00	158.89	0.00	0.00	0.00	-3.94
86	1	50	0.00	9.53	0.00	0.00	0.00	3.94
		51	0.00	8.84	0.00	0.00	0.00	-3.19
87	1	51	0.00	9.10	0.00	0.00	0.00	3.19
		52	0.00	9.28	0.00	0.00	0.00	-3.39
88	1	52	0.00	9.21	0.00	0.00	0.00	3.39
		53	0.00	9.17	0.00	0.00	0.00	-3.34
89	1	53	0.00	9.19	0.00	0.00	0.00	3.34
		54	0.00	9.18	0.00	0.00	0.00	-3.34

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.34
		55	0.00	9.22	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

243. PRINT JOI DIS LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-31.03343	340.42380	0.00000	0.00000	0.00000	-0.26727
39	1	-31.03343	282.03156	0.00000	0.00000	0.00000	-0.26461
40	1	-31.03343	225.50719	0.00000	0.00000	0.00000	-0.25047
41	1	-31.03343	173.11334	0.00000	0.00000	0.00000	-0.22723
42	1	-31.03343	126.58237	0.00000	0.00000	0.00000	-0.19728
43	1	-31.03343	87.11363	0.00000	0.00000	0.00000	-0.16304
44	1	-31.03343	55.38992	0.00000	0.00000	0.00000	-0.12689
45	1	-31.03343	31.56338	0.00000	0.00000	0.00000	-0.09123
46	1	-31.03343	15.26722	0.00000	0.00000	0.00000	-0.05845
47	1	-31.03343	5.60657	0.00000	0.00000	0.00000	-0.03095
48	1	-31.03343	1.16487	0.00000	0.00000	0.00000	-0.01114
49	1	-31.03343	0.00000	0.00000	0.00000	0.00000	-0.00139
50	1	-31.03343	0.00000	0.00000	0.00000	0.00000	0.00073
51	1	-31.03343	0.00000	0.00000	0.00000	0.00000	-0.00020
52	1	-31.03343	0.00000	0.00000	0.00000	0.00000	0.00005
53	1	-31.03343	0.00000	0.00000	0.00000	0.00000	-0.00002
54	1	-31.03343	0.00000	0.00000	0.00000	0.00000	0.00003
55	1	-31.03343	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	-31.03343	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	-31.03343	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	-31.03343	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
18	1	0.00	524.33	0.00	0.00	0.00	0.00
49	1	0.00	298.52	0.00	0.00	0.00	0.00
50	1	0.00	168.41	0.00	0.00	0.00	0.00
51	1	0.00	17.94	0.00	0.00	0.00	0.00
52	1	0.00	18.49	0.00	0.00	0.00	0.00
53	1	0.00	18.36	0.00	0.00	0.00	0.00
54	1	0.00	18.34	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

245. PLOT BEND FILE
246. PLOT DISP FILE
247. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 10: 0:46 ****

****
* 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 *
****

Posicion 20

```
*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  1, 1997        *
*          Time=    10: 2:17            *
*                                       *
*****************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. MEMBER INCIDENCES
15.  1   1   2
16.  2   2   3
17.  3   3   4
18.  4   4   5
19.  5   5   6
20.  6   6   7
21.  7   7   8
22.  8   8   9
23.  9   9  10
24. 10  10  11
25. 11  11  12
26. 12  12  13
27. 13  13  14
28. 14  14  15
29. 15  15  16
30. 16  16  17
31. 17  17  18
32. 18  18  19
33. 19  29  30
34. 20  30  31
35. 21  31  32
36. 22  32  33
37. 23  33  34
38. 24  34  35
39. 25  35  36
40. 26  36  37
41. 27  37  38
42. 28   1  29
43. 29   2  20
44. 30   3  30
45. 31   4  21
46. 32   5  31
47. 33   6  22
```



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48. 34   7  32
49. 35   8  23
50. 36   9  33
51. 37  10  24
52. 38  11  34
53. 39  12  25
54. 40  13  35
55. 41  14  26
56. 42  15  36
57. 43  16  27
58. 44  17  37
59. 45  18  28
60. 46  19  38
61. 47  29  20
62. 48  20   3
63. 49  30  21
64. 50  21   5
65. 51  31  22
66. 52  22   7
67. 53  32  23
68. 54  23   9
69. 55  33  24
70. 56  24  11
71. 57  34  25
72. 58  25  13
73. 59  35  26
74. 60  26  15
75. 61  36  27
76. 62  27  17
77. 63  37  28
78. 64  28  19
79. 65   3  21
80. 66   5  22
81. 67   7  23
82. 68   9  24
83. 69  11  25
84. 70  13  26
85. 71  15  27
86. 72  17  28
87. 73   1  20
88. 74  19  39
89. 75  39  40
90. 76  40  41
91. 77  41  42
92. 78  42  43
93. 79  43  44
94. 80  44  45
95. 81  45  46
96. 82  46  47
97. 83  47  48
98. 84  48  49
99. 85  49  50
100. 86  50  51
101. 87  51  52
102. 88  52  53
103. 89  53  54
104. 90  54  55
105. 91  55  56
 06. 92  56  57
107. 93  57  58
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108. MEMBER PROPERTY
 09. *CORDON INFERIOR
110.   1                    PR  AX  0.0500  IZ  0.00151406
111.   2                    PR  AX  0.0500  IZ  0.00151406
112.   3                    PR  AX  0.0532  IZ  0.00156748
113.   4                    PR  AX  0.0532  IZ  0.00156748
114.   5                    PR  AX  0.0670  IZ  0.00233098
115.   6                    PR  AX  0.0670  IZ  0.00233098
116.   7                    PR  AX  0.0750  IZ  0.00271328
117.   8                    PR  AX  0.0750  IZ  0.00271328
118.   9                    PR  AX  0.0900  IZ  0.00380584
119.  10                    PR  AX  0.0900  IZ  0.00380584
120.  11                    PR  AX  0.1070  IZ  0.00464364
121.  12                    PR  AX  0.1070  IZ  0.00464364
122.  13                    PR  AX  0.1180  IZ  0.00593306
123.  14                    PR  AX  0.1180  IZ  0.00593306
124.  15                    PR  AX  0.1410  IZ  0.00804164
125.  16                    PR  AX  0.1410  IZ  0.00804164
126.  17                    PR  AX  0.1520  IZ  0.00926892
127.  18                    PR  AX  0.1520  IZ  0.00926892
 28. *CORDON SUPERIOR
129.  19                    PR  AX  0.0280  IZ  0.00046454
130.  20                    PR  AX  0.0280  IZ  0.00046454
131.  21                    PR  AX  0.0280  IZ  0.00046454
132.  22                    PR  AX  0.0320  IZ  0.00072626
133.  23                    PR  AX  0.0320  IZ  0.00072626
134.  24                    PR  AX  0.0450  IZ  0.00164273
135.  25                    PR  AX  0.0600  IZ  0.00261476
136.  26                    PR  AX  0.0720  IZ  0.00316788
137.  27                    PR  AX  0.0840  IZ  0.00380920
138. *MONTANTES PRINCIPALES
139.  28                    PR  AX  0.0068  IZ  0.00000001
140.  30                    PR  AX  0.0082  IZ  0.00000001
141.  32                    PR  AX  0.0148  IZ  0.00000001
142.  34                    PR  AX  0.0212  IZ  0.00000001
143.  36                    PR  AX  0.0298  IZ  0.00000001
144.  38                    PR  AX  0.0298  IZ  0.00000001
145.  40                    PR  AX  0.0398  IZ  0.00000001
146.  42                    PR  AX  0.0498  IZ  0.00000001
 47.  44                    PR  AX  0.0578  IZ  0.00000001
148.  46                    PR  AX  0.0578  IZ  10000.0000
149. *MONTANTES SECUNDARIOS
150.  29                    PR  AX  0.0068  IZ  0.00000001
151.  31                    PR  AX  0.0068  IZ  0.00000001
152.  33                    PR  AX  0.0068  IZ  0.00000001
153.  35                    PR  AX  0.0096  IZ  0.00000001
154.  37                    PR  AX  0.0112  IZ  0.00000001
155.  39                    PR  AX  0.0128  IZ  0.00000001
156.  41                    PR  AX  0.0168  IZ  0.00000001
157.  43                    PR  AX  0.0192  IZ  0.00000001
158.  45                    PR  AX  0.0298  IZ  0.00000001
159. *DIAGONALES 1
160.  47                    PR  AX  0.0068  IZ  0.00001456
161.  48                    PR  AX  0.0068  IZ  0.00001456
162.  49                    PR  AX  0.0096  IZ  0.00003700
163.  50                    PR  AX  0.0096  IZ  0.00003700
164.  51                    PR  AX  0.0128  IZ  0.00007640
165.  52                    PR  AX  0.0128  IZ  0.00007640
 66.  53                    PR  AX  0.0212  IZ  0.00025120
167.  54                    PR  AX  0.0212  IZ  0.00025120
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  55                    PR  AX  0.0298  IZ  0.00025166
 59.  56                    PR  AX  0.0298  IZ  0.00025166
170.  57                    PR  AX  0.0398  IZ  0.00037183
171.  58                    PR  AX  0.0398  IZ  0.00037183
172.  59                    PR  AX  0.0498  IZ  0.00050799
173.  60                    PR  AX  0.0498  IZ  0.00050799
174.  61                    PR  AX  0.0578  IZ  0.00061053
175.  62                    PR  AX  0.0578  IZ  0.00061053
176.  63                    PR  AX  0.0648  IZ  0.00071462
177.  64                    PR  AX  0.0648  IZ  0.00071462
178. *DIAGONALES 2
179.  65                    PR  AX  0.0068  IZ  0.00000001
180.  66                    PR  AX  0.0068  IZ  0.00000001
181.  67                    PR  AX  0.0068  IZ  0.00000001
182.  68                    PR  AX  0.0056  IZ  0.00000001
183.  69                    PR  AX  0.0056  IZ  0.00000001
184.  70                    PR  AX  0.0150  IZ  0.00000001
185.  71                    PR  AX  0.0150  IZ  0.00000001
186.  72                    PR  AX  0.0193  IZ  0.00000001
187.  73                    PR  AX  0.0068  IZ  0.00000001
 88. *SECCION DE HORMIGON
189.  74                    PR  AX 13.4810  IZ 45.3025
190.  75                    PR  AX 13.4810  IZ 45.3025
191.  76                    PR  AX 13.4810  IZ 45.3025
192.  77                    PR  AX 13.4810  IZ 45.3025
193.  78                    PR  AX 13.4810  IZ 45.3025
194.  79                    PR  AX 13.4810  IZ 45.3025
195.  80                    PR  AX 13.4810  IZ 45.3025
196.  81                    PR  AX 13.4810  IZ 45.3025
197.  82                    PR  AX 13.4810  IZ 45.3025
198.  83                    PR  AX 13.4810  IZ 45.3025
199.  84                    PR  AX 13.4810  IZ 45.3025
200.  85                    PR  AX 13.4810  IZ 45.3025
201.  86                    PR  AX  3.3600  IZ  0.1577
202.  87                    PR  AX  3.3600  IZ  0.1577
203.  88                    PR  AX  3.3600  IZ  0.1577
204.  89                    PR  AX  3.3600  IZ  0.1577
205.  90                    PR  AX  3.3600  IZ  0.1577
206.  91                    PR  AX  3.3600  IZ  0.1577
 07.  92                    PR  AX  3.3600  IZ  0.1577
208.  93                    PR  AX  3.3600  IZ  0.1577
209. MEMBER RELEASES
210. 29 TO 46 65 TO 73 START MZ
211. 29 TO 46 65 TO 73  END   MZ
212. 47 49 51 53 55 57 59 61 63 START MZ
213. 48 50 52 54 56 58 60 62 64 END MZ
214. CONSTANTS
215. E   21000.  MEM  1  TO  73
216. DEN 10.15       MEM  1  TO  73
217. POISSON  0.15  MEM  1  TO  73
218. E    3250.  MEM  74 TO  93
219. DEN  2.50       MEM  74 TO  93
220. POISSON  0.20  MEM  74 TO  93
221. SUPPORTS
222. 19       PINNED
223. 42       FIXED BUT FX MZ
224. 46       FIXED BUT FX MZ
225. *47       FIXED BUT FX MZ
 26. 48       FIXED BUT FX MZ
227. 49       FIXED BUT FX MZ
```

```
228. 50      FIXED BUT FX MZ
 29. 51      FIXED BUT FX MZ
230. 52      FIXED BUT FX MZ
231. 53      FIXED BUT FX MZ
232. 54      FIXED BUT FX MZ
233. 55      FIXED BUT FX MZ
234. 56      FIXED BUT FX MZ
235. 57      FIXED BUT FX MZ
236. 58      FIXED BUT FX MZ
237. LOADING 1 PESO PROPIO
238. SELFWEIGHT   Y  -1.0
239. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 58/ 93/ 14
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 159
SIZE OF STIFFNESS MATRIX = 3339 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.19 MEGA-BYTES

```
++ PROCESSING ELEMENT STIFFNESS MATRIX.          10: 2:20
++ PROCESSING GLOBAL STIFFNESS MATRIX.           10: 2:21
++ PROCESSING TRIANGULAR FACTORIZATION.          10: 2:21
++ CALCULATING JOINT DISPLACEMENTS.              10: 2:21
++ CALCULATING MEMBER  FORCES.                   10: 2:21

240. LOAD LIST 1
241. PRINT MEMBER FORCES LIST 74 TO 93
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	330.98	0.00	0.00	0.00	1484.97
		39	0.00	-257.28	0.00	0.00	0.00	-841.71
75	1	39	0.00	257.28	0.00	0.00	0.00	841.71
		40	0.00	-183.55	0.00	0.00	0.00	-359.55
76	1	40	0.00	183.55	0.00	0.00	0.00	359.55
		41	0.00	-109.83	0.00	0.00	0.00	-38.65
77	1	41	0.00	109.83	0.00	0.00	0.00	38.65
		42	0.00	-36.10	0.00	0.00	0.00	120.95
78	1	42	0.00	100.60	0.00	0.00	0.00	-120.95
		43	0.00	-26.87	0.00	0.00	0.00	260.38
79	1	43	0.00	26.87	0.00	0.00	0.00	-260.38
		44	0.00	46.85	0.00	0.00	0.00	238.52
80	1	44	0.00	-46.85	0.00	0.00	0.00	-238.52
		45	0.00	120.58	0.00	0.00	0.00	55.38
81	1	45	0.00	-120.58	0.00	0.00	0.00	-55.38
		46	0.00	194.31	0.00	0.00	0.00	-289.03
82	1	46	0.00	149.11	0.00	0.00	0.00	289.03
		47	0.00	-75.38	0.00	0.00	0.00	-43.48
83	1	47	0.00	75.38	0.00	0.00	0.00	43.48
		48	0.00	-1.66	0.00	0.00	0.00	40.78
4	1	48	0.00	4.73	0.00	0.00	0.00	-40.78
		49	0.00	69.00	0.00	0.00	0.00	-29.52
85	1	49	0.00	48.82	0.00	0.00	0.00	29.52
		50	0.00	24.90	0.00	0.00	0.00	-3.36
86	1	50	0.00	9.19	0.00	0.00	0.00	3.36
		51	0.00	9.18	0.00	0.00	0.00	-3.35
87	1	51	0.00	9.19	0.00	0.00	0.00	3.35
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.19	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.23	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

242. PRINT JOI DIS LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.02183
39	1	0.00000	2.73209	0.00000	0.00000	0.00000	0.00475
40	1	0.00000	2.68601	0.00000	0.00000	0.00000	-0.00398
41	1	0.00000	1.42764	0.00000	0.00000	0.00000	-0.00673
42	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00592
43	1	0.00000	-1.00181	0.00000	0.00000	0.00000	-0.00289
44	1	0.00000	-1.20100	0.00000	0.00000	0.00000	0.00102
45	1	0.00000	-0.66864	0.00000	0.00000	0.00000	0.00340
46	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00186
47	1	0.00000	0.09251	0.00000	0.00000	0.00000	-0.00041
48	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00023
49	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005
50	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
51	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

243. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
19	1	0.00	428.03	0.00	0.00	0.00	0.00
42	1	0.00	64.50	0.00	0.00	0.00	0.00
46	1	0.00	343.42	0.00	0.00	0.00	0.00
48	1	0.00	3.07	0.00	0.00	0.00	0.00
49	1	0.00	117.82	0.00	0.00	0.00	0.00
50	1	0.00	34.09	0.00	0.00	0.00	0.00
51	1	0.00	18.37	0.00	0.00	0.00	0.00
52	1	0.00	18.37	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
54	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

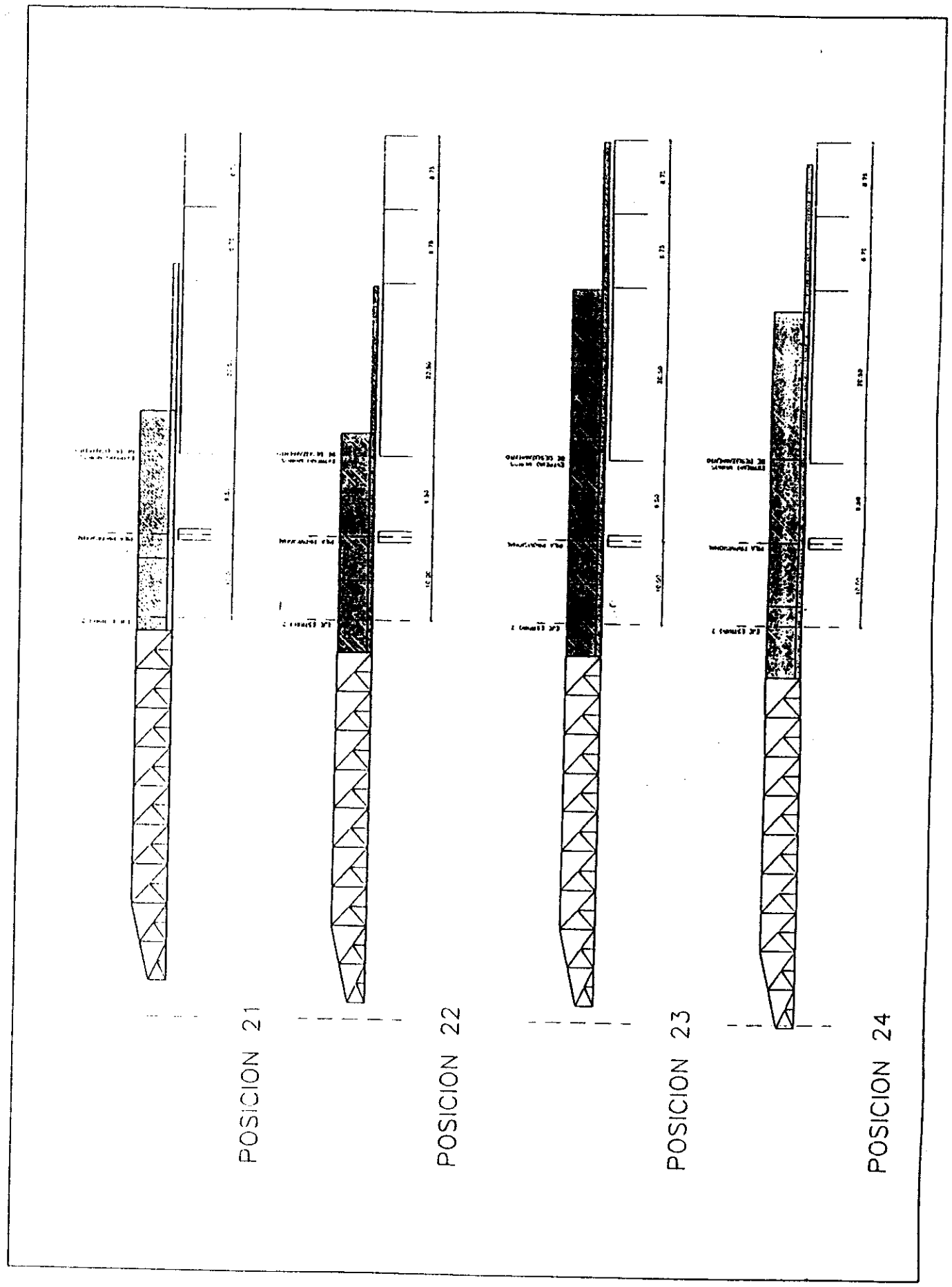
********** END OF LATEST ANALYSIS RESULT **********

244. PLOT BEND FILE
245. PLOT DISP FILE
246. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 1,1997 TIME= 10: 2:24 ****

****
* 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 *
****


POSICION 21
POSICION 22
POSICION 23
POSICION 24

```
*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  1, 1997            *
*          Time=    10: 3:50                *
*                                           *
*********************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20    2.333   1.0625  0.000
7.  21    6.999   1.59375 0.000
8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29    0.000   2.125   0.000
10. 30    4.666   3.1875  0.000
11. 31    9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39   44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51   70.437   0.000   0.000 58   85.75    0.000   0.000
14. MEMBER INCIDENCES
15.  1    1    2
16.  2    2    3
17.  3    3    4
18.  4    4    5
19.  5    5    6
20.  6    6    7
21.  7    7    8
22.  8    8    9
23.  9    9   10
24. 10   10   11
25. 11   11   12
26. 12   12   13
27. 13   13   14
28. 14   14   15
29. 15   15   16
30. 16   16   17
31. 17   17   18
32. 18   18   19
33. 19   29   30
34. 20   30   31
35. 21   31   32
36. 22   32   33
37. 23   33   34
38. 24   34   35
39. 25   35   36
40. 26   36   37
41. 27   37   38
42. 28    1   29
43. 29    2   20
44. 30    3   30
45. 31    4   21
46. 32    5   31
47. 33    6   22
```



```
48.  34    7   32
49.  35    8   23
50.  36    9   33
51.  37   10   24
52.  38   11   34
53.  39   12   25
54.  40   13   35
55.  41   14   26
56.  42   15   36
57.  43   16   27
58.  44   17   37
59.  45   18   28
60.  46   19   38
61.  47   29   20
62.  48   20    3
63.  49   30   21
64.  50   21    5
65.  51   31   22
66.  52   22    7
67.  53   32   23
68.  54   23    9
69.  55   33   24
70.  56   24   11
71.  57   34   25
72.  58   25   13
73.  59   35   26
74.  60   26   15
75.  61   36   27
76.  62   27   17
77.  63   37   28
78.  64   28   19
79.  65    3   21
80.  66    5   22
81.  67    7   23
82.  68    9   24
83.  69   11   25
84.  70   13   26
85.  71   15   27
86.  72   17   28
87.  73    1   20
88.  74   19   39
89.  75   39   40
90.  76   40   41
91.  77   41   42
92.  78   42   43
93.  79   43   44
94.  80   44   45
95.  81   45   46
96.  82   46   47
97.  83   47   48
98.  84   48   49
99.  85   49   50
100. 86   50   51
101. 87   51   52
102. 88   52   53
103. 89   53   54
104. 90   54   55
105. 91   55   56
.06. 92   56   57
107. 93   57   58
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108. MEMBER PROPERTY
 99. *CORDON INFERIOR
110.   1                    PR  AX  0.0500  IZ  0.00151406
111.   2                    PR  AX  0.0500  IZ  0.00151406
112.   3                    PR  AX  0.0532  IZ  0.00156748
113.   4                    PR  AX  0.0532  IZ  0.00156748
114.   5                    PR  AX  0.0670  IZ  0.00233098
115.   6                    PR  AX  0.0670  IZ  0.00233098
116.   7                    PR  AX  0.0750  IZ  0.00271328
117.   8                    PR  AX  0.0750  IZ  0.00271328
118.   9                    PR  AX  0.0900  IZ  0.00380584
119.  10                    PR  AX  0.0900  IZ  0.00380584
120.  11                    PR  AX  0.1070  IZ  0.00464364
121.  12                    PR  AX  0.1070  IZ  0.00464364
122.  13                    PR  AX  0.1180  IZ  0.00593306
123.  14                    PR  AX  0.1180  IZ  0.00593306
124.  15                    PR  AX  0.1410  IZ  0.00804164
125.  16                    PR  AX  0.1410  IZ  0.00804164
126.  17                    PR  AX  0.1520  IZ  0.00926892
127.  18                    PR  AX  0.1520  IZ  0.00926892
 28. *CORDON SUPERIOR
129.  19                    PR  AX  0.0280  IZ  0.00046454
130.  20                    PR  AX  0.0280  IZ  0.00046454
131.  21                    PR  AX  0.0280  IZ  0.00046454
132.  22                    PR  AX  0.0320  IZ  0.00072626
133.  23                    PR  AX  0.0320  IZ  0.00072626
134.  24                    PR  AX  0.0450  IZ  0.00164273
135.  25                    PR  AX  0.0600  IZ  0.00261476
136.  26                    PR  AX  0.0720  IZ  0.00316788
137.  27                    PR  AX  0.0840  IZ  0.00380920
138. *MONTANTES PRINCIPALES
139.  28                    PR  AX  0.0068  IZ  0.00000001
140.  30                    PR  AX  0.0082  IZ  0.00000001
141.  32                    PR  AX  0.0148  IZ  0.00000001
142.  34                    PR  AX  0.0212  IZ  0.00000001
143.  36                    PR  AX  0.0298  IZ  0.00000001
144.  38                    PR  AX  0.0298  IZ  0.00000001
145.  40                    PR  AX  0.0398  IZ  0.00000001
146.  42                    PR  AX  0.0498  IZ  0.00000001
 47.  44                    PR  AX  0.0578  IZ  0.00000001
148.  46                    PR  AX  0.0578  IZ  10000.0000
149. *MONTANTES SECUNDARIOS
150.  29                    PR  AX  0.0068  IZ  0.00000001
151.  31                    PR  AX  0.0068  IZ  0.00000001
152.  33                    PR  AX  0.0068  IZ  0.00000001
153.  35                    PR  AX  0.0096  IZ  0.00000001
154.  37                    PR  AX  0.0112  IZ  0.00000001
155.  39                    PR  AX  0.0128  IZ  0.00000001
156.  41                    PR  AX  0.0168  IZ  0.00000001
157.  43                    PR  AX  0.0192  IZ  0.00000001
158.  45                    PR  AX  0.0298  IZ  0.00000001
159. *DIAGONALES 1
160.  47                    PR  AX  0.0068  IZ  0.00001456
161.  48                    PR  AX  0.0068  IZ  0.00001456
162.  49                    PR  AX  0.0096  IZ  0.00003700
163.  50                    PR  AX  0.0096  IZ  0.00003700
164.  51                    PR  AX  0.0128  IZ  0.00007640
165.  52                    PR  AX  0.0128  IZ  0.00007640
166.  53                    PR  AX  0.0212  IZ  0.00025120
167.  54                    PR  AX  0.0212  IZ  0.00025120
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.  55                    PR  AX  0.0298  IZ  0.00025166
 59.  56                    PR  AX  0.0298  IZ  0.00025166
170.  57                    PR  AX  0.0398  IZ  0.00037183
171.  58                    PR  AX  0.0398  IZ  0.00037183
172.  59                    PR  AX  0.0498  IZ  0.00050799
173.  60                    PR  AX  0.0498  IZ  0.00050799
174.  61                    PR  AX  0.0578  IZ  0.00061053
175.  62                    PR  AX  0.0578  IZ  0.00061053
176.  63                    PR  AX  0.0648  IZ  0.00071462
177.  64                    PR  AX  0.0648  IZ  0.00071462
178. *DIAGONALES 2
179.  65                    PR  AX  0.0068  IZ  0.00000001
180.  66                    PR  AX  0.0068  IZ  0.00000001
181.  67                    PR  AX  0.0068  IZ  0.00000001
182.  68                    PR  AX  0.0056  IZ  0.00000001
183.  69                    PR  AX  0.0056  IZ  0.00000001
184.  70                    PR  AX  0.0150  IZ  0.00000001
185.  71                    PR  AX  0.0150  IZ  0.00000001
186.  72                    PR  AX  0.0193  IZ  0.00000001
187.  73                    PR  AX  0.0068  IZ  0.00000001
 88. *SECCION DE HORMIGON
189.  74                    PR  AX 13.4810  IZ 45.3025
190.  75                    PR  AX 13.4810  IZ 45.3025
191.  76                    PR  AX 13.4810  IZ 45.3025
192.  77                    PR  AX 13.4810  IZ 45.3025
193.  78                    PR  AX 13.4810  IZ 45.3025
194.  79                    PR  AX 13.4810  IZ 45.3025
195.  80                    PR  AX 13.4810  IZ 45.3025
196.  81                    PR  AX 13.4810  IZ 45.3025
197.  82                    PR  AX 13.4810  IZ 45.3025
198.  83                    PR  AX 13.4810  IZ 45.3025
199.  84                    PR  AX 13.4810  IZ 45.3025
200.  85                    PR  AX 13.4810  IZ 45.3025
201.  86                    PR  AX  3.3600  IZ  0.1577
202.  87                    PR  AX  3.3600  IZ  0.1577
203.  88                    PR  AX  3.3600  IZ  0.1577
204.  89                    PR  AX  3.3600  IZ  0.1577
205.  90                    PR  AX  3.3600  IZ  0.1577
206.  91                    PR  AX  3.3600  IZ  0.1577
 07.  92                    PR  AX  3.3600  IZ  0.1577
208.  93                    PR  AX  3.3600  IZ  0.1577
209. MEMBER RELEASES
210. 29 TO 46 65 TO 73 START MZ
211. 29 TO 46 65 TO 73  END   MZ
212. 47 49 51 53 55 57 59 61 63 START MZ
213. 48 50 52 54 56 58 60 62 64 END MZ
214. CONSTANTS
215. E   21000.  MEM  1  TO  73
216. DEN 10.15       MEM  1  TO  73
217. POISSON  0.15  MEM  1  TO  73
218. E    3250.  MEM  74 TO  93
219. DEN  2.50       MEM  74 TO  93
220. POISSON  0.20  MEM  74 TO  93
221. SUPPORTS
222. 39       PINNED
223. 43       FIXED BUT FX MZ
224. 47       FIXED BUT FX MZ
225. *48       FIXED BUT FX MZ
226. 49       FIXED BUT FX MZ
227. 50       FIXED BUT FX MZ
```

```
228. 51      FIXED BUT FX MZ
 29. 52      FIXED BUT FX MZ
230. 53      FIXED BUT FX MZ
231. 54      FIXED BUT FX MZ
232. 55      FIXED BUT FX MZ
233. 56      FIXED BUT FX MZ
234. 57      FIXED BUT FX MZ
235. 58      FIXED BUT FX MZ
236. LOADING 1 PESO PROPIO
237. SELFWEIGHT   Y  -1.0
238. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS = 58/ 93/ 13
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 160
SIZE OF STIFFNESS MATRIX = 3360 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.19 MEGA-BYTES

```
++ PROCESSING ELEMENT STIFFNESS MATRIX.          10: 3:54
++ PROCESSING GLOBAL STIFFNESS MATRIX.           10: 3:54
++ PROCESSING TRIANGULAR FACTORIZATION.          10: 3:54
++ CALCULATING JOINT DISPLACEMENTS.              10: 3:54
++ CALCULATING MEMBER  FORCES.                   10: 3:55

239. LOAD LIST 1
240. PRINT MEMBER FORCES LIST 74 TO 93
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.01	-97.05	0.00	0.00	0.00	1484.97
		39	-0.01	170.76	0.00	0.00	0.00	-1777.81
75	1	39	0.00	373.60	0.00	0.00	0.00	1777.81
		40	0.00	-299.88	0.00	0.00	0.00	-1041.20
76	1	40	0.00	299.88	0.00	0.00	0.00	1041.20
		41	0.00	-226.15	0.00	0.00	0.00	-465.84
77	1	41	0.00	226.15	0.00	0.00	0.00	465.84
		42	0.00	-152.42	0.00	0.00	0.00	-51.77
78	1	42	0.00	152.42	0.00	0.00	0.00	51.77
		43	0.00	-78.70	0.00	0.00	0.00	201.03
79	1	43	0.00	88.30	0.00	0.00	0.00	-201.03
		44	0.00	-14.58	0.00	0.00	0.00	313.56
80	1	44	0.00	14.58	0.00	0.00	0.00	-313.56
		45	0.00	59.15	0.00	0.00	0.00	264.81
81	1	45	0.00	-59.15	0.00	0.00	0.00	-264.81
		46	0.00	132.87	0.00	0.00	0.00	54.78
82	1	46	0.00	-132.87	0.00	0.00	0.00	-54.78
		47	0.00	206.60	0.00	0.00	0.00	-316.53
83	1	47	0.00	156.50	0.00	0.00	0.00	316.53
		48	0.00	-82.78	0.00	0.00	0.00	-54.82
4	1	48	0.00	82.78	0.00	0.00	0.00	54.82
		49	0.00	-9.05	0.00	0.00	0.00	45.62
85	1	49	0.00	14.41	0.00	0.00	0.00	-45.62
		50	0.00	59.32	0.00	0.00	0.00	-3.51
86	1	50	0.00	9.28	0.00	0.00	0.00	3.51
		51	0.00	9.09	0.00	0.00	0.00	-3.31
87	1	51	0.00	9.16	0.00	0.00	0.00	3.31
		52	0.00	9.21	0.00	0.00	0.00	-3.36
88	1	52	0.00	9.19	0.00	0.00	0.00	3.36
		53	0.00	9.18	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.22	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.67	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

241. PRINT JOI DIS LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00003	-8.57674	0.00000	0.00000	0.00000	0.05087
39	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.02684
40	1	0.00000	3.40262	0.00000	0.00000	0.00000	0.00610
41	1	0.00000	3.37757	0.00000	0.00000	0.00000	-0.00490
42	1	0.00000	1.79479	0.00000	0.00000	0.00000	-0.00855
43	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00724
44	1	0.00000	-1.17365	0.00000	0.00000	0.00000	-0.00321
45	1	0.00000	-1.37189	0.00000	0.00000	0.00000	0.00128
46	1	0.00000	-0.75314	0.00000	0.00000	0.00000	0.00386
47	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00211
48	1	0.00000	0.11093	0.00000	0.00000	0.00000	-0.00045
49	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00032
50	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020
51	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00005
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

242. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
39	1	-0.01	544.36	0.00	0.00	0.00	0.00
43	1	0.00	9.61	0.00	0.00	0.00	0.00
47	1	0.00	363.10	0.00	0.00	0.00	0.00
49	1	0.00	5.36	0.00	0.00	0.00	0.00
50	1	0.00	68.59	0.00	0.00	0.00	0.00
51	1	0.00	18.26	0.00	0.00	0.00	0.00
52	1	0.00	18.40	0.00	0.00	0.00	0.00
53	1	0.00	18.38	0.00	0.00	0.00	0.00
54	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

243. PLOT BEND FILE
244. PLOT DISP FILE
245. FINISH

********** END OF STAAD-III **********
**** DATE= JUL 1,1997 TIME= 10: 3:57 ****

****
* 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 *
****

DOS 22

****
* *
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 4, 1997 *
* Time= 14: 4:37 *
* *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.375	0.000	0.000
61.	57	83.562	0.000	0.000
62.	58	85.750	0.000	0.000
63.	* 59	87.937	0.000	0.000
64.	* 60	90.125	0.000	0.000
65.	* 61	92.312	0.000	0.000
66.	* 62	94.500	0.000	0.000
67.	* 63	96.687	0.000	0.000
68.	* 64	98.875	0.000	0.000
69.	* 65	101.062	0.000	0.000
70.	* 66	103.250	0.000	0.000
71.	* 67	105.437	0.000	0.000
72.	* 68	107.625	0.000	0.000
73.	* 69	109.812	0.000	0.000
74.	* 70	112.000	0.000	0.000
75.	* 71	114.187	0.000	0.000
76.	* 72	116.375	0.000	0.000
77.	* 73	118.562	0.000	0.000
78.	* 74	120.750	0.000	0.000
79.	*75	122.937	0.000	0.000
80.	*76	125.125	0.000	0.000
81.	*77	127.312	0.000	0.000
82.	*78	129.000	0.000	0.000
83.	*79	131.687	0.000	0.000
84.	*80	133.875	0.000	0.000
85.	*81	136.062	0.000	0.000
86.	*82	138.250	0.000	0.000

87. MEMBER INCIDENCES

88.	1	1	2
89.	2	2	3
90.	3	3	4
91.	4	4	5
92.	5	5	6
93.	6	6	7
94.	7	7	8
95.	8	8	9
96.	9	9	10
97.	10	10	11
98.	11	11	12
99.	12	12	13
100.	13	13	14
101.	14	14	15
102.	15	15	16
103.	16	16	17
104.	17	17	18
105.	18	18	19
106.	19	29	30
107.	20	30	31

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	21	31	32
109.	22	32	33
110.	23	33	34
111.	24	34	35
112.	25	35	36
113.	26	36	37
114.	27	37	38
115.	28	1	29
116.	29	2	20
117.	30	3	30
118.	31	4	21
119.	32	5	31
120.	33	6	22
121.	34	7	32
122.	35	8	23
123.	36	9	33
124.	37	10	24
125.	38	11	34
126.	39	12	25
127.	40	13	35
128.	41	14	26
129.	42	15	36
130.	43	16	27
131.	44	17	37
132.	45	18	28
133.	46	19	38
134.	47	29	20
135.	48	20	3
136.	49	30	21
137.	50	21	5
138.	51	31	22
139.	52	22	7
140.	53	32	23
141.	54	23	9
142.	55	33	24
143.	56	24	11
144.	57	34	25
145.	58	25	13
146.	59	35	26
147.	60	26	15
148.	61	36	27
149.	62	27	17
150.	63	37	28
151.	64	28	19
152.	65	3	21
153.	66	5	22
154.	67	7	23
155.	68	9	24
156.	69	11	25
157.	70	13	26
158.	71	15	27
159.	72	17	28
160.	73	1	20
161.	74	19	39
162.	75	39	40
163.	76	40	41
164.	77	41	42
165.	78	42	43
166.	79	43	44
167.	80	44	45

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168.      81    45    46
169.      82    46    47
170.      83    47    48
171.      84    48    49
172.      85    49    50
173.      86    50    51
174.      87    51    52
175.      88    52    53
176.      89    53    54
177.      90    54    55
178.      91    55    56
179.      92    56    57
180.      93    57    58
181.    * 94    58    59
182.    * 95    59    60
183.    * 96    60    61
184.    * 97    61    62
185.    * 98    62    63
186.    * 99    63    64
187.    *100    64    65
188.    *101    65    66
189.    *102    66    67
190.    *103    67    68
191.    *104    68    69
192.    *105    69    70
193.    *106    70    71
194.    *107    71    72
195.    *108    72    73
196.    *109    73    74
197.    *110    74    75
198.    *111    75    76
199.    *112    76    77
200.    *113    77    78
201.    *114    78    79
202.    *115    79    80
203.    *116    80    81
204.    *117    81    82
205. MEMBER PROPERTY
206. * CORDON INFERIOR
207. 1                PR AX  0.0500   IZ 0.00151406
208. 2                PR AX  0.0500   IZ 0.00151406
209. 3                PR AX  0.0532   IZ 0.00156748
210. 4                PR AX  0.0532   IZ 0.00156748
211. 5                PR AX  0.0670   IZ 0.00233098
212. 6                PR AX  0.0670   IZ 0.00233098
213. 7                PR AX  0.0750   IZ 0.00271328
214. 8                PR AX  0.0750   IZ 0.00271328
215. 9                PR AX  0.0900   IZ 0.00380584
216. 10               PR AX  0.0900   IZ 0.00380584
217. 11               PR AX  0.1070   IZ 0.00464364
218. 12               PR AX  0.1070   IZ 0.00464364
219. 13               PR AX  0.1180   IZ 0.00593306
220. 14               PR AX  0.1180   IZ 0.00593306
221. 15               PR AX  0.1410   IZ 0.00804164
222. 16               PR AX  0.1410   IZ 0.00804164
223. 17               PR AX  0.1520   IZ 0.00926892
224. 18               PR AX  0.1520   IZ 0.00926892
225. * CORDON SUPERIOR
226. 19               PR AX  0.0280   IZ 0.00046454
227. 20               PR AX  0.0280   IZ 0.00046454
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228. 21               PR AX  0.0280   IZ 0.00046454
229. 22               PR AX  0.0320   IZ 0.00072626
230. 23               PR AX  0.0320   IZ 0.00072626
231. 24               PR AX  0.0450   IZ 0.00164273
232. 25               PR AX  0.0600   IZ 0.00261476
233. 26               PR AX  0.0720   IZ 0.00316788
234. 27               PR AX  0.0840   IZ 0.00380920
235. * MONTANTES PRINCIPALES
236. 28               PR AX  0.0068   IZ 0.00000001
237. 30               PR AX  0.0082   IZ 0.00000001
238. 32               PR AX  0.0148   IZ 0.00000001
239. 34               PR AX  0.0212   IZ 0.00000001
240. 36               PR AX  0.0298   IZ 0.00000001
241. 38               PR AX  0.0298   IZ 0.00000001
242. 40               PR AX  0.0398   IZ 0.00000001
243. 42               PR AX  0.0498   IZ 0.00000001
244. 44               PR AX  0.0578   IZ 0.00000001
245. 46               PR AX  0.0578   IZ 10000.
246. * MONTANTES SECUNDARIOS
247. 29               PR AX  0.0068   IZ 0.00000001
248. 31               PR AX  0.0068   IZ 0.00000001
249. 33               PR AX  0.0068   IZ 0.00000001
250. 35               PR AX  0.0096   IZ 0.00000001
251. 37               PR AX  0.0112   IZ 0.00000001
252. 39               PR AX  0.0128   IZ 0.00000001
253. 41               PR AX  0.0168   IZ 0.00000001
254. 43               PR AX  0.0192   IZ 0.00000001
255. 45               PR AX  0.0298   IZ 0.00000001
256. * DIAGONALES 1
257. 47               PR AX  0.0068   IZ 0.00001456
258. 48               PR AX  0.0068   IZ 0.00001456
259. 49               PR AX  0.0096   IZ 0.00003700
260. 50               PR AX  0.0096   IZ 0.00003700
261. 51               PR AX  0.0128   IZ 0.00007640
262. 52               PR AX  0.0128   IZ 0.00007640
263. 53               PR AX  0.0212   IZ 0.00025120
264. 54               PR AX  0.0212   IZ 0.00025120
265. 55               PR AX  0.0298   IZ 0.00025166
266. 56               PR AX  0.0298   IZ 0.00025166
267. 57               PR AX  0.0398   IZ 0.00037183
268. 58               PR AX  0.0398   IZ 0.00037183
269. 59               PR AX  0.0498   IZ 0.00050799
270. 60               PR AX  0.0498   IZ 0.00050799
271. 61               PR AX  0.0578   IZ 0.00061053
272. 62               PR AX  0.0578   IZ 0.00061053
273. 63               PR AX  0.0648   IZ 0.00071462
274. 64               PR AX  0.0648   IZ 0.00071462
275. * DIAGONALES 2
276. 65               PR AX  0.0068   IZ 0.00000001
277. 66               PR AX  0.0068   IZ 0.00000001
278. 67               PR AX  0.0068   IZ 0.00000001
279. 68               PR AX  0.0056   IZ 0.00000001
280. 69               PR AX  0.0056   IZ 0.00000001
281. 70               PR AX  0.0150   IZ 0.00000001
282. 71               PR AX  0.0150   IZ 0.00000001
283. 72               PR AX  0.0193   IZ 0.00000001
284. 73               PR AX  0.0068   IZ 0.00000001
285. * SECCION DE HORMIGON
286. 74               PR AX 13.4810   IZ 45.3025
287. 75               PR AX 13.4810   IZ 45.3025
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288. 76              PR AX 13.4810   IZ 45.3025
289. 77              PR AX 13.4810   IZ 45.3025
290. 78              PR AX 13.4810   IZ 45.3025
291. 79              PR AX 13.4810   IZ 45.3025
292. 80              PR AX 13.4810   IZ 45.3025
293. 81              PR AX 13.4810   IZ 45.3025
294. 82              PR AX 13.4810   IZ 45.3025
295. 83              PR AX 13.4810   IZ 45.3025
296. 84              PR AX 13.4810   IZ 45.3025
297. 85              PR AX 13.4810   IZ 45.3025
298. 86              PR AX  3.3600   IZ  0.1577
299. 87              PR AX  3.3600   IZ  0.1577
300. 88              PR AX  3.3600   IZ  0.1577
301. 89              PR AX  3.3600   IZ  0.1577
302. 90              PR AX  3.3600   IZ  0.1577
303. 91              PR AX  3.3600   IZ  0.1577
304. 92              PR AX  3.3600   IZ  0.1577
305. 93              PR AX  3.3600   IZ  0.1577
306. MEMBER RELEASE
307. 29 TO 46 65 TO 73          STA MZ
308. 47 49 51 53 55 57 59 61 63 STA MZ
309. 29 TO 46 65 TO 73          END MZ
310. 48 50 52 54 56 58 60 62 64 END MZ
311. CONSTANT
312. E 21000.       MEMB 1  TO  73
313. E  3250.       MEMB 74 TO  93
314. POI   0.15     MEMB 1  TO  73
315. POI   0.2      MEMB 74 TO  93
316. DEN  10.15     MEMB 1  TO  73
317. DEN   2.5      MEMB 74 TO  93
318. SUPPORT
319. 40 PINNED
320. *44 FIXED BUT FX MZ
321. 48 FIXED BUT FX MZ
322. *49 FIXED BUT FX MZ
323. 50 FIXED BUT FX MZ
324. 51 FIXED BUT FX MZ
325. 52 FIXED BUT FX MZ
326. 53 FIXED BUT FX MZ
327. 54 FIXED BUT FX MZ
328. 55 FIXED BUT FX MZ
329. 56 FIXED BUT FX MZ
330. 57 FIXED BUT FX MZ
331. 58 FIXED BUT FX MZ
332. LOAD 1 PESO PROPIO
333. SELFWEIGHT Y   -1.
334. 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 =    58/   93/   11
ORIGINAL/FINAL BAND-WIDTH =   28/    6
TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   162
SIZE OF STIFFNESS MATRIX =    3402 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.19 MEGA-BYTES
```



```
++ PROCESSING ELEMENT STIFFNESS MATRIX.          14: 4:41
++ PROCESSING GLOBAL STIFFNESS MATRIX.           14: 4:41
++ PROCESSING TRIANGULAR FACTORIZATION.          14: 4:42
++ CALCULATING JOINT DISPLACEMENTS.              14: 4:42
++ CALCULATING MEMBER  FORCES.                   14: 4:42

335. LOAD LIS  1
336. PRINT MEMBER FORCES LIST 74 TO 93
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.01	-97.05	0.00	0.00	0.00	1484.84
		39	-0.01	170.76	0.00	0.00	0.00	-1777.69
75	1	39	0.01	-170.75	0.00	0.00	0.00	1777.69
		40	-0.01	244.50	0.00	0.00	0.00	-2231.97
76	1	40	0.00	413.57	0.00	0.00	0.00	2231.97
		41	0.00	-339.87	0.00	0.00	0.00	-1408.09
77	1	41	0.00	339.87	0.00	0.00	0.00	1408.09
		42	0.00	-266.12	0.00	0.00	0.00	-745.13
78	1	42	0.00	266.12	0.00	0.00	0.00	745.13
		43	0.00	-192.42	0.00	0.00	0.00	-243.72
79	1	43	0.00	192.42	0.00	0.00	0.00	243.72
		44	0.00	-118.68	0.00	0.00	0.00	96.62
80	1	44	0.00	118.68	0.00	0.00	0.00	-96.62
		45	0.00	-44.97	0.00	0.00	0.00	275.56
81	1	45	0.00	44.97	0.00	0.00	0.00	-275.56
		46	0.00	28.77	0.00	0.00	0.00	293.28
82	1	46	0.00	-28.77	0.00	0.00	0.00	-293.28
		47	0.00	102.48	0.00	0.00	0.00	149.76
83	1	47	0.00	-102.48	0.00	0.00	0.00	-149.76
		48	0.00	176.22	0.00	0.00	0.00	-155.14
84	1	48	0.00	108.42	0.00	0.00	0.00	155.14
		49	0.00	-34.71	0.00	0.00	0.00	1.37
85	1	49	0.00	34.71	0.00	0.00	0.00	-1.37
		50	0.00	39.03	0.00	0.00	0.00	-3.34
86	1	50	0.00	9.18	0.00	0.00	0.00	3.34
		51	0.00	9.19	0.00	0.00	0.00	-3.35
87	1	51	0.00	9.19	0.00	0.00	0.00	3.35
		52	0.00	9.19	0.00	0.00	0.00	-3.35
88	1	52	0.00	9.18	0.00	0.00	0.00	3.35
		53	0.00	9.19	0.00	0.00	0.00	-3.35
89	1	53	0.00	9.20	0.00	0.00	0.00	3.35
		54	0.00	9.18	0.00	0.00	0.00	-3.33

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	9.15	0.00	0.00	0.00	3.33
		55	0.00	9.22	0.00	0.00	0.00	-3.41
91	1	55	0.00	9.33	0.00	0.00	0.00	3.41
		56	0.00	9.05	0.00	0.00	0.00	-3.11
92	1	56	0.00	8.66	0.00	0.00	0.00	3.11
		57	0.00	9.71	0.00	0.00	0.00	-4.25
93	1	57	0.00	11.13	0.00	0.00	0.00	4.25
		58	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

337. PRINT JOINT DISPLACEMENT LIST 19 39 TO 58

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00005	-30.20914	0.00000	0.00000	0.00000	0.09401
39	1	0.00003	-12.19729	0.00000	0.00000	0.00000	0.06998
40	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.04039
41	1	0.00000	5.67519	0.00000	0.00000	0.00000	0.01355
42	1	0.00000	6.73226	0.00000	0.00000	0.00000	-0.00225
43	1	0.00000	5.32372	0.00000	0.00000	0.00000	-0.00939
44	1	0.00000	3.07877	0.00000	0.00000	0.00000	-0.01029
45	1	0.00000	1.10500	0.00000	0.00000	0.00000	-0.00732
46	1	0.00000	-0.01754	0.00000	0.00000	0.00000	-0.00290
47	1	0.00000	-0.23023	0.00000	0.00000	0.00000	0.00059
48	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00075
49	1	0.00000	0.01959	0.00000	0.00000	0.00000	-0.00019
50	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
51	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

338. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
40	1	-0.01	658.07	0.00	0.00	0.00	0.00
48	1	0.00	284.64	0.00	0.00	0.00	0.00
50	1	0.00	48.21	0.00	0.00	0.00	0.00
51	1	0.00	18.38	0.00	0.00	0.00	0.00
52	1	0.00	18.37	0.00	0.00	0.00	0.00
53	1	0.00	18.39	0.00	0.00	0.00	0.00
54	1	0.00	18.33	0.00	0.00	0.00	0.00
55	1	0.00	18.55	0.00	0.00	0.00	0.00
56	1	0.00	17.72	0.00	0.00	0.00	0.00
57	1	0.00	20.84	0.00	0.00	0.00	0.00
58	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

339. PLOT DISPLACEMENT FILE
340. PLOT BENDING FILE
341. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 4,1997 TIME= 14: 4:45 ****

****
* 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 *
****

posicion 24

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  2, 1997        *
*          Time=     7:48: 7             *
*                                       *
*****************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. 59  87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1   1   2
17.  2   2   3
18.  3   3   4
19.  4   4   5
20.  5   5   6
21.  6   6   7
22.  7   7   8
23.  8   8   9
24.  9   9  10
25. 10  10  11
26. 11  11  12
27. 12  12  13
28. 13  13  14
29. 14  14  15
30. 15  15  16
31. 16  16  17
32. 17  17  18
33. 18  18  19
34. 19  29  30
35. 20  30  31
36. 21  31  32
37. 22  32  33
38. 23  33  34
39. 24  34  35
40. 25  35  36
41. 26  36  37
42. 27  37  38
43. 28   1  29
44. 29   2  20
45. 30   3  30
46. 31   4  21
47. 32   5  31
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48. 33   6  22
49. 34   7  32
50. 35   8  23
51. 36   9  33
52. 37  10  24
53. 38  11  34
54. 39  12  25
55. 40  13  35
56. 41  14  26
57. 42  15  36
58. 43  16  27
59. 44  17  37
60. 45  18  28
61. 46  19  38
62. 47  29  20
63. 48  20   3
64. 49  30  21
65. 50  21   5
66. 51  31  22
67. 52  22   7
68. 53  32  23
69. 54  23   9
70. 55  33  24
71. 56  24  11
72. 57  34  25
73. 58  25  13
74. 59  35  26
75. 60  26  15
76. 61  36  27
77. 62  27  17
78. 63  37  28
79. 64  28  19
80. 65   3  21
81. 66   5  22
82. 67   7  23
83. 68   9  24
84. 69  11  25
85. 70  13  26
86. 71  15  27
87. 72  17  28
88. 73   1  20
89. 74  19  39
90. 75  39  40
91. 76  40  41
92. 77  41  42
93. 78  42  43
94. 79  43  44
95. 80  44  45
96. 81  45  46
97. 82  46  47
98. 83  47  48
99. 84  48  49
100. 85  49  50
101. 86  50  51
102. 87  51  52
103. 88  52  53
104. 89  53  54
105. 90  54  55
 06. 91  55  56
107. 92  56  57
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.  93   57    58
 09.  94   58    59
110.  95   59    60
111.  96   60    61
112.  97   61    62
113.  98   62    63
114.  99   63    64
115.  100  64    65
116.  101  65    66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR  AX  0.0500  IZ  0.00151406
120.   2                    PR  AX  0.0500  IZ  0.00151406
121.   3                    PR  AX  0.0532  IZ  0.00156748
122.   4                    PR  AX  0.0532  IZ  0.00156748
123.   5                    PR  AX  0.0670  IZ  0.00233098
124.   6                    PR  AX  0.0670  IZ  0.00233098
125.   7                    PR  AX  0.0750  IZ  0.00271328
126.   8                    PR  AX  0.0750  IZ  0.00271328
127.   9                    PR  AX  0.0900  IZ  0.00380584
 28.  10                    PR  AX  0.0900  IZ  0.00380584
129.  11                    PR  AX  0.1070  IZ  0.00464364
130.  12                    PR  AX  0.1070  IZ  0.00464364
131.  13                    PR  AX  0.1180  IZ  0.00593306
132.  14                    PR  AX  0.1180  IZ  0.00593306
133.  15                    PR  AX  0.1410  IZ  0.00804164
134.  16                    PR  AX  0.1410  IZ  0.00804164
135.  17                    PR  AX  0.1520  IZ  0.00926892
136.  18                    PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                    PR  AX  0.0280  IZ  0.00046454
139.  20                    PR  AX  0.0280  IZ  0.00046454
140.  21                    PR  AX  0.0280  IZ  0.00046454
141.  22                    PR  AX  0.0320  IZ  0.00072626
142.  23                    PR  AX  0.0320  IZ  0.00072626
143.  24                    PR  AX  0.0450  IZ  0.00164273
144.  25                    PR  AX  0.0600  IZ  0.00261476
145.  26                    PR  AX  0.0720  IZ  0.00316788
146.  27                    PR  AX  0.0840  IZ  0.00380920
 47. *MONTANTES PRINCIPALES
148.  28                    PR  AX  0.0068  IZ  0.00000001
149.  30                    PR  AX  0.0082  IZ  0.00000001
150.  32                    PR  AX  0.0148  IZ  0.00000001
151.  34                    PR  AX  0.0212  IZ  0.00000001
152.  36                    PR  AX  0.0298  IZ  0.00000001
153.  38                    PR  AX  0.0298  IZ  0.00000001
154.  40                    PR  AX  0.0398  IZ  0.00000001
155.  42                    PR  AX  0.0498  IZ  0.00000001
156.  44                    PR  AX  0.0578  IZ  0.00000001
157.  46                    PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                    PR  AX  0.0068  IZ  0.00000001
160.  31                    PR  AX  0.0068  IZ  0.00000001
161.  33                    PR  AX  0.0068  IZ  0.00000001
162.  35                    PR  AX  0.0096  IZ  0.00000001
163.  37                    PR  AX  0.0112  IZ  0.00000001
164.  39                    PR  AX  0.0128  IZ  0.00000001
165.  41                    PR  AX  0.0168  IZ  0.00000001
 66.  43                    PR  AX  0.0192  IZ  0.00000001
167.  45                    PR  AX  0.0298  IZ  0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
 69.  47                    PR  AX  0.0068  IZ  0.00001456
170.  48                    PR  AX  0.0068  IZ  0.00001456
171.  49                    PR  AX  0.0096  IZ  0.00003700
172.  50                    PR  AX  0.0096  IZ  0.00003700
173.  51                    PR  AX  0.0128  IZ  0.00007640
174.  52                    PR  AX  0.0128  IZ  0.00007640
175.  53                    PR  AX  0.0212  IZ  0.00025120
176.  54                    PR  AX  0.0212  IZ  0.00025120
177.  55                    PR  AX  0.0298  IZ  0.00025166
178.  56                    PR  AX  0.0298  IZ  0.00025166
179.  57                    PR  AX  0.0398  IZ  0.00037183
180.  58                    PR  AX  0.0398  IZ  0.00037183
181.  59                    PR  AX  0.0498  IZ  0.00050799
182.  60                    PR  AX  0.0498  IZ  0.00050799
183.  61                    PR  AX  0.0578  IZ  0.00061053
184.  62                    PR  AX  0.0578  IZ  0.00061053
185.  63                    PR  AX  0.0648  IZ  0.00071462
186.  64                    PR  AX  0.0648  IZ  0.00071462
187. *DIAGONALES 2
 88.  65                    PR  AX  0.0068  IZ  0.00000001
189.  66                    PR  AX  0.0068  IZ  0.00000001
190.  67                    PR  AX  0.0068  IZ  0.00000001
191.  68                    PR  AX  0.0056  IZ  0.00000001
192.  69                    PR  AX  0.0056  IZ  0.00000001
193.  70                    PR  AX  0.0150  IZ  0.00000001
194.  71                    PR  AX  0.0150  IZ  0.00000001
195.  72                    PR  AX  0.0193  IZ  0.00000001
196.  73                    PR  AX  0.0068  IZ  0.00000001
197. *SECCION DE HORMIGON
198.  74                    PR  AX 13.4810  IZ 45.3025
199.  75                    PR  AX 13.4810  IZ 45.3025
200.  76                    PR  AX 13.4810  IZ 45.3025
201.  77                    PR  AX 13.4810  IZ 45.3025
202.  78                    PR  AX 13.4810  IZ 45.3025
203.  79                    PR  AX 13.4810  IZ 45.3025
204.  80                    PR  AX 13.4810  IZ 45.3025
205.  81                    PR  AX 13.4810  IZ 45.3025
206.  82                    PR  AX 13.4810  IZ 45.3025
 07.  83                    PR  AX 13.4810  IZ 45.3025
208.  84                    PR  AX 13.4810  IZ 45.3025
209.  85                    PR  AX 13.4810  IZ 45.3025
210.  86                    PR  AX 13.4810  IZ 45.3025
211.  87                    PR  AX 13.4810  IZ 45.3025
212.  88                    PR  AX 13.4810  IZ 45.3025
213.  89                    PR  AX 13.4810  IZ 45.3025
214.  90                    PR  AX 13.4810  IZ 45.3025
215.  91                    PR  AX 13.4810  IZ 45.3025
216.  92                    PR  AX 13.4810  IZ 45.3025
217.  93                    PR  AX 13.4810  IZ 45.3025
218.  94                    PR  AX  3.3600  IZ  0.1577
219.  95                    PR  AX  3.3600  IZ  0.1577
220.  96                    PR  AX  3.3600  IZ  0.1577
221.  97                    PR  AX  3.3600  IZ  0.1577
222.  98                    PR  AX  3.3600  IZ  0.1577
223.  99                    PR  AX  3.3600  IZ  0.1577
224.  100                   PR  AX  3.3600  IZ  0.1577
225.  101                   PR  AX  3.3600  IZ  0.1577
 26. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```

```
228. 29 TO 46 65 TO 73  END   MZ
 29. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 1        FIXED BUT FX MZ
240. 41       PINNED
241. 45       FIXED BUT FX MZ
242. 49       FIXED BUT FX MZ
243. *50       FIXED BUT FX MZ
244. 51       FIXED BUT FX MZ
245. 52       FIXED BUT FX MZ
246. 53       FIXED BUT FX MZ
247. 54       FIXED BUT FX MZ
 48. 55       FIXED BUT FX MZ
249. 56       FIXED BUT FX MZ
250. 57       FIXED BUT FX MZ
251. 58       FIXED BUT FX MZ
252. 59       FIXED BUT FX MZ
253. 60       FIXED BUT FX MZ
254. 61       FIXED BUT FX MZ
255. 62       FIXED BUT FX MZ
256. 63       FIXED BUT FX MZ
257. 64       FIXED BUT FX MZ
258. 65       FIXED BUT FX MZ
259. 66       FIXED BUT FX MZ
260. LOADING 1 PESO PROPIO
261. SELFWEIGHT   Y  -1.0
262. PERFORM ANALISIS

      P R O B L E M   S T A T I S T I C S
      -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   20
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   177
   SIZE OF STIFFNESS MATRIX =    3717 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.          7:48:11
++ PROCESSING GLOBAL STIFFNESS MATRIX.           7:48:12
++ PROCESSING TRIANGULAR FACTORIZATION.          7:48:12
++ CALCULATING JOINT DISPLACEMENTS.              7:48:12
++ CALCULATING MEMBER  FORCES.                   7:48:12

263. LOAD LIST 1
264. PRINT MEMBER FORCES LIST 74 TO 101
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-64.58	0.00	0.00	0.00	121.51
		39	0.00	138.29	0.00	0.00	0.00	-343.34
75	1	39	0.00	-138.29	0.00	0.00	0.00	343.34
		40	0.00	212.01	0.00	0.00	0.00	-726.48
76	1	40	0.00	-212.01	0.00	0.00	0.00	726.47
		41	0.00	285.74	0.00	0.00	0.00	-1270.91
77	1	41	0.00	299.81	0.00	0.00	0.00	1270.91
		42	0.00	-226.08	0.00	0.00	0.00	-695.72
78	1	42	0.00	226.08	0.00	0.00	0.00	695.72
		43	0.00	-152.35	0.00	0.00	0.00	-281.79
79	1	43	0.00	152.35	0.00	0.00	0.00	281.79
		44	0.00	-78.63	0.00	0.00	0.00	-29.15
80	1	44	0.00	78.63	0.00	0.00	0.00	29.15
		45	0.00	-4.90	0.00	0.00	0.00	62.22
81	1	45	0.00	109.69	0.00	0.00	0.00	-62.22
		46	0.00	-35.97	0.00	0.00	0.00	221.53
82	1	46	0.00	35.97	0.00	0.00	0.00	-221.53
		47	0.00	37.76	0.00	0.00	0.00	219.57
83	1	47	0.00	-37.76	0.00	0.00	0.00	-219.57
		48	0.00	111.49	0.00	0.00	0.00	56.33
84	1	48	0.00	-111.49	0.00	0.00	0.00	-56.33
		49	0.00	185.21	0.00	0.00	0.00	-268.20
85	1	49	0.00	142.63	0.00	0.00	0.00	268.20
		50	0.00	-68.90	0.00	0.00	0.00	-36.84
86	1	50	0.00	68.90	0.00	0.00	0.00	36.84
		51	0.00	4.80	0.00	0.00	0.00	33.26
87	1	51	0.00	9.80	0.00	0.00	0.00	-33.26
		52	0.00	63.93	0.00	0.00	0.00	-25.95
88	1	52	0.00	44.11	0.00	0.00	0.00	25.95
		53	0.00	29.62	0.00	0.00	0.00	-10.10
89	1	53	0.00	34.95	0.00	0.00	0.00	10.10
		54	0.00	38.78	0.00	0.00	0.00	-14.29

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	37.27	0.00	0.00	0.00	14.29
		55	0.00	36.46	0.00	0.00	0.00	-13.39
91	1	55	0.00	37.14	0.00	0.00	0.00	13.39
		56	0.00	36.58	0.00	0.00	0.00	-12.78
92	1	56	0.00	35.34	0.00	0.00	0.00	12.78
		57	0.00	38.39	0.00	0.00	0.00	-16.12
93	1	57	0.00	42.69	0.00	0.00	0.00	16.12
		58	0.00	31.04	0.00	0.00	0.00	-3.38
94	1	58	0.00	9.20	0.00	0.00	0.00	3.38
		59	0.00	9.17	0.00	0.00	0.00	-3.34
95	1	59	0.00	9.18	0.00	0.00	0.00	3.34
		60	0.00	9.19	0.00	0.00	0.00	-3.35
96	1	60	0.00	9.19	0.00	0.00	0.00	3.35
		61	0.00	9.19	0.00	0.00	0.00	-3.35
97	1	61	0.00	9.20	0.00	0.00	0.00	3.35
		62	0.00	9.18	0.00	0.00	0.00	-3.33
98	1	62	0.00	9.15	0.00	0.00	0.00	3.33
		63	0.00	9.23	0.00	0.00	0.00	-3.41
99	1	63	0.00	9.33	0.00	0.00	0.00	3.41
		64	0.00	9.05	0.00	0.00	0.00	-3.11
0	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

265. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00001	-23.13767	0.00000	0.00000	0.00000	0.04381
39	1	0.00001	-13.85201	0.00000	0.00000	0.00000	0.04056
40	1	0.00000	-5.72372	0.00000	0.00000	0.00000	0.03281
41	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.01817
42	1	0.00000	2.24301	0.00000	0.00000	0.00000	0.00376
43	1	0.00000	2.18119	0.00000	0.00000	0.00000	-0.00330
44	1	0.00000	1.15983	0.00000	0.00000	0.00000	-0.00541
45	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00497
46	1	0.00000	-0.87707	0.00000	0.00000	0.00000	-0.00266
47	1	0.00000	-1.07781	0.00000	0.00000	0.00000	0.00082
48	1	0.00000	-0.60861	0.00000	0.00000	0.00000	0.00307
49	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00169
50	1	0.00000	0.08170	0.00000	0.00000	0.00000	-0.00037
51	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00020
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00004
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

266. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	1	0.00	32.47	0.00	0.00	0.00	0.00
41	1	0.00	585.54	0.00	0.00	0.00	0.00
45	1	0.00	104.79	0.00	0.00	0.00	0.00
49	1	0.00	327.84	0.00	0.00	0.00	0.00
51	1	0.00	14.60	0.00	0.00	0.00	0.00
52	1	0.00	108.04	0.00	0.00	0.00	0.00
53	1	0.00	64.57	0.00	0.00	0.00	0.00
54	1	0.00	76.05	0.00	0.00	0.00	0.00
55	1	0.00	73.60	0.00	0.00	0.00	0.00
56	1	0.00	71.92	0.00	0.00	0.00	0.00
57	1	0.00	81.07	0.00	0.00	0.00	0.00
58	1	0.00	40.25	0.00	0.00	0.00	0.00
59	1	0.00	18.35	0.00	0.00	0.00	0.00
60	1	0.00	18.38	0.00	0.00	0.00	0.00
61	1	0.00	18.39	0.00	0.00	0.00	0.00
62	1	0.00	18.33	0.00	0.00	0.00	0.00
63	1	0.00	18.55	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

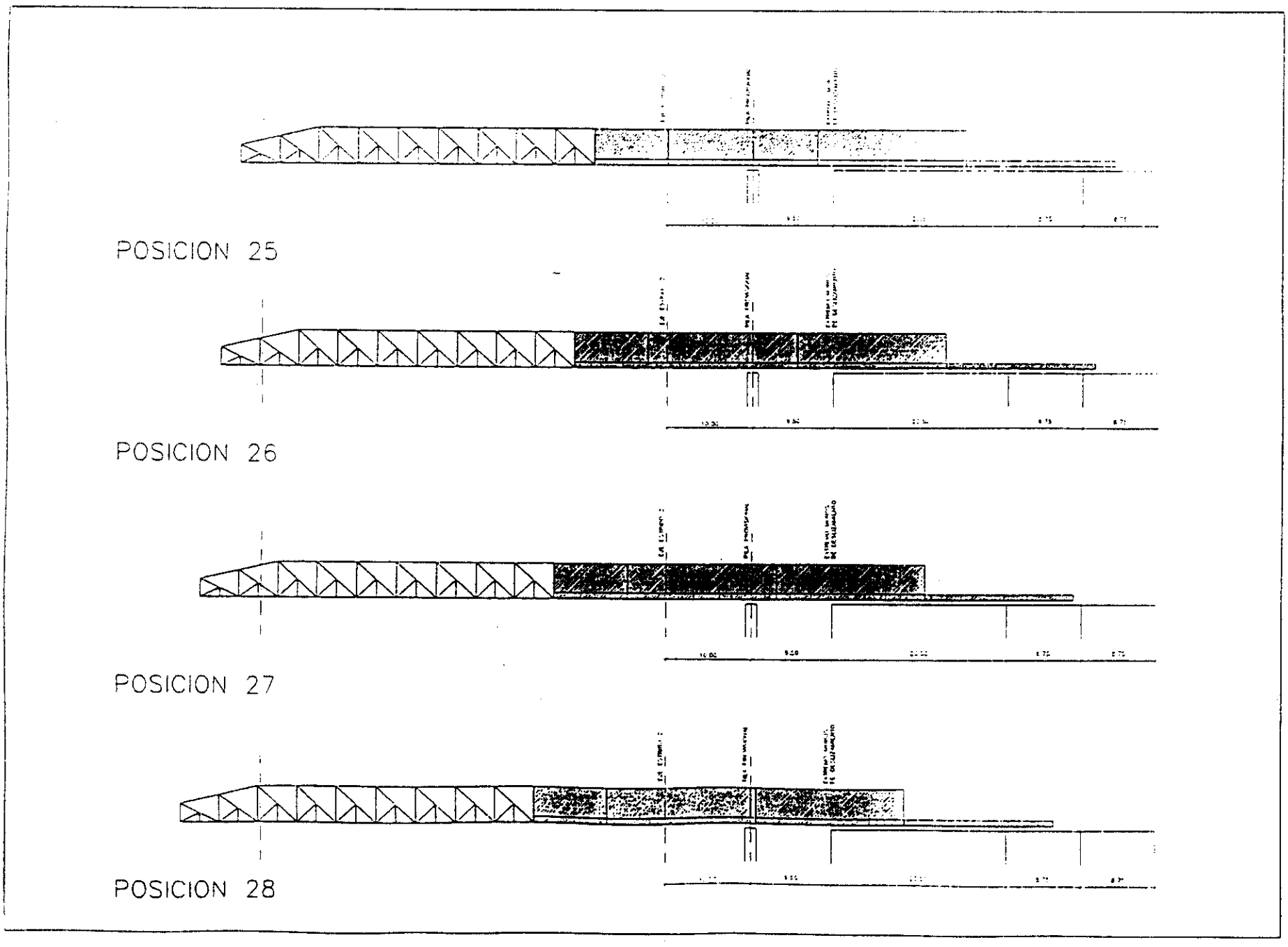
********** END OF LATEST ANALYSIS RESULT **********

267. PLOT BEND FILE
268. PLOT DISP FILE
269. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 7:48:15 ****

****
* 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 *
****



POSICION 25

POSICION 26

POSICION 27

POSICION 28

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  2, 1997        *
*          Time=     7:53:29             *
*                                       *
*****************************************
```

```
 1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
 2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000   0.000 19   42.000   0.000   0.000
 6.  20    2.333   1.0625  0.000
 7.  21    6.999   1.59375 0.000
 8.  22   11.666   2.125   0.000 28   39.666   2.125   0.000
 9.  29    0.000   2.125   0.000
10.  30    4.666   3.1875  0.000
11.  31    9.333   4.250   0.000 38   42.000   4.250   0.000
12.  39   44.187   0.000   0.000 50   68.250   0.000   0.000
13.  51   70.437   0.000   0.000 58   85.75    0.000   0.000
14.  59   87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.   1    1    2
17.   2    2    3
18.   3    3    4
19.   4    4    5
20.   5    5    6
21.   6    6    7
22.   7    7    8
23.   8    8    9
24.   9    9   10
25.  10   10   11
26.  11   11   12
27.  12   12   13
28.  13   13   14
29.  14   14   15
30.  15   15   16
31.  16   16   17
32.  17   17   18
33.  18   18   19
34.  19   29   30
35.  20   30   31
36.  21   31   32
37.  22   32   33
38.  23   33   34
39.  24   34   35
40.  25   35   36
41.  26   36   37
42.  27   37   38
43.  28    1   29
44.  29    2   20
45.  30    3   30
46.  31    4   21
47.  32    5   31
```



```
48.  33    6   22
49.  34    7   32
50.  35    8   23
51.  36    9   33
52.  37   10   24
53.  38   11   34
54.  39   12   25
55.  40   13   35
56.  41   14   26
57.  42   15   36
58.  43   16   27
59.  44   17   37
60.  45   18   28
61.  46   19   38
62.  47   29   20
63.  48   20    3
64.  49   30   21
65.  50   21    5
66.  51   31   22
67.  52   22    7
68.  53   32   23
69.  54   23    9
70.  55   33   24
71.  56   24   11
72.  57   34   25
73.  58   25   13
74.  59   35   26
75.  60   26   15
76.  61   36   27
77.  62   27   17
78.  63   37   28
79.  64   28   19
80.  65    3   21
81.  66    5   22
82.  67    7   23
83.  68    9   24
84.  69   11   25
85.  70   13   26
86.  71   15   27
87.  72   17   28
88.  73    1   20
89.  74   19   39
90.  75   39   40
91.  76   40   41
92.  77   41   42
93.  78   42   43
94.  79   43   44
95.  80   44   45
96.  81   45   46
97.  82   46   47
98.  83   47   48
99.  84   48   49
100. 85   49   50
101. 86   50   51
102. 87   51   52
103. 88   52   53
104. 89   53   54
105. 90   54   55
 06. 91   55   56
107. 92   56   57
```

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.  93  57  58
 09.  94  58  59
110.  95  59  60
111.  96  60  61
112.  97  61  62
113.  98  62  63
114.  99  63  64
115.  100 64  65
116.  101 65  66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.  1                    PR  AX  0.0500  IZ  0.00151406
120.  2                    PR  AX  0.0500  IZ  0.00151406
121.  3                    PR  AX  0.0532  IZ  0.00156748
122.  4                    PR  AX  0.0532  IZ  0.00156748
123.  5                    PR  AX  0.0670  IZ  0.00233098
124.  6                    PR  AX  0.0670  IZ  0.00233098
125.  7                    PR  AX  0.0750  IZ  0.00271328
126.  8                    PR  AX  0.0750  IZ  0.00271328
127.  9                    PR  AX  0.0900  IZ  0.00380584
 28.  10                   PR  AX  0.0900  IZ  0.00380584
129.  11                   PR  AX  0.1070  IZ  0.00464364
130.  12                   PR  AX  0.1070  IZ  0.00464364
131.  13                   PR  AX  0.1180  IZ  0.00593306
132.  14                   PR  AX  0.1180  IZ  0.00593306
133.  15                   PR  AX  0.1410  IZ  0.00804164
134.  16                   PR  AX  0.1410  IZ  0.00804164
135.  17                   PR  AX  0.1520  IZ  0.00926892
136.  18                   PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                   PR  AX  0.0280  IZ  0.00046454
139.  20                   PR  AX  0.0280  IZ  0.00046454
140.  21                   PR  AX  0.0280  IZ  0.00046454
141.  22                   PR  AX  0.0320  IZ  0.00072626
142.  23                   PR  AX  0.0320  IZ  0.00072626
143.  24                   PR  AX  0.0450  IZ  0.00164273
144.  25                   PR  AX  0.0600  IZ  0.00261476
145.  26                   PR  AX  0.0720  IZ  0.00316788
146.  27                   PR  AX  0.0840  IZ  0.00380920
 47. *MONTANTES PRINCIPALES
148.  28                   PR  AX  0.0068  IZ  0.00000001
149.  30                   PR  AX  0.0082  IZ  0.00000001
150.  32                   PR  AX  0.0148  IZ  0.00000001
151.  34                   PR  AX  0.0212  IZ  0.00000001
152.  36                   PR  AX  0.0298  IZ  0.00000001
153.  38                   PR  AX  0.0298  IZ  0.00000001
154.  40                   PR  AX  0.0398  IZ  0.00000001
155.  42                   PR  AX  0.0498  IZ  0.00000001
156.  44                   PR  AX  0.0578  IZ  0.00000001
157.  46                   PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                   PR  AX  0.0068  IZ  0.00000001
160.  31                   PR  AX  0.0068  IZ  0.00000001
161.  33                   PR  AX  0.0068  IZ  0.00000001
162.  35                   PR  AX  0.0096  IZ  0.00000001
163.  37                   PR  AX  0.0112  IZ  0.00000001
164.  39                   PR  AX  0.0128  IZ  0.00000001
165.  41                   PR  AX  0.0168  IZ  0.00000001
.66.  43                   PR  AX  0.0192  IZ  0.00000001
167.  45                   PR  AX  0.0298  IZ  0.00000001
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
 59.  47                   PR  AX  0.0068  IZ  0.00001456
170.  48                   PR  AX  0.0068  IZ  0.00001456
171.  49                   PR  AX  0.0096  IZ  0.00003700
172.  50                   PR  AX  0.0096  IZ  0.00003700
173.  51                   PR  AX  0.0128  IZ  0.00007640
174.  52                   PR  AX  0.0128  IZ  0.00007640
175.  53                   PR  AX  0.0212  IZ  0.00025120
176.  54                   PR  AX  0.0212  IZ  0.00025120
177.  55                   PR  AX  0.0298  IZ  0.00025166
178.  56                   PR  AX  0.0298  IZ  0.00025166
179.  57                   PR  AX  0.0398  IZ  0.00037183
180.  58                   PR  AX  0.0398  IZ  0.00037183
181.  59                   PR  AX  0.0498  IZ  0.00050799
182.  60                   PR  AX  0.0498  IZ  0.00050799
183.  61                   PR  AX  0.0578  IZ  0.00061053
184.  62                   PR  AX  0.0578  IZ  0.00061053
185.  63                   PR  AX  0.0648  IZ  0.00071462
186.  64                   PR  AX  0.0648  IZ  0.00071462
187. *DIAGONALES 2
 88.  65                   PR  AX  0.0068  IZ  0.00000001
189.  66                   PR  AX  0.0068  IZ  0.00000001
190.  67                   PR  AX  0.0068  IZ  0.00000001
191.  68                   PR  AX  0.0056  IZ  0.00000001
192.  69                   PR  AX  0.0056  IZ  0.00000001
193.  70                   PR  AX  0.0150  IZ  0.00000001
194.  71                   PR  AX  0.0150  IZ  0.00000001
195.  72                   PR  AX  0.0193  IZ  0.00000001
196.  73                   PR  AX  0.0068  IZ  0.00000001
197. *SECCION DE HORMIGON
198.  74                   PR  AX 13.4810  IZ 45.3025
199.  75                   PR  AX 13.4810  IZ 45.3025
200.  76                   PR  AX 13.4810  IZ 45.3025
201.  77                   PR  AX 13.4810  IZ 45.3025
202.  78                   PR  AX 13.4810  IZ 45.3025
203.  79                   PR  AX 13.4810  IZ 45.3025
204.  80                   PR  AX 13.4810  IZ 45.3025
205.  81                   PR  AX 13.4810  IZ 45.3025
206.  82                   PR  AX 13.4810  IZ 45.3025
'07.  83                   PR  AX 13.4810  IZ 45.3025
208.  84                   PR  AX 13.4810  IZ 45.3025
209.  85                   PR  AX 13.4810  IZ 45.3025
210.  86                   PR  AX 13.4810  IZ 45.3025
211.  87                   PR  AX 13.4810  IZ 45.3025
212.  88                   PR  AX 13.4810  IZ 45.3025
213.  89                   PR  AX 13.4810  IZ 45.3025
214.  90                   PR  AX 13.4810  IZ 45.3025
215.  91                   PR  AX 13.4810  IZ 45.3025
216.  92                   PR  AX 13.4810  IZ 45.3025
217.  93                   PR  AX 13.4810  IZ 45.3025
218.  94                   PR  AX  3.3600  IZ  0.1577
219.  95                   PR  AX  3.3600  IZ  0.1577
220.  96                   PR  AX  3.3600  IZ  0.1577
221.  97                   PR  AX  3.3600  IZ  0.1577
222.  98                   PR  AX  3.3600  IZ  0.1577
223.  99                   PR  AX  3.3600  IZ  0.1577
224.  100                  PR  AX  3.3600  IZ  0.1577
225.  101                  PR  AX  3.3600  IZ  0.1577
:26. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```

```
228. 29 TO 46 65 TO 73  END   MZ
 29. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 2        FIXED BUT FX MZ
240. 42       PINNED
241. *46       FIXED BUT FX MZ
242. 50       FIXED BUT FX MZ
243. *51       FIXED BUT FX MZ
244. 52       FIXED BUT FX MZ
245. 53       FIXED BUT FX MZ
246. 54       FIXED BUT FX MZ
247. 55       FIXED BUT FX MZ
 48. 56       FIXED BUT FX MZ
249. 57       FIXED BUT FX MZ
250. 58       FIXED BUT FX MZ
251. 59       FIXED BUT FX MZ
252. 60       FIXED BUT FX MZ
253. 61       FIXED BUT FX MZ
254. 62       FIXED BUT FX MZ
255. 63       FIXED BUT FX MZ
256. 64       FIXED BUT FX MZ
257. 65       FIXED BUT FX MZ
258. 66       FIXED BUT FX MZ
259. LOADING 1 PESO PROPIO
260. SELFWEIGHT   Y  -1.0
261. PERFORM ANALISIS

      P R O B L E M   S T A T I S T I C S
      -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   18
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   179
   SIZE OF STIFFNESS MATRIX =    3759 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.          7:53:33
++ PROCESSING GLOBAL STIFFNESS MATRIX.           7:53:34
++ PROCESSING TRIANGULAR FACTORIZATION.          7:53:34
++ CALCULATING JOINT DISPLACEMENTS.              7:53:34
++ CALCULATING MEMBER  FORCES.                   7:53:34

262. LOAD LIST 1
263. PRINT MEMBER FORCES LIST 74 TO 101
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-62.20	0.00	0.00	0.00	103.11
		39	0.00	135.91	0.00	0.00	0.00	-319.75
75	1	39	0.00	-135.91	0.00	0.00	0.00	319.75
		40	0.00	209.63	0.00	0.00	0.00	-697.69
76	1	40	0.00	-209.64	0.00	0.00	0.00	697.69
		41	0.00	283.36	0.00	0.00	0.00	-1236.94
77	1	41	0.00	-283.37	0.00	0.00	0.00	1236.94
		42	0.00	357.09	0.00	0.00	0.00	-1937.44
78	1	42	0.00	389.78	0.00	0.00	0.00	1937.43
		43	0.00	-316.06	0.00	0.00	0.00	-1165.39
79	1	43	0.00	316.06	0.00	0.00	0.00	1165.39
		44	0.00	-242.33	0.00	0.00	0.00	-554.64
80	1	44	0.00	242.33	0.00	0.00	0.00	554.65
		45	0.00	-168.61	0.00	0.00	0.00	-105.16
81	1	45	0.00	168.61	0.00	0.00	0.00	105.16
		46	0.00	-94.88	0.00	0.00	0.00	183.03
82	1	46	0.00	94.88	0.00	0.00	0.00	-183.03
		47	0.00	-21.15	0.00	0.00	0.00	309.95
83	1	47	0.00	21.15	0.00	0.00	0.00	-309.95
		48	0.00	52.57	0.00	0.00	0.00	275.59
'4	1	48	0.00	-52.57	0.00	0.00	0.00	-275.59
		49	0.00	126.30	0.00	0.00	0.00	79.94
85	1	49	0.00	-126.30	0.00	0.00	0.00	-79.94
		50	0.00	200.02	0.00	0.00	0.00	-276.97
86	1	50	0.00	145.33	0.00	0.00	0.00	276.97
		51	0.00	-71.63	0.00	0.00	0.00	-39.73
87	1	51	0.00	71.63	0.00	0.00	0.00	39.73
		52	0.00	2.10	0.00	0.00	0.00	36.32
88	1	52	0.00	8.01	0.00	0.00	0.00	-36.32
		53	0.00	65.71	0.00	0.00	0.00	-26.79
89	1	53	0.00	44.62	0.00	0.00	0.00	26.79
		54	0.00	29.11	0.00	0.00	0.00	-9.82

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	34.68	0.00	0.00	0.00	9.82
		55	0.00	39.05	0.00	0.00	0.00	-14.59
91	1	55	0.00	37.84	0.00	0.00	0.00	14.59
		56	0.00	35.89	0.00	0.00	0.00	-12.46
92	1	56	0.00	35.15	0.00	0.00	0.00	12.46
		57	0.00	38.57	0.00	0.00	0.00	-16.20
93	1	57	0.00	42.72	0.00	0.00	0.00	16.20
		58	0.00	31.01	0.00	0.00	0.00	-3.38
94	1	58	0.00	9.20	0.00	0.00	0.00	3.38
		59	0.00	9.17	0.00	0.00	0.00	-3.34
95	1	59	0.00	9.18	0.00	0.00	0.00	3.34
		60	0.00	9.19	0.00	0.00	0.00	-3.35
96	1	60	0.00	9.19	0.00	0.00	0.00	3.35
		61	0.00	9.19	0.00	0.00	0.00	-3.35
97	1	61	0.00	9.20	0.00	0.00	0.00	3.35
		62	0.00	9.18	0.00	0.00	0.00	-3.33
98	1	62	0.00	9.15	0.00	0.00	0.00	3.33
		63	0.00	9.23	0.00	0.00	0.00	-3.41
99	1	63	0.00	9.33	0.00	0.00	0.00	3.41
		64	0.00	9.05	0.00	0.00	0.00	-3.11
10	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

264. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00001	-56.12032	0.00000	0.00000	0.00000	0.07898
39	1	0.00001	-39.10957	0.00000	0.00000	0.00000	0.07604
40	1	0.00000	-23.17778	0.00000	0.00000	0.00000	0.06868
41	1	0.00000	-9.55666	0.00000	0.00000	0.00000	0.05451
42	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.03113
43	1	0.00000	4.10128	0.00000	0.00000	0.00000	0.00828
44	1	0.00000	4.37102	0.00000	0.00000	0.00000	-0.00430
45	1	0.00000	2.79436	0.00000	0.00000	0.00000	-0.00900
46	1	0.00000	0.83230	0.00000	0.00000	0.00000	-0.00822
47	1	0.00000	-0.57863	0.00000	0.00000	0.00000	-0.00436
48	1	0.00000	-1.02581	0.00000	0.00000	0.00000	0.00019
49	1	0.00000	-0.62097	0.00000	0.00000	0.00000	0.00303
50	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00176
51	1	0.00000	0.08635	0.00000	0.00000	0.00000	-0.00039
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00021
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00006
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00002
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00004
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

265. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
2	1	0.00	34.84	0.00	0.00	0.00	0.00
42	1	0.00	746.87	0.00	0.00	0.00	0.00
50	1	0.00	345.36	0.00	0.00	0.00	0.00
52	1	0.00	10.12	0.00	0.00	0.00	0.00
53	1	0.00	110.33	0.00	0.00	0.00	0.00
54	1	0.00	63.79	0.00	0.00	0.00	0.00
55	1	0.00	76.88	0.00	0.00	0.00	0.00
56	1	0.00	71.04	0.00	0.00	0.00	0.00
57	1	0.00	81.29	0.00	0.00	0.00	0.00
58	1	0.00	40.21	0.00	0.00	0.00	0.00
59	1	0.00	18.35	0.00	0.00	0.00	0.00
60	1	0.00	18.38	0.00	0.00	0.00	0.00
61	1	0.00	18.39	0.00	0.00	0.00	0.00
62	1	0.00	18.33	0.00	0.00	0.00	0.00
63	1	0.00	18.55	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

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266. PLOT BEND FILE
267. PLOT DISP FILE
268. FINISH
```

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 7:53:37 ****

```
**********************************************************
*  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 *
**********************************************************
```



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*********************************************
*                                           *
*          S T A A D - III                  *
*          Revision 17.0a                   *
*          Proprietary Program of           *
*          RESEARCH ENGINEERS, Inc.         *
*          Date=    JUL  2, 1997            *
*          Time=     7:55:34                 *
*                                           *
*********************************************
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```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. 59  87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1   1   2
17.  2   2   3
18.  3   3   4
19.  4   4   5
20.  5   5   6
21.  6   6   7
22.  7   7   8
23.  8   8   9
24.  9   9  10
25. 10  10  11
26. 11  11  12
27. 12  12  13
28. 13  13  14
29. 14  14  15
30. 15  15  16
31. 16  16  17
32. 17  17  18
33. 18  18  19
34. 19  29  30
35. 20  30  31
36. 21  31  32
37. 22  32  33
38. 23  33  34
39. 24  34  35
40. 25  35  36
41. 26  36  37
42. 27  37  38
43. 28   1  29
44. 29   2  20
45. 30   3  30
46. 31   4  21
47. 32   5  31
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 48.  33   6   22
 49.  34   7   32
 50.  35   8   23
 51.  36   9   33
 52.  37  10   24
 53.  38  11   34
 54.  39  12   25
 55.  40  13   35
 56.  41  14   26
 57.  42  15   36
 58.  43  16   27
 59.  44  17   37
 60.  45  18   28
 61.  46  19   38
 62.  47  29   20
 63.  48  20    3
 64.  49  30   21
 65.  50  21    5
 66.  51  31   22
 67.  52  22    7
 68.  53  32   23
 69.  54  23    9
 70.  55  33   24
 71.  56  24   11
 72.  57  34   25
 73.  58  25   13
 74.  59  35   26
 75.  60  26   15
 76.  61  36   27
 77.  62  27   17
 78.  63  37   28
 79.  64  28   19
 80.  65   3   21
 81.  66   5   22
 82.  67   7   23
 83.  68   9   24
 84.  69  11   25
 85.  70  13   26
 86.  71  15   27
 87.  72  17   28
 88.  73   1   20
 89.  74  19   39
 90.  75  39   40
 91.  76  40   41
 92.  77  41   42
 93.  78  42   43
 94.  79  43   44
 95.  80  44   45
 96.  81  45   46
 97.  82  46   47
 98.  83  47   48
 99.  84  48   49
100.  85  49   50
101.  86  50   51
102.  87  51   52
103.  88  52   53
104.  89  53   54
105.  90  54   55
106.  91  55   56
107.  92  56   57
```



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108.  93  57   58
 09.  94  58   59
110.  95  59   60
111.  96  60   61
112.  97  61   62
113.  98  62   63
114.  99  63   64
115. 100  64   65
116. 101  65   66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR  AX  0.0500  IZ  0.00151406
120.   2                    PR  AX  0.0500  IZ  0.00151406
121.   3                    PR  AX  0.0532  IZ  0.00156748
122.   4                    PR  AX  0.0532  IZ  0.00156748
123.   5                    PR  AX  0.0670  IZ  0.00233098
124.   6                    PR  AX  0.0670  IZ  0.00233098
125.   7                    PR  AX  0.0750  IZ  0.00271328
126.   8                    PR  AX  0.0750  IZ  0.00271328
127.   9                    PR  AX  0.0900  IZ  0.00380584
 28.  10                    PR  AX  0.0900  IZ  0.00380584
129.  11                    PR  AX  0.1070  IZ  0.00464364
130.  12                    PR  AX  0.1070  IZ  0.00464364
131.  13                    PR  AX  0.1180  IZ  0.00593306
132.  14                    PR  AX  0.1180  IZ  0.00593306
133.  15                    PR  AX  0.1410  IZ  0.00804164
134.  16                    PR  AX  0.1410  IZ  0.00804164
135.  17                    PR  AX  0.1520  IZ  0.00926892
136.  18                    PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                    PR  AX  0.0280  IZ  0.00046454
139.  20                    PR  AX  0.0280  IZ  0.00046454
140.  21                    PR  AX  0.0280  IZ  0.00046454
141.  22                    PR  AX  0.0320  IZ  0.00072626
142.  23                    PR  AX  0.0320  IZ  0.00072626
143.  24                    PR  AX  0.0450  IZ  0.00164273
144.  25                    PR  AX  0.0600  IZ  0.00261476
145.  26                    PR  AX  0.0720  IZ  0.00316788
146.  27                    PR  AX  0.0840  IZ  0.00380920
 47. *MONTANTES PRINCIPALES
148.  28                    PR  AX  0.0068  IZ  0.00000001
149.  30                    PR  AX  0.0082  IZ  0.00000001
150.  32                    PR  AX  0.0148  IZ  0.00000001
151.  34                    PR  AX  0.0212  IZ  0.00000001
152.  36                    PR  AX  0.0298  IZ  0.00000001
153.  38                    PR  AX  0.0298  IZ  0.00000001
154.  40                    PR  AX  0.0398  IZ  0.00000001
155.  42                    PR  AX  0.0498  IZ  0.00000001
156.  44                    PR  AX  0.0578  IZ  0.00000001
157.  46                    PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                    PR  AX  0.0068  IZ  0.00000001
160.  31                    PR  AX  0.0068  IZ  0.00000001
161.  33                    PR  AX  0.0068  IZ  0.00000001
162.  35                    PR  AX  0.0096  IZ  0.00000001
163.  37                    PR  AX  0.0112  IZ  0.00000001
164.  39                    PR  AX  0.0128  IZ  0.00000001
165.  41                    PR  AX  0.0168  IZ  0.00000001
166.  43                    PR  AX  0.0192  IZ  0.00000001
167.  45                    PR  AX  0.0298  IZ  0.00000001
```

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168. *DIAGONALES 1
 69.   47                          PR   AX  0.0068   IZ  0.00001456
170.   48                          PR   AX  0.0068   IZ  0.00001456
171.   49                          PR   AX  0.0096   IZ  0.00003700
172.   50                          PR   AX  0.0096   IZ  0.00003700
173.   51                          PR   AX  0.0128   IZ  0.00007640
174.   52                          PR   AX  0.0128   IZ  0.00007640
175.   53                          PR   AX  0.0212   IZ  0.00025120
176.   54                          PR   AX  0.0212   IZ  0.00025120
177.   55                          PR   AX  0.0298   IZ  0.00025166
178.   56                          PR   AX  0.0298   IZ  0.00025166
179.   57                          PR   AX  0.0398   IZ  0.00037183
180.   58                          PR   AX  0.0398   IZ  0.00037183
181.   59                          PR   AX  0.0498   IZ  0.00050799
182.   60                          PR   AX  0.0498   IZ  0.00050799
183.   61                          PR   AX  0.0578   IZ  0.00061053
184.   62                          PR   AX  0.0578   IZ  0.00061053
185.   63                          PR   AX  0.0648   IZ  0.00071462
186.   64                          PR   AX  0.0648   IZ  0.00071462
187. *DIAGONALES 2
 88.   65                          PR   AX  0.0068   IZ  0.00000001
189.   66                          PR   AX  0.0068   IZ  0.00000001
190.   67                          PR   AX  0.0068   IZ  0.00000001
191.   68                          PR   AX  0.0056   IZ  0.00000001
192.   69                          PR   AX  0.0056   IZ  0.00000001
193.   70                          PR   AX  0.0150   IZ  0.00000001
194.   71                          PR   AX  0.0150   IZ  0.00000001
195.   72                          PR   AX  0.0193   IZ  0.00000001
196.   73                          PR   AX  0.0068   IZ  0.00000001
197. *SECCION DE HORMIGON
198.   74                          PR   AX 13.4810   IZ 45.3025
199.   75                          PR   AX 13.4810   IZ 45.3025
200.   76                          PR   AX 13.4810   IZ 45.3025
201.   77                          PR   AX 13.4810   IZ 45.3025
202.   78                          PR   AX 13.4810   IZ 45.3025
203.   79                          PR   AX 13.4810   IZ 45.3025
204.   80                          PR   AX 13.4810   IZ 45.3025
205.   81                          PR   AX 13.4810   IZ 45.3025
206.   82                          PR   AX 13.4810   IZ 45.3025
207.   83                          PR   AX 13.4810   IZ 45.3025
208.   84                          PR   AX 13.4810   IZ 45.3025
209.   85                          PR   AX 13.4810   IZ 45.3025
210.   86                          PR   AX 13.4810   IZ 45.3025
211.   87                          PR   AX 13.4810   IZ 45.3025
212.   88                          PR   AX 13.4810   IZ 45.3025
213.   89                          PR   AX 13.4810   IZ 45.3025
214.   90                          PR   AX 13.4810   IZ 45.3025
215.   91                          PR   AX 13.4810   IZ 45.3025
216.   92                          PR   AX 13.4810   IZ 45.3025
217.   93                          PR   AX 13.4810   IZ 45.3025
218.   94                          PR   AX  3.3600   IZ  0.1577
219.   95                          PR   AX  3.3600   IZ  0.1577
220.   96                          PR   AX  3.3600   IZ  0.1577
221.   97                          PR   AX  3.3600   IZ  0.1577
222.   98                          PR   AX  3.3600   IZ  0.1577
223.   99                          PR   AX  3.3600   IZ  0.1577
224.  100                          PR   AX  3.3600   IZ  0.1577
225.  101                          PR   AX  3.3600   IZ  0.1577
226. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```



```
228. 29 TO 46 65 TO 73  END   MZ
 29. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 3        FIXED BUT FX MZ
240. 43       PINNED
241. *47       FIXED BUT FX MZ
242. 51       FIXED BUT FX MZ
243. 52       FIXED BUT FX MZ
244. 53       FIXED BUT FX MZ
245. 54       FIXED BUT FX MZ
246. 55       FIXED BUT FX MZ
247. 56       FIXED BUT FX MZ
 48. 57       FIXED BUT FX MZ
249. 58       FIXED BUT FX MZ
250. 59       FIXED BUT FX MZ
251. 60       FIXED BUT FX MZ
252. 61       FIXED BUT FX MZ
253. 62       FIXED BUT FX MZ
254. 63       FIXED BUT FX MZ
255. 64       FIXED BUT FX MZ
256. 65       FIXED BUT FX MZ
257. 66       FIXED BUT FX MZ
258. LOADING 1 PESO PROPIO
259. SELFWEIGHT   Y  -1.0
260. PERFORM ANALISIS

                P R O B L E M   S T A T I S T I C S
                -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   18
  ORIGINAL/FINAL BAND-WIDTH =   28/    6
  TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   179
  SIZE OF STIFFNESS MATRIX =    3759 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              7:55:38
++ PROCESSING GLOBAL STIFFNESS MATRIX.               7:55:39
++ PROCESSING TRIANGULAR FACTORIZATION.              7:55:39
++ CALCULATING JOINT DISPLACEMENTS.                  7:55:39
++ CALCULATING MEMBER  FORCES.                       7:55:39

261. LOAD LIST 1
262. PRINT MEMBER FORCES LIST 74 TO 101
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-59.33	0.00	0.00	0.00	77.48
		39	0.00	133.03	0.00	0.00	0.00	-287.82
75	1	39	0.00	-133.06	0.00	0.00	0.00	287.84
		40	0.00	206.78	0.00	0.00	0.00	-659.52
76	1	40	0.00	-206.77	0.00	0.00	0.00	659.51
		41	0.00	280.50	0.00	0.00	0.00	-1192.50
77	1	41	0.00	-280.50	0.00	0.00	0.00	1192.49
		42	0.00	354.22	0.00	0.00	0.00	-1886.72
78	1	42	0.00	-354.22	0.00	0.00	0.00	1886.73
		43	0.00	427.95	0.00	0.00	0.00	-2742.27
79	1	43	0.00	455.70	0.00	0.00	0.00	2742.27
		44	0.00	-381.97	0.00	0.00	0.00	-1826.07
80	1	44	0.00	381.97	0.00	0.00	0.00	1826.07
		45	0.00	-308.25	0.00	0.00	0.00	-1071.10
81	1	45	0.00	308.24	0.00	0.00	0.00	1071.10
		46	0.00	-234.52	0.00	0.00	0.00	-477.45
82	1	46	0.00	234.52	0.00	0.00	0.00	477.45
		47	0.00	-160.79	0.00	0.00	0.00	-45.06
83	1	47	0.00	160.79	0.00	0.00	0.00	45.06
		48	0.00	-87.07	0.00	0.00	0.00	226.04
84	1	48	0.00	87.07	0.00	0.00	0.00	-226.04
		49	0.00	-13.34	0.00	0.00	0.00	335.87
85	1	49	0.00	13.34	0.00	0.00	0.00	-335.87
		50	0.00	60.38	0.00	0.00	0.00	284.42
86	1	50	0.00	-60.38	0.00	0.00	0.00	-284.42
		51	0.00	134.09	0.00	0.00	0.00	71.76
87	1	51	0.00	-12.52	0.00	0.00	0.00	-71.76
		52	0.00	86.25	0.00	0.00	0.00	-36.27
88	1	52	0.00	50.09	0.00	0.00	0.00	36.27
		53	0.00	23.64	0.00	0.00	0.00	-7.34
89	1	53	0.00	33.35	0.00	0.00	0.00	7.34
		54	0.00	40.38	0.00	0.00	0.00	-15.03

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	37.70	0.00	0.00	0.00	15.03
		55	0.00	36.03	0.00	0.00	0.00	-13.20
91	1	55	0.00	37.03	0.00	0.00	0.00	13.20
		56	0.00	36.70	0.00	0.00	0.00	-12.83
92	1	56	0.00	35.37	0.00	0.00	0.00	12.83
		57	0.00	38.36	0.00	0.00	0.00	-16.11
93	1	57	0.00	42.68	0.00	0.00	0.00	16.11
		58	0.00	31.05	0.00	0.00	0.00	-3.38
94	1	58	0.00	9.20	0.00	0.00	0.00	3.38
		59	0.00	9.17	0.00	0.00	0.00	-3.34
95	1	59	0.00	9.18	0.00	0.00	0.00	3.34
		60	0.00	9.19	0.00	0.00	0.00	-3.35
96	1	60	0.00	9.19	0.00	0.00	0.00	3.35
		61	0.00	9.19	0.00	0.00	0.00	-3.35
97	1	61	0.00	9.20	0.00	0.00	0.00	3.35
		62	0.00	9.18	0.00	0.00	0.00	-3.33
98	1	62	0.00	9.15	0.00	0.00	0.00	3.33
		63	0.00	9.23	0.00	0.00	0.00	-3.41
99	1	63	0.00	9.33	0.00	0.00	0.00	3.41
		64	0.00	9.05	0.00	0.00	0.00	-3.11
10	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

263. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00001	-123.03653	0.00000	0.00000	0.00000	0.13588
39	1	0.00001	-93.53644	0.00000	0.00000	0.00000	0.13337
40	1	0.00001	-65.00877	0.00000	0.00000	0.00000	0.12653
41	1	0.00000	-38.66710	0.00000	0.00000	0.00000	0.11297
42	1	0.00000	-16.24601	0.00000	0.00000	0.00000	0.09030
43	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.05611
44	1	0.00000	8.33599	0.00000	0.00000	0.00000	0.02237
45	1	0.00000	10.69352	0.00000	0.00000	0.00000	0.00105
46	1	0.00000	9.52600	0.00000	0.00000	0.00000	-0.01025
47	1	0.00000	6.76293	0.00000	0.00000	0.00000	-0.01394
48	1	0.00000	3.80982	0.00000	0.00000	0.00000	-0.01239
49	1	0.00000	1.54762	0.00000	0.00000	0.00000	-0.00802
50	1	0.00000	0.33345	0.00000	0.00000	0.00000	-0.00321
51	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00037
52	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00003
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00004
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

264. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
3	1	0.00	37.71	0.00	0.00	0.00	0.00
43	1	0.00	883.65	0.00	0.00	0.00	0.00
51	1	0.00	121.57	0.00	0.00	0.00	0.00
52	1	0.00	136.34	0.00	0.00	0.00	0.00
53	1	0.00	56.98	0.00	0.00	0.00	0.00
54	1	0.00	78.08	0.00	0.00	0.00	0.00
55	1	0.00	73.05	0.00	0.00	0.00	0.00
56	1	0.00	72.07	0.00	0.00	0.00	0.00
57	1	0.00	81.04	0.00	0.00	0.00	0.00
58	1	0.00	40.25	0.00	0.00	0.00	0.00
59	1	0.00	18.35	0.00	0.00	0.00	0.00
60	1	0.00	18.38	0.00	0.00	0.00	0.00
61	1	0.00	18.39	0.00	0.00	0.00	0.00
62	1	0.00	18.33	0.00	0.00	0.00	0.00
63	1	0.00	18.55	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

265. PLOT BEND FILE
266. PLOT DISP FILE
267. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 7:55:42 ****

****
* 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 *
****

posición 27

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*****************************************************
*                                                   *
*          S T A A D - III                          *
*          Revision 17.0a                           *
*          Proprietary Program of                   *
*          RESEARCH ENGINEERS, Inc.                 *
*          Date=    JUL  2, 1997                    *
*          Time=     7:58:21                        *
*                                                   *
*****************************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. 59  87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1   1   2
17.  2   2   3
18.  3   3   4
19.  4   4   5
20.  5   5   6
21.  6   6   7
22.  7   7   8
23.  8   8   9
24.  9   9  10
25. 10  10  11
26. 11  11  12
27. 12  12  13
28. 13  13  14
29. 14  14  15
30. 15  15  16
31. 16  16  17
32. 17  17  18
33. 18  18  19
34. 19  29  30
35. 20  30  31
36. 21  31  32
37. 22  32  33
38. 23  33  34
39. 24  34  35
40. 25  35  36
41. 26  36  37
42. 27  37  38
43. 28   1  29
44. 29   2  20
45. 30   3  30
46. 31   4  21
47. 32   5  31
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* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.  33   6  22
49.  34   7  32
50.  35   8  23
51.  36   9  33
52.  37  10  24
53.  38  11  34
54.  39  12  25
55.  40  13  35
56.  41  14  26
57.  42  15  36
58.  43  16  27
59.  44  17  37
60.  45  18  28
61.  46  19  38
62.  47  29  20
63.  48  20   3
64.  49  30  21
65.  50  21   5
66.  51  31  22
67.  52  22   7
68.  53  32  23
69.  54  23   9
70.  55  33  24
71.  56  24  11
72.  57  34  25
73.  58  25  13
74.  59  35  26
75.  60  26  15
76.  61  36  27
77.  62  27  17
78.  63  37  28
79.  64  28  19
80.  65   3  21
81.  66   5  22
82.  67   7  23
83.  68   9  24
84.  69  11  25
85.  70  13  26
86.  71  15  27
87.  72  17  28
88.  73   1  20
89.  74  19  39
90.  75  39  40
91.  76  40  41
92.  77  41  42
93.  78  42  43
94.  79  43  44
95.  80  44  45
96.  81  45  46
97.  82  46  47
98.  83  47  48
99.  84  48  49
100. 85  49  50
101. 86  50  51
102. 87  51  52
103. 88  52  53
104. 89  53  54
105. 90  54  55
106. 91  55  56
107. 92  56  57
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108.  93  57  58
 09.  94  58  59
110.  95  59  60
111.  96  60  61
112.  97  61  62
113.  98  62  63
114.  99  63  64
115.  100 64  65
116.  101 65  66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR  AX  0.0500  IZ  0.00151406
120.   2                    PR  AX  0.0500  IZ  0.00151406
121.   3                    PR  AX  0.0532  IZ  0.00156748
122.   4                    PR  AX  0.0532  IZ  0.00156748
123.   5                    PR  AX  0.0670  IZ  0.00233098
124.   6                    PR  AX  0.0670  IZ  0.00233098
125.   7                    PR  AX  0.0750  IZ  0.00271328
126.   8                    PR  AX  0.0750  IZ  0.00271328
127.   9                    PR  AX  0.0900  IZ  0.00380584
 28.   10                   PR  AX  0.0900  IZ  0.00380584
129.   11                   PR  AX  0.1070  IZ  0.00464364
130.   12                   PR  AX  0.1070  IZ  0.00464364
131.   13                   PR  AX  0.1180  IZ  0.00593306
132.   14                   PR  AX  0.1180  IZ  0.00593306
133.   15                   PR  AX  0.1410  IZ  0.00804164
134.   16                   PR  AX  0.1410  IZ  0.00804164
135.   17                   PR  AX  0.1520  IZ  0.00926892
136.   18                   PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.   19                   PR  AX  0.0280  IZ  0.00046454
139.   20                   PR  AX  0.0280  IZ  0.00046454
140.   21                   PR  AX  0.0280  IZ  0.00046454
141.   22                   PR  AX  0.0320  IZ  0.00072626
142.   23                   PR  AX  0.0320  IZ  0.00072626
143.   24                   PR  AX  0.0450  IZ  0.00164273
144.   25                   PR  AX  0.0600  IZ  0.00261476
145.   26                   PR  AX  0.0720  IZ  0.00316788
146.   27                   PR  AX  0.0840  IZ  0.00380920
147. *MONTANTES PRINCIPALES
148.   28                   PR  AX  0.0068  IZ  0.00000001
149.   30                   PR  AX  0.0082  IZ  0.00000001
150.   32                   PR  AX  0.0148  IZ  0.00000001
151.   34                   PR  AX  0.0212  IZ  0.00000001
152.   36                   PR  AX  0.0298  IZ  0.00000001
153.   38                   PR  AX  0.0298  IZ  0.00000001
154.   40                   PR  AX  0.0398  IZ  0.00000001
155.   42                   PR  AX  0.0498  IZ  0.00000001
156.   44                   PR  AX  0.0578  IZ  0.00000001
157.   46                   PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.   29                   PR  AX  0.0068  IZ  0.00000001
160.   31                   PR  AX  0.0068  IZ  0.00000001
161.   33                   PR  AX  0.0068  IZ  0.00000001
162.   35                   PR  AX  0.0096  IZ  0.00000001
163.   37                   PR  AX  0.0112  IZ  0.00000001
164.   39                   PR  AX  0.0128  IZ  0.00000001
165.   41                   PR  AX  0.0168  IZ  0.00000001
166.   43                   PR  AX  0.0192  IZ  0.00000001
167.   45                   PR  AX  0.0298  IZ  0.00000001
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168. *DIAGONALES 1
 69.   47                   PR  AX  0.0068  IZ  0.00001456
170.   48                   PR  AX  0.0068  IZ  0.00001456
171.   49                   PR  AX  0.0096  IZ  0.00003700
172.   50                   PR  AX  0.0096  IZ  0.00003700
173.   51                   PR  AX  0.0128  IZ  0.00007640
174.   52                   PR  AX  0.0128  IZ  0.00007640
175.   53                   PR  AX  0.0212  IZ  0.00025120
176.   54                   PR  AX  0.0212  IZ  0.00025120
177.   55                   PR  AX  0.0298  IZ  0.00025166
178.   56                   PR  AX  0.0298  IZ  0.00025166
179.   57                   PR  AX  0.0398  IZ  0.00037183
180.   58                   PR  AX  0.0398  IZ  0.00037183
181.   59                   PR  AX  0.0498  IZ  0.00050799
182.   60                   PR  AX  0.0498  IZ  0.00050799
183.   61                   PR  AX  0.0578  IZ  0.00061053
184.   62                   PR  AX  0.0578  IZ  0.00061053
185.   63                   PR  AX  0.0648  IZ  0.00071462
186.   64                   PR  AX  0.0648  IZ  0.00071462
187. *DIAGONALES 2
 88.   65                   PR  AX  0.0068  IZ  0.00000001
189.   66                   PR  AX  0.0068  IZ  0.00000001
190.   67                   PR  AX  0.0068  IZ  0.00000001
191.   68                   PR  AX  0.0056  IZ  0.00000001
192.   69                   PR  AX  0.0056  IZ  0.00000001
193.   70                   PR  AX  0.0150  IZ  0.00000001
194.   71                   PR  AX  0.0150  IZ  0.00000001
195.   72                   PR  AX  0.0193  IZ  0.00000001
196.   73                   PR  AX  0.0068  IZ  0.00000001
197. *SECCION DE HORMIGON
198.   74                   PR  AX 13.4810  IZ 45.3025
199.   75                   PR  AX 13.4810  IZ 45.3025
200.   76                   PR  AX 13.4810  IZ 45.3025
201.   77                   PR  AX 13.4810  IZ 45.3025
202.   78                   PR  AX 13.4810  IZ 45.3025
203.   79                   PR  AX 13.4810  IZ 45.3025
204.   80                   PR  AX 13.4810  IZ 45.3025
205.   81                   PR  AX 13.4810  IZ 45.3025
206.   82                   PR  AX 13.4810  IZ 45.3025
207.   83                   PR  AX 13.4810  IZ 45.3025
208.   84                   PR  AX 13.4810  IZ 45.3025
209.   85                   PR  AX 13.4810  IZ 45.3025
210.   86                   PR  AX 13.4810  IZ 45.3025
211.   87                   PR  AX 13.4810  IZ 45.3025
212.   88                   PR  AX 13.4810  IZ 45.3025
213.   89                   PR  AX 13.4810  IZ 45.3025
214.   90                   PR  AX 13.4810  IZ 45.3025
215.   91                   PR  AX 13.4810  IZ 45.3025
216.   92                   PR  AX 13.4810  IZ 45.3025
217.   93                   PR  AX 13.4810  IZ 45.3025
218.   94                   PR  AX  3.3600  IZ  0.1577
219.   95                   PR  AX  3.3600  IZ  0.1577
220.   96                   PR  AX  3.3600  IZ  0.1577
221.   97                   PR  AX  3.3600  IZ  0.1577
222.   98                   PR  AX  3.3600  IZ  0.1577
223.   99                   PR  AX  3.3600  IZ  0.1577
224.   100                  PR  AX  3.3600  IZ  0.1577
225.   101                  PR  AX  3.3600  IZ  0.1577
226. MEMBER RELEASES
227.  29 TO 46 65 TO 73 START MZ
```

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228. 29 TO 46 65 TO 73  END   MZ
 29. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 4        FIXED BUT FX MZ
240. 44       PINNED
241. *48       FIXED BUT FX MZ
242. *52       FIXED BUT FX MZ
243. 53       FIXED BUT FX MZ
244. 54       FIXED BUT FX MZ
245. 55       FIXED BUT FX MZ
246. 56       FIXED BUT FX MZ
247. 57       FIXED BUT FX MZ
248. 58       FIXED BUT FX MZ
249. 59       FIXED BUT FX MZ
250. 60       FIXED BUT FX MZ
251. 61       FIXED BUT FX MZ
252. 62       FIXED BUT FX MZ
253. 63       FIXED BUT FX MZ
254. 64       FIXED BUT FX MZ
255. 65       FIXED BUT FX MZ
256. 66       FIXED BUT FX MZ
257. LOADING 1 PESO PROPIO
258. SELFWEIGHT   Y  -1.0
259. PERFORM ANALISIS
```

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      P R O B L E M   S T A T I S T I C S
      -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   16
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   181
   SIZE OF STIFFNESS MATRIX =   3801 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.          7:58:25
++ PROCESSING GLOBAL STIFFNESS MATRIX.           7:58:26
++ PROCESSING TRIANGULAR FACTORIZATION.          7:58:26
++ CALCULATING JOINT DISPLACEMENTS.              7:58:26
++ CALCULATING MEMBER  FORCES.                   7:58:26

 260. LOAD LIST 1
 261. PRINT MEMBER FORCES LIST 74 TO 101
```


MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-56.06	0.00	0.00	0.00	51.70
		39	0.00	129.77	0.00	0.00	0.00	-254.96
75	1	39	0.00	-129.77	0.00	0.00	0.00	254.99
		40	0.00	203.50	0.00	0.00	0.00	-619.55
76	1	40	0.00	-203.54	0.00	0.00	0.00	619.53
		41	0.00	277.26	0.00	0.00	0.00	-1145.45
77	1	41	0.00	-277.26	0.00	0.00	0.00	1145.40
		42	0.00	350.98	0.00	0.00	0.00	-1832.55
78	1	42	0.00	-350.98	0.00	0.00	0.00	1832.54
		43	0.00	424.71	0.00	0.00	0.00	-2680.98
79	1	43	0.00	-424.70	0.00	0.00	0.00	2680.97
		44	0.00	498.43	0.00	0.00	0.00	-3690.65
80	1	44	0.00	529.00	0.00	0.00	0.00	3690.65
		45	0.00	-455.28	0.00	0.00	0.00	-2614.04
81	1	45	0.00	455.28	0.00	0.00	0.00	2614.04
		46	0.00	-381.55	0.00	0.00	0.00	-1698.76
82	1	46	0.00	381.55	0.00	0.00	0.00	1698.76
		47	0.00	-307.82	0.00	0.00	0.00	-944.72
83	1	47	0.00	307.82	0.00	0.00	0.00	944.72
		48	0.00	-234.10	0.00	0.00	0.00	-351.99
84	1	48	0.00	234.10	0.00	0.00	0.00	351.99
		49	0.00	-160.37	0.00	0.00	0.00	79.49
85	1	49	0.00	160.37	0.00	0.00	0.00	-79.49
		50	0.00	-86.65	0.00	0.00	0.00	349.67
86	1	50	0.00	86.65	0.00	0.00	0.00	-349.67
		51	0.00	-12.94	0.00	0.00	0.00	458.57
87	1	51	0.00	12.94	0.00	0.00	0.00	-458.57
		52	0.00	60.79	0.00	0.00	0.00	406.24
88	1	52	0.00	-60.79	0.00	0.00	0.00	-406.24
		53	0.00	134.51	0.00	0.00	0.00	192.63
89	1	53	0.00	-82.55	0.00	0.00	0.00	-192.63
		54	0.00	156.28	0.00	0.00	0.00	-68.61

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	68.75	0.00	0.00	0.00	68.61
		55	0.00	4.97	0.00	0.00	0.00	1.16
91	1	55	0.00	28.72	0.00	0.00	0.00	-1.16
		56	0.00	45.01	0.00	0.00	0.00	-16.66
92	1	56	0.00	37.55	0.00	0.00	0.00	16.66
		57	0.00	36.17	0.00	0.00	0.00	-15.15
93	1	57	0.00	42.24	0.00	0.00	0.00	15.15
		58	0.00	31.49	0.00	0.00	0.00	-3.38
94	1	58	0.00	9.21	0.00	0.00	0.00	3.38
		59	0.00	9.16	0.00	0.00	0.00	-3.34
95	1	59	0.00	9.18	0.00	0.00	0.00	3.34
		60	0.00	9.19	0.00	0.00	0.00	-3.35
96	1	60	0.00	9.19	0.00	0.00	0.00	3.35
		61	0.00	9.19	0.00	0.00	0.00	-3.35
97	1	61	0.00	9.20	0.00	0.00	0.00	3.35
		62	0.00	9.18	0.00	0.00	0.00	-3.33
98	1	62	0.00	9.15	0.00	0.00	0.00	3.33
		63	0.00	9.23	0.00	0.00	0.00	-3.41
99	1	63	0.00	9.33	0.00	0.00	0.00	3.41
		64	0.00	9.05	0.00	0.00	0.00	-3.11
10	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

262. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00001	-231.38251	0.00000	0.00000	0.00000	0.21110
39	1	0.00001	-185.38693	0.00000	0.00000	0.00000	0.20902
40	1	0.00001	-140.25327	0.00000	0.00000	0.00000	0.20273
41	1	0.00000	-97.17495	0.00000	0.00000	0.00000	0.18981
42	1	0.00000	-57.86493	0.00000	0.00000	0.00000	0.16789
43	1	0.00000	-24.55315	0.00000	0.00000	0.00000	0.13456
44	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.08743
45	1	0.00000	13.73255	0.00000	0.00000	0.00000	0.04079
46	1	0.00000	18.92476	0.00000	0.00000	0.00000	0.00895
47	1	0.00000	18.55215	0.00000	0.00000	0.00000	-0.01049
48	1	0.00000	15.06539	0.00000	0.00000	0.00000	-0.01992
49	1	0.00000	10.39078	0.00000	0.00000	0.00000	-0.02175
50	1	0.00000	5.93102	0.00000	0.00000	0.00000	-0.01836
51	1	0.00000	2.56463	0.00000	0.00000	0.00000	-0.01216
52	1	0.00000	0.64395	0.00000	0.00000	0.00000	-0.00553
53	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00088
54	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00024
55	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00006
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00002
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

263. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
4	1	0.00	40.96	0.00	0.00	0.00	0.00
44	1	0.00	1027.43	0.00	0.00	0.00	0.00
53	1	0.00	51.96	0.00	0.00	0.00	0.00
54	1	0.00	225.04	0.00	0.00	0.00	0.00
55	1	0.00	33.69	0.00	0.00	0.00	0.00
56	1	0.00	82.56	0.00	0.00	0.00	0.00
57	1	0.00	78.41	0.00	0.00	0.00	0.00
58	1	0.00	40.69	0.00	0.00	0.00	0.00
59	1	0.00	18.35	0.00	0.00	0.00	0.00
60	1	0.00	18.38	0.00	0.00	0.00	0.00
61	1	0.00	18.39	0.00	0.00	0.00	0.00
62	1	0.00	18.33	0.00	0.00	0.00	0.00
63	1	0.00	18.55	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

```
264. PLOT BEND FILE
265. PLOT DISP FILE
266. FINISH
```

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 7:58:29 ****

****
* 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 *
****

PONTICH 28

****
* *
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 2, 1997 *
* Time= 8: 1:47 *
* *
****

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. 59  87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1   1   2
17.  2   2   3
18.  3   3   4
19.  4   4   5
20.  5   5   6
21.  6   6   7
22.  7   7   8
23.  8   8   9
24.  9   9  10
25. 10  10  11
26. 11  11  12
27. 12  12  13
28. 13  13  14
29. 14  14  15
30. 15  15  16
31. 16  16  17
32. 17  17  18
33. 18  18  19
34. 19  29  30
35. 20  30  31
36. 21  31  32
37. 22  32  33
38. 23  33  34
39. 24  34  35
40. 25  35  36
41. 26  36  37
42. 27  37  38
43. 28   1  29
44. 29   2  20
45. 30   3  30
46. 31   4  21
47. 32   5  31
```

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

```
48.  33   6   22
49.  34   7   32
50.  35   8   23
51.  36   9   33
52.  37  10   24
53.  38  11   34
54.  39  12   25
55.  40  13   35
56.  41  14   26
57.  42  15   36
58.  43  16   27
59.  44  17   37
60.  45  18   28
61.  46  19   38
62.  47  29   20
63.  48  20    3
64.  49  30   21
65.  50  21    5
66.  51  31   22
67.  52  22    7
68.  53  32   23
69.  54  23    9
70.  55  33   24
71.  56  24   11
72.  57  34   25
73.  58  25   13
74.  59  35   26
75.  60  26   15
76.  61  36   27
77.  62  27   17
78.  63  37   28
79.  64  28   19
80.  65   3   21
81.  66   5   22
82.  67   7   23
83.  68   9   24
84.  69  11   25
85.  70  13   26
86.  71  15   27
87.  72  17   28
88.  73   1   20
89.  74  19   39
90.  75  39   40
91.  76  40   41
92.  77  41   42
93.  78  42   43
94.  79  43   44
95.  80  44   45
96.  81  45   46
97.  82  46   47
98.  83  47   48
99.  84  48   49
100. 85  49   50
101. 86  50   51
102. 87  51   52
103. 88  52   53
104. 89  53   54
105. 90  54   55
 06. 91  55   56
107. 92  56   57
```


* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

```
108.  93  57   58
 09.  94  58   59
110.  95  59   60
111.  96  60   61
112.  97  61   62
113.  98  62   63
114.  99  63   64
115. 100  64   65
116. 101  65   66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR  AX  0.0500  IZ  0.00151406
120.   2                    PR  AX  0.0500  IZ  0.00151406
121.   3                    PR  AX  0.0532  IZ  0.00156748
122.   4                    PR  AX  0.0532  IZ  0.00156748
123.   5                    PR  AX  0.0670  IZ  0.00233098
124.   6                    PR  AX  0.0670  IZ  0.00233098
125.   7                    PR  AX  0.0750  IZ  0.00271328
126.   8                    PR  AX  0.0750  IZ  0.00271328
127.   9                    PR  AX  0.0900  IZ  0.00380584
128.  10                    PR  AX  0.0900  IZ  0.00380584
129.  11                    PR  AX  0.1070  IZ  0.00464364
130.  12                    PR  AX  0.1070  IZ  0.00464364
131.  13                    PR  AX  0.1180  IZ  0.00593306
132.  14                    PR  AX  0.1180  IZ  0.00593306
133.  15                    PR  AX  0.1410  IZ  0.00804164
134.  16                    PR  AX  0.1410  IZ  0.00804164
135.  17                    PR  AX  0.1520  IZ  0.00926892
136.  18                    PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                    PR  AX  0.0280  IZ  0.00046454
139.  20                    PR  AX  0.0280  IZ  0.00046454
140.  21                    PR  AX  0.0280  IZ  0.00046454
141.  22                    PR  AX  0.0320  IZ  0.00072626
142.  23                    PR  AX  0.0320  IZ  0.00072626
143.  24                    PR  AX  0.0450  IZ  0.00164273
144.  25                    PR  AX  0.0600  IZ  0.00261476
145.  26                    PR  AX  0.0720  IZ  0.00316788
146.  27                    PR  AX  0.0840  IZ  0.00380920
 47. *MONTANTES PRINCIPALES
148.  28                    PR  AX  0.0068  IZ  0.00000001
149.  30                    PR  AX  0.0082  IZ  0.00000001
150.  32                    PR  AX  0.0148  IZ  0.00000001
151.  34                    PR  AX  0.0212  IZ  0.00000001
152.  36                    PR  AX  0.0298  IZ  0.00000001
153.  38                    PR  AX  0.0298  IZ  0.00000001
154.  40                    PR  AX  0.0398  IZ  0.00000001
155.  42                    PR  AX  0.0498  IZ  0.00000001
156.  44                    PR  AX  0.0578  IZ  0.00000001
157.  46                    PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                    PR  AX  0.0068  IZ  0.00000001
160.  31                    PR  AX  0.0068  IZ  0.00000001
161.  33                    PR  AX  0.0068  IZ  0.00000001
162.  35                    PR  AX  0.0096  IZ  0.00000001
163.  37                    PR  AX  0.0112  IZ  0.00000001
164.  39                    PR  AX  0.0128  IZ  0.00000001
165.  41                    PR  AX  0.0168  IZ  0.00000001
 66.  43                    PR  AX  0.0192  IZ  0.00000001
167.  45                    PR  AX  0.0298  IZ  0.00000001
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
169.   47                    PR   AX  0.0068   IZ  0.00001456
170.   48                    PR   AX  0.0068   IZ  0.00001456
171.   49                    PR   AX  0.0096   IZ  0.00003700
172.   50                    PR   AX  0.0096   IZ  0.00003700
173.   51                    PR   AX  0.0128   IZ  0.00007640
174.   52                    PR   AX  0.0128   IZ  0.00007640
175.   53                    PR   AX  0.0212   IZ  0.00025120
176.   54                    PR   AX  0.0212   IZ  0.00025120
177.   55                    PR   AX  0.0298   IZ  0.00025166
178.   56                    PR   AX  0.0298   IZ  0.00025166
179.   57                    PR   AX  0.0398   IZ  0.00037183
180.   58                    PR   AX  0.0398   IZ  0.00037183
181.   59                    PR   AX  0.0498   IZ  0.00050799
182.   60                    PR   AX  0.0498   IZ  0.00050799
183.   61                    PR   AX  0.0578   IZ  0.00061053
184.   62                    PR   AX  0.0578   IZ  0.00061053
185.   63                    PR   AX  0.0648   IZ  0.00071462
186.   64                    PR   AX  0.0648   IZ  0.00071462
187. *DIAGONALES 2
188.   65                    PR   AX  0.0068   IZ  0.00000001
189.   66                    PR   AX  0.0068   IZ  0.00000001
190.   67                    PR   AX  0.0068   IZ  0.00000001
191.   68                    PR   AX  0.0056   IZ  0.00000001
192.   69                    PR   AX  0.0056   IZ  0.00000001
193.   70                    PR   AX  0.0150   IZ  0.00000001
194.   71                    PR   AX  0.0150   IZ  0.00000001
195.   72                    PR   AX  0.0193   IZ  0.00000001
196.   73                    PR   AX  0.0068   IZ  0.00000001
197. *SECCION DE HORMIGON
198.   74                    PR   AX 13.4810   IZ 45.3025
199.   75                    PR   AX 13.4810   IZ 45.3025
200.   76                    PR   AX 13.4810   IZ 45.3025
201.   77                    PR   AX 13.4810   IZ 45.3025
202.   78                    PR   AX 13.4810   IZ 45.3025
203.   79                    PR   AX 13.4810   IZ 45.3025
204.   80                    PR   AX 13.4810   IZ 45.3025
205.   81                    PR   AX 13.4810   IZ 45.3025
206.   82                    PR   AX 13.4810   IZ 45.3025
207.   83                    PR   AX 13.4810   IZ 45.3025
208.   84                    PR   AX 13.4810   IZ 45.3025
209.   85                    PR   AX 13.4810   IZ 45.3025
210.   86                    PR   AX 13.4810   IZ 45.3025
211.   87                    PR   AX 13.4810   IZ 45.3025
212.   88                    PR   AX 13.4810   IZ 45.3025
213.   89                    PR   AX 13.4810   IZ 45.3025
214.   90                    PR   AX 13.4810   IZ 45.3025
215.   91                    PR   AX 13.4810   IZ 45.3025
216.   92                    PR   AX 13.4810   IZ 45.3025
217.   93                    PR   AX 13.4810   IZ 45.3025
218.   94                    PR   AX  3.3600   IZ  0.1577
219.   95                    PR   AX  3.3600   IZ  0.1577
220.   96                    PR   AX  3.3600   IZ  0.1577
221.   97                    PR   AX  3.3600   IZ  0.1577
222.   98                    PR   AX  3.3600   IZ  0.1577
223.   99                    PR   AX  3.3600   IZ  0.1577
224.   100                   PR   AX  3.3600   IZ  0.1577
225.   101                   PR   AX  3.3600   IZ  0.1577
 26. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 29 TO 46 65 TO 73  END   MZ
229. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 5        FIXED BUT FX MZ
240. 45       PINNED
241. *49       FIXED BUT FX MZ
242. *53       FIXED BUT FX MZ
243. *54       FIXED BUT FX MZ
244. *55       FIXED BUT FX MZ
245. 56       FIXED BUT FX MZ
246. 57       FIXED BUT FX MZ
247. 58       FIXED BUT FX MZ
248. 59       FIXED BUT FX MZ
249. 60       FIXED BUT FX MZ
250. 61       FIXED BUT FX MZ
251. 62       FIXED BUT FX MZ
252. 63       FIXED BUT FX MZ
253. 64       FIXED BUT FX MZ
254. 65       FIXED BUT FX MZ
255. 66       FIXED BUT FX MZ
256. LOADING 1 PESO PROPIO
257. SELFWEIGHT   Y  -1.0
258. PERFORM ANALISIS

                P R O B L E M   S T A T I S T I C S
                -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   13
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   184
   SIZE OF STIFFNESS MATRIX =    3864 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              8: 1:51
++ PROCESSING GLOBAL STIFFNESS MATRIX.               8: 1:51
++ PROCESSING TRIANGULAR FACTORIZATION.              8: 1:51
++ CALCULATING JOINT DISPLACEMENTS.                  8: 1:52
++ CALCULATING MEMBER  FORCES.                       8: 1:52

259. LOAD LIST 1
260. PRINT MEMBER FORCES LIST 74 TO 101
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-52.08	0.00	0.00	0.00	15.25
		39	0.00	125.79	0.00	0.00	0.00	-209.80
75	1	39	0.00	-125.78	0.00	0.00	0.00	209.73
		40	0.00	199.50	0.00	0.00	0.00	-565.48
76	1	40	0.00	-199.49	0.00	0.00	0.00	565.49
		41	0.00	273.22	0.00	0.00	0.00	-1082.49
77	1	41	0.00	-273.21	0.00	0.00	0.00	1082.50
		42	0.00	346.94	0.00	0.00	0.00	-1760.79
78	1	42	0.00	-346.93	0.00	0.00	0.00	1760.78
		43	0.00	420.66	0.00	0.00	0.00	-2600.40
79	1	43	0.00	-420.67	0.00	0.00	0.00	2600.38
		44	0.00	494.39	0.00	0.00	0.00	-3601.22
80	1	44	0.00	-494.39	0.00	0.00	0.00	3601.22
		45	0.00	568.11	0.00	0.00	0.00	-4763.38
81	1	45	0.00	601.19	0.00	0.00	0.00	4763.38
		46	0.00	-527.47	0.00	0.00	0.00	-3528.91
82	1	46	0.00	527.47	0.00	0.00	0.00	3528.92
		47	0.00	-453.74	0.00	0.00	0.00	-2455.67
83	1	47	0.00	453.74	0.00	0.00	0.00	2455.67
		48	0.00	-380.01	0.00	0.00	0.00	-1543.76
84	1	48	0.00	380.01	0.00	0.00	0.00	1543.76
		49	0.00	-306.29	0.00	0.00	0.00	-793.08
85	1	49	0.00	306.29	0.00	0.00	0.00	793.08
		50	0.00	-232.56	0.00	0.00	0.00	-203.71
86	1	50	0.00	232.56	0.00	0.00	0.00	203.72
		51	0.00	-158.86	0.00	0.00	0.00	224.30
87	1	51	0.00	158.85	0.00	0.00	0.00	-224.30
		52	0.00	-85.13	0.00	0.00	0.00	491.17
88	1	52	0.00	85.13	0.00	0.00	0.00	-491.17
		53	0.00	-11.40	0.00	0.00	0.00	596.74
89	1	53	0.00	11.40	0.00	0.00	0.00	-596.75
		54	0.00	62.32	0.00	0.00	0.00	541.05

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-62.32	0.00	0.00	0.00	-541.05
		55	0.00	136.05	0.00	0.00	0.00	324.06
91	1	55	0.00	-136.05	0.00	0.00	0.00	-324.06
		56	0.00	209.78	0.00	0.00	0.00	-54.21
92	1	56	0.00	59.01	0.00	0.00	0.00	54.21
		57	0.00	14.71	0.00	0.00	0.00	-5.76
93	1	57	0.00	37.94	0.00	0.00	0.00	5.76
		58	0.00	35.79	0.00	0.00	0.00	-3.40
94	1	58	0.00	9.22	0.00	0.00	0.00	3.40
		59	0.00	9.15	0.00	0.00	0.00	-3.33
95	1	59	0.00	9.18	0.00	0.00	0.00	3.33
		60	0.00	9.20	0.00	0.00	0.00	-3.35
96	1	60	0.00	9.19	0.00	0.00	0.00	3.35
		61	0.00	9.19	0.00	0.00	0.00	-3.35
97	1	61	0.00	9.20	0.00	0.00	0.00	3.35
		62	0.00	9.18	0.00	0.00	0.00	-3.33
98	1	62	0.00	9.15	0.00	0.00	0.00	3.33
		63	0.00	9.23	0.00	0.00	0.00	-3.41
99	1	63	0.00	9.33	0.00	0.00	0.00	3.41
		64	0.00	9.05	0.00	0.00	0.00	-3.11
100	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

261. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00001	-396.95938	0.00000	0.00000	0.00000	0.30810
39	1	0.00001	-329.68704	0.00000	0.00000	0.00000	0.30662
40	1	0.00000	-263.12482	0.00000	0.00000	0.00000	0.30107
41	1	0.00000	-198.44124	0.00000	0.00000	0.00000	0.28902
42	1	0.00000	-137.32240	0.00000	0.00000	0.00000	0.26810
43	1	0.00000	-81.96766	0.00000	0.00000	0.00000	0.23590
44	1	0.00000	-35.11061	0.00000	0.00000	0.00000	0.19003
45	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.12809
46	1	0.00000	20.96925	0.00000	0.00000	0.00000	0.06669
47	1	0.00000	30.42592	0.00000	0.00000	0.00000	0.02243
48	1	0.00000	31.85719	0.00000	0.00000	0.00000	-0.00708
49	1	0.00000	28.22726	0.00000	0.00000	0.00000	-0.02424
50	1	0.00000	21.97617	0.00000	0.00000	0.00000	-0.03145
51	1	0.00000	15.02087	0.00000	0.00000	0.00000	-0.03110
52	1	0.00000	8.74903	0.00000	0.00000	0.00000	-0.02558
53	1	0.00000	4.03014	0.00000	0.00000	0.00000	-0.01730
54	1	0.00000	1.20695	0.00000	0.00000	0.00000	-0.00865
55	1	0.00000	0.09866	0.00000	0.00000	0.00000	-0.00202
56	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00018
57	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00006
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00007
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00002
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00001
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00008
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

262. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
5	1	0.00	45.00	0.00	0.00	0.00	0.00
45	1	0.00	1169.30	0.00	0.00	0.00	0.00
56	1	0.00	268.79	0.00	0.00	0.00	0.00
57	1	0.00	52.65	0.00	0.00	0.00	0.00
58	1	0.00	45.00	0.00	0.00	0.00	0.00
59	1	0.00	18.33	0.00	0.00	0.00	0.00
60	1	0.00	18.38	0.00	0.00	0.00	0.00
61	1	0.00	18.38	0.00	0.00	0.00	0.00
62	1	0.00	18.33	0.00	0.00	0.00	0.00
63	1	0.00	18.55	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

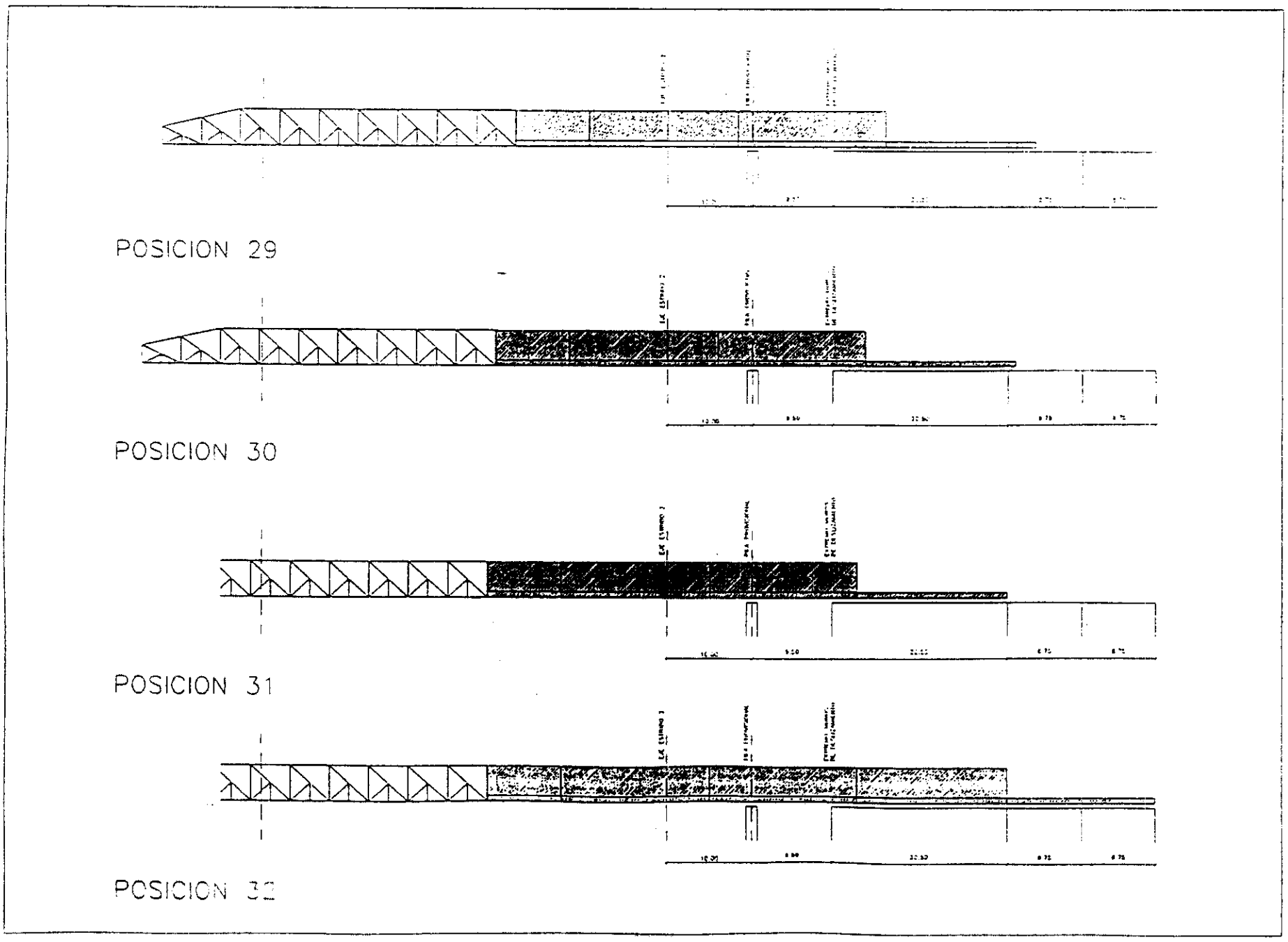
********** END OF LATEST ANALYSIS RESULT **********

263. PLOT BEND FILE
264. PLOT DISP FILE
265. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 8: 1:54 ****

****
* 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 *
****



POSICION 29

POSICION 30

POSICION 31

POSICION 32

DONCION 29

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  2, 1997        *
*          Time=     8: 5:56             *
*                                       *
*****************************************
```

```
1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5.   1   0.000   0.000   0.000 19   42.000   0.000   0.000
6.  20   2.333   1.0625  0.000
7.  21   6.999   1.59375 0.000
8.  22  11.666   2.125   0.000 28   39.666   2.125   0.000
9.  29   0.000   2.125   0.000
10. 30   4.666   3.1875  0.000
11. 31   9.333   4.250   0.000 38   42.000   4.250   0.000
12. 39  44.187   0.000   0.000 50   68.250   0.000   0.000
13. 51  70.437   0.000   0.000 58   85.75    0.000   0.000
14. 59  87.937   0.000   0.000 66  103.25    0.000   0.000
15. MEMBER INCIDENCES
16.  1   1   2
17.  2   2   3
18.  3   3   4
19.  4   4   5
20.  5   5   6
21.  6   6   7
22.  7   7   8
23.  8   8   9
24.  9   9  10
25. 10  10  11
26. 11  11  12
27. 12  12  13
28. 13  13  14
29. 14  14  15
30. 15  15  16
31. 16  16  17
32. 17  17  18
33. 18  18  19
34. 19  29  30
35. 20  30  31
36. 21  31  32
37. 22  32  33
38. 23  33  34
39. 24  34  35
40. 25  35  36
41. 26  36  37
42. 27  37  38
43. 28   1  29
44. 29   2  20
45. 30   3  30
46. 31   4  21
47. 32   5  31
```



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48. 33   6  22
49. 34   7  32
50. 35   8  23
51. 36   9  33
52. 37  10  24
53. 38  11  34
54. 39  12  25
55. 40  13  35
56. 41  14  26
57. 42  15  36
58. 43  16  27
59. 44  17  37
60. 45  18  28
61. 46  19  38
62. 47  29  20
63. 48  20   3
64. 49  30  21
65. 50  21   5
66. 51  31  22
67. 52  22   7
68. 53  32  23
69. 54  23   9
70. 55  33  24
71. 56  24  11
72. 57  34  25
73. 58  25  13
74. 59  35  26
75. 60  26  15
76. 61  36  27
77. 62  27  17
78. 63  37  28
79. 64  28  19
80. 65   3  21
81. 66   5  22
82. 67   7  23
83. 68   9  24
84. 69  11  25
85. 70  13  26
86. 71  15  27
87. 72  17  28
88. 73   1  20
89. 74  19  39
90. 75  39  40
91. 76  40  41
92. 77  41  42
93. 78  42  43
94. 79  43  44
95. 80  44  45
96. 81  45  46
97. 82  46  47
98. 83  47  48
99. 84  48  49
100. 85  49  50
101. 86  50  51
102. 87  51  52
103. 88  52  53
104. 89  53  54
105. 90  54  55
 06. 91  55  56
107. 92  56  57
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.  93  57  58
109.  94  58  59
110.  95  59  60
111.  96  60  61
112.  97  61  62
113.  98  62  63
114.  99  63  64
115.  100 64  65
116.  101 65  66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.  1                          PR  AX  0.0500  IZ  0.00151406
120.  2                          PR  AX  0.0500  IZ  0.00151406
121.  3                          PR  AX  0.0532  IZ  0.00156748
122.  4                          PR  AX  0.0532  IZ  0.00156748
123.  5                          PR  AX  0.0670  IZ  0.00233098
124.  6                          PR  AX  0.0670  IZ  0.00233098
125.  7                          PR  AX  0.0750  IZ  0.00271328
126.  8                          PR  AX  0.0750  IZ  0.00271328
127.  9                          PR  AX  0.0900  IZ  0.00380584
128.  10                         PR  AX  0.0900  IZ  0.00380584
129.  11                         PR  AX  0.1070  IZ  0.00464364
130.  12                         PR  AX  0.1070  IZ  0.00464364
131.  13                         PR  AX  0.1180  IZ  0.00593306
132.  14                         PR  AX  0.1180  IZ  0.00593306
133.  15                         PR  AX  0.1410  IZ  0.00804164
134.  16                         PR  AX  0.1410  IZ  0.00804164
135.  17                         PR  AX  0.1520  IZ  0.00926892
136.  18                         PR  AX  0.1520  IZ  0.00926892
137. *CORDON SUPERIOR
138.  19                         PR  AX  0.0280  IZ  0.00046454
139.  20                         PR  AX  0.0280  IZ  0.00046454
140.  21                         PR  AX  0.0280  IZ  0.00046454
141.  22                         PR  AX  0.0320  IZ  0.00072626
142.  23                         PR  AX  0.0320  IZ  0.00072626
143.  24                         PR  AX  0.0450  IZ  0.00164273
144.  25                         PR  AX  0.0600  IZ  0.00261476
145.  26                         PR  AX  0.0720  IZ  0.00316788
146.  27                         PR  AX  0.0840  IZ  0.00380920
147. *MONTANTES PRINCIPALES
148.  28                         PR  AX  0.0068  IZ  0.00000001
149.  30                         PR  AX  0.0082  IZ  0.00000001
150.  32                         PR  AX  0.0148  IZ  0.00000001
151.  34                         PR  AX  0.0212  IZ  0.00000001
152.  36                         PR  AX  0.0298  IZ  0.00000001
153.  38                         PR  AX  0.0298  IZ  0.00000001
154.  40                         PR  AX  0.0398  IZ  0.00000001
155.  42                         PR  AX  0.0498  IZ  0.00000001
156.  44                         PR  AX  0.0578  IZ  0.00000001
157.  46                         PR  AX  0.0578  IZ  10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                         PR  AX  0.0068  IZ  0.00000001
160.  31                         PR  AX  0.0068  IZ  0.00000001
161.  33                         PR  AX  0.0068  IZ  0.00000001
162.  35                         PR  AX  0.0096  IZ  0.00000001
163.  37                         PR  AX  0.0112  IZ  0.00000001
164.  39                         PR  AX  0.0128  IZ  0.00000001
165.  41                         PR  AX  0.0168  IZ  0.00000001
166.  43                         PR  AX  0.0192  IZ  0.00000001
167.  45                         PR  AX  0.0298  IZ  0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
169.  47                         PR  AX  0.0068  IZ  0.00001456
170.  48                         PR  AX  0.0068  IZ  0.00001456
171.  49                         PR  AX  0.0096  IZ  0.00003700
172.  50                         PR  AX  0.0096  IZ  0.00003700
173.  51                         PR  AX  0.0128  IZ  0.00007640
174.  52                         PR  AX  0.0128  IZ  0.00007640
175.  53                         PR  AX  0.0212  IZ  0.00025120
176.  54                         PR  AX  0.0212  IZ  0.00025120
177.  55                         PR  AX  0.0298  IZ  0.00025166
178.  56                         PR  AX  0.0298  IZ  0.00025166
179.  57                         PR  AX  0.0398  IZ  0.00037183
180.  58                         PR  AX  0.0398  IZ  0.00037183
181.  59                         PR  AX  0.0498  IZ  0.00050799
182.  60                         PR  AX  0.0498  IZ  0.00050799
183.  61                         PR  AX  0.0578  IZ  0.00061053
184.  62                         PR  AX  0.0578  IZ  0.00061053
185.  63                         PR  AX  0.0648  IZ  0.00071462
186.  64                         PR  AX  0.0648  IZ  0.00071462
187. *DIAGONALES 2
188.  65                         PR  AX  0.0068  IZ  0.00000001
189.  66                         PR  AX  0.0068  IZ  0.00000001
190.  67                         PR  AX  0.0068  IZ  0.00000001
191.  68                         PR  AX  0.0056  IZ  0.00000001
192.  69                         PR  AX  0.0056  IZ  0.00000001
193.  70                         PR  AX  0.0150  IZ  0.00000001
194.  71                         PR  AX  0.0150  IZ  0.00000001
195.  72                         PR  AX  0.0193  IZ  0.00000001
196.  73                         PR  AX  0.0068  IZ  0.00000001
197. *SECCION DE HORMIGON
198.  74                         PR  AX 13.4810  IZ 45.3025
199.  75                         PR  AX 13.4810  IZ 45.3025
200.  76                         PR  AX 13.4810  IZ 45.3025
201.  77                         PR  AX 13.4810  IZ 45.3025
202.  78                         PR  AX 13.4810  IZ 45.3025
203.  79                         PR  AX 13.4810  IZ 45.3025
204.  80                         PR  AX 13.4810  IZ 45.3025
205.  81                         PR  AX 13.4810  IZ 45.3025
206.  82                         PR  AX 13.4810  IZ 45.3025
207.  83                         PR  AX 13.4810  IZ 45.3025
208.  84                         PR  AX 13.4810  IZ 45.3025
209.  85                         PR  AX 13.4810  IZ 45.3025
210.  86                         PR  AX 13.4810  IZ 45.3025
211.  87                         PR  AX 13.4810  IZ 45.3025
212.  88                         PR  AX 13.4810  IZ 45.3025
213.  89                         PR  AX 13.4810  IZ 45.3025
214.  90                         PR  AX 13.4810  IZ 45.3025
215.  91                         PR  AX 13.4810  IZ 45.3025
216.  92                         PR  AX 13.4810  IZ 45.3025
217.  93                         PR  AX 13.4810  IZ 45.3025
218.  94                         PR  AX  3.3600  IZ  0.1577
219.  95                         PR  AX  3.3600  IZ  0.1577
220.  96                         PR  AX  3.3600  IZ  0.1577
221.  97                         PR  AX  3.3600  IZ  0.1577
222.  98                         PR  AX  3.3600  IZ  0.1577
223.  99                         PR  AX  3.3600  IZ  0.1577
224.  100                        PR  AX  3.3600  IZ  0.1577
225.  101                        PR  AX  3.3600  IZ  0.1577
226. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 29 TO 46 65 TO 73  END   MZ
229. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 6        FIXED BUT FX MZ
240. 46       PINNED
241. *50       FIXED BUT FX MZ
242. *54       FIXED BUT FX MZ
243. *55       FIXED BUT FX MZ
244. *56       FIXED BUT FX MZ
245. *57       FIXED BUT FX MZ
246. 58       FIXED BUT FX MZ
247. 59       FIXED BUT FX MZ
248. 60       FIXED BUT FX MZ
249. 61       FIXED BUT FX MZ
250. 62       FIXED BUT FX MZ
251. 63       FIXED BUT FX MZ
252. 64       FIXED BUT FX MZ
253. 65       FIXED BUT FX MZ
254. 66       FIXED BUT FX MZ
255. LOADING 1 PESO PROPIO
256. SELFWEIGHT   Y  -1.0
257. PERFORM ANALISIS
```

P R O B L E M S T A T I S T I C S

```
 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   11
 ORIGINAL/FINAL BAND-WIDTH =   28/    6
 TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   186
 SIZE OF STIFFNESS MATRIX =    3906 DOUBLE PREC. WORDS
 TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX.          8: 6: 0
++ PROCESSING GLOBAL STIFFNESS MATRIX.           8: 6: 0
++ PROCESSING TRIANGULAR FACTORIZATION.          8: 6: 0
++ CALCULATING JOINT DISPLACEMENTS.              8: 6: 0
++ CALCULATING MEMBER  FORCES.                   8: 6: 0

258. LOAD LIST 1
259. PRINT MEMBER FORCES LIST 74 TO 101
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-47.33	0.00	0.00	0.00	-26.47
		39	0.00	121.04	0.00	0.00	0.00	-157.61
75	1	39	0.00	-120.94	0.00	0.00	0.00	157.43
		40	0.00	194.67	0.00	0.00	0.00	-502.66
76	1	40	0.00	-194.59	0.00	0.00	0.00	502.69
		41	0.00	268.32	0.00	0.00	0.00	-1008.97
77	1	41	0.00	-268.33	0.00	0.00	0.00	1009.09
		42	0.00	342.06	0.00	0.00	0.00	-1676.78
78	1	42	0.00	-342.08	0.00	0.00	0.00	1676.79
		43	0.00	415.81	0.00	0.00	0.00	-2505.77
79	1	43	0.00	-415.83	0.00	0.00	0.00	2505.77
		44	0.00	489.55	0.00	0.00	0.00	-3496.03
80	1	44	0.00	-489.54	0.00	0.00	0.00	3496.03
		45	0.00	563.27	0.00	0.00	0.00	-4647.63
81	1	45	0.00	-563.27	0.00	0.00	0.00	4647.63
		46	0.00	637.00	0.00	0.00	0.00	-5960.42
82	1	46	0.00	669.43	0.00	0.00	0.00	5960.43
		47	0.00	-595.70	0.00	0.00	0.00	-4576.64
83	1	47	0.00	595.70	0.00	0.00	0.00	4576.64
		48	0.00	-521.97	0.00	0.00	0.00	-3354.18
84	1	48	0.00	521.97	0.00	0.00	0.00	3354.18
		49	0.00	-448.24	0.00	0.00	0.00	-2292.95
85	1	49	0.00	448.24	0.00	0.00	0.00	2292.96
		50	0.00	-374.52	0.00	0.00	0.00	-1393.06
86	1	50	0.00	374.51	0.00	0.00	0.00	1393.06
		51	0.00	-300.81	0.00	0.00	0.00	-654.58
87	1	51	0.00	300.81	0.00	0.00	0.00	654.58
		52	0.00	-227.08	0.00	0.00	0.00	-77.16
88	1	52	0.00	227.08	0.00	0.00	0.00	77.16
		53	0.00	-153.36	0.00	0.00	0.00	338.95
89	1	53	0.00	153.36	0.00	0.00	0.00	-338.95
		54	0.00	-79.63	0.00	0.00	0.00	593.80

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	79.63	0.00	0.00	0.00	-593.80
		55	0.00	-5.91	0.00	0.00	0.00	687.37
91	1	55	0.00	5.91	0.00	0.00	0.00	-687.37
		56	0.00	67.82	0.00	0.00	0.00	619.65
92	1	56	0.00	-67.82	0.00	0.00	0.00	-619.65
		57	0.00	141.55	0.00	0.00	0.00	390.65
93	1	57	0.00	-141.55	0.00	0.00	0.00	-390.65
		58	0.00	215.27	0.00	0.00	0.00	0.36
94	1	58	0.00	7.03	0.00	0.00	0.00	-0.36
		59	0.00	11.34	0.00	0.00	0.00	-4.34
95	1	59	0.00	9.76	0.00	0.00	0.00	4.34
		60	0.00	8.61	0.00	0.00	0.00	-3.08
96	1	60	0.00	9.03	0.00	0.00	0.00	3.08
		61	0.00	9.34	0.00	0.00	0.00	-3.43
97	1	61	0.00	9.24	0.00	0.00	0.00	3.43
		62	0.00	9.14	0.00	0.00	0.00	-3.31
98	1	62	0.00	9.14	0.00	0.00	0.00	3.31
		63	0.00	9.24	0.00	0.00	0.00	-3.42
99	1	63	0.00	9.33	0.00	0.00	0.00	3.42
		64	0.00	9.04	0.00	0.00	0.00	-3.11
100	1	64	0.00	8.66	0.00	0.00	0.00	3.11
		65	0.00	9.71	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

260. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00000	-640.85175	0.00000	0.00000	0.00000	0.43212
39	1	0.00000	-546.38208	0.00000	0.00000	0.00000	0.43135
40	1	0.00000	-452.44653	0.00000	0.00000	0.00000	0.42664
41	1	0.00000	-360.18405	0.00000	0.00000	0.00000	0.41561
42	1	0.00000	-271.24884	0.00000	0.00000	0.00000	0.39586
43	1	0.00000	-187.80341	0.00000	0.00000	0.00000	0.36499
44	1	0.00000	-112.54945	0.00000	0.00000	0.00000	0.32060
45	1	0.00000	-48.69871	0.00000	0.00000	0.00000	0.26030
46	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.18170
47	1	0.00000	30.83242	0.00000	0.00000	0.00000	0.10362
48	1	0.00000	46.74512	0.00000	0.00000	0.00000	0.04490
49	1	0.00000	51.71288	0.00000	0.00000	0.00000	0.00315
50	1	0.00000	49.18431	0.00000	0.00000	0.00000	-0.02404
51	1	0.00000	42.08652	0.00000	0.00000	0.00000	-0.03904
52	1	0.00000	32.81596	0.00000	0.00000	0.00000	-0.04428
53	1	0.00000	23.25133	0.00000	0.00000	0.00000	-0.04214
54	1	0.00000	14.74431	0.00000	0.00000	0.00000	-0.03501
55	1	0.00000	8.12367	0.00000	0.00000	0.00000	-0.02529
56	1	0.00000	3.69351	0.00000	0.00000	0.00000	-0.01538
57	1	0.00000	1.23380	0.00000	0.00000	0.00000	-0.00768
58	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00457
59	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00122
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00033
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00008
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00007
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00111
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

261. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
6	1	0.00	49.83	0.00	0.00	0.00	0.00
46	1	0.00	1306.42	0.00	0.00	0.00	0.00
58	1	0.00	222.31	0.00	0.00	0.00	0.00
59	1	0.00	21.10	0.00	0.00	0.00	0.00
60	1	0.00	17.64	0.00	0.00	0.00	0.00
61	1	0.00	18.58	0.00	0.00	0.00	0.00
62	1	0.00	18.28	0.00	0.00	0.00	0.00
63	1	0.00	18.57	0.00	0.00	0.00	0.00
64	1	0.00	17.71	0.00	0.00	0.00	0.00
65	1	0.00	20.84	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

262. PLOT BEND FILE
263. PLOT DISP FILE
264. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 8: 6: 3 ****

****
* 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 *
****

Posición 30

****
* *
* STAAD - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 2, 1997 *
* Time= 8: 9:53 *
* *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT METER MTON
4. JOINT COORDINATES
5. 1 0.000 0.000 0.000 19 42.000 0.000 0.000
6. 20 2.333 1.0625 0.000
7. 21 6.999 1.59375 0.000
8. 22 11.666 2.125 0.000 28 39.666 2.125 0.000
9. 29 0.000 2.125 0.000
10. 30 4.666 3.1875 0.000
11. 31 9.333 4.250 0.000 38 42.000 4.250 0.000
12. 39 44.187 0.000 0.000 50 68.250 0.000 0.000
13. 51 70.437 0.000 0.000 58 85.75 0.000 0.000
14. 59 87.937 0.000 0.000 66 103.25 0.000 0.000
15. MEMBER INCIDENCES
16. 1 1 2
17. 2 2 3
18. 3 3 4
19. 4 4 5
20. 5 5 6
21. 6 6 7
22. 7 7 8
23. 8 8 9
24. 9 9 10
25. 10 10 11
26. 11 11 12
27. 12 12 13
28. 13 13 14
29. 14 14 15
30. 15 15 16
31. 16 16 17
32. 17 17 18
33. 18 18 19
34. 19 29 30
35. 20 30 31
36. 21 31 32
37. 22 32 33
38. 23 33 34
39. 24 34 35
40. 25 35 36
41. 26 36 37
42. 27 37 38
43. 28 1 29
44. 29 2 20
45. 30 3 30
46. 31 4 21
47. 32 5 31

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

```
48.  33   6   22
49.  34   7   32
50.  35   8   23
51.  36   9   33
52.  37  10   24
53.  38  11   34
54.  39  12   25
55.  40  13   35
56.  41  14   26
57.  42  15   36
58.  43  16   27
59.  44  17   37
60.  45  18   28
61.  46  19   38
62.  47  29   20
63.  48  20    3
64.  49  30   21
65.  50  21    5
66.  51  31   22
67.  52  22    7
68.  53  32   23
69.  54  23    9
70.  55  33   24
71.  56  24   11
72.  57  34   25
73.  58  25   13
74.  59  35   26
75.  60  26   15
76.  61  36   27
77.  62  27   17
78.  63  37   28
79.  64  28   19
80.  65   3   21
81.  66   5   22
82.  67   7   23
83.  68   9   24
84.  69  11   25
85.  70  13   26
86.  71  15   27
87.  72  17   28
88.  73   1   20
89.  74  19   39
90.  75  39   40
91.  76  40   41
92.  77  41   42
93.  78  42   43
94.  79  43   44
95.  80  44   45
96.  81  45   46
97.  82  46   47
98.  83  47   48
99.  84  48   49
100. 85  49   50
101. 86  50   51
102. 87  51   52
103. 88  52   53
104. 89  53   54
105. 90  54   55
106. 91  55   56
107. 92  56   57
```


* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

```
108.  93  57   58
 09.  94  58   59
.10.  95  59   60
111.  96  60   61
112.  97  61   62
113.  98  62   63
114.  99  63   64
115. 100  64   65
116. 101  65   66
117. MEMBER PROPERTY
118. *CORDON INFERIOR
119.   1                    PR AX 0.0500 IZ 0.00151406
120.   2                    PR AX 0.0500 IZ 0.00151406
121.   3                    PR AX 0.0532 IZ 0.00156748
122.   4                    PR AX 0.0532 IZ 0.00156748
123.   5                    PR AX 0.0670 IZ 0.00233098
124.   6                    PR AX 0.0670 IZ 0.00233098
125.   7                    PR AX 0.0750 IZ 0.00271328
126.   8                    PR AX 0.0750 IZ 0.00271328
127.   9                    PR AX 0.0900 IZ 0.00380584
 28.  10                    PR AX 0.0900 IZ 0.00380584
.29.  11                    PR AX 0.1070 IZ 0.00464364
130.  12                    PR AX 0.1070 IZ 0.00464364
131.  13                    PR AX 0.1180 IZ 0.00593306
132.  14                    PR AX 0.1180 IZ 0.00593306
133.  15                    PR AX 0.1410 IZ 0.00804164
134.  16                    PR AX 0.1410 IZ 0.00804164
135.  17                    PR AX 0.1520 IZ 0.00926892
136.  18                    PR AX 0.1520 IZ 0.00926892
137. *CORDON SUPERIOR
138.  19                    PR AX 0.0280 IZ 0.00046454
139.  20                    PR AX 0.0280 IZ 0.00046454
140.  21                    PR AX 0.0280 IZ 0.00046454
141.  22                    PR AX 0.0320 IZ 0.00072626
142.  23                    PR AX 0.0320 IZ 0.00072626
143.  24                    PR AX 0.0450 IZ 0.00164273
144.  25                    PR AX 0.0600 IZ 0.00261476
145.  26                    PR AX 0.0720 IZ 0.00316788
146.  27                    PR AX 0.0840 IZ 0.00380920
 47. *MONTANTES PRINCIPALES
.48.  28                    PR AX 0.0068 IZ 0.00000001
149.  30                    PR AX 0.0082 IZ 0.00000001
150.  32                    PR AX 0.0148 IZ 0.00000001
151.  34                    PR AX 0.0212 IZ 0.00000001
152.  36                    PR AX 0.0298 IZ 0.00000001
153.  38                    PR AX 0.0298 IZ 0.00000001
154.  40                    PR AX 0.0398 IZ 0.00000001
155.  42                    PR AX 0.0498 IZ 0.00000001
156.  44                    PR AX 0.0578 IZ 0.00000001
157.  46                    PR AX 0.0578 IZ 10000.0000
158. *MONTANTES SECUNDARIOS
159.  29                    PR AX 0.0068 IZ 0.00000001
160.  31                    PR AX 0.0068 IZ 0.00000001
161.  33                    PR AX 0.0068 IZ 0.00000001
162.  35                    PR AX 0.0096 IZ 0.00000001
163.  37                    PR AX 0.0112 IZ 0.00000001
164.  39                    PR AX 0.0128 IZ 0.00000001
165.  41                    PR AX 0.0168 IZ 0.00000001
 6.   43                    PR AX 0.0192 IZ 0.00000001
167.  45                    PR AX 0.0298 IZ 0.00000001
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168. *DIAGONALES 1
169.   47                          PR   AX  0.0068   IZ  0.00001456
170.   48                          PR   AX  0.0068   IZ  0.00001456
171.   49                          PR   AX  0.0096   IZ  0.00003700
172.   50                          PR   AX  0.0096   IZ  0.00003700
173.   51                          PR   AX  0.0128   IZ  0.00007640
174.   52                          PR   AX  0.0128   IZ  0.00007640
175.   53                          PR   AX  0.0212   IZ  0.00025120
176.   54                          PR   AX  0.0212   IZ  0.00025120
177.   55                          PR   AX  0.0298   IZ  0.00025166
178.   56                          PR   AX  0.0298   IZ  0.00025166
179.   57                          PR   AX  0.0398   IZ  0.00037183
180.   58                          PR   AX  0.0398   IZ  0.00037183
181.   59                          PR   AX  0.0498   IZ  0.00050799
182.   60                          PR   AX  0.0498   IZ  0.00050799
183.   61                          PR   AX  0.0578   IZ  0.00061053
184.   62                          PR   AX  0.0578   IZ  0.00061053
185.   63                          PR   AX  0.0648   IZ  0.00071462
186.   64                          PR   AX  0.0648   IZ  0.00071462
187. *DIAGONALES 2
188.   65                          PR   AX  0.0068   IZ  0.00000001
189.   66                          PR   AX  0.0068   IZ  0.00000001
190.   67                          PR   AX  0.0068   IZ  0.00000001
191.   68                          PR   AX  0.0056   IZ  0.00000001
192.   69                          PR   AX  0.0056   IZ  0.00000001
193.   70                          PR   AX  0.0150   IZ  0.00000001
194.   71                          PR   AX  0.0150   IZ  0.00000001
195.   72                          PR   AX  0.0193   IZ  0.00000001
196.   73                          PR   AX  0.0068   IZ  0.00000001
197. *SECCION DE HORMIGON
198.   74                          PR   AX 13.4810   IZ 45.3025
199.   75                          PR   AX 13.4810   IZ 45.3025
200.   76                          PR   AX 13.4810   IZ 45.3025
201.   77                          PR   AX 13.4810   IZ 45.3025
202.   78                          PR   AX 13.4810   IZ 45.3025
203.   79                          PR   AX 13.4810   IZ 45.3025
204.   80                          PR   AX 13.4810   IZ 45.3025
205.   81                          PR   AX 13.4810   IZ 45.3025
206.   82                          PR   AX 13.4810   IZ 45.3025
207.   83                          PR   AX 13.4810   IZ 45.3025
208.   84                          PR   AX 13.4810   IZ 45.3025
209.   85                          PR   AX 13.4810   IZ 45.3025
210.   86                          PR   AX 13.4810   IZ 45.3025
211.   87                          PR   AX 13.4810   IZ 45.3025
212.   88                          PR   AX 13.4810   IZ 45.3025
213.   89                          PR   AX 13.4810   IZ 45.3025
214.   90                          PR   AX 13.4810   IZ 45.3025
215.   91                          PR   AX 13.4810   IZ 45.3025
216.   92                          PR   AX 13.4810   IZ 45.3025
217.   93                          PR   AX 13.4810   IZ 45.3025
218.   94                          PR   AX  3.3600   IZ  0.1577
219.   95                          PR   AX  3.3600   IZ  0.1577
220.   96                          PR   AX  3.3600   IZ  0.1577
221.   97                          PR   AX  3.3600   IZ  0.1577
222.   98                          PR   AX  3.3600   IZ  0.1577
223.   99                          PR   AX  3.3600   IZ  0.1577
224.  100                          PR   AX  3.3600   IZ  0.1577
225.  101                          PR   AX  3.3600   IZ  0.1577
 26. MEMBER RELEASES
227. 29 TO 46 65 TO 73 START MZ
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 29 TO 46 65 TO 73  END   MZ
229. 47 49 51 53 55 57 59 61 63 START MZ
230. 48 50 52 54 56 58 60 62 64 END MZ
231. CONSTANTS
232. E   21000.  MEM  1  TO  73
233. DEN 10.15       MEM  1  TO  73
234. POISSON  0.15  MEM  1  TO  73
235. E    3250.  MEM  74 TO  101
236. DEN  2.50       MEM  74 TO  101
237. POISSON  0.20  MEM  74 TO  101
238. SUPPORTS
239. 7        FIXED BUT FX MZ
240. 47       PINNED
241. *51       FIXED BUT FX MZ
242. *55       FIXED BUT FX MZ
243. *56       FIXED BUT FX MZ
244. *57       FIXED BUT FX MZ
245. 58       FIXED BUT FX MZ
246. 59       FIXED BUT FX MZ
247. 60       FIXED BUT FX MZ
248. 61       FIXED BUT FX MZ
249. 62       FIXED BUT FX MZ
250. 63       FIXED BUT FX MZ
251. 64       FIXED BUT FX MZ
252. 65       FIXED BUT FX MZ
253. 66       FIXED BUT FX MZ
254. LOADING 1 PESO PROPIO
255. SELFWEIGHT   Y  -1.0
256. PERFORM ANALISIS

                P R O B L E M   S T A T I S T I C S
                -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =    66/  101/   11
   ORIGINAL/FINAL BAND-WIDTH =   28/    6
   TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   186
   SIZE OF STIFFNESS MATRIX =    3906 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.21 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              8: 9:57
++ PROCESSING GLOBAL STIFFNESS MATRIX.               8: 9:57
++ PROCESSING TRIANGULAR FACTORIZATION.              8: 9:57
++ CALCULATING JOINT DISPLACEMENTS.                  8: 9:57
++ CALCULATING MEMBER  FORCES.                       8: 9:57

257. LOAD LIST 1
258. PRINT MEMBER FORCES LIST 74 TO 101
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-41.03	0.00	0.00	0.00	-85.55
		39	0.00	114.74	0.00	0.00	0.00	-84.69
75	1	39	0.00	-114.77	0.00	0.00	0.00	84.65
		40	0.00	188.50	0.00	0.00	0.00	-416.22
76	1	40	0.00	-188.46	0.00	0.00	0.00	416.08
		41	0.00	262.19	0.00	0.00	0.00	-908.96
77	1	41	0.00	-262.06	0.00	0.00	0.00	908.91
		42	0.00	335.78	0.00	0.00	0.00	-1562.90
8	1	42	0.00	-335.82	0.00	0.00	0.00	1562.86
		43	0.00	409.54	0.00	0.00	0.00	-2378.21
79	1	43	0.00	-409.51	0.00	0.00	0.00	2378.23
		44	0.00	483.24	0.00	0.00	0.00	-3354.73
80	1	44	0.00	-483.27	0.00	0.00	0.00	3354.82
		45	0.00	556.99	0.00	0.00	0.00	-4492.59
81	1	45	0.00	-557.00	0.00	0.00	0.00	4492.65
		46	0.00	630.73	0.00	0.00	0.00	-5791.75
82	1	46	0.00	-630.74	0.00	0.00	0.00	5791.75
		47	0.00	704.47	0.00	0.00	0.00	-7252.21
83	1	47	0.00	708.83	0.00	0.00	0.00	7252.20
		48	0.00	-635.10	0.00	0.00	0.00	-5782.27
84	1	48	0.00	635.10	0.00	0.00	0.00	5782.27
		49	0.00	-561.38	0.00	0.00	0.00	-4473.56
85	1	49	0.00	561.40	0.00	0.00	0.00	4473.56
		50	0.00	-487.67	0.00	0.00	0.00	-3326.18
86	1	50	0.00	487.65	0.00	0.00	0.00	3326.18
		51	0.00	-413.94	0.00	0.00	0.00	-2340.29
87	1	51	0.00	413.95	0.00	0.00	0.00	2340.29
		52	0.00	-340.23	0.00	0.00	0.00	-1515.38
88	1	52	0.00	340.22	0.00	0.00	0.00	1515.39
		53	0.00	-266.49	0.00	0.00	0.00	-851.78
89	1	53	0.00	266.50	0.00	0.00	0.00	851.79
		54	0.00	-192.77	0.00	0.00	0.00	-349.45

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON METE

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	192.77	0.00	0.00	0.00	349.45
		55	0.00	-119.04	0.00	0.00	0.00	-8.38
91	1	55	0.00	119.04	0.00	0.00	0.00	8.40
		56	0.00	-45.31	0.00	0.00	0.00	171.38
92	1	56	0.00	45.31	0.00	0.00	0.00	-171.37
		57	0.00	28.41	0.00	0.00	0.00	189.86
93	1	57	0.00	-28.41	0.00	0.00	0.00	-189.86
		58	0.00	102.14	0.00	0.00	0.00	47.06
4	1	58	0.00	-20.04	0.00	0.00	0.00	-47.06
		59	0.00	38.41	0.00	0.00	0.00	-16.85
95	1	59	0.00	17.02	0.00	0.00	0.00	16.85
		60	0.00	1.36	0.00	0.00	0.00	0.27
96	1	60	0.00	7.09	0.00	0.00	0.00	-0.27
		61	0.00	11.29	0.00	0.00	0.00	-4.32
97	1	61	0.00	9.76	0.00	0.00	0.00	4.32
		62	0.00	8.62	0.00	0.00	0.00	-3.07
98	1	62	0.00	9.00	0.00	0.00	0.00	3.07
		63	0.00	9.38	0.00	0.00	0.00	-3.48
99	1	63	0.00	9.37	0.00	0.00	0.00	3.48
		64	0.00	9.01	0.00	0.00	0.00	-3.09
00	1	64	0.00	8.65	0.00	0.00	0.00	3.09
		65	0.00	9.72	0.00	0.00	0.00	-4.25
101	1	65	0.00	11.13	0.00	0.00	0.00	4.25
		66	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

259. PRINT JOI DIS LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00000**********	0.00000	0.00000	0.00000	0.00000	0.59451
39	1	0.00000-872.93506	0.00000	0.00000	0.00000	0.00000	0.59471
40	1	0.00000-743.13696	0.00000	0.00000	0.00000	0.00000	0.59119
41	1	0.00000-614.72931	0.00000	0.00000	0.00000	0.00000	0.58155
42	1	0.00000-489.32501	0.00000	0.00000	0.00000	0.00000	0.56339
43	1	0.00000-369.03879	0.00000	0.00000	0.00000	0.00000	0.53431
44	1	0.00000-256.53116	0.00000	0.00000	0.00000	0.00000	0.49192
45	1	0.00000-154.96581	0.00000	0.00000	0.00000	0.00000	0.43382
46	1	0.00000 -68.05062	0.00000	0.00000	0.00000	0.00000	0.35762
47	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.26091
48	1	0.00000 46.10814	0.00000	0.00000	0.00000	0.00000	0.16429
49	1	0.00000 73.38068	0.00000	0.00000	0.00000	0.00000	0.08829
50	1	0.00000 86.06863	0.00000	0.00000	0.00000	0.00000	0.03055
51	1	0.00000 87.90324	0.00000	0.00000	0.00000	0.00000	-0.01133
52	1	0.00000 82.08924	0.00000	0.00000	0.00000	0.00000	-0.03978
53	1	0.00000 71.30660	0.00000	0.00000	0.00000	0.00000	-0.05716
54	1	0.00000 57.71133	0.00000	0.00000	0.00000	0.00000	-0.06589
55	1	0.00000 42.93655	0.00000	0.00000	0.00000	0.00000	-0.06835
56	1	0.00000 28.09080	0.00000	0.00000	0.00000	0.00000	-0.06694
57	1	0.00000 13.75902	0.00000	0.00000	0.00000	0.00000	-0.06405
58	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	-0.06209
59	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.01664
60	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00446
61	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00119
62	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00030
63	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
64	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00027
65	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00110
66	1	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

260. PRINT REACC ALL

UPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
7	1	0.00	56.10	0.00	0.00	0.00	0.00
47	1	0.00	1413.29	0.00	0.00	0.00	0.00
58	1	0.00	82.10	0.00	0.00	0.00	0.00
59	1	0.00	55.43	0.00	0.00	0.00	0.00
60	1	0.00	8.45	0.00	0.00	0.00	0.00
61	1	0.00	21.05	0.00	0.00	0.00	0.00
62	1	0.00	17.62	0.00	0.00	0.00	0.00
63	1	0.00	18.74	0.00	0.00	0.00	0.00
64	1	0.00	17.66	0.00	0.00	0.00	0.00
65	1	0.00	20.85	0.00	0.00	0.00	0.00
66	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

261. PLOT BEND FILE
262. PLOT DISP FILE
263. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 2,1997 TIME= 8:10: 0 ****

****
* 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 *
****

Dotación 51

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*****************************************************
*                                                   *
*          S T A A D - III                          *
*          Revision 17.0a                           *
*          Proprietary Program of                   *
*          RESEARCH ENGINEERS, Inc.                 *
*          Date=    JUL  4, 1997                    *
*          Time=    13:24:18                        *
*                                                   *
*****************************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.375	0.000	0.000
61.	57	83.562	0.000	0.000
62.	58	85.750	0.000	0.000
63.	59	87.937	0.000	0.000
64.	60	90.125	0.000	0.000
65.	61	92.312	0.000	0.000
66.	62	94.500	0.000	0.000
67.	63	96.687	0.000	0.000
68.	64	98.875	0.000	0.000
69.	65	101.062	0.000	0.000
70.	66	103.250	0.000	0.000
71.	* 67	105.437	0.000	0.000
72.	* 68	107.625	0.000	0.000
73.	* 69	109.812	0.000	0.000
74.	* 70	112.000	0.000	0.000
75.	* 71	114.187	0.000	0.000
76.	* 72	116.375	0.000	0.000
77.	* 73	118.562	0.000	0.000
78.	* 74	120.750	0.000	0.000
79.	*75	122.937	0.000	0.000
80.	*76	125.125	0.000	0.000
81.	*77	127.312	0.000	0.000
82.	*78	129.000	0.000	0.000
83.	*79	131.687	0.000	0.000
84.	*80	133.875	0.000	0.000
85.	*81	136.062	0.000	0.000
86.	*82	138.250	0.000	0.000

87. MEMBER INCIDENCES

88.	1	1	2
89.	2	2	3
90.	3	3	4
91.	4	4	5
92.	5	5	6
93.	6	6	7
94.	7	7	8
95.	8	8	9
96.	9	9	10
97.	10	10	11
98.	11	11	12
99.	12	12	13
100.	13	13	14
101.	14	14	15
102.	15	15	16
103.	16	16	17
104.	17	17	18
105.	18	18	19
06.	19	29	30
107.	20	30	31

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	21	31	32
109.	22	32	33
10.	23	33	34
111.	24	34	35
112.	25	35	36
113.	26	36	37
114.	27	37	38
115.	28	1	29
116.	29	2	20
117.	30	3	30
118.	31	4	21
119.	32	5	31
120.	33	6	22
121.	34	7	32
122.	35	8	23
123.	36	9	33
124.	37	10	24
125.	38	11	34
126.	39	12	25
127.	40	13	35
128.	41	14	26
29.	42	15	36
130.	43	16	27
131.	44	17	37
132.	45	18	28
133.	46	19	38
134.	47	29	20
135.	48	20	3
136.	49	30	21
137.	50	21	5
138.	51	31	22
139.	52	22	7
140.	53	32	23
141.	54	23	9
142.	55	33	24
143.	56	24	11
144.	57	34	25
145.	58	25	13
146.	59	35	26
147.	60	26	15
148.	61	36	27
149.	62	27	17
150.	63	37	28
151.	64	28	19
152.	65	3	21
153.	66	5	22
154.	67	7	23
155.	68	9	24
156.	69	11	25
157.	70	13	26
158.	71	15	27
159.	72	17	28
160.	73	1	20
161.	74	19	39
162.	75	39	40
163.	76	40	41
164.	77	41	42
165.	78	42	43
166.	79	43	44
167.	80	44	45

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	81	45	46
169.	82	46	47
170.	83	47	48
171.	84	48	49
172.	85	49	50
173.	86	50	51
174.	87	51	52
175.	88	52	53
176.	89	53	54
177.	90	54	55
178.	91	55	56
179.	92	56	57
180.	93	57	58
181.	94	58	59
182.	95	59	60
183.	96	60	61
184.	97	61	62
185.	98	62	63
186.	99	63	64
187.	100	64	65
188.	101	65	66
39.	*102	66	67
190.	*103	67	68
191.	*104	68	69
192.	*105	69	70
193.	*106	70	71
194.	*107	71	72
195.	*108	72	73
196.	*109	73	74
197.	*110	74	75
198.	*111	75	76
199.	*112	76	77
200.	*113	77	78
201.	*114	78	79
202.	*115	79	80
203.	*116	80	81
204.	*117	81	82

205. MEMBER PROPERTY
206. * CORDON INFERIOR
207. 1 PR AX 0.0500 IZ 0.00151406
208. 2 PR AX 0.0500 IZ 0.00151406
209. 3 PR AX 0.0532 IZ 0.00156748
210. 4 PR AX 0.0532 IZ 0.00156748
211. 5 PR AX 0.0670 IZ 0.00233098
212. 6 PR AX 0.0670 IZ 0.00233098
213. 7 PR AX 0.0750 IZ 0.00271328
214. 8 PR AX 0.0750 IZ 0.00271328
215. 9 PR AX 0.0900 IZ 0.00380584
216. 10 PR AX 0.0900 IZ 0.00380584
217. 11 PR AX 0.1070 IZ 0.00464364
218. 12 PR AX 0.1070 IZ 0.00464364
219. 13 PR AX 0.1180 IZ 0.00593306
220. 14 PR AX 0.1180 IZ 0.00593306
221. 15 PR AX 0.1410 IZ 0.00804164
222. 16 PR AX 0.1410 IZ 0.00804164
223. 17 PR AX 0.1520 IZ 0.00926892
224. 18 PR AX 0.1520 IZ 0.00926892
225. * CORDON SUPERIOR
226. 19 PR AX 0.0280 IZ 0.00046454
227. 20 PR AX 0.0280 IZ 0.00046454

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 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 21              PR AX  0.0280   IZ 0.00046454
229. 22              PR AX  0.0320   IZ 0.00072626
230. 23              PR AX  0.0320   IZ 0.00072626
231. 24              PR AX  0.0450   IZ 0.00164273
232. 25              PR AX  0.0600   IZ 0.00261476
233. 26              PR AX  0.0720   IZ 0.00316788
234. 27              PR AX  0.0840   IZ 0.00380920
235. * MONTANTES PRINCIPALES
236. 28              PR AX  0.0068   IZ 0.00000001
237. 30              PR AX  0.0082   IZ 0.00000001
238. 32              PR AX  0.0148   IZ 0.00000001
239. 34              PR AX  0.0212   IZ 0.00000001
240. 36              PR AX  0.0298   IZ 0.00000001
241. 38              PR AX  0.0298   IZ 0.00000001
242. 40              PR AX  0.0398   IZ 0.00000001
243. 42              PR AX  0.0498   IZ 0.00000001
244. 44              PR AX  0.0578   IZ 0.00000001
245. 46              PR AX  0.0578   IZ 10000.
246. * MONTANTES SECUNDARIOS
247. 29              PR AX  0.0068   IZ 0.00000001
248. 31              PR AX  0.0068   IZ 0.00000001
249. 33              PR AX  0.0068   IZ 0.00000001
250. 35              PR AX  0.0096   IZ 0.00000001
251. 37              PR AX  0.0112   IZ 0.00000001
252. 39              PR AX  0.0128   IZ 0.00000001
253. 41              PR AX  0.0168   IZ 0.00000001
254. 43              PR AX  0.0192   IZ 0.00000001
255. 45              PR AX  0.0298   IZ 0.00000001
256. * DIAGONALES 1
257. 47              PR AX  0.0068   IZ 0.00001456
258. 48              PR AX  0.0068   IZ 0.00001456
259. 49              PR AX  0.0096   IZ 0.00003700
260. 50              PR AX  0.0096   IZ 0.00003700
261. 51              PR AX  0.0128   IZ 0.00007640
262. 52              PR AX  0.0128   IZ 0.00007640
263. 53              PR AX  0.0212   IZ 0.00025120
264. 54              PR AX  0.0212   IZ 0.00025120
265. 55              PR AX  0.0298   IZ 0.00025166
266. 56              PR AX  0.0298   IZ 0.00025166
267. 57              PR AX  0.0398   IZ 0.00037183
268. 58              PR AX  0.0398   IZ 0.00037183
269. 59              PR AX  0.0498   IZ 0.00050799
270. 60              PR AX  0.0498   IZ 0.00050799
271. 61              PR AX  0.0578   IZ 0.00061053
272. 62              PR AX  0.0578   IZ 0.00061053
273. 63              PR AX  0.0648   IZ 0.00071462
274. 64              PR AX  0.0648   IZ 0.00071462
275. * DIAGONALES 2
276. 65              PR AX  0.0068   IZ 0.00000001
277. 66              PR AX  0.0068   IZ 0.00000001
278. 67              PR AX  0.0068   IZ 0.00000001
279. 68              PR AX  0.0056   IZ 0.00000001
280. 69              PR AX  0.0056   IZ 0.00000001
281. 70              PR AX  0.0150   IZ 0.00000001
282. 71              PR AX  0.0150   IZ 0.00000001
283. 72              PR AX  0.0193   IZ 0.00000001
284. 73              PR AX  0.0068   IZ 0.00000001
285. * SECCION DE HORMIGON
286. 74              PR AX 13.4810   IZ 45.3025
287. 75              PR AX 13.4810   IZ 45.3025
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 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
288. 76              PR AX 13.4810   IZ 45.3025
289. 77              PR AX 13.4810   IZ 45.3025
 90. 78              PR AX 13.4810   IZ 45.3025
291. 79              PR AX 13.4810   IZ 45.3025
292. 80              PR AX 13.4810   IZ 45.3025
293. 81              PR AX 13.4810   IZ 45.3025
294. 82              PR AX 13.4810   IZ 45.3025
295. 83              PR AX 13.4810   IZ 45.3025
296. 84              PR AX 13.4810   IZ 45.3025
297. 85              PR AX 13.4810   IZ 45.3025
298. 86              PR AX 13.4800   IZ 45.3025
299. 87              PR AX 13.4800   IZ 45.3025
300. 88              PR AX 13.4800   IZ 45.3025
301. 89              PR AX 13.4800   IZ 45.3025
302. 90              PR AX 13.4800   IZ 45.3025
303. 91              PR AX 13.4800   IZ 45.3025
304. 92              PR AX 13.4800   IZ 45.3025
305. 93              PR AX 13.4800   IZ 45.3025
306. 94              PR AX  3.3600   IZ  0.1577
307. 95              PR AX  3.3600   IZ  0.1577
308. 96              PR AX  3.3600   IZ  0.1577
 09. 97              PR AX  3.3600   IZ  0.1577
310. 98              PR AX  3.3600   IZ  0.1577
311. 99              PR AX  3.3600   IZ  0.1577
312. 100             PR AX  3.3600   IZ  0.1577
313. 101             PR AX  3.3600   IZ  0.1577
314. MEMBER RELEASE
315. 29 TO 46 65 TO 73          STA MZ
316. 47 49 51 53 55 57 59 61 63 STA MZ
317. 29 TO 46 65 TO 73          END MZ
318. 48 50 52 54 56 58 60 62 64 END MZ
319. CONSTANT
320. E 21000.       MEMB 1  TO  73
321. E  3250.       MEMB 74 TO  101
322. POI    0.15    MEMB 1  TO  73
323. POI    0.2     MEMB 74 TO  101
324. DEN   10.15    MEMB 1  TO  73
325. DEN    2.5     MEMB 74 TO  101
326. SUPPORT
327. 8  FIXED BUT FX MZ
328. 48 PINNED
329. *52 FIXED BUT FX MZ
330. *56 FIXED BUT FX MZ
331. *57 FIXED BUT FX MZ
332. *58 FIXED BUT FX MZ
333. *59 FIXED BUT FX MZ
334. 60 FIXED BUT FX MZ
335. 61 FIXED BUT FX MZ
336. 62 FIXED BUT FX MZ
337. 63 FIXED BUT FX MZ
338. 64 FIXED BUT FX MZ
339. 65 FIXED BUT FX MZ
340. 66 FIXED BUT FX MZ
341. LOAD 1 PESO PROPIO
342. SELFWEIGHT Y   -1.
343. 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 = 66/ 101/ 9
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 188
SIZE OF STIFFNESS MATRIX = 3948 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.21 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 13:24:22
++ PROCESSING GLOBAL STIFFNESS MATRIX. 13:24:23
++ PROCESSING TRIANGULAR FACTORIZATION. 13:24:23
++ CALCULATING JOINT DISPLACEMENTS. 13:24:23
++ CALCULATING MEMBER FORCES. 13:24:23

344. LOAD LIS 1
345. PRINT MEMBER FORCES LIST 74 TO 101

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-33.18	0.00	0.00	0.00	-151.75
		39	0.00	106.89	0.00	0.00	0.00	-1.67
75	1	39	0.00	-107.21	0.00	0.00	0.00	1.55
		40	0.00	180.95	0.00	0.00	0.00	-316.51
76	1	40	0.00	-180.73	0.00	0.00	0.00	316.33
		41	0.00	254.44	0.00	0.00	0.00	-792.14
77	1	41	0.00	-254.25	0.00	0.00	0.00	792.26
		42	0.00	327.99	0.00	0.00	0.00	-1429.50
78	1	42	0.00	-328.20	0.00	0.00	0.00	1429.53
		43	0.00	401.91	0.00	0.00	0.00	-2227.98
79	1	43	0.00	-401.85	0.00	0.00	0.00	2227.91
		44	0.00	475.59	0.00	0.00	0.00	-3187.83
80	1	44	0.00	-475.59	0.00	0.00	0.00	3187.87
		45	0.00	549.30	0.00	0.00	0.00	-4308.59
81	1	45	0.00	-549.31	0.00	0.00	0.00	4308.64
		46	0.00	623.05	0.00	0.00	0.00	-5591.18
82	1	46	0.00	-623.04	0.00	0.00	0.00	5591.20
		47	0.00	696.75	0.00	0.00	0.00	-7034.46
83	1	47	0.00	-696.77	0.00	0.00	0.00	7034.45
		48	0.00	770.51	0.00	0.00	0.00	-8639.66
84	1	48	0.00	762.68	0.00	0.00	0.00	8639.66
		49	0.00	-688.97	0.00	0.00	0.00	-7052.30
85	1	49	0.00	688.97	0.00	0.00	0.00	7052.31
		50	0.00	-615.23	0.00	0.00	0.00	-5625.52
86	1	50	0.00	615.22	0.00	0.00	0.00	5625.54
		51	0.00	-541.52	0.00	0.00	0.00	-4360.64
87	1	51	0.00	541.52	0.00	0.00	0.00	4360.63
		52	0.00	-467.78	0.00	0.00	0.00	-3256.45
88	1	52	0.00	467.79	0.00	0.00	0.00	3256.47
		53	0.00	-394.09	0.00	0.00	0.00	-2313.99
89	1	53	0.00	394.07	0.00	0.00	0.00	2314.00
		54	0.00	-320.33	0.00	0.00	0.00	-1532.42

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	320.36	0.00	0.00	0.00	1532.43
		55	0.00	-246.66	0.00	0.00	0.00	-912.42
91	1	55	0.00	246.65	0.00	0.00	0.00	912.43
		56	0.00	-172.92	0.00	0.00	0.00	-453.42
92	1	56	0.00	172.90	0.00	0.00	0.00	453.44
		57	0.00	-99.20	0.00	0.00	0.00	-155.87
93	1	57	0.00	99.20	0.00	0.00	0.00	155.87
		58	0.00	-25.46	0.00	0.00	0.00	-19.49
4	1	58	0.00	25.47	0.00	0.00	0.00	19.48
		59	0.00	-7.10	0.00	0.00	0.00	16.13
95	1	59	0.00	7.10	0.00	0.00	0.00	-16.13
		60	0.00	11.28	0.00	0.00	0.00	11.56
96	1	60	0.00	0.54	0.00	0.00	0.00	-11.56
		61	0.00	17.83	0.00	0.00	0.00	-7.35
97	1	61	0.00	11.51	0.00	0.00	0.00	7.35
		62	0.00	6.86	0.00	0.00	0.00	-2.26
98	1	62	0.00	8.53	0.00	0.00	0.00	2.26
		63	0.00	9.84	0.00	0.00	0.00	-3.70
99	1	63	0.00	9.49	0.00	0.00	0.00	3.70
		64	0.00	8.88	0.00	0.00	0.00	-3.03
0	1	64	0.00	8.62	0.00	0.00	0.00	3.03
		65	0.00	9.75	0.00	0.00	0.00	-4.27
101	1	65	0.00	11.14	0.00	0.00	0.00	4.27
		66	0.00	7.24	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

346. PRINT JOINT DISPLACEMENT LIST 19 39 TO 66

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-0.00001**********		0.00000	0.00000	0.00000	0.77554
39	1	0.00000**********		0.00000	0.00000	0.00000	0.77686
40	1	0.00000**********		0.00000	0.00000	0.00000	0.77469
41	1	0.00000	-955.04218	0.00000	0.00000	0.00000	0.76666
42	1	0.00000	-788.90857	0.00000	0.00000	0.00000	0.75035
43	1	0.00000	-627.53943	0.00000	0.00000	0.00000	0.72339
44	1	0.00000	-473.38281	0.00000	0.00000	0.00000	0.68335
45	1	0.00000	-329.69843	0.00000	0.00000	0.00000	0.62787
46	1	0.00000	-199.99876	0.00000	0.00000	0.00000	0.55451
47	1	0.00000	-88.56882	0.00000	0.00000	0.00000	0.46094
48	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.34467
49	1	0.00000	62.22793	0.00000	0.00000	0.00000	0.22833
50	1	0.00000	101.51595	0.00000	0.00000	0.00000	0.13433
51	1	0.00000	122.46256	0.00000	0.00000	0.00000	0.06036
52	1	0.00000	129.20020	0.00000	0.00000	0.00000	0.00396
53	1	0.00000	125.30936	0.00000	0.00000	0.00000	-0.03721
54	1	0.00000	113.85108	0.00000	0.00000	0.00000	-0.06559
55	1	0.00000	97.37476	0.00000	0.00000	0.00000	-0.08355
56	1	0.00000	77.88133	0.00000	0.00000	0.00000	-0.09350
57	1	0.00000	56.87968	0.00000	0.00000	0.00000	-0.09782
58	1	0.00000	35.31807	0.00000	0.00000	0.00000	-0.09893
59	1	0.00000	11.69405	0.00000	0.00000	0.00000	-0.09178
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.01836
61	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00491
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00129
63	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00027
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020
65	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00108
66	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00412

********** END OF LATEST ANALYSIS RESULT **********

347. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
8	1	0.00	63.78	0.00	0.00	0.00	0.00
48	1	0.00	1533.19	0.00	0.00	0.00	0.00
60	1	0.00	11.82	0.00	0.00	0.00	0.00
61	1	0.00	29.35	0.00	0.00	0.00	0.00
62	1	0.00	15.39	0.00	0.00	0.00	0.00
63	1	0.00	19.34	0.00	0.00	0.00	0.00
64	1	0.00	17.51	0.00	0.00	0.00	0.00
65	1	0.00	20.89	0.00	0.00	0.00	0.00
66	1	0.00	7.24	0.00	0.00	0.00	0.00

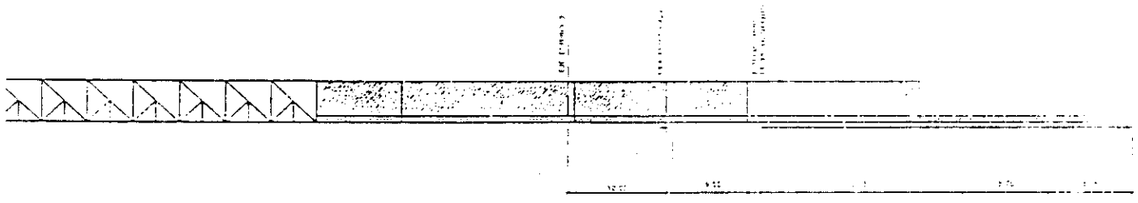
********** END OF LATEST ANALYSIS RESULT **********

348. PLOT DISPLACEMENT FILE
349. PLOT BENDING FILE
350. FINISH

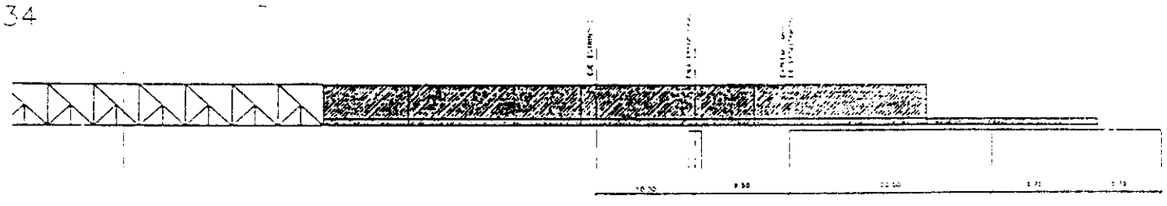
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**** DATE= JUL 4,1997 TIME= 13:24:27 ****

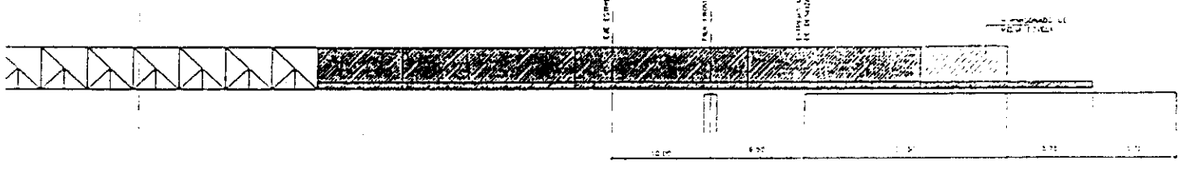
****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL:(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****



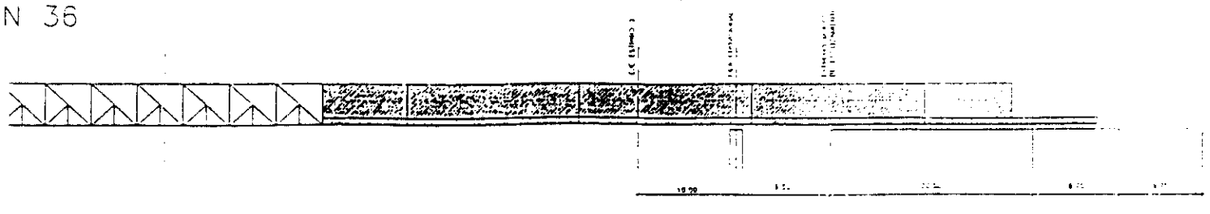
POSICION 34



POSICION 35



POSICION 36



POSICION 37

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*****************************************************
*                                                   *
*          S T A A D - III                          *
*          Revision 17.0a                           *
*          Proprietary Program of                   *
*          RESEARCH ENGINEERS, Inc.                 *
*          Date=    JUL  9, 1997                    *
*          Time=     8:53:14                        *
*                                                   *
*****************************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES
5.    1    0.000    0.000    0.000
6.    2    2.333    0.000    0.000
7.    3    4.667    0.000    0.000
8.    4    7.000    0.000    0.000
9.    5    9.333    0.000    0.000
10.   6   11.667    0.000    0.000
11.   7   14.000    0.000    0.000
12.   8   16.333    0.000    0.000
13.   9   18.667    0.000    0.000
14.  10   21.000    0.000    0.000
15.  11   23.333    0.000    0.000
16.  12   25.667    0.000    0.000
17.  13   28.000    0.000    0.000
18.  14   30.333    0.000    0.000
19.  15   32.667    0.000    0.000
20.  16   35.000    0.000    0.000
21.  17   37.333    0.000    0.000
22.  18   39.667    0.000    0.000
23.  19   42.000    0.000    0.000
24.  20    2.333    1.063    0.000
25.  21    6.999    1.594    0.000
26.  22   11.666    2.125    0.000
27.  23   16.333    2.125    0.000
28.  24   20.999    2.125    0.000
29.  25   25.666    2.125    0.000
30.  26   30.333    2.125    0.000
31.  27   34.999    2.125    0.000
32.  28   39.666    2.125    0.000
33.  29    0.000    2.125    0.000
34.  30    4.666    3.188    0.000
35.  31    9.333    4.250    0.000
36.  32   14.000    4.250    0.000
37.  33   18.666    4.250    0.000
38.  34   23.333    4.250    0.000
39.  35   28.000    4.250    0.000
40.  36   32.667    4.250    0.000
41.  37   37.333    4.250    0.000
42.  38   42.000    4.250    0.000
43.  39   44.187    0.000    0.000
44.  40   46.375    0.000    0.000
45.  41   48.562    0.000    0.000
46.  42   50.750    0.000    0.000
47.  43   52.937    0.000    0.000
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.   44   55.125    0.000    0.000
49.   45   57.312    0.000    0.000
50.   46   59.500    0.000    0.000
51.   47   61.687    0.000    0.000
52.   48   63.875    0.000    0.000
53.   49   67.875    0.000    0.000
54.  * 49   66.062    0.000    0.000
55.   50   68.250    0.000    0.000
56.   51   70.437    0.000    0.000
57.   52   72.250    0.000    0.000
58.   53   74.812    0.000    0.000
59.   54   77.875    0.000    0.000
60.  * 54   77.000    0.000    0.000
61.   55   79.187    0.000    0.000
62.   56   81.375    0.000    0.000
63.   57   83.562    0.000    0.000
64.   58   85.750    0.000    0.000
65.   59   87.375    0.000    0.000
66.  * 59   87.937    0.000    0.000
67.   60   90.125    0.000    0.000
68.   61   92.312    0.000    0.000
69.   62   94.500    0.000    0.000
70.   63   96.687    0.000    0.000
71.   64   98.875    0.000    0.000
72.   65  101.062    0.000    0.000
73.   66  103.250    0.000    0.000
74.   67  105.437    0.000    0.000
75.   68  107.625    0.000    0.000
76.   69  109.812    0.000    0.000
77.   70  112.000    0.000    0.000
78.   71  114.187    0.000    0.000
79.   72  116.375    0.000    0.000
80.   73  118.562    0.000    0.000
81.   74  120.750    0.000    0.000
82.  * 75  122.937    0.000    0.000
83.  * 76  125.125    0.000    0.000
84.  * 77  127.312    0.000    0.000
85.  * 78  129.000    0.000    0.000
86.  * 79  131.687    0.000    0.000
87.  * 80  133.875    0.000    0.000
88.  * 81  136.062    0.000    0.000
89.  * 82  138.250    0.000    0.000
90. MEMBER INCIDENCES
91.    1    1    2
92.    2    2    3
93.    3    3    4
94.    4    4    5
95.    5    5    6
96.    6    6    7
97.    7    7    8
98.    8    8    9
99.    9    9   10
100.  10   10   11
101.  11   11   12
102.  12   12   13
103.  13   13   14
104.  14   14   15
105.  15   15   16
106.  16   16   17
107.  17   17   18
```

108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

168.		78	42	43
169.		79	43	44
170.		80	44	45
171.		81	45	46
172.		82	46	47
173.		83	47	48
174.		84	48	49
175.		85	49	50
176.		86	50	51
177.		87	51	52
178.		88	52	53
179.		89	53	54
180.		90	54	55
181.		91	55	56
182.		92	56	57
183.		93	57	58
184.		94	58	59
185.		95	59	60
186.		96	60	61
187.		97	61	62
188.		98	62	63
189.		99	63	64
190.		100	64	65
191.		101	65	66
192.		102	66	67
193.		103	67	68
194.		104	68	69
195.		105	69	70
196.		106	70	71
197.		107	71	72
198.		108	72	73
199.		109	73	74
200.	*	110	74	75
201.	*	111	75	76
202.	*	112	76	77
203.	*	113	77	78
204.	*	114	78	79
205.	*	115	79	80
206.	*	116	80	81
207.	*	117	81	82

208. MEMBER PROPERTY
209. * CORDON INFERIOR

210.	1	PR AX	0.0500	IZ 0.00151406
211.	2	PR AX	0.0500	IZ 0.00151406
212.	3	PR AX	0.0532	IZ 0.00156748
213.	4	PR AX	0.0532	IZ 0.00156748
214.	5	PR AX	0.0670	IZ 0.00233098
215.	6	PR AX	0.0670	IZ 0.00233098
216.	7	PR AX	0.0750	IZ 0.00271328
217.	8	PR AX	0.0750	IZ 0.00271328
218.	9	PR AX	0.0900	IZ 0.00380584
219.	10	PR AX	0.0900	IZ 0.00380584
220.	11	PR AX	0.1070	IZ 0.00464364
221.	12	PR AX	0.1070	IZ 0.00464364
222.	13	PR AX	0.1180	IZ 0.00593306
223.	14	PR AX	0.1180	IZ 0.00593306
224.	15	PR AX	0.1410	IZ 0.00804164
225.	16	PR AX	0.1410	IZ 0.00804164
226.	17	PR AX	0.1520	IZ 0.00926892
227.	18	PR AX	0.1520	IZ 0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. * CORDON SUPERIOR
229. 19              PR AX  0.0280   IZ 0.00046454
230. 20              PR AX  0.0280   IZ 0.00046454
231. 21              PR AX  0.0280   IZ 0.00046454
232. 22              PR AX  0.0320   IZ 0.00072626
233. 23              PR AX  0.0320   IZ 0.00072626
234. 24              PR AX  0.0450   IZ 0.00164273
235. 25              PR AX  0.0600   IZ 0.00261476
236. 26              PR AX  0.0720   IZ 0.00316788
237. 27              PR AX  0.0840   IZ 0.00380920
238. * MONTANTES PRINCIPALES
239. 28              PR AX  0.0068   IZ 0.00000001
240. 30              PR AX  0.0082   IZ 0.00000001
241. 32              PR AX  0.0148   IZ 0.00000001
242. 34              PR AX  0.0212   IZ 0.00000001
243. 36              PR AX  0.0298   IZ 0.00000001
244. 38              PR AX  0.0298   IZ 0.00000001
245. 40              PR AX  0.0398   IZ 0.00000001
246. 42              PR AX  0.0498   IZ 0.00000001
247. 44              PR AX  0.0578   IZ 0.00000001
248. 46              PR AX  0.0578   IZ 10000.
249. * MONTANTES SECUNDARIOS
250. 29              PR AX  0.0068   IZ 0.00000001
251. 31              PR AX  0.0068   IZ 0.00000001
252. 33              PR AX  0.0068   IZ 0.00000001
253. 35              PR AX  0.0096   IZ 0.00000001
254. 37              PR AX  0.0112   IZ 0.00000001
255. 39              PR AX  0.0128   IZ 0.00000001
256. 41              PR AX  0.0168   IZ 0.00000001
257. 43              PR AX  0.0192   IZ 0.00000001
258. 45              PR AX  0.0298   IZ 0.00000001
259. * DIAGONALES 1
260. 47              PR AX  0.0068   IZ 0.00001456
261. 48              PR AX  0.0068   IZ 0.00001456
262. 49              PR AX  0.0096   IZ 0.00003700
263. 50              PR AX  0.0096   IZ 0.00003700
264. 51              PR AX  0.0128   IZ 0.00007640
265. 52              PR AX  0.0128   IZ 0.00007640
266. 53              PR AX  0.0212   IZ 0.00025120
267. 54              PR AX  0.0212   IZ 0.00025120
268. 55              PR AX  0.0298   IZ 0.00025166
269. 56              PR AX  0.0298   IZ 0.00025166
270. 57              PR AX  0.0398   IZ 0.00037183
271. 58              PR AX  0.0398   IZ 0.00037183
272. 59              PR AX  0.0498   IZ 0.00050799
273. 60              PR AX  0.0498   IZ 0.00050799
274. 61              PR AX  0.0578   IZ 0.00061053
275. 62              PR AX  0.0578   IZ 0.00061053
276. 63              PR AX  0.0648   IZ 0.00071462
277. 64              PR AX  0.0648   IZ 0.00071462
278. * DIAGONALES 2
279. 65              PR AX  0.0068   IZ 0.00000001
280. 66              PR AX  0.0068   IZ 0.00000001
281. 67              PR AX  0.0068   IZ 0.00000001
282. 68              PR AX  0.0056   IZ 0.00000001
283. 69              PR AX  0.0056   IZ 0.00000001
284. 70              PR AX  0.0150   IZ 0.00000001
285. 71              PR AX  0.0150   IZ 0.00000001
286. 72              PR AX  0.0193   IZ 0.00000001
287. 73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
288. * SECCION DE HORMIGON
289. 74   TO   77     PR AX 13.4810   IZ 45.3025
290. 78   TO   81     PR AX 13.4810   IZ 45.3025
291. 82   TO   85     PR AX 13.4810   IZ 45.3025
292. 86   TO   89     PR AX 13.4810   IZ 45.3025
293. 90   TO   93     PR AX 13.4810   IZ 45.3025
294. 94   TO   97     PR AX 13.4810   IZ 45.3025
295. 98   TO   101    PR AX 13.4810   IZ 45.3025
296. 102  TO   105    PR AX  3.3600   IZ  0.1577
297. 106  TO   109    PR AX  3.3600   IZ  0.1577
298. *110 TO   113    PR AX  3.3600   IZ  0.1577
299. *114 TO   117    PR AX  3.3600   IZ  0.1577
300. MEMBER RELEASE
301. 29 TO 46 65 TO 73          STA MZ
302. 47 49 51 53 55 57 59 61 63 STA MZ
303. 29 TO 46 65 TO 73          END MZ
304. 48 50 52 54 56 58 60 62 64 END MZ
305. CONSTANT
306. E 21000.       MEMB 1  TO  73
307. E  3250.       MEMB 74 TO  109
308. POI   0.15     MEMB 1  TO  73
309. POI   0.2      MEMB 74 TO  109
310. DEN  10.15     MEMB 1  TO  73
311. DEN   2.5      MEMB 74 TO  109
312. SUPPORT
313. 9  PINNED
314. 49 FIXED BUT FX MZ
315. *54 FIXED BUT FX MZ
316. *59 FIXED BUT FX MZ
317. *60 FIXED BUT FX MZ
318. *61 FIXED BUT FX MZ
319. *62 FIXED BUT FX MZ
320. *63 FIXED BUT FX MZ
321. *64 FIXED BUT FX MZ
322. *65 FIXED BUT FX MZ
323. 66 FIXED BUT FX MZ
324. 67 FIXED BUT FX MZ
325. 68 FIXED BUT FX MZ
326. 69 FIXED BUT FX MZ
327. 70 FIXED BUT FX MZ
328. 71 FIXED BUT FX MZ
329. 72 FIXED BUT FX MZ
330. 73 FIXED BUT FX MZ
331. 74 FIXED BUT FX MZ
332. *75 FIXED BUT FX MZ
333. *76 FIXED BUT FX MZ
334. *77 FIXED BUT FX MZ
335. *78 FIXED BUT FX MZ
336. *79 FIXED BUT FX MZ
337. *80 FIXED BUT FX MZ
338. *81 FIXED BUT FX MZ
339. *82 FIXED BUT FX MZ
340. LOAD 1 PESO PROPIO
341. SELFWEIGHT Y  -1.
342. 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 = 74/ 109/ 11
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 210
SIZE OF STIFFNESS MATRIX = 4410 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.23 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8:53:19
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8:53:19
++ PROCESSING TRIANGULAR FACTORIZATION. 8:53:19
++ CALCULATING JOINT DISPLACEMENTS. 8:53:19
++ CALCULATING MEMBER FORCES. 8:53:20

343. LOAD LIS 1
344. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-20.37	0.00	0.00	0.00	-300.93
		39	0.00	94.08	0.00	0.00	0.00	175.50
75	1	39	0.00	-94.26	0.00	0.00	0.00	-175.49
		40	0.00	168.00	0.00	0.00	0.00	-111.28
76	1	40	0.00	-167.90	0.00	0.00	0.00	111.14
		41	0.00	241.61	0.00	0.00	0.00	-559.28
77	1	41	0.00	-241.67	0.00	0.00	0.00	559.00
		42	0.00	315.41	0.00	0.00	0.00	-1168.64
78	1	42	0.00	-315.21	0.00	0.00	0.00	1168.63
		43	0.00	388.91	0.00	0.00	0.00	-1938.83
79	1	43	0.00	-389.00	0.00	0.00	0.00	1938.87
		44	0.00	462.75	0.00	0.00	0.00	-2870.98
80	1	44	0.00	-462.82	0.00	0.00	0.00	2870.94
		45	0.00	536.53	0.00	0.00	0.00	-3963.86
81	1	45	0.00	-536.62	0.00	0.00	0.00	3963.71
		46	0.00	610.36	0.00	0.00	0.00	-5218.39
82	1	46	0.00	-610.22	0.00	0.00	0.00	5218.42
		47	0.00	683.93	0.00	0.00	0.00	-6633.62
83	1	47	0.00	-683.99	0.00	0.00	0.00	6633.71
		48	0.00	757.73	0.00	0.00	0.00	-8210.92
84	1	48	0.00	-757.74	0.00	0.00	0.00	8210.95
		49	0.00	892.55	0.00	0.00	0.00	-11511.52
85	1	49	0.00	922.32	0.00	0.00	0.00	11511.52
		50	0.00	-909.68	0.00	0.00	0.00	-11168.02
86	1	50	0.00	909.64	0.00	0.00	0.00	11168.04
		51	0.00	-835.93	0.00	0.00	0.00	-9259.26
87	1	51	0.00	835.92	0.00	0.00	0.00	9259.25
		52	0.00	-774.82	0.00	0.00	0.00	-7799.14
88	1	52	0.00	774.83	0.00	0.00	0.00	7799.12
		53	0.00	-688.49	0.00	0.00	0.00	-5924.62
89	1	53	0.00	688.48	0.00	0.00	0.00	5924.63
		54	0.00	-585.25	0.00	0.00	0.00	-3973.91

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	585.26	0.00	0.00	0.00	3973.84
		55	0.00	-541.04	0.00	0.00	0.00	-3235.14
91	1	55	0.00	541.04	0.00	0.00	0.00	3235.09
		56	0.00	-467.30	0.00	0.00	0.00	-2131.96
92	1	56	0.00	467.27	0.00	0.00	0.00	2131.99
		57	0.00	-393.56	0.00	0.00	0.00	-1190.60
93	1	57	0.00	393.58	0.00	0.00	0.00	1190.61
		58	0.00	-319.84	0.00	0.00	0.00	-410.14
94	1	58	0.00	319.81	0.00	0.00	0.00	410.10
		59	0.00	-265.05	0.00	0.00	0.00	65.09
95	1	59	0.00	265.07	0.00	0.00	0.00	-65.13
		60	0.00	-172.39	0.00	0.00	0.00	666.63
96	1	60	0.00	172.39	0.00	0.00	0.00	-666.63
		61	0.00	-98.69	0.00	0.00	0.00	963.07
97	1	61	0.00	98.69	0.00	0.00	0.00	-963.06
		62	0.00	-24.95	0.00	0.00	0.00	1098.31
98	1	62	0.00	24.94	0.00	0.00	0.00	-1098.31
		63	0.00	48.77	0.00	0.00	0.00	1072.27
99	1	63	0.00	-48.77	0.00	0.00	0.00	-1072.27
		64	0.00	122.51	0.00	0.00	0.00	884.90
100	1	64	0.00	-122.51	0.00	0.00	0.00	-884.90
		65	0.00	196.21	0.00	0.00	0.00	536.38
101	1	65	0.00	-196.21	0.00	0.00	0.00	-536.38
		66	0.00	269.95	0.00	0.00	0.00	26.40
102	1	66	0.00	-8.06	0.00	0.00	0.00	-26.40
		67	0.00	26.43	0.00	0.00	0.00	-11.32
103	1	67	0.00	13.81	0.00	0.00	0.00	11.32
		68	0.00	4.57	0.00	0.00	0.00	-1.21
104	1	68	0.00	7.94	0.00	0.00	0.00	1.21
		69	0.00	10.43	0.00	0.00	0.00	-3.93
105	1	69	0.00	9.53	0.00	0.00	0.00	3.93
		70	0.00	8.85	0.00	0.00	0.00	-3.18
106	1	70	0.00	9.06	0.00	0.00	0.00	3.18
		71	0.00	9.31	0.00	0.00	0.00	-3.46

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	9.35	0.00	0.00	0.00	3.46
		72	0.00	9.03	0.00	0.00	0.00	-3.10
108	1	72	0.00	8.66	0.00	0.00	0.00	3.10
		73	0.00	9.71	0.00	0.00	0.00	-4.25
109	1	73	0.00	11.13	0.00	0.00	0.00	4.25
		74	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

345. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	31.94601**********	0.00000	0.00000	0.00000	1.15329	
39	1	31.94601**********	0.00000	0.00000	0.00000	1.15703	
40	1	31.94601**********	0.00000	0.00000	0.00000	1.15771	
41	1	31.94601**********	0.00000	0.00000	0.00000	1.15293	
42	1	31.94601**********	0.00000	0.00000	0.00000	1.14029	
43	1	31.94601**********	0.00000	0.00000	0.00000	1.11741	
44	1	31.94601**********	0.00000	0.00000	0.00000	1.08187	
45	1	31.94601-855.72040	0.00000	0.00000	0.00000	1.03131	
46	1	31.94601-637.17261	0.00000	0.00000	0.00000	0.96328	
47	1	31.94601-435.72382	0.00000	0.00000	0.00000	0.87546	
48	1	31.94601-255.79230	0.00000	0.00000	0.00000	0.76535	
49	1	31.94601 0.00000	0.00000	0.00000	0.00000	0.49867	
50	1	31.94601 18.15559	0.00000	0.00000	0.00000	0.46979	
51	1	31.94601 103.81250	0.00000	0.00000	0.00000	0.31827	
52	1	31.94601 151.73302	0.00000	0.00000	0.00000	0.21336	
53	1	31.94601 190.44432	0.00000	0.00000	0.00000	0.09428	
54	1	31.94601 202.60017	0.00000	0.00000	0.00000	-0.00814	
55	1	31.94601 199.35605	0.00000	0.00000	0.00000	-0.04022	
56	1	31.94601 185.91689	0.00000	0.00000	0.00000	-0.07990	
57	1	31.94601 165.51231	0.00000	0.00000	0.00000	-0.10437	
58	1	31.94601 141.18469	0.00000	0.00000	0.00000	-0.11607	
59	1	31.94601 122.10471	0.00000	0.00000	0.00000	-0.11789	
60	1	31.94601 90.42189	0.00000	0.00000	0.00000	-0.11066	
61	1	31.94601 67.48600	0.00000	0.00000	0.00000	-0.09836	
62	1	31.94601 47.62669	0.00000	0.00000	0.00000	-0.08284	
63	1	31.94601 31.30155	0.00000	0.00000	0.00000	-0.06652	
64	1	31.94601 18.41084	0.00000	0.00000	0.00000	-0.05178	
65	1	31.94601 8.35785	0.00000	0.00000	0.00000	-0.04102	
66	1	31.94601 0.00000	0.00000	0.00000	0.00000	-0.03664	
67	1	31.94601 0.00000	0.00000	0.00000	0.00000	0.00982	
68	1	31.94601 0.00000	0.00000	0.00000	0.00000	-0.00263	
69	1	31.94601 0.00000	0.00000	0.00000	0.00000	0.00070	
70	1	31.94601 0.00000	0.00000	0.00000	0.00000	-0.00016	
71	1	31.94601 0.00000	0.00000	0.00000	0.00000	-0.00003	
72	1	31.94601 0.00000	0.00000	0.00000	0.00000	0.00029	
73	1	31.94601 0.00000	0.00000	0.00000	0.00000	-0.00111	
74	1	31.94601 0.00000	0.00000	0.00000	0.00000	0.00413	

********** END OF LATEST ANALYSIS RESULT **********

346. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
9	1	0.00	76.55	0.00	0.00	0.00	0.00
49	1	0.00	1814.87	0.00	0.00	0.00	0.00
66	1	0.00	261.89	0.00	0.00	0.00	0.00
67	1	0.00	40.24	0.00	0.00	0.00	0.00
68	1	0.00	12.52	0.00	0.00	0.00	0.00
69	1	0.00	19.96	0.00	0.00	0.00	0.00
70	1	0.00	17.91	0.00	0.00	0.00	0.00
71	1	0.00	18.66	0.00	0.00	0.00	0.00
72	1	0.00	17.69	0.00	0.00	0.00	0.00
73	1	0.00	20.84	0.00	0.00	0.00	0.00
74	1	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

347. PLOT DISPLACEMENT FILE
348. PLOT BENDING FILE
349. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 8:53:23 ****

****
* 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 *
****

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*****************************************************
*                                                   *
*          S T A A D - III                          *
*          Revision 17.0a                           *
*          Proprietary Program of                   *
*          RESEARCH ENGINEERS, Inc.                 *
*          Date=    JUL  9, 1997                    *
*          Time=     8:46:11                        *
*                                                   *
*****************************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES
5.    1      0.000      0.000      0.000
6.    2      2.333      0.000      0.000
7.    3      4.667      0.000      0.000
8.    4      7.000      0.000      0.000
9.    5      9.333      0.000      0.000
10.   6     11.667      0.000      0.000
11.   7     14.000      0.000      0.000
12.   8     16.333      0.000      0.000
13.   9     18.667      0.000      0.000
14.  10     21.000      0.000      0.000
15.  11     23.333      0.000      0.000
16.  12     25.667      0.000      0.000
17.  13     28.000      0.000      0.000
18.  14     30.333      0.000      0.000
19.  15     32.667      0.000      0.000
20.  16     35.000      0.000      0.000
21.  17     37.333      0.000      0.000
22.  18     39.667      0.000      0.000
23.  19     42.000      0.000      0.000
24.  20      2.333      1.063      0.000
25.  21      6.999      1.594      0.000
26.  22     11.666      2.125      0.000
27.  23     16.333      2.125      0.000
28.  24     20.999      2.125      0.000
29.  25     25.666      2.125      0.000
30.  26     30.333      2.125      0.000
31.  27     34.999      2.125      0.000
32.  28     39.666      2.125      0.000
33.  29      0.000      2.125      0.000
34.  30      4.666      3.188      0.000
35.  31      9.333      4.250      0.000
36.  32     14.000      4.250      0.000
37.  33     18.666      4.250      0.000
38.  34     23.333      4.250      0.000
39.  35     28.000      4.250      0.000
40.  36     32.667      4.250      0.000
41.  37     37.333      4.250      0.000
42.  38     42.000      4.250      0.000
43.  39     44.187      0.000      0.000
44.  40     46.375      0.000      0.000
45.  41     48.562      0.000      0.000
46.  42     50.750      0.000      0.000
47.  43     52.937      0.000      0.000
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* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
48.   44      55.125      0.000      0.000
49.   45      57.312      0.000      0.000
50.   46      59.500      0.000      0.000
51.   47      61.687      0.000      0.000
52.   48      63.875      0.000      0.000
53.   49      66.062      0.000      0.000
54.   50      68.250      0.000      0.000
55.   51      70.437      0.000      0.000
56.   52      72.625      0.000      0.000
57.  * 52       72.250      0.000      0.000
58.   53      74.812      0.000      0.000
59.   54      77.000      0.000      0.000
60.   55      79.187      0.000      0.000
61.   56      82.250      0.000      0.000
62.  * 56       81.375      0.000      0.000
63.   57      83.562      0.000      0.000
64.   58      85.750      0.000      0.000
65.   59      87.937      0.000      0.000
66.   60      90.125      0.000      0.000
67.   61      91.750      0.000      0.000
68.  * 61       92.312      0.000      0.000
69.   62      94.500      0.000      0.000
70.   63      96.687      0.000      0.000
71.   64      98.875      0.000      0.000
72.   65     101.062      0.000      0.000
73.   66     103.250      0.000      0.000
74.   67     105.437      0.000      0.000
75.   68     107.625      0.000      0.000
76.   69     109.812      0.000      0.000
77.   70     112.000      0.000      0.000
78.   71     114.187      0.000      0.000
79.   72     116.375      0.000      0.000
80.   73     118.562      0.000      0.000
81.   74     120.750      0.000      0.000
82.  * 75       122.937      0.000      0.000
83.  * 76       125.125      0.000      0.000
84.  * 77       127.312      0.000      0.000
85.  * 78       129.000      0.000      0.000
86.  * 79       131.687      0.000      0.000
87.  * 80       133.875      0.000      0.000
88.  * 81       136.062      0.000      0.000
89.  * 82       138.250      0.000      0.000
90. MEMBER INCIDENCES
91.    1    1    2
92.    2    2    3
93.    3    3    4
94.    4    4    5
95.    5    5    6
96.    6    6    7
97.    7    7    8
98.    8    8    9
99.    9    9   10
100.  10   10   11
101.  11   11   12
102.  12   12   13
103.  13   13   14
104.  14   14   15
105.  15   15   16
106.  16   16   17
107.  17   17   18
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108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

168.		78	42	43
169.		79	43	44
170.		80	44	45
171.		81	45	46
172.		82	46	47
173.		83	47	48
174.		84	48	49
175.		85	49	50
176.		86	50	51
177.		87	51	52
178.		88	52	53
179.		89	53	54
180.		90	54	55
181.		91	55	56
182.		92	56	57
183.		93	57	58
184.		94	58	59
185.		95	59	60
186.		96	60	61
187.		97	61	62
188.		98	62	63
189.		99	63	64
190.		100	64	65
191.		101	65	66
192.		102	66	67
193.		103	67	68
194.		104	68	69
195.		105	69	70
196.		106	70	71
197.		107	71	72
198.		108	72	73
199.		109	73	74
200.	*	110	74	75
201.	*	111	75	76
202.	*	112	76	77
203.	*	113	77	78
204.	*	114	78	79
205.	*	115	79	80
206.	*	116	80	81
207.	*	117	81	82

208. MEMBER PROPERTY
209. * CORDON INFERIOR

210.	1	PR AX	0.0500	IZ 0.00151406
211.	2	PR AX	0.0500	IZ 0.00151406
212.	3	PR AX	0.0532	IZ 0.00156748
213.	4	PR AX	0.0532	IZ 0.00156748
214.	5	PR AX	0.0670	IZ 0.00233098
215.	6	PR AX	0.0670	IZ 0.00233098
216.	7	PR AX	0.0750	IZ 0.00271328
217.	8	PR AX	0.0750	IZ 0.00271328
218.	9	PR AX	0.0900	IZ 0.00380584
219.	10	PR AX	0.0900	IZ 0.00380584
220.	11	PR AX	0.1070	IZ 0.00464364
221.	12	PR AX	0.1070	IZ 0.00464364
222.	13	PR AX	0.1180	IZ 0.00593306
223.	14	PR AX	0.1180	IZ 0.00593306
224.	15	PR AX	0.1410	IZ 0.00804164
225.	16	PR AX	0.1410	IZ 0.00804164
226.	17	PR AX	0.1520	IZ 0.00926892
227.	18	PR AX	0.1520	IZ 0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* CORDON SUPERIOR
19              PR AX  0.0280   IZ 0.00046454
20              PR AX  0.0280   IZ 0.00046454
21              PR AX  0.0280   IZ 0.00046454
22              PR AX  0.0320   IZ 0.00072626
23              PR AX  0.0320   IZ 0.00072626
24              PR AX  0.0450   IZ 0.00164273
25              PR AX  0.0600   IZ 0.00261476
26              PR AX  0.0720   IZ 0.00316788
27              PR AX  0.0840   IZ 0.00380920
* MONTANTES PRINCIPALES
28              PR AX  0.0068   IZ 0.00000001
30              PR AX  0.0082   IZ 0.00000001
32              PR AX  0.0148   IZ 0.00000001
34              PR AX  0.0212   IZ 0.00000001
36              PR AX  0.0298   IZ 0.00000001
38              PR AX  0.0298   IZ 0.00000001
40              PR AX  0.0398   IZ 0.00000001
42              PR AX  0.0498   IZ 0.00000001
44              PR AX  0.0578   IZ 0.00000001
46              PR AX  0.0578   IZ 10000.
* MONTANTES SECUNDARIOS
29              PR AX  0.0068   IZ 0.00000001
31              PR AX  0.0068   IZ 0.00000001
33              PR AX  0.0068   IZ 0.00000001
35              PR AX  0.0096   IZ 0.00000001
37              PR AX  0.0112   IZ 0.00000001
39              PR AX  0.0128   IZ 0.00000001
41              PR AX  0.0168   IZ 0.00000001
43              PR AX  0.0192   IZ 0.00000001
45              PR AX  0.0298   IZ 0.00000001
* DIAGONALES 1
47              PR AX  0.0068   IZ 0.00001456
48              PR AX  0.0068   IZ 0.00001456
49              PR AX  0.0096   IZ 0.00003700
50              PR AX  0.0096   IZ 0.00003700
51              PR AX  0.0128   IZ 0.00007640
52              PR AX  0.0128   IZ 0.00007640
53              PR AX  0.0212   IZ 0.00025120
54              PR AX  0.0212   IZ 0.00025120
55              PR AX  0.0298   IZ 0.00025166
56              PR AX  0.0298   IZ 0.00025166
57              PR AX  0.0398   IZ 0.00037183
58              PR AX  0.0398   IZ 0.00037183
59              PR AX  0.0498   IZ 0.00050799
60              PR AX  0.0498   IZ 0.00050799
61              PR AX  0.0578   IZ 0.00061053
62              PR AX  0.0578   IZ 0.00061053
63              PR AX  0.0648   IZ 0.00071462
64              PR AX  0.0648   IZ 0.00071462
* DIAGONALES 2
65              PR AX  0.0068   IZ 0.00000001
66              PR AX  0.0068   IZ 0.00000001
67              PR AX  0.0068   IZ 0.00000001
68              PR AX  0.0056   IZ 0.00000001
69              PR AX  0.0056   IZ 0.00000001
70              PR AX  0.0150   IZ 0.00000001
71              PR AX  0.0150   IZ 0.00000001
72              PR AX  0.0193   IZ 0.00000001
73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* SECCION DE HORMIGON
74   TO   77     PR AX 13.4810   IZ 45.3025
78   TO   81     PR AX 13.4810   IZ 45.3025
82   TO   85     PR AX 13.4810   IZ 45.3025
86   TO   89     PR AX 13.4810   IZ 45.3025
90   TO   93     PR AX 13.4810   IZ 45.3025
94   TO   97     PR AX 13.4810   IZ 45.3025
98   TO   101    PR AX 13.4810   IZ 45.3025
102  TO   105    PR AX  3.3600   IZ  0.1577
106  TO   109    PR AX  3.3600   IZ  0.1577
*110  TO   113    PR AX  3.3600   IZ  0.1577
*114  TO   117    PR AX  3.3600   IZ  0.1577
MEMBER RELEASE
29 TO 46 65 TO 73          STA MZ
47 49 51 53 55 57 59 61 63 STA MZ
29 TO 46 65 TO 73          END MZ
48 50 52 54 56 58 60 62 64 END MZ
CONSTANT
E 21000.       MEMB 1  TO  73
E  3250.       MEMB 74 TO  109
POI   0.15     MEMB 1  TO  73
POI   0.2      MEMB 74 TO  109
DEN  10.15     MEMB 1  TO  73
DEN   2.5      MEMB 74 TO  109
SUPPORT
11 PINNED
52 FIXED BUT FX MZ
*56 FIXED BUT FX MZ
*61 FIXED BUT FX MZ
*62 FIXED BUT FX MZ
*63 FIXED BUT FX MZ
*64 FIXED BUT FX MZ
*65 FIXED BUT FX MZ
*66 FIXED BUT FX MZ
67 FIXED BUT FX MZ
68 FIXED BUT FX MZ
69 FIXED BUT FX MZ
70 FIXED BUT FX MZ
71 FIXED BUT FX MZ
72 FIXED BUT FX MZ
73 FIXED BUT FX MZ
74 FIXED BUT FX MZ
*75 FIXED BUT FX MZ
*76 FIXED BUT FX MZ
*77 FIXED BUT FX MZ
*78 FIXED BUT FX MZ
*79 FIXED BUT FX MZ
*80 FIXED BUT FX MZ
*81 FIXED BUT FX MZ
*82 FIXED BUT FX MZ
LOAD 1 PESO PROPIO
SELFWEIGHT Y   -1.
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 = 74/ 109/ 10
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 211
SIZE OF STIFFNESS MATRIX = 4431 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.23 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8:46:16
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8:46:16
++ PROCESSING TRIANGULAR FACTORIZATION. 8:46:16
++ CALCULATING JOINT DISPLACEMENTS. 8:46:16
++ CALCULATING MEMBER FORCES. 8:46:17

341. LOAD LIS 1
342. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	14.54	0.00	0.00	0.00	-603.77
		39	0.00	59.17	0.00	0.00	0.00	554.37
75	1	39	0.00	-59.24	0.00	0.00	0.00	-554.53
		40	0.00	132.98	0.00	0.00	0.00	344.91
76	1	40	0.00	-132.65	0.00	0.00	0.00	-345.74
		41	0.00	206.36	0.00	0.00	0.00	-25.84
77	1	41	0.00	-206.90	0.00	0.00	0.00	24.55
		42	0.00	280.64	0.00	0.00	0.00	-558.12
78	1	42	0.00	-280.35	0.00	0.00	0.00	557.25
		43	0.00	354.06	0.00	0.00	0.00	-1250.98
79	1	43	0.00	-353.67	0.00	0.00	0.00	1250.40
		44	0.00	427.42	0.00	0.00	0.00	-2105.56
80	1	44	0.00	-427.37	0.00	0.00	0.00	2105.19
		45	0.00	501.08	0.00	0.00	0.00	-3121.09
81	1	45	0.00	-501.27	0.00	0.00	0.00	3120.83
		46	0.00	575.01	0.00	0.00	0.00	-4298.43
82	1	46	0.00	-575.26	0.00	0.00	0.00	4298.18
		47	0.00	648.97	0.00	0.00	0.00	-5636.61
83	1	47	0.00	-648.77	0.00	0.00	0.00	5636.43
		48	0.00	722.51	0.00	0.00	0.00	-7136.36
84	1	48	0.00	-722.28	0.00	0.00	0.00	7136.50
		49	0.00	795.99	0.00	0.00	0.00	-8796.78
85	1	49	0.00	-796.04	0.00	0.00	0.00	8796.89
		50	0.00	869.78	0.00	0.00	0.00	-10619.40
86	1	50	0.00	-869.87	0.00	0.00	0.00	10619.45
		51	0.00	943.58	0.00	0.00	0.00	-12602.44
87	1	51	0.00	-943.53	0.00	0.00	0.00	12602.46
		52	0.00	1017.27	0.00	0.00	0.00	-14747.61
88	1	52	0.00	1000.64	0.00	0.00	0.00	14747.64
		53	0.00	-926.93	0.00	0.00	0.00	-12639.85
89	1	53	0.00	926.95	0.00	0.00	0.00	12639.90
		54	0.00	-853.21	0.00	0.00	0.00	-10692.40

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	853.18	0.00	0.00	0.00	10692.42
		55	0.00	-779.47	0.00	0.00	0.00	-8907.13
91	1	55	0.00	779.46	0.00	0.00	0.00	8907.08
		56	0.00	-676.23	0.00	0.00	0.00	-6677.72
92	1	56	0.00	676.35	0.00	0.00	0.00	6677.85
		57	0.00	-632.13	0.00	0.00	0.00	-5819.33
93	1	57	0.00	632.05	0.00	0.00	0.00	5819.48
		58	0.00	-558.31	0.00	0.00	0.00	-4517.25
94	1	58	0.00	558.34	0.00	0.00	0.00	4517.29
		59	0.00	-484.64	0.00	0.00	0.00	-3376.84
95	1	59	0.00	484.58	0.00	0.00	0.00	3376.87
		60	0.00	-410.84	0.00	0.00	0.00	-2397.31
96	1	60	0.00	410.88	0.00	0.00	0.00	2397.36
		61	0.00	-356.11	0.00	0.00	0.00	-1774.11
97	1	61	0.00	356.07	0.00	0.00	0.00	1774.21
		62	0.00	-263.39	0.00	0.00	0.00	-922.46
98	1	62	0.00	263.36	0.00	0.00	0.00	922.44
		63	0.00	-189.65	0.00	0.00	0.00	-427.02
99	1	63	0.00	189.66	0.00	0.00	0.00	427.02
		64	0.00	-115.92	0.00	0.00	0.00	-92.69
100	1	64	0.00	115.93	0.00	0.00	0.00	92.67
		65	0.00	-42.22	0.00	0.00	0.00	80.28
101	1	65	0.00	42.23	0.00	0.00	0.00	-80.28
		66	0.00	31.51	0.00	0.00	0.00	92.02
102	1	66	0.00	-31.51	0.00	0.00	0.00	-92.01
		67	0.00	49.88	0.00	0.00	0.00	3.01
103	1	67	0.00	5.50	0.00	0.00	0.00	-3.01
		68	0.00	12.88	0.00	0.00	0.00	-5.05
104	1	68	0.00	10.17	0.00	0.00	0.00	5.05
		69	0.00	8.20	0.00	0.00	0.00	-2.90
105	1	69	0.00	8.93	0.00	0.00	0.00	2.90
		70	0.00	9.44	0.00	0.00	0.00	-3.45
106	1	70	0.00	9.22	0.00	0.00	0.00	3.45
		71	0.00	9.15	0.00	0.00	0.00	-3.38

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	9.31	0.00	0.00	0.00	3.38
		72	0.00	9.07	0.00	0.00	0.00	-3.12
108	1	72	0.00	8.67	0.00	0.00	0.00	3.12
		73	0.00	9.70	0.00	0.00	0.00	-4.25
109	1	73	0.00	11.13	0.00	0.00	0.00	4.25
		74	0.00	7.25	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

343. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	29.34604**********		0.00000	0.00000	0.00000	1.67460
39	1	29.34603**********		0.00000	0.00000	0.00000	1.68340
40	1	29.34603**********		0.00000	0.00000	0.00000	1.69029
41	1	29.34603**********		0.00000	0.00000	0.00000	1.69286
42	1	29.34603**********		0.00000	0.00000	0.00000	1.68873
43	1	29.34603**********		0.00000	0.00000	0.00000	1.67550
44	1	29.34603**********		0.00000	0.00000	0.00000	1.65076
45	1	29.34603**********		0.00000	0.00000	0.00000	1.61215
46	1	29.34603**********		0.00000	0.00000	0.00000	1.55722
47	1	29.34603**********		0.00000	0.00000	0.00000	1.48363
48	1	29.34603	-969.38531	0.00000	0.00000	0.00000	1.38893
49	1	29.34603	-678.09692	0.00000	0.00000	0.00000	1.27079
50	1	29.34603	-415.31592	0.00000	0.00000	0.00000	1.12672
51	1	29.34603	-187.20406	0.00000	0.00000	0.00000	0.95445
52	1	29.34603	0.00000	0.00000	0.00000	0.00000	0.75143
53	1	29.34603	141.54553	0.00000	0.00000	0.00000	0.54822
54	1	29.34603	242.02409	0.00000	0.00000	0.00000	0.37505
55	1	29.34603	307.66873	0.00000	0.00000	0.00000	0.22969
56	1	29.34603	352.09439	0.00000	0.00000	0.00000	0.06812
57	1	29.34603	357.29868	0.00000	0.00000	0.00000	0.01249
58	1	29.34603	351.29694	0.00000	0.00000	0.00000	-0.06412
59	1	29.34602	330.57568	0.00000	0.00000	0.00000	-0.12255
60	1	29.34603	298.82407	0.00000	0.00000	0.00000	-0.16526
61	1	29.34603	270.01309	0.00000	0.00000	0.00000	-0.18819
62	1	29.34603	214.48694	0.00000	0.00000	0.00000	-0.21298
63	1	29.34603	166.69974	0.00000	0.00000	0.00000	-0.22280
64	1	29.34603	117.45880	0.00000	0.00000	0.00000	-0.22647
65	1	29.34603	67.89568	0.00000	0.00000	0.00000	-0.22636
66	1	29.34602	18.52712	0.00000	0.00000	0.00000	-0.22488
67	1	29.34602	0.00000	0.00000	0.00000	0.00000	-0.00785
68	1	29.34602	0.00000	0.00000	0.00000	0.00000	0.00211
69	1	29.34602	0.00000	0.00000	0.00000	0.00000	-0.00057
70	1	29.34602	0.00000	0.00000	0.00000	0.00000	0.00018
71	1	29.34602	0.00000	0.00000	0.00000	0.00000	-0.00012
72	1	29.34602	0.00000	0.00000	0.00000	0.00000	0.00031
73	1	29.34602	0.00000	0.00000	0.00000	0.00000	-0.00111
74	1	29.34602	0.00000	0.00000	0.00000	0.00000	0.00413

********** END OF LATEST ANALYSIS RESULT **********

344. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
11	1	0.00	111.88	0.00	0.00	0.00	0.00
52	1	0.00	2017.91	0.00	0.00	0.00	0.00
67	1	0.00	55.38	0.00	0.00	0.00	0.00
68	1	0.00	23.05	0.00	0.00	0.00	0.00
69	1	0.00	17.13	0.00	0.00	0.00	0.00
70	1	0.00	18.66	0.00	0.00	0.00	0.00
71	1	0.00	18.46	0.00	0.00	0.00	0.00
72	1	0.00	17.74	0.00	0.00	0.00	0.00
73	1	0.00	20.83	0.00	0.00	0.00	0.00
74	1	0.00	7.25	0.00	0.00	0.00	0.00

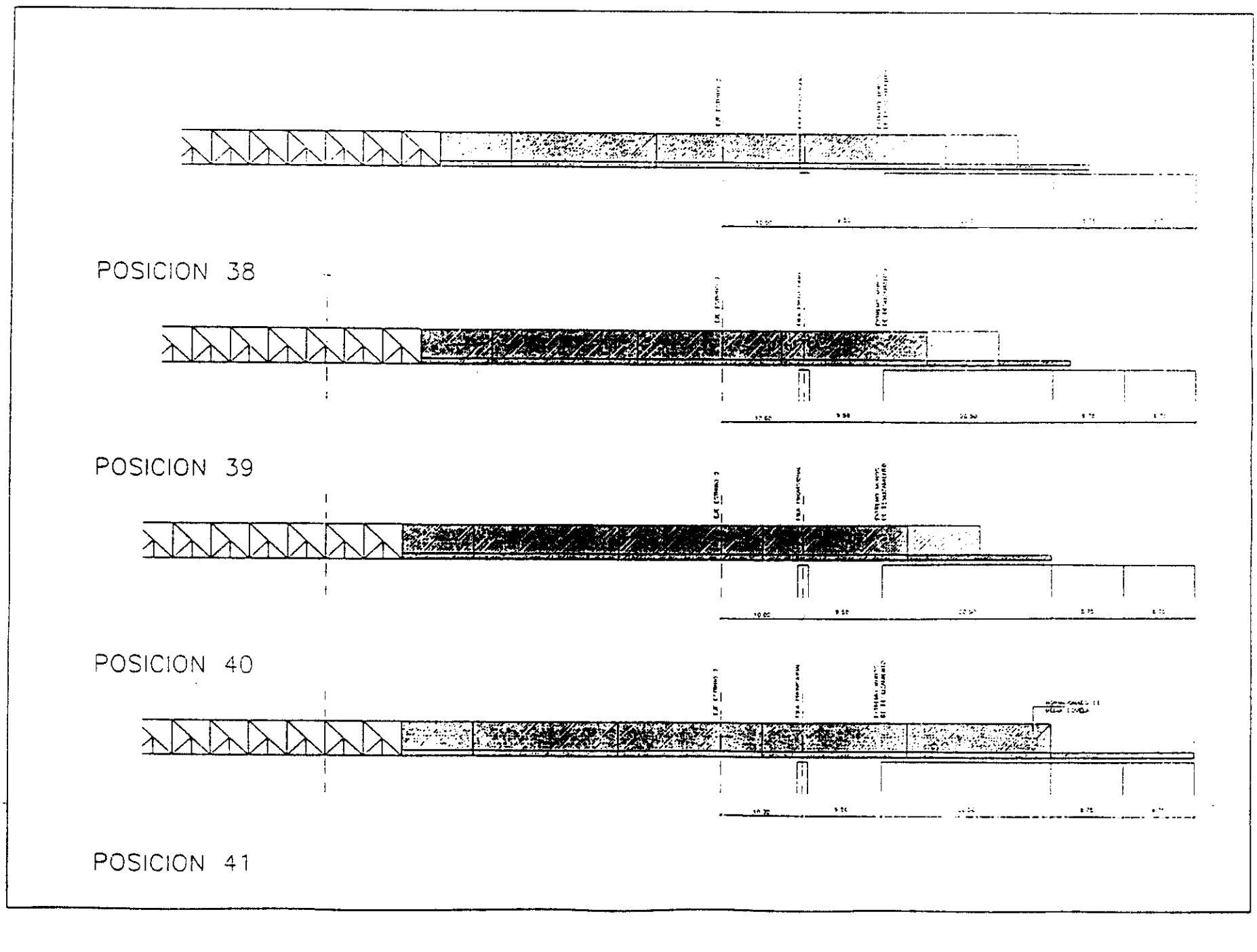
********** END OF LATEST ANALYSIS RESULT **********

345. PLOT DISPLACEMENT FILE
346. PLOT BENDING FILE
347. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 8:46:20 ****

****
* 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 *
****


POSICION 38
POSICION 39
POSICION 40
POSICION 41

PONCA 32

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  9, 1997        *
*          Time=     8:37:36            *
*                                       *
*****************************************
```

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	* 54	77.000	0.000	0.000
60.	55	79.187	0.000	0.000
61.	56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	86.625	0.000	0.000
64.	* 58	85.750	0.000	0.000
65.	59	87.937	0.000	0.000
66.	60	90.125	0.000	0.000
67.	61	92.312	0.000	0.000
68.	62	94.500	0.000	0.000
69.	63	96.125	0.000	0.000
70.	* 63	96.687	0.000	0.000
71.	64	98.875	0.000	0.000
72.	65	101.062	0.000	0.000
73.	66	103.250	0.000	0.000
74.	67	105.437	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	* 75	122.937	0.000	0.000
83.	* 76	125.125	0.000	0.000
84.	* 77	127.312	0.000	0.000
85.	* 78	129.000	0.000	0.000
86.	* 79	131.687	0.000	0.000
87.	* 80	133.875	0.000	0.000
88.	* 81	136.062	0.000	0.000
89.	* 82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.    18   18   19
109.    19   29   30
110.    20   30   31
111.    21   31   32
112.    22   32   33
113.    23   33   34
114.    24   34   35
115.    25   35   36
116.    26   36   37
117.    27   37   38
118.    28    1   29
119.    29    2   20
120.    30    3   30
121.    31    4   21
122.    32    5   31
123.    33    6   22
124.    34    7   32
125.    35    8   23
126.    36    9   33
127.    37   10   24
128.    38   11   34
129.    39   12   25
130.    40   13   35
131.    41   14   26
132.    42   15   36
133.    43   16   27
134.    44   17   37
135.    45   18   28
136.    46   19   38
137.    47   29   20
138.    48   20    3
139.    49   30   21
140.    50   21    5
141.    51   31   22
142.    52   22    7
143.    53   32   23
144.    54   23    9
145.    55   33   24
146.    56   24   11
147.    57   34   25
148.    58   25   13
149.    59   35   26
150.    60   26   15
151.    61   36   27
152.    62   27   17
153.    63   37   28
154.    64   28   19
155.    65    3   21
156.    66    5   22
157.    67    7   23
158.    68    9   24
159.    69   11   25
160.    70   13   26
161.    71   15   27
162.    72   17   28
163.    73    1   20
164.    74   19   39
165.    75   39   40
166.    76   40   41
167.    77   41   42
```



```
* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.    78   42   43
169.    79   43   44
170.    80   44   45
171.    81   45   46
172.    82   46   47
173.    83   47   48
174.    84   48   49
175.    85   49   50
176.    86   50   51
177.    87   51   52
178.    88   52   53
179.    89   53   54
180.    90   54   55
181.    91   55   56
182.    92   56   57
183.    93   57   58
184.    94   58   59
185.    95   59   60
186.    96   60   61
187.    97   61   62
188.    98   62   63
189.    99   63   64
190.   100   64   65
191.   101   65   66
192.   102   66   67
193.   103   67   68
194.   104   68   69
195.   105   69   70
196.   106   70   71
197.   107   71   72
198.   108   72   73
199.   109   73   74
200. *  110   74   75
201. *  111   75   76
202. *  112   76   77
203. *  113   77   78
204. *  114   78   79
205. *  115   79   80
206. *  116   80   81
207. *  117   81   82
208. MEMBER PROPERTY
209. * CORDON INFERIOR
210. 1              PR AX  0.0500   IZ 0.00151406
211. 2              PR AX  0.0500   IZ 0.00151406
212. 3              PR AX  0.0532   IZ 0.00156748
213. 4              PR AX  0.0532   IZ 0.00156748
214. 5              PR AX  0.0670   IZ 0.00233098
215. 6              PR AX  0.0670   IZ 0.00233098
216. 7              PR AX  0.0750   IZ 0.00271328
217. 8              PR AX  0.0750   IZ 0.00271328
218. 9              PR AX  0.0900   IZ 0.00380584
219. 10             PR AX  0.0900   IZ 0.00380584
220. 11             PR AX  0.1070   IZ 0.00464364
221. 12             PR AX  0.1070   IZ 0.00464364
222. 13             PR AX  0.1180   IZ 0.00593306
223. 14             PR AX  0.1180   IZ 0.00593306
224. 15             PR AX  0.1410   IZ 0.00804164
225. 16             PR AX  0.1410   IZ 0.00804164
226. 17             PR AX  0.1520   IZ 0.00926892
227. 18             PR AX  0.1520   IZ 0.00926892
```

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* CORDON SUPERIOR
19              PR AX  0.0280   IZ 0.00046454
20              PR AX  0.0280   IZ 0.00046454
21              PR AX  0.0280   IZ 0.00046454
22              PR AX  0.0320   IZ 0.00072626
23              PR AX  0.0320   IZ 0.00072626
24              PR AX  0.0450   IZ 0.00164273
25              PR AX  0.0600   IZ 0.00261476
26              PR AX  0.0720   IZ 0.00316788
27              PR AX  0.0840   IZ 0.00380920
* MONTANTES PRINCIPALES
28              PR AX  0.0068   IZ 0.00000001
30              PR AX  0.0082   IZ 0.00000001
32              PR AX  0.0148   IZ 0.00000001
34              PR AX  0.0212   IZ 0.00000001
36              PR AX  0.0298   IZ 0.00000001
38              PR AX  0.0298   IZ 0.00000001
40              PR AX  0.0398   IZ 0.00000001
42              PR AX  0.0498   IZ 0.00000001
44              PR AX  0.0578   IZ 0.00000001
46              PR AX  0.0578   IZ 10000.
* MONTANTES SECUNDARIOS
29              PR AX  0.0068   IZ 0.00000001
31              PR AX  0.0068   IZ 0.00000001
33              PR AX  0.0068   IZ 0.00000001
35              PR AX  0.0096   IZ 0.00000001
37              PR AX  0.0112   IZ 0.00000001
39              PR AX  0.0128   IZ 0.00000001
41              PR AX  0.0168   IZ 0.00000001
43              PR AX  0.0192   IZ 0.00000001
45              PR AX  0.0298   IZ 0.00000001
* DIAGONALES 1
47              PR AX  0.0068   IZ 0.00001456
48              PR AX  0.0068   IZ 0.00001456
49              PR AX  0.0096   IZ 0.00003700
50              PR AX  0.0096   IZ 0.00003700
51              PR AX  0.0128   IZ 0.00007640
52              PR AX  0.0128   IZ 0.00007640
53              PR AX  0.0212   IZ 0.00025120
54              PR AX  0.0212   IZ 0.00025120
55              PR AX  0.0298   IZ 0.00025166
56              PR AX  0.0298   IZ 0.00025166
57              PR AX  0.0398   IZ 0.00037183
58              PR AX  0.0398   IZ 0.00037183
59              PR AX  0.0498   IZ 0.00050799
60              PR AX  0.0498   IZ 0.00050799
61              PR AX  0.0578   IZ 0.00061053
62              PR AX  0.0578   IZ 0.00061053
63              PR AX  0.0648   IZ 0.00071462
64              PR AX  0.0648   IZ 0.00071462
* DIAGONALES 2
65              PR AX  0.0068   IZ 0.00000001
66              PR AX  0.0068   IZ 0.00000001
67              PR AX  0.0068   IZ 0.00000001
68              PR AX  0.0056   IZ 0.00000001
69              PR AX  0.0056   IZ 0.00000001
70              PR AX  0.0150   IZ 0.00000001
71              PR AX  0.0150   IZ 0.00000001
72              PR AX  0.0193   IZ 0.00000001
73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* SECCION DE HORMIGON
74   TO   77     PR AX 13.4810   IZ 45.3025
78   TO   81     PR AX 13.4810   IZ 45.3025
82   TO   85     PR AX 13.4810   IZ 45.3025
86   TO   89     PR AX 13.4810   IZ 45.3025
90   TO   93     PR AX 13.4810   IZ 45.3025
94   TO   97     PR AX 13.4810   IZ 45.3025
98   TO   101    PR AX 13.4810   IZ 45.3025
102  TO   105    PR AX  3.3600   IZ  0.1577
106  TO   109    PR AX  3.3600   IZ  0.1577
*110  TO   113    PR AX  3.3600   IZ  0.1577
*114  TO   117    PR AX  3.3600   IZ  0.1577
MEMBER RELEASE
29 TO 46 65 TO 73          STA MZ
47 49 51 53 55 57 59 61 63 STA MZ
29 TO 46 65 TO 73          END MZ
48 50 52 54 56 58 60 62 64 END MZ
CONSTANT
E 21000.       MEMB 1  TO  73
E  3250.       MEMB 74 TO  109
POI   0.15     MEMB 1  TO  73
POI   0.2      MEMB 74 TO  109
DEN  10.15     MEMB 1  TO  73
DEN   2.5      MEMB 74 TO  109
SUPPORT
13 PINNED
54 FIXED BUT FX MZ
*58 FIXED BUT FX MZ
*63 FIXED BUT FX MZ
*64 FIXED BUT FX MZ
*65 FIXED BUT FX MZ
*66 FIXED BUT FX MZ
*67 FIXED BUT FX MZ
*68 FIXED BUT FX MZ
*69 FIXED BUT FX MZ
*70 FIXED BUT FX MZ
*71 FIXED BUT FX MZ
*72 FIXED BUT FX MZ
*73 FIXED BUT FX MZ
74 FIXED BUT FX MZ
*75 FIXED BUT FX MZ
*76 FIXED BUT FX MZ
*77 FIXED BUT FX MZ
*78 FIXED BUT FX MZ
*79 FIXED BUT FX MZ
*80 FIXED BUT FX MZ
*81 FIXED BUT FX MZ
*82 FIXED BUT FX MZ
LOAD 1 PESO PROPIO
SELFWEIGHT Y   -1.
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 = 74/ 109/ 3
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 218
SIZE OF STIFFNESS MATRIX = 4578 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.24 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8:37:41
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8:37:41
++ PROCESSING TRIANGULAR FACTORIZATION. 8:37:41
++ CALCULATING JOINT DISPLACEMENTS. 8:37:41
++ CALCULATING MEMBER FORCES. 8:37:42

339. LOAD LIS 1
340. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	116.28	0.00	0.00	0.00	-1522.41
		39	0.00	-42.58	0.00	0.00	0.00	1695.06
75	1	39	0.00	43.78	0.00	0.00	0.00	-1698.66
		40	0.00	29.96	0.00	0.00	0.00	1711.88
76	1	40	0.00	-30.51	0.00	0.00	0.00	-1713.26
		41	0.00	104.22	0.00	0.00	0.00	1566.41
77	1	41	0.00	-103.19	0.00	0.00	0.00	-1565.78
		42	0.00	176.93	0.00	0.00	0.00	1261.03
78	1	42	0.00	-178.37	0.00	0.00	0.00	-1260.48
		43	0.00	252.08	0.00	0.00	0.00	791.98
79	1	43	0.00	-252.39	0.00	0.00	0.00	-793.28
		44	0.00	326.13	0.00	0.00	0.00	161.85
80	1	44	0.00	-324.88	0.00	0.00	0.00	-163.32
		45	0.00	398.58	0.00	0.00	0.00	-628.62
81	1	45	0.00	-398.34	0.00	0.00	0.00	627.89
		46	0.00	472.08	0.00	0.00	0.00	-1580.73
82	1	46	0.00	-472.12	0.00	0.00	0.00	1581.37
		47	0.00	545.83	0.00	0.00	0.00	-2692.66
83	1	47	0.00	-545.35	0.00	0.00	0.00	2693.07
		48	0.00	619.09	0.00	0.00	0.00	-3967.95
84	1	48	0.00	-619.89	0.00	0.00	0.00	3968.33
		49	0.00	693.60	0.00	0.00	0.00	-5403.78
85	1	49	0.00	-692.97	0.00	0.00	0.00	5404.05
		50	0.00	766.71	0.00	0.00	0.00	-7001.12
86	1	50	0.00	-767.27	0.00	0.00	0.00	7001.00
		51	0.00	840.98	0.00	0.00	0.00	-8759.45
87	1	51	0.00	-840.79	0.00	0.00	0.00	8759.10
		52	0.00	914.53	0.00	0.00	0.00	-10679.33
88	1	52	0.00	-914.55	0.00	0.00	0.00	10679.30
		53	0.00	988.26	0.00	0.00	0.00	-12759.87
89	1	53	0.00	-988.09	0.00	0.00	0.00	12759.86
		54	0.00	1061.83	0.00	0.00	0.00	-15002.53

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	991.58	0.00	0.00	0.00	15002.58
		55	0.00	-917.87	0.00	0.00	0.00	-12914.54
91	1	55	0.00	917.89	0.00	0.00	0.00	12914.59
		56	0.00	-844.15	0.00	0.00	0.00	-10986.86
92	1	56	0.00	844.29	0.00	0.00	0.00	10987.02
		57	0.00	-770.58	0.00	0.00	0.00	-9221.12
93	1	57	0.00	770.48	0.00	0.00	0.00	9221.41
		58	0.00	-667.25	0.00	0.00	0.00	-7019.51
94	1	58	0.00	667.97	0.00	0.00	0.00	7019.49
		59	0.00	-623.75	0.00	0.00	0.00	-6173.09
95	1	59	0.00	622.88	0.00	0.00	0.00	6172.80
		60	0.00	-549.14	0.00	0.00	0.00	-4890.97
96	1	60	0.00	549.39	0.00	0.00	0.00	4890.55
		61	0.00	-475.68	0.00	0.00	0.00	-3770.03
97	1	61	0.00	475.72	0.00	0.00	0.00	3770.01
		62	0.00	-401.98	0.00	0.00	0.00	-2810.62
98	1	62	0.00	402.14	0.00	0.00	0.00	2810.75
		63	0.00	-347.38	0.00	0.00	0.00	-2200.94
99	1	63	0.00	347.22	0.00	0.00	0.00	2202.17
		64	0.00	-254.54	0.00	0.00	0.00	-1374.83
100	1	64	0.00	254.18	0.00	0.00	0.00	1374.71
		65	0.00	-180.48	0.00	0.00	0.00	-899.44
101	1	65	0.00	180.55	0.00	0.00	0.00	899.00
		66	0.00	-106.81	0.00	0.00	0.00	-584.91
102	1	66	0.00	106.91	0.00	0.00	0.00	584.65
		67	0.00	-88.54	0.00	0.00	0.00	-370.93
103	1	67	0.00	88.54	0.00	0.00	0.00	370.93
		68	0.00	-70.16	0.00	0.00	0.00	-197.31
104	1	68	0.00	70.16	0.00	0.00	0.00	197.32
		69	0.00	-51.79	0.00	0.00	0.00	-63.96
105	1	69	0.00	51.79	0.00	0.00	0.00	63.96
		70	0.00	-33.41	0.00	0.00	0.00	29.24
106	1	70	0.00	33.41	0.00	0.00	0.00	-29.24
		71	0.00	-15.04	0.00	0.00	0.00	82.22

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	15.04	0.00	0.00	0.00	-82.22
		72	0.00	3.34	0.00	0.00	0.00	95.01
108	1	72	0.00	-3.34	0.00	0.00	0.00	-95.01
		73	0.00	21.71	0.00	0.00	0.00	67.61
109	1	73	0.00	-21.71	0.00	0.00	0.00	-67.61
		74	0.00	40.09	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

341. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	60.15007**********		0.00000	0.00000	0.00000	2.84197
39	1	60.15008**********		0.00000	0.00000	0.00000	2.86607
40	1	60.15007**********		0.00000	0.00000	0.00000	2.89161
41	1	60.15007**********		0.00000	0.00000	0.00000	2.91617
42	1	60.15007**********		0.00000	0.00000	0.00000	2.93739
43	1	60.15008**********		0.00000	0.00000	0.00000	2.95283
44	1	60.15008**********		0.00000	0.00000	0.00000	2.96013
45	1	60.15008**********		0.00000	0.00000	0.00000	2.95687
46	1	60.15009**********		0.00000	0.00000	0.00000	2.94066
47	1	60.15009**********		0.00000	0.00000	0.00000	2.90912
48	1	60.15009**********		0.00000	0.00000	0.00000	2.85983
49	1	60.15009**********		0.00000	0.00000	0.00000	2.79042
50	1	60.15009**********		0.00000	0.00000	0.00000	2.69845
51	1	60.15009**********		0.00000	0.00000	0.00000	2.58159
52	1	60.15009-987.90808		0.00000	0.00000	0.00000	2.43736
53	1	60.15009-473.31073		0.00000	0.00000	0.00000	2.26347
54	1	60.15009 0.00000		0.00000	0.00000	0.00000	2.05739
55	1	60.15009 426.73322		0.00000	0.00000	0.00000	1.85025
56	1	60.15009 811.63727		0.00000	0.00000	0.00000	1.67285
57	1	60.150091160.62036		0.00000	0.00000	0.00000	1.52296
58	1	60.150091600.14685		0.00000	0.00000	0.00000	1.35458
59	1	60.150081773.93018		0.00000	0.00000	0.00000	1.29584
60	1	60.150092048.14111		0.00000	0.00000	0.00000	1.21383
61	1	60.150092306.28979		0.00000	0.00000	0.00000	1.14971
62	1	60.150092552.25806		0.00000	0.00000	0.00000	1.10101
63	1	60.150092728.84058		0.00000	0.00000	0.00000	1.07343
64	1	60.150093019.14209		0.00000	0.00000	0.00000	1.04043
65	1	60.150093244.72925		0.00000	0.00000	0.00000	1.02374
66	1	60.150093467.45337		0.00000	0.00000	0.00000	1.01291
67	1	60.150093450.98022		0.00000	0.00000	0.00000	-1.01157
68	1	60.150093085.00415		0.00000	0.00000	0.00000	-2.21020
69	1	60.150092531.87085		0.00000	0.00000	0.00000	-2.75336
70	1	60.150091915.63721		0.00000	0.00000	0.00000	-2.81318
71	1	60.150091323.84131		0.00000	0.00000	0.00000	-2.56110
72	1	60.15009 805.42694		0.00000	0.00000	0.00000	-2.16851
73	1	60.15009 372.80969		0.00000	0.00000	0.00000	-1.80725
74	1	60.15009 0.00000		0.00000	0.00000	0.00000	-1.64863

********** END OF LATEST ANALYSIS RESULT **********

342. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
13	1	0.00	214.75	0.00	0.00	0.00	0.00
54	1	0.00	2053.41	0.00	0.00	0.00	0.00
74	1	0.00	40.09	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

343. PLOT DISPLACEMENT FILE
344. PLOT BENDING FILE
345. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 8:37:45 ****

****
* 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 *
****

Posicion 38-Q

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  9, 1997        *
*          Time=    9:17:20             *
*                                       *
*****************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.250	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	76.625	0.000	0.000
59.	* 54	77.000	0.000	0.000
60.	55	79.187	0.000	0.000
61.	56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	86.625	0.000	0.000
64.	* 58	85.750	0.000	0.000
65.	59	87.937	0.000	0.000
66.	60	90.125	0.000	0.000
67.	61	92.312	0.000	0.000
68.	62	94.500	0.000	0.000
69.	63	96.125	0.000	0.000
70.	* 63	96.687	0.000	0.000
71.	64	98.875	0.000	0.000
72.	65	101.062	0.000	0.000
73.	66	103.250	0.000	0.000
74.	67	105.437	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	* 75	122.937	0.000	0.000
83.	* 76	125.125	0.000	0.000
84.	* 77	127.312	0.000	0.000
85.	* 78	129.000	0.000	0.000
86.	* 79	131.687	0.000	0.000
87.	* 80	133.875	0.000	0.000
88.	* 81	136.062	0.000	0.000
89.	* 82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	78	42	43
169.	79	43	44
170.	80	44	45
171.	81	45	46
172.	82	46	47
173.	83	47	48
174.	84	48	49
175.	85	49	50
176.	86	50	51
177.	87	51	52
178.	88	52	53
179.	89	53	54
180.	90	54	55
181.	91	55	56
182.	92	56	57
183.	93	57	58
184.	94	58	59
185.	95	59	60
186.	96	60	61
187.	97	61	62
188.	98	62	63
189.	99	63	64
190.	100	64	65
191.	101	65	66
192.	102	66	67
193.	103	67	68
194.	104	68	69
195.	105	69	70
196.	106	70	71
197.	107	71	72
198.	108	72	73
199.	109	73	74
200. *	110	74	75
201. *	111	75	76
202. *	112	76	77
203. *	113	77	78
204. *	114	78	79
205. *	115	79	80
206. *	116	80	81
207. *	117	81	82

208. MEMBER PROPERTY

209. * CORDON INFERIOR

210.	1	PR	AX	0.0500	IZ 0.00151406
211.	2	PR	AX	0.0500	IZ 0.00151406
212.	3	PR	AX	0.0532	IZ 0.00156748
213.	4	PR	AX	0.0532	IZ 0.00156748
214.	5	PR	AX	0.0670	IZ 0.00233098
215.	6	PR	AX	0.0670	IZ 0.00233098
216.	7	PR	AX	0.0750	IZ 0.00271328
217.	8	PR	AX	0.0750	IZ 0.00271328
218.	9	PR	AX	0.0900	IZ 0.00380584
219.	10	PR	AX	0.0900	IZ 0.00380584
220.	11	PR	AX	0.1070	IZ 0.00464364
221.	12	PR	AX	0.1070	IZ 0.00464364
222.	13	PR	AX	0.1180	IZ 0.00593306
223.	14	PR	AX	0.1180	IZ 0.00593306
224.	15	PR	AX	0.1410	IZ 0.00804164
225.	16	PR	AX	0.1410	IZ 0.00804164
226.	17	PR	AX	0.1520	IZ 0.00926892
227.	18	PR	AX	0.1520	IZ 0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* CORDON SUPERIOR
19              PR AX  0.0280   IZ 0.00046454
20              PR AX  0.0280   IZ 0.00046454
21              PR AX  0.0280   IZ 0.00046454
22              PR AX  0.0320   IZ 0.00072626
23              PR AX  0.0320   IZ 0.00072626
24              PR AX  0.0450   IZ 0.00164273
25              PR AX  0.0600   IZ 0.00261476
26              PR AX  0.0720   IZ 0.00316788
27              PR AX  0.0840   IZ 0.00380920
* MONTANTES PRINCIPALES
28              PR AX  0.0068   IZ 0.00000001
30              PR AX  0.0082   IZ 0.00000001
32              PR AX  0.0148   IZ 0.00000001
34              PR AX  0.0212   IZ 0.00000001
36              PR AX  0.0298   IZ 0.00000001
38              PR AX  0.0298   IZ 0.00000001
40              PR AX  0.0398   IZ 0.00000001
42              PR AX  0.0498   IZ 0.00000001
44              PR AX  0.0578   IZ 0.00000001
46              PR AX  0.0578   IZ 10000.
* MONTANTES SECUNDARIOS
29              PR AX  0.0068   IZ 0.00000001
31              PR AX  0.0068   IZ 0.00000001
33              PR AX  0.0068   IZ 0.00000001
35              PR AX  0.0096   IZ 0.00000001
37              PR AX  0.0112   IZ 0.00000001
39              PR AX  0.0128   IZ 0.00000001
41              PR AX  0.0168   IZ 0.00000001
43              PR AX  0.0192   IZ 0.00000001
45              PR AX  0.0298   IZ 0.00000001
* DIAGONALES 1
47              PR AX  0.0068   IZ 0.00001456
48              PR AX  0.0068   IZ 0.00001456
49              PR AX  0.0096   IZ 0.00003700
50              PR AX  0.0096   IZ 0.00003700
51              PR AX  0.0128   IZ 0.00007640
52              PR AX  0.0128   IZ 0.00007640
53              PR AX  0.0212   IZ 0.00025120
54              PR AX  0.0212   IZ 0.00025120
55              PR AX  0.0298   IZ 0.00025166
56              PR AX  0.0298   IZ 0.00025166
57              PR AX  0.0398   IZ 0.00037183
58              PR AX  0.0398   IZ 0.00037183
59              PR AX  0.0498   IZ 0.00050799
60              PR AX  0.0498   IZ 0.00050799
61              PR AX  0.0578   IZ 0.00061053
62              PR AX  0.0578   IZ 0.00061053
63              PR AX  0.0648   IZ 0.00071462
64              PR AX  0.0648   IZ 0.00071462
* DIAGONALES 2
65              PR AX  0.0068   IZ 0.00000001
66              PR AX  0.0068   IZ 0.00000001
67              PR AX  0.0068   IZ 0.00000001
68              PR AX  0.0056   IZ 0.00000001
69              PR AX  0.0056   IZ 0.00000001
70              PR AX  0.0150   IZ 0.00000001
71              PR AX  0.0150   IZ 0.00000001
72              PR AX  0.0193   IZ 0.00000001
73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* SECCION DE HORMIGON
74   TO   77     PR AX 13.4810   IZ 45.3025
78   TO   81     PR AX 13.4810   IZ 45.3025
82   TO   85     PR AX 13.4810   IZ 45.3025
86   TO   89     PR AX 13.4810   IZ 45.3025
90   TO   93     PR AX 13.4810   IZ 45.3025
94   TO   97     PR AX 13.4810   IZ 45.3025
98   TO   101    PR AX 13.4810   IZ 45.3025
102  TO   105    PR AX 13.4810   IZ 45.3025
106  TO   109    PR AX  3.3600   IZ  0.1577
*110  TO   113    PR AX  3.3600   IZ  0.1577
*114  TO   117    PR AX  3.3600   IZ  0.1577
MEMBER RELEASE
29 TO 46 65 TO 73          STA MZ
47 49 51 53 55 57 59 61 63 STA MZ
29 TO 46 65 TO 73          END MZ
48 50 52 54 56 58 60 62 64 END MZ
CONSTANT
E 21000.      MEMB 1  TO  73
E  3250.      MEMB 74 TO  109
POI   0.15    MEMB 1  TO  73
POI   0.2     MEMB 74 TO  109
DEN  10.15    MEMB 1  TO  73
DEN   2.5     MEMB 74 TO  109
SUPPORT
13 PINNED
54 FIXED BUT FX MZ
*58 FIXED BUT FX MZ
*63 FIXED BUT FX MZ
*64 FIXED BUT FX MZ
*65 FIXED BUT FX MZ
*66 FIXED BUT FX MZ
*67 FIXED BUT FX MZ
*68 FIXED BUT FX MZ
*69 FIXED BUT FX MZ
70 FIXED BUT FX MZ
71 FIXED BUT FX MZ
*72 FIXED BUT FX MZ
73 FIXED BUT FX MZ
74 FIXED BUT FX MZ
*75 FIXED BUT FX MZ
*76 FIXED BUT FX MZ
*77 FIXED BUT FX MZ
*78 FIXED BUT FX MZ
*79 FIXED BUT FX MZ
*80 FIXED BUT FX MZ
*81 FIXED BUT FX MZ
*82 FIXED BUT FX MZ
LOAD 1 PESO PROPIO
SELFWEIGHT Y   -1.
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 = 74/ 109/ 6
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 215
SIZE OF STIFFNESS MATRIX = 4515 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.24 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 9:17:24
++ PROCESSING GLOBAL STIFFNESS MATRIX. 9:17:24
++ PROCESSING TRIANGULAR FACTORIZATION. 9:17:25
++ CALCULATING JOINT DISPLACEMENTS. 9:17:25
++ CALCULATING MEMBER FORCES. 9:17:25

339. LOAD LIS 1
340. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	76.76	0.00	0.00	0.00	-974.63
		39	0.00	-3.06	0.00	0.00	0.00	1061.09
75	1	39	0.00	5.52	0.00	0.00	0.00	-1061.76
		40	0.00	68.22	0.00	0.00	0.00	994.54
76	1	40	0.00	-69.23	0.00	0.00	0.00	-993.69
		41	0.00	142.94	0.00	0.00	0.00	760.89
77	1	41	0.00	142.35	0.00	0.00	0.00	-761.43
		42	0.00	216.09	0.00	0.00	0.00	369.43
78	1	42	0.00	-216.92	0.00	0.00	0.00	-369.59
		43	0.00	290.63	0.00	0.00	0.00	-184.89
79	1	43	0.00	-289.86	0.00	0.00	0.00	184.50
		44	0.00	363.60	0.00	0.00	0.00	-900.42
80	1	44	0.00	-364.08	0.00	0.00	0.00	900.74
		45	0.00	437.78	0.00	0.00	0.00	-1776.27
81	1	45	0.00	-437.63	0.00	0.00	0.00	1776.52
		46	0.00	511.37	0.00	0.00	0.00	-2814.59
82	1	46	0.00	-511.10	0.00	0.00	0.00	2814.58
		47	0.00	584.81	0.00	0.00	0.00	-4013.56
83	1	47	0.00	-584.65	0.00	0.00	0.00	4013.30
		48	0.00	658.39	0.00	0.00	0.00	-5373.75
84	1	48	0.00	-658.76	0.00	0.00	0.00	5374.17
		49	0.00	732.46	0.00	0.00	0.00	-6894.94
85	1	49	0.00	-732.09	0.00	0.00	0.00	6895.56
		50	0.00	805.83	0.00	0.00	0.00	-8578.27
86	1	50	0.00	-806.11	0.00	0.00	0.00	8578.39
		51	0.00	879.82	0.00	0.00	0.00	-10422.34
87	1	51	0.00	-879.92	0.00	0.00	0.00	10422.10
		52	0.00	941.02	0.00	0.00	0.00	-12073.03
88	1	52	0.00	-941.02	0.00	0.00	0.00	12072.82
		53	0.00	1027.37	0.00	0.00	0.00	-14594.21
89	1	53	0.00	-1027.38	0.00	0.00	0.00	14594.19
		54	0.00	1088.48	0.00	0.00	0.00	-16512.24

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	1067.84	0.00	0.00	0.00	16512.18
		55	0.00	-981.50	0.00	0.00	0.00	-13886.99
91	1	55	0.00	981.45	0.00	0.00	0.00	13886.97
		56	0.00	-907.71	0.00	0.00	0.00	-11820.17
92	1	56	0.00	907.78	0.00	0.00	0.00	11820.21
		57	0.00	-834.07	0.00	0.00	0.00	-9915.42
93	1	57	0.00	834.06	0.00	0.00	0.00	9915.50
		58	0.00	-730.83	0.00	0.00	0.00	-7518.88
94	1	58	0.00	730.78	0.00	0.00	0.00	7518.90
		59	0.00	-686.57	0.00	0.00	0.00	-6589.07
95	1	59	0.00	686.63	0.00	0.00	0.00	6589.03
		60	0.00	-612.89	0.00	0.00	0.00	-5167.44
96	1	60	0.00	612.86	0.00	0.00	0.00	5167.38
		61	0.00	-539.15	0.00	0.00	0.00	-3907.75
97	1	61	0.00	539.14	0.00	0.00	0.00	3907.77
		62	0.00	-465.40	0.00	0.00	0.00	-2808.72
98	1	62	0.00	465.33	0.00	0.00	0.00	2808.72
		63	0.00	-410.56	0.00	0.00	0.00	-2096.99
99	1	63	0.00	410.64	0.00	0.00	0.00	2097.00
		64	0.00	-317.96	0.00	0.00	0.00	-1095.08
100	1	64	0.00	317.93	0.00	0.00	0.00	1095.12
		65	0.00	-244.23	0.00	0.00	0.00	-480.33
101	1	65	0.00	244.27	0.00	0.00	0.00	480.38
		66	0.00	-170.52	0.00	0.00	0.00	-26.59
102	1	66	0.00	170.51	0.00	0.00	0.00	26.59
		67	0.00	-96.80	0.00	0.00	0.00	265.72
103	1	67	0.00	96.82	0.00	0.00	0.00	-265.72
		68	0.00	-23.08	0.00	0.00	0.00	396.86
104	1	68	0.00	23.07	0.00	0.00	0.00	-396.85
		69	0.00	50.64	0.00	0.00	0.00	366.70
105	1	69	0.00	-50.64	0.00	0.00	0.00	-366.70
		70	0.00	124.39	0.00	0.00	0.00	175.21
106	1	70	0.00	-91.12	0.00	0.00	0.00	-175.22
		71	0.00	109.49	0.00	0.00	0.00	-44.15

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	28.39	0.00	0.00	0.00	44.15
		72	0.00	-10.01	0.00	0.00	0.00	-2.15
108	1	72	0.00	10.01	0.00	0.00	0.00	2.15
		73	0.00	8.36	0.00	0.00	0.00	-0.36
109	1	73	0.00	9.35	0.00	0.00	0.00	0.36
		74	0.00	9.03	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

341. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	26.83812**********		0.00000	0.00000	0.00000	1.92863
39	1	26.83812**********		0.00000	0.00000	0.00000	1.94394
40	1	26.83812**********		0.00000	0.00000	0.00000	1.95942
41	1	26.83812**********		0.00000	0.00000	0.00000	1.97266
42	1	26.83812**********		0.00000	0.00000	0.00000	1.98126
43	1	26.83812**********		0.00000	0.00000	0.00000	1.98283
44	1	26.83812**********		0.00000	0.00000	0.00000	1.97496
45	1	26.83812**********		0.00000	0.00000	0.00000	1.95528
46	1	26.83812**********		0.00000	0.00000	0.00000	1.92137
47	1	26.83812**********		0.00000	0.00000	0.00000	1.87086
48	1	26.83812**********		0.00000	0.00000	0.00000	1.80131
49	1	26.83812**********		0.00000	0.00000	0.00000	1.71038
50	1	26.83811**********		0.00000	0.00000	0.00000	1.59561
51	1	26.83812	-739.63501	0.00000	0.00000	0.00000	1.45469
52	1	26.83812	-488.13748	0.00000	0.00000	0.00000	1.31630
53	1	26.83812	-179.64529	0.00000	0.00000	0.00000	1.08461
54	1	26.83812	0.00000	0.00000	0.00000	0.00000	0.89320
55	1	26.83812	194.02303	0.00000	0.00000	0.00000	0.62904
56	1	26.83812	310.22067	0.00000	0.00000	0.00000	0.43822
57	1	26.83812	387.91309	0.00000	0.00000	0.00000	0.27699
58	1	26.83812	443.79272	0.00000	0.00000	0.00000	0.09619
59	1	26.83812	452.20126	0.00000	0.00000	0.00000	0.03337
60	1	26.83812	449.58322	0.00000	0.00000	0.00000	-0.05378
61	1	26.83812	430.13141	0.00000	0.00000	0.00000	-0.12098
62	1	26.83812	397.92432	0.00000	0.00000	0.00000	-0.17069
63	1	26.83812	367.88770	0.00000	0.00000	0.00000	-0.19768
64	1	26.83812	309.05212	0.00000	0.00000	0.00000	-0.22710
65	1	26.83812	257.96246	0.00000	0.00000	0.00000	-0.23860
66	1	26.83812	205.24438	0.00000	0.00000	0.00000	-0.24216
67	1	26.83812	152.42041	0.00000	0.00000	0.00000	-0.24019
68	1	26.83812	100.39194	0.00000	0.00000	0.00000	-0.23507
69	1	26.83812	49.63347	0.00000	0.00000	0.00000	-0.22919
70	1	26.83811	0.00000	0.00000	0.00000	0.00000	-0.22497
71	1	26.83811	0.00000	0.00000	0.00000	0.00000	0.06895
72	1	26.83811	2.56991	0.00000	0.00000	0.00000	-0.01558
73	1	26.83811	0.00000	0.00000	0.00000	0.00000	-0.00665
74	1	26.83812	0.00000	0.00000	0.00000	0.00000	0.00690

********** END OF LATEST ANALYSIS RESULT **********

342. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
13	1	0.00	175.56	0.00	0.00	0.00	0.00
54	1	0.00	2156.32	0.00	0.00	0.00	0.00
70	1	0.00	33.26	0.00	0.00	0.00	0.00
71	1	0.00	137.88	0.00	0.00	0.00	0.00
73	1	0.00	17.72	0.00	0.00	0.00	0.00
74	1	0.00	9.03	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

343. PLOT DISPLACEMENT FILE
344. PLOT BENDING FILE
345. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 9:17:29 ****

****
* 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 *
****

Posición 40

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*****************************************************
*                                                   *
*          S T A A D - III                          *
*          Revision 17.0a                           *
*          Proprietary Program of                   *
*          RESEARCH ENGINEERS, Inc.                 *
*          Date=     JUL  9, 1997                   *
*          Time=      8:24:10                       *
*                                                   *
*****************************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.000	0.000	0.000
61.	* 56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	85.750	0.000	0.000
64.	59	87.937	0.000	0.000
65.	60	91.000	0.000	0.000
66.	* 60	90.125	0.000	0.000
67.	61	92.312	0.000	0.000
68.	62	94.500	0.000	0.000
69.	63	96.687	0.000	0.000
70.	64	98.875	0.000	0.000
71.	65	100.500	0.000	0.000
72.	* 65	101.062	0.000	0.000
73.	66	103.250	0.000	0.000
74.	67	105.437	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	* 75	122.937	0.000	0.000
83.	* 76	125.125	0.000	0.000
84.	* 77	127.312	0.000	0.000
85.	* 78	129.000	0.000	0.000
86.	* 79	131.687	0.000	0.000
87.	* 80	133.875	0.000	0.000
88.	* 81	136.062	0.000	0.000
89.	* 82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	78	42	43
169.	79	43	44
170.	80	44	45
171.	81	45	46
172.	82	46	47
173.	83	47	48
174.	84	48	49
175.	85	49	50
176.	86	50	51
177.	87	51	52
178.	88	52	53
179.	89	53	54
180.	90	54	55
181.	91	55	56
182.	92	56	57
183.	93	57	58
184.	94	58	59
185.	95	59	60
186.	96	60	61
187.	97	61	62
188.	98	62	63
189.	99	63	64
190.	100	64	65
191.	101	65	66
192.	102	66	67
193.	103	67	68
194.	104	68	69
195.	105	69	70
196.	106	70	71
197.	107	71	72
198.	108	72	73
199.	109	73	74
200. *	110	74	75
201. *	111	75	76
202. *	112	76	77
203. *	113	77	78
204. *	114	78	79
205. *	115	79	80
206. *	116	80	81
207. *	117	81	82

208. MEMBER PROPERTY

209. * CORDON INFERIOR

210.	1	PR	AX	0.0500	IZ 0.00151406
211.	2	PR	AX	0.0500	IZ 0.00151406
212.	3	PR	AX	0.0532	IZ 0.00156748
213.	4	PR	AX	0.0532	IZ 0.00156748
214.	5	PR	AX	0.0670	IZ 0.00233098
215.	6	PR	AX	0.0670	IZ 0.00233098
216.	7	PR	AX	0.0750	IZ 0.00271328
217.	8	PR	AX	0.0750	IZ 0.00271328
218.	9	PR	AX	0.0900	IZ 0.00380584
219.	10	PR	AX	0.0900	IZ 0.00380584
220.	11	PR	AX	0.1070	IZ 0.00464364
221.	12	PR	AX	0.1070	IZ 0.00464364
222.	13	PR	AX	0.1180	IZ 0.00593306
223.	14	PR	AX	0.1180	IZ 0.00593306
224.	15	PR	AX	0.1410	IZ 0.00804164
225.	16	PR	AX	0.1410	IZ 0.00804164
226.	17	PR	AX	0.1520	IZ 0.00926892
227.	18	PR	AX	0.1520	IZ 0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* CORDON SUPERIOR
19              PR AX  0.0280   IZ 0.00046454
20              PR AX  0.0280   IZ 0.00046454
21              PR AX  0.0280   IZ 0.00046454
22              PR AX  0.0320   IZ 0.00072626
23              PR AX  0.0320   IZ 0.00072626
24              PR AX  0.0450   IZ 0.00164273
25              PR AX  0.0600   IZ 0.00261476
26              PR AX  0.0720   IZ 0.00316788
27              PR AX  0.0840   IZ 0.00380920
* MONTANTES PRINCIPALES
28              PR AX  0.0068   IZ 0.00000001
30              PR AX  0.0082   IZ 0.00000001
32              PR AX  0.0148   IZ 0.00000001
34              PR AX  0.0212   IZ 0.00000001
36              PR AX  0.0298   IZ 0.00000001
38              PR AX  0.0298   IZ 0.00000001
40              PR AX  0.0398   IZ 0.00000001
42              PR AX  0.0498   IZ 0.00000001
44              PR AX  0.0578   IZ 0.00000001
46              PR AX  0.0578   IZ 10000.
* MONTANTES SECUNDARIOS
29              PR AX  0.0068   IZ 0.00000001
31              PR AX  0.0068   IZ 0.00000001
33              PR AX  0.0068   IZ 0.00000001
35              PR AX  0.0096   IZ 0.00000001
37              PR AX  0.0112   IZ 0.00000001
39              PR AX  0.0128   IZ 0.00000001
41              PR AX  0.0168   IZ 0.00000001
43              PR AX  0.0192   IZ 0.00000001
45              PR AX  0.0298   IZ 0.00000001
* DIAGONALES 1
47              PR AX  0.0068   IZ 0.00001456
48              PR AX  0.0068   IZ 0.00001456
49              PR AX  0.0096   IZ 0.00003700
50              PR AX  0.0096   IZ 0.00003700
51              PR AX  0.0128   IZ 0.00007640
52              PR AX  0.0128   IZ 0.00007640
53              PR AX  0.0212   IZ 0.00025120
54              PR AX  0.0212   IZ 0.00025120
55              PR AX  0.0298   IZ 0.00025166
56              PR AX  0.0298   IZ 0.00025166
57              PR AX  0.0398   IZ 0.00037183
58              PR AX  0.0398   IZ 0.00037183
59              PR AX  0.0498   IZ 0.00050799
60              PR AX  0.0498   IZ 0.00050799
61              PR AX  0.0578   IZ 0.00061053
62              PR AX  0.0578   IZ 0.00061053
63              PR AX  0.0648   IZ 0.00071462
64              PR AX  0.0648   IZ 0.00071462
* DIAGONALES 2
65              PR AX  0.0068   IZ 0.00000001
66              PR AX  0.0068   IZ 0.00000001
67              PR AX  0.0068   IZ 0.00000001
68              PR AX  0.0056   IZ 0.00000001
69              PR AX  0.0056   IZ 0.00000001
70              PR AX  0.0150   IZ 0.00000001
71              PR AX  0.0150   IZ 0.00000001
72              PR AX  0.0193   IZ 0.00000001
73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
* SECCION DE HORMIGON
74   TO   77     PR AX 13.4810   IZ 45.3025
78   TO   81     PR AX 13.4810   IZ 45.3025
82   TO   85     PR AX 13.4810   IZ 45.3025
86   TO   89     PR AX 13.4810   IZ 45.3025
90   TO   93     PR AX 13.4810   IZ 45.3025
94   TO   97     PR AX 13.4810   IZ 45.3025
98   TO   101    PR AX 13.4810   IZ 45.3025
102  TO   105    PR AX  3.3600   IZ  0.1577
106  TO   109    PR AX  3.3600   IZ  0.1577
*110  TO   113    PR AX  3.3600   IZ  0.1577
*114  TO   117    PR AX  3.3600   IZ  0.1577
MEMBER RELEASE
29 TO 46 65 TO 73           STA MZ
47 49 51 53 55 57 59 61 63 STA MZ
29 TO 46 65 TO 73           END MZ
48 50 52 54 56 58 60 62 64 END MZ
CONSTANT
E 21000.       MEMB 1  TO  73
E  3250.       MEMB 74 TO  109
POI   0.15     MEMB 1  TO  73
POI   0.2      MEMB 74 TO  109
DEN  10.15     MEMB 1  TO  73
DEN   2.5      MEMB 74 TO  109
SUPPORT
15 PINNED
56 FIXED BUT FX MZ
*60 FIXED BUT FX MZ
*65 FIXED BUT FX MZ
*66 FIXED BUT FX MZ
*67 FIXED BUT FX MZ
*68 FIXED BUT FX MZ
*69 FIXED BUT FX MZ
*70 FIXED BUT FX MZ
*71 FIXED BUT FX MZ
*72 FIXED BUT FX MZ
*73 FIXED BUT FX MZ
74 FIXED BUT FX MZ
*75 FIXED BUT FX MZ
*76 FIXED BUT FX MZ
*77 FIXED BUT FX MZ
*78 FIXED BUT FX MZ
*79 FIXED BUT FX MZ
*80 FIXED BUT FX MZ
*81 FIXED BUT FX MZ
*82 FIXED BUT FX MZ
LOAD 1 PESO PROPIO
SELFWEIGHT Y   -1.
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 = 74/ 109/ 3
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 218
SIZE OF STIFFNESS MATRIX = 4578 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.24 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8:24:15
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8:24:15
++ PROCESSING TRIANGULAR FACTORIZATION. 8:24:16
++ CALCULATING JOINT DISPLACEMENTS. 8:24:16
++ CALCULATING MEMBER FORCES. 8:24:16

337. LOAD LIS 1
338. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	304.05	0.00	0.00	0.00	-2256.68
		39	0.00	-230.34	0.00	0.00	0.00	2841.71
75	1	39	0.00	230.73	0.00	0.00	0.00	-2842.38
		40	0.00	-156.99	0.00	0.00	0.00	3265.68
76	1	40	0.00	157.25	0.00	0.00	0.00	-3264.97
		41	0.00	-83.54	0.00	0.00	0.00	3527.70
77	1	41	0.00	82.66	0.00	0.00	0.00	-3528.02
		42	0.00	-8.92	0.00	0.00	0.00	3628.18
78	1	42	0.00	10.17	0.00	0.00	0.00	-3628.35
		43	0.00	63.53	0.00	0.00	0.00	3567.69
79	1	43	0.00	-64.52	0.00	0.00	0.00	-3566.84
		44	0.00	138.26	0.00	0.00	0.00	3345.69
80	1	44	0.00	-137.61	0.00	0.00	0.00	-3345.26
		45	0.00	211.31	0.00	0.00	0.00	2962.72
81	1	45	0.00	-211.17	0.00	0.00	0.00	-2961.64
		46	0.00	284.91	0.00	0.00	0.00	2418.20
82	1	46	0.00	-285.30	0.00	0.00	0.00	-2417.64
		47	0.00	359.01	0.00	0.00	0.00	1712.19
83	1	47	0.00	-360.54	0.00	0.00	0.00	-1712.21
		48	0.00	434.28	0.00	0.00	0.00	845.40
84	1	48	0.00	-432.29	0.00	0.00	0.00	-845.15
		49	0.00	506.00	0.00	0.00	0.00	-182.14
85	1	49	0.00	-507.02	0.00	0.00	0.00	182.41
		50	0.00	580.76	0.00	0.00	0.00	-1372.28
86	1	50	0.00	-580.48	0.00	0.00	0.00	1372.15
		51	0.00	654.19	0.00	0.00	0.00	-2723.17
87	1	51	0.00	-654.40	0.00	0.00	0.00	2722.76
		52	0.00	728.14	0.00	0.00	0.00	-4235.30
88	1	52	0.00	-728.44	0.00	0.00	0.00	4234.96
		53	0.00	802.15	0.00	0.00	0.00	-5908.69
89	1	53	0.00	-801.85	0.00	0.00	0.00	5908.35
		54	0.00	875.59	0.00	0.00	0.00	-7742.89

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-875.48	0.00	0.00	0.00	7743.08
		55	0.00	949.19	0.00	0.00	0.00	-9738.54
91	1	55	0.00	-949.22	0.00	0.00	0.00	9738.53
		56	0.00	1010.32	0.00	0.00	0.00	-11514.82
92	1	56	0.00	862.08	0.00	0.00	0.00	11514.86
		57	0.00	-775.74	0.00	0.00	0.00	-9416.80
93	1	57	0.00	775.59	0.00	0.00	0.00	9416.90
		58	0.00	-701.85	0.00	0.00	0.00	-7800.40
94	1	58	0.00	702.13	0.00	0.00	0.00	7800.43
		59	0.00	-628.42	0.00	0.00	0.00	-6345.67
95	1	59	0.00	628.21	0.00	0.00	0.00	6345.67
		60	0.00	-524.98	0.00	0.00	0.00	-4579.57
96	1	60	0.00	523.60	0.00	0.00	0.00	4578.91
		61	0.00	-479.38	0.00	0.00	0.00	-3920.43
97	1	61	0.00	480.85	0.00	0.00	0.00	3919.59
		62	0.00	-407.11	0.00	0.00	0.00	-2948.47
98	1	62	0.00	407.30	0.00	0.00	0.00	2948.60
		63	0.00	-333.59	0.00	0.00	0.00	-2138.49
99	1	63	0.00	333.67	0.00	0.00	0.00	2138.70
		64	0.00	-259.93	0.00	0.00	0.00	-1489.74
100	1	64	0.00	260.61	0.00	0.00	0.00	1489.70
		65	0.00	-205.84	0.00	0.00	0.00	-1112.35
101	1	65	0.00	204.90	0.00	0.00	0.00	1112.39
		66	0.00	-112.22	0.00	0.00	0.00	-676.90
102	1	66	0.00	112.17	0.00	0.00	0.00	676.69
		67	0.00	-93.80	0.00	0.00	0.00	-451.47
103	1	67	0.00	93.80	0.00	0.00	0.00	451.47
		68	0.00	-75.42	0.00	0.00	0.00	-266.35
104	1	68	0.00	75.42	0.00	0.00	0.00	266.35
		69	0.00	-57.05	0.00	0.00	0.00	-121.49
105	1	69	0.00	57.05	0.00	0.00	0.00	121.49
		70	0.00	-38.67	0.00	0.00	0.00	-16.78
106	1	70	0.00	38.67	0.00	0.00	0.00	16.78
		71	0.00	-20.30	0.00	0.00	0.00	47.70

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	20.30	0.00	0.00	0.00	-47.70
		72	0.00	-1.92	0.00	0.00	0.00	72.00
108	1	72	0.00	1.92	0.00	0.00	0.00	-72.00
		73	0.00	16.45	0.00	0.00	0.00	56.11
109	1	73	0.00	-16.45	0.00	0.00	0.00	-56.11
		74	0.00	34.83	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

339. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.46245
39	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.50052
40	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.54610
41	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.59675
42	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.65011
43	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.70375
44	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.75532
45	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.80236
46	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.84254
47	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.87342
48	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.89262
49	1	60.58856**********	0.00000	0.00000	0.00000	0.00000	2.89774
50	1	60.58856**********	0.00000	0.00000	0.00000	0.00000	2.88639
51	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.85617
52	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.80467
53	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.72953
54	1	60.58857**********	0.00000	0.00000	0.00000	0.00000	2.62830
55	1	60.58857-441.48630	0.00000	0.00000	0.00000	0.00000	2.49866
56	1	60.58856 0.00000	0.00000	0.00000	0.00000	0.00000	2.36792
57	1	60.58856 582.59186	0.00000	0.00000	0.00000	0.00000	2.18613
58	1	60.588561046.50415	0.00000	0.00000	0.00000	0.00000	2.05840
59	1	60.588561484.81323	0.00000	0.00000	0.00000	0.00000	1.95353
60	1	60.588562064.92236	0.00000	0.00000	0.00000	0.00000	1.84044
61	1	60.588562303.84131	0.00000	0.00000	0.00000	0.00000	1.80261
62	1	60.588562692.42847	0.00000	0.00000	0.00000	0.00000	1.75178
63	1	60.588563071.21289	0.00000	0.00000	0.00000	0.00000	1.71420
64	1	60.588573443.17651	0.00000	0.00000	0.00000	0.00000	1.68744
65	1	60.588573716.16699	0.00000	0.00000	0.00000	0.00000	1.67316
66	1	60.588574173.85498	0.00000	0.00000	0.00000	0.00000	1.65684
67	1	60.588574257.05029	0.00000	0.00000	0.00000	0.00000	-0.73585
68	1	60.588563915.57788	0.00000	0.00000	0.00000	0.00000	-2.25375
69	1	60.588573322.49878	0.00000	0.00000	0.00000	0.00000	-3.06694
70	1	60.588572612.57813	0.00000	0.00000	0.00000	0.00000	-3.34779
71	1	60.588571884.17920	0.00000	0.00000	0.00000	0.00000	-3.26755
72	1	60.588571196.86499	0.00000	0.00000	0.00000	0.00000	-2.99775
73	1	60.58857 573.94495	0.00000	0.00000	0.00000	0.00000	-2.71015
74	1	60.58857 0.00000	0.00000	0.00000	0.00000	0.00000	-2.57608

********** END OF LATEST ANALYSIS RESULT **********

340. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
15	1	0.01	401.11	0.00	0.00	0.00	0.00
56	1	0.00	1872.40	0.00	0.00	0.00	0.00
74	1	0.00	34.83	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

341. PLOT DISPLACEMENT FILE
342. PLOT BENDING FILE
343. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 8:24:19 ****

****
* 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 *
****

PONCIONADO 2

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  9, 1997        *
*          Time=     9: 5: 3             *
*                                       *
*****************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.250	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.000	0.000	0.000
61.	* 56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	85.750	0.000	0.000
64.	59	87.937	0.000	0.000
65.	60	91.000	0.000	0.000
66.	* 60	90.125	0.000	0.000
67.	61	92.312	0.000	0.000
68.	62	94.500	0.000	0.000
69.	63	96.687	0.000	0.000
70.	64	98.875	0.000	0.000
71.	65	100.500	0.000	0.000
72.	* 65	101.062	0.000	0.000
73.	66	103.250	0.000	0.000
74.	67	105.437	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	* 75	122.937	0.000	0.000
83.	* 76	125.125	0.000	0.000
84.	* 77	127.312	0.000	0.000
85.	* 78	129.000	0.000	0.000
86.	* 79	131.687	0.000	0.000
87.	* 80	133.875	0.000	0.000
88.	* 81	136.062	0.000	0.000
89.	* 82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

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* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
108.    18   18   19
109.    19   29   30
110.    20   30   31
111.    21   31   32
112.    22   32   33
113.    23   33   34
114.    24   34   35
115.    25   35   36
116.    26   36   37
117.    27   37   38
118.    28    1   29
119.    29    2   20
120.    30    3   30
121.    31    4   21
122.    32    5   31
123.    33    6   22
124.    34    7   32
125.    35    8   23
126.    36    9   33
127.    37   10   24
128.    38   11   34
129.    39   12   25
130.    40   13   35
131.    41   14   26
132.    42   15   36
133.    43   16   27
134.    44   17   37
135.    45   18   28
136.    46   19   38
137.    47   29   20
138.    48   20    3
139.    49   30   21
140.    50   21    5
141.    51   31   22
142.    52   22    7
143.    53   32   23
144.    54   23    9
145.    55   33   24
146.    56   24   11
147.    57   34   25
148.    58   25   13
149.    59   35   26
150.    60   26   15
151.    61   36   27
152.    62   27   17
153.    63   37   28
154.    64   28   19
155.    65    3   21
156.    66    5   22
157.    67    7   23
158.    68    9   24
159.    69   11   25
160.    70   13   26
161.    71   15   27
162.    72   17   28
163.    73    1   20
164.    74   19   39
165.    75   39   40
166.    76   40   41
167.    77   41   42
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* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.    78   42   43
169.    79   43   44
170.    80   44   45
171.    81   45   46
172.    82   46   47
173.    83   47   48
174.    84   48   49
175.    85   49   50
176.    86   50   51
177.    87   51   52
178.    88   52   53
179.    89   53   54
180.    90   54   55
181.    91   55   56
182.    92   56   57
183.    93   57   58
184.    94   58   59
185.    95   59   60
186.    96   60   61
187.    97   61   62
188.    98   62   63
189.    99   63   64
190.   100   64   65
191.   101   65   66
192.   102   66   67
193.   103   67   68
194.   104   68   69
195.   105   69   70
196.   106   70   71
197.   107   71   72
198.   108   72   73
199.   109   73   74
200.  *  110   74   75
201.  *  111   75   76
202.  *  112   76   77
203.  *  113   77   78
204.  *  114   78   79
205.  *  115   79   80
206.  *  116   80   81
207.  *  117   81   82
208. MEMBER PROPERTY
209. * CORDON INFERIOR
210. 1              PR AX  0.0500   IZ 0.00151406
211. 2              PR AX  0.0500   IZ 0.00151406
212. 3              PR AX  0.0532   IZ 0.00156748
213. 4              PR AX  0.0532   IZ 0.00156748
214. 5              PR AX  0.0670   IZ 0.00233098
215. 6              PR AX  0.0670   IZ 0.00233098
216. 7              PR AX  0.0750   IZ 0.00271328
217. 8              PR AX  0.0750   IZ 0.00271328
218. 9              PR AX  0.0900   IZ 0.00380584
219. 10             PR AX  0.0900   IZ 0.00380584
220. 11             PR AX  0.1070   IZ 0.00464364
221. 12             PR AX  0.1070   IZ 0.00464364
222. 13             PR AX  0.1180   IZ 0.00593306
223. 14             PR AX  0.1180   IZ 0.00593306
224. 15             PR AX  0.1410   IZ 0.00804164
225. 16             PR AX  0.1410   IZ 0.00804164
226. 17             PR AX  0.1520   IZ 0.00926892
227. 18             PR AX  0.1520   IZ 0.00926892
```

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 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. * CORDON SUPERIOR
229. 19              PR AX  0.0280   IZ 0.00046454
230. 20              PR AX  0.0280   IZ 0.00046454
231. 21              PR AX  0.0280   IZ 0.00046454
232. 22              PR AX  0.0320   IZ 0.00072626
233. 23              PR AX  0.0320   IZ 0.00072626
234. 24              PR AX  0.0450   IZ 0.00164273
235. 25              PR AX  0.0600   IZ 0.00261476
236. 26              PR AX  0.0720   IZ 0.00316788
237. 27              PR AX  0.0840   IZ 0.00380920
238. * MONTANTES PRINCIPALES
239. 28              PR AX  0.0068   IZ 0.00000001
240. 30              PR AX  0.0082   IZ 0.00000001
241. 32              PR AX  0.0148   IZ 0.00000001
242. 34              PR AX  0.0212   IZ 0.00000001
243. 36              PR AX  0.0298   IZ 0.00000001
244. 38              PR AX  0.0298   IZ 0.00000001
245. 40              PR AX  0.0398   IZ 0.00000001
246. 42              PR AX  0.0498   IZ 0.00000001
247. 44              PR AX  0.0578   IZ 0.00000001
248. 46              PR AX  0.0578   IZ 10000.
249. * MONTANTES SECUNDARIOS
250. 29              PR AX  0.0068   IZ 0.00000001
251. 31              PR AX  0.0068   IZ 0.00000001
252. 33              PR AX  0.0068   IZ 0.00000001
253. 35              PR AX  0.0096   IZ 0.00000001
254. 37              PR AX  0.0112   IZ 0.00000001
255. 39              PR AX  0.0128   IZ 0.00000001
256. 41              PR AX  0.0168   IZ 0.00000001
257. 43              PR AX  0.0192   IZ 0.00000001
258. 45              PR AX  0.0298   IZ 0.00000001
259. * DIAGONALES 1
260. 47              PR AX  0.0068   IZ 0.00001456
261. 48              PR AX  0.0068   IZ 0.00001456
262. 49              PR AX  0.0096   IZ 0.00003700
263. 50              PR AX  0.0096   IZ 0.00003700
264. 51              PR AX  0.0128   IZ 0.00007640
265. 52              PR AX  0.0128   IZ 0.00007640
266. 53              PR AX  0.0212   IZ 0.00025120
267. 54              PR AX  0.0212   IZ 0.00025120
268. 55              PR AX  0.0298   IZ 0.00025166
269. 56              PR AX  0.0298   IZ 0.00025166
270. 57              PR AX  0.0398   IZ 0.00037183
271. 58              PR AX  0.0398   IZ 0.00037183
272. 59              PR AX  0.0498   IZ 0.00050799
273. 60              PR AX  0.0498   IZ 0.00050799
274. 61              PR AX  0.0578   IZ 0.00061053
275. 62              PR AX  0.0578   IZ 0.00061053
276. 63              PR AX  0.0648   IZ 0.00071462
277. 64              PR AX  0.0648   IZ 0.00071462
278. * DIAGONALES 2
279. 65              PR AX  0.0068   IZ 0.00000001
280. 66              PR AX  0.0068   IZ 0.00000001
281. 67              PR AX  0.0068   IZ 0.00000001
282. 68              PR AX  0.0056   IZ 0.00000001
283. 69              PR AX  0.0056   IZ 0.00000001
284. 70              PR AX  0.0150   IZ 0.00000001
285. 71              PR AX  0.0150   IZ 0.00000001
286. 72              PR AX  0.0193   IZ 0.00000001
287. 73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
288. * SECCION DE HORMIGON
289. 74   TO  77     PR AX 13.4810   IZ 45.3025
290. 78   TO  81     PR AX 13.4810   IZ 45.3025
291. 82   TO  85     PR AX 13.4810   IZ 45.3025
292. 86   TO  89     PR AX 13.4810   IZ 45.3025
293. 90   TO  93     PR AX 13.4810   IZ 45.3025
294. 94   TO  97     PR AX 13.4810   IZ 45.3025
295. 98   TO  101    PR AX 13.4810   IZ 45.3025
296. 102  TO  105    PR AX 13.4810   IZ 45.3025
297. 106  TO  109    PR AX  3.3600   IZ  0.1577
298. *110 TO  113    PR AX  3.3600   IZ  0.1577
299. *114 TO  117    PR AX  3.3600   IZ  0.1577
300. MEMBER RELEASE
301. 29 TO 46 65 TO 73          STA MZ
302. 47 49 51 53 55 57 59 61 63 STA MZ
303. 29 TO 46 65 TO 73          END MZ
304. 48 50 52 54 56 58 60 62 64 END MZ
305. CONSTANT
306. E 21000.       MEMB 1  TO  73
307  E  3250.       MEMB 74 TO  109
308. POI   0.15     MEMB 1  TO  73
309. POI   0.2      MEMB 74 TO  109
310. DEN  10.15     MEMB 1  TO  73
311. DEN   2.5      MEMB 74 TO  109
312. SUPPORT
313. 15 PINNED
314. 56 FIXED BUT FX MZ
315. *60 FIXED BUT FX MZ
316. *65 FIXED BUT FX MZ
317. *66 FIXED BUT FX MZ
318. *67 FIXED BUT FX MZ
319. *68 FIXED BUT FX MZ
320. *69 FIXED BUT FX MZ
321. *70 FIXED BUT FX MZ
322. 71 FIXED BUT FX MZ
323. 72 FIXED BUT FX MZ
324. 73 FIXED BUT FX MZ
325. 74 FIXED BUT FX MZ
326. *75 FIXED BUT FX MZ
327. *76 FIXED BUT FX MZ
328. *77 FIXED BUT FX MZ
329. *78 FIXED BUT FX MZ
330. *79 FIXED BUT FX MZ
331. *80 FIXED BUT FX MZ
332. *81 FIXED BUT FX MZ
333. *82 FIXED BUT FX MZ
334. LOAD 1 PESO PROPIO
335. SELFWEIGHT Y   -1.
336. 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 = 74/ 109/ 6
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 215
SIZE OF STIFFNESS MATRIX = 4515 DOUBLE PREC WORDS
TOTAL REQUIRED DISK SPACE = 12.24 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 9: 5: 7
++ PROCESSING GLOBAL STIFFNESS MATRIX. 9: 5: 8
++ PROCESSING TRIANGULAR FACTORIZATION. 9: 5: 8
++ CALCULATING JOINT DISPLACEMENTS. 9: 5: 8
++ CALCULATING MEMBER FORCES. 9: 5: 8

337. LOAD LIS 1
338. PRINT MEMBER FORCES LIST 74 TO 109

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR Y	SHEAR Z	TORSION	MOM Y	MOM Z
74	1	19	0.00	210.10	0.00	0.00	0.00	-1390.18
		39	0.00	-136.40	0.00	0.00	0.00	1769.23
75	1	39	0.00	136.95	0.00	0.00	0.00	-1769.90
		40	0.00	-63.71	0.00	0.00	0.00	1989.48
76	1	40	0.00	63.97	0.00	0.00	0.00	-1988.92
		41	0.00	9.74	0.00	0.00	0.00	2048.55
77	1	41	0.00	-10.80	0.00	0.00	0.00	-2048.23
		42	0.00	84.54	0.00	0.00	0.00	1944.63
78	1	42	0.00	-83.95	0.00	0.00	0.00	-1944.89
		43	0.00	157.65	0.00	0.00	0.00	1680.97
79	1	43	0.00	-157.59	0.00	0.00	0.00	-1681.11
		44	0.00	231.33	0.00	0.00	0.00	1255.04
80	1	44	0.00	-231.71	0.00	0.00	0.00	-1255.78
		45	0.00	305.42	0.00	0.00	0.00	667.84
81	1	45	0.00	-305.31	0.00	0.00	0.00	-668.89
		46	0.00	379.05	0.00	0.00	0.00	-79.77
82	1	46	0.00	-378.71	0.00	0.00	0.00	79.82
		47	0.00	452.42	0.00	0.00	0.00	-988.45
83	1	47	0.00	-452.60	0.00	0.00	0.00	988.40
		48	0.00	526.35	0.00	0.00	0.00	-2059.48
84	1	48	0.00	-526.28	0.00	0.00	0.00	2059.28
		49	0.00	599.98	0.00	0.00	0.00	-3291.20
85	1	49	0.00	-600.24	0.00	0.00	0.00	3290.53
		50	0.00	673.98	0.00	0.00	0.00	-4684.44
86	1	50	0.00	-673.63	0.00	0.00	0.00	4684.44
		51	0.00	747.34	0.00	0.00	0.00	-6238.27
87	1	51	0.00	-747.55	0.00	0.00	0.00	6238.22
		52	0.00	808.65	0.00	0.00	0.00	-7648.91
88	1	52	0.00	-808.58	0.00	0.00	0.00	7648.70
		53	0.00	894.93	0.00	0.00	0.00	-9830.88
89	1	53	0.00	-894.79	0.00	0.00	0.00	9830.84
		54	0.00	968.53	0.00	0.00	0.00	-11869.42

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-968.60	0.00	0.00	0.00	11869.46
		55	0.00	1042.30	0.00	0.00	0.00	-14068.36
91	1	55	0.00	-1042.30	0.00	0.00	0.00	14068.39
		56	0.00	1103.40	0.00	0.00	0.00	-16013.51
92	1	56	0.00	1040.95	0.00	0.00	0.00	16013.51
		57	0.00	-954.61	0.00	0.00	0.00	-13457.20
93	1	57	0.00	954.60	0.00	0.00	0.00	13457.17
		58	0.00	-880.86	0.00	0.00	0.00	-11449.24
94	1	58	0.00	880.86	0.00	0.00	0.00	11449.18
		59	0.00	-807.16	0.00	0.00	0.00	-9603.37
95	1	59	0.00	807.15	0.00	0.00	0.00	9603.35
		60	0.00	-703.92	0.00	0.00	0.00	-7289.12
96	1	60	0.00	703.85	0.00	0.00	0.00	7289.10
		61	0.00	-659.63	0.00	0.00	0.00	-6394.48
97	1	61	0.00	659.75	0.00	0.00	0.00	6394.64
		62	0.00	-586.01	0.00	0.00	0.00	-5031.77
98	1	62	0.00	585.97	0.00	0.00	0.00	5031.80
		63	0.00	-512.26	0.00	0.00	0.00	-3830.89
99	1	63	0.00	512.19	0.00	0.00	0.00	3830.87
		64	0.00	-438.45	0.00	0.00	0.00	-2790.76
100	1	64	0.00	438.42	0.00	0.00	0.00	2790.63
		65	0.00	-383.66	0.00	0.00	0.00	-2122.71
101	1	65	0.00	383.75	0.00	0.00	0.00	2122.67
		66	0.00	-291.07	0.00	0.00	0.00	-1194.79
102	1	66	0.00	291.05	0.00	0.00	0.00	1194.72
		67	0.00	-217.35	0.00	0.00	0.00	-638.84
103	1	67	0.00	217.37	0.00	0.00	0.00	638.81
		68	0.00	-143.62	0.00	0.00	0.00	-243.90
104	1	68	0.00	143.62	0.00	0.00	0.00	243.90
		69	0.00	-69.91	0.00	0.00	0.00	-10.40
105	1	69	0.00	69.91	0.00	0.00	0.00	10.39
		70	0.00	3.83	0.00	0.00	0.00	61.92
106	1	70	0.00	-3.83	0.00	0.00	0.00	-61.91
		71	0.00	22.20	0.00	0.00	0.00	33.45

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	-12.01	0.00	0.00	0.00	-33.45
		72	0.00	30.39	0.00	0.00	0.00	-12.94
108	1	72	0.00	14.28	0.00	0.00	0.00	12.94
		73	0.00	4.09	0.00	0.00	0.00	-1.79
109	1	73	0.00	10.01	0.00	0.00	0.00	1.79
		74	0.00	8.37	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

339. PRINT JOINT DISPLACEMENT LIST 19 39 TO 74

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	23.54661**********		0.00000	0.00000	0.00000	1.65312
39	1	23.54661**********		0.00000	0.00000	0.00000	1.67678
40	1	23.54661**********		0.00000	0.00000	0.00000	1.70491
41	1	23.54661**********		0.00000	0.00000	0.00000	1.73510
42	1	23.54661**********		0.00000	0.00000	0.00000	1.76497
43	1	23.54661**********		0.00000	0.00000	0.00000	1.79209
44	1	23.54661**********		0.00000	0.00000	0.00000	1.81411
45	1	23.54661**********		0.00000	0.00000	0.00000	1.82860
46	1	23.54661**********		0.00000	0.00000	0.00000	1.83318
47	1	23.54661**********		0.00000	0.00000	0.00000	1.82544
48	1	23.54661**********		0.00000	0.00000	0.00000	1.80300
49	1	23.54660**********		0.00000	0.00000	0.00000	1.76346
50	1	23.54660**********		0.00000	0.00000	0.00000	1.70440
51	1	23.54660**********		0.00000	0.00000	0.00000	1.62348
52	1	23.54660**********		0.00000	0.00000	0.00000	1.53809
53	1	23.54660	-704.62451	0.00000	0.00000	0.00000	1.38633
54	1	23.54660	-418.36026	0.00000	0.00000	0.00000	1.22529
55	1	23.54661	-170.83833	0.00000	0.00000	0.00000	1.03285
56	1	23.54661	0.00000	0.00000	0.00000	0.00000	0.84775
57	1	23.54661	183.43864	0.00000	0.00000	0.00000	0.59166
58	1	23.54661	292.12619	0.00000	0.00000	0.00000	0.40680
59	1	23.54661	363.51733	0.00000	0.00000	0.00000	0.25064
60	1	23.54661	412.23331	0.00000	0.00000	0.00000	0.07548
61	1	23.54661	418.05191	0.00000	0.00000	0.00000	0.01455
62	1	23.54661	411.59995	0.00000	0.00000	0.00000	-0.07015
63	1	23.54660	388.75677	0.00000	0.00000	0.00000	-0.13578
64	1	23.54660	353.40640	0.00000	0.00000	0.00000	-0.18478
65	1	23.54660	321.08401	0.00000	0.00000	0.00000	-0.21181
66	1	23.54660	258.23380	0.00000	0.00000	0.00000	-0.24239
67	1	23.54660	203.60466	0.00000	0.00000	0.00000	-0.25581
68	1	23.54660	146.82983	0.00000	0.00000	0.00000	-0.26217
69	1	23.54660	89.24509	0.00000	0.00000	0.00000	-0.26386
70	1	23.54661	31.55649	0.00000	0.00000	0.00000	-0.26328
71	1	23.54661	0.00000	0.00000	0.00000	0.00000	-0.04554
72	1	23.54661	0.00000	0.00000	0.00000	0.00000	0.01254
73	1	23.54661	0.00000	0.00000	0.00000	0.00000	-0.00461
74	1	23.54661	0.00000	0.00000	0.00000	0.00000	0.00588

********** END OF LATEST ANALYSIS RESULT **********

340. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
15	1	0.00	308.03	0.00	0.00	0.00	0.00
56	1	0.00	2144.36	0.00	0.00	0.00	0.00
71	1	0.00	10.19	0.00	0.00	0.00	0.00
72	1	0.00	44.68	0.00	0.00	0.00	0.00
73	1	0.00	14.09	0.00	0.00	0.00	0.00
74	1	0.00	8.37	0.00	0.00	0.00	0.00

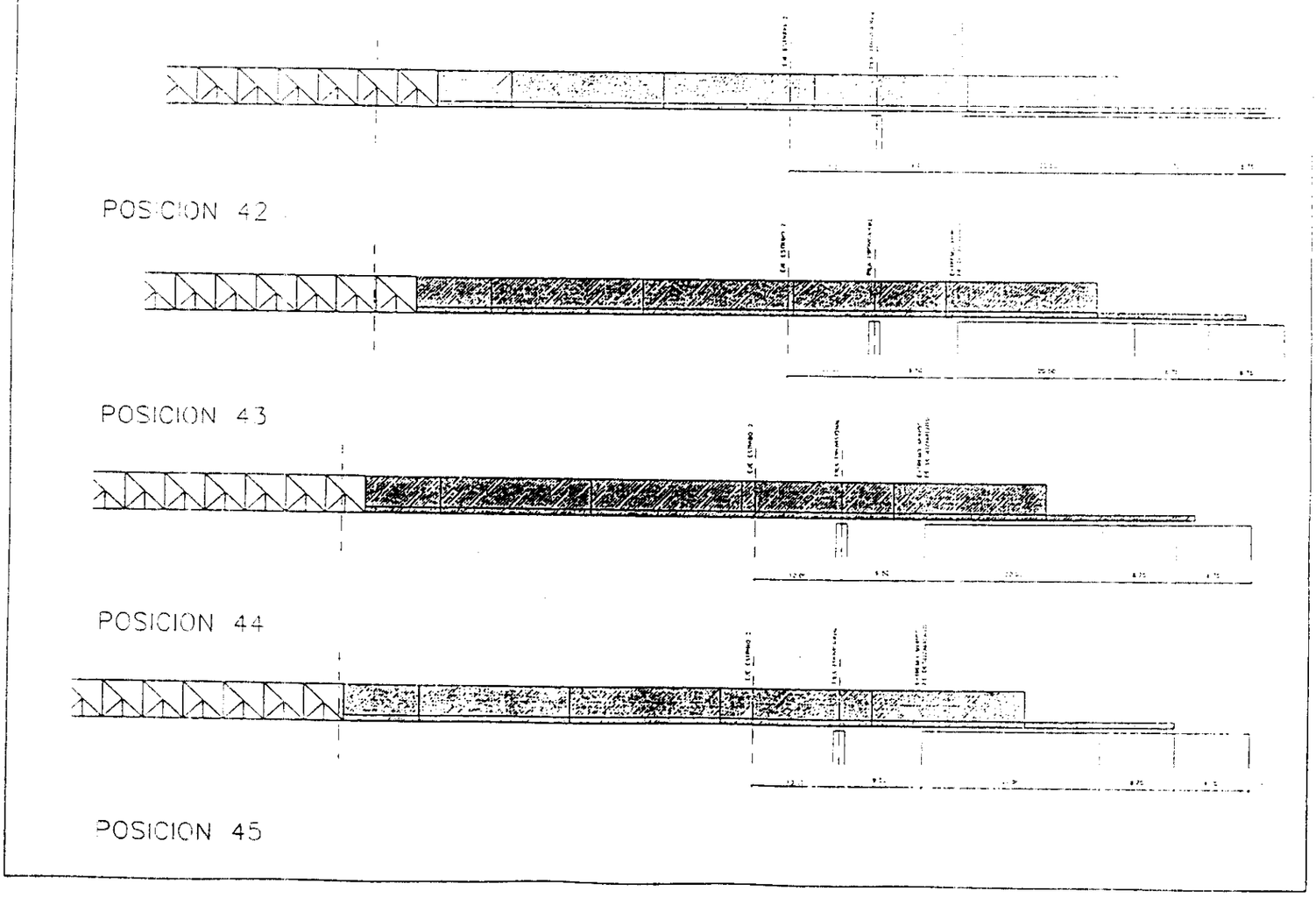
********** END OF LATEST ANALYSIS RESULT **********

341. PLOT DISPLACEMENT FILE
342. PLOT BENDING FILE
343. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 9: 5:12 ****

****
* 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 *
****


POSICION 42
POSICION 43
POSICION 44
POSICION 45

Portico 43

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  9, 1997        *
*          Time=     8: 5: 2            *
*                                       *
*****************************************
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1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.375	0.000	0.000
61.	57	83.562	0.000	0.000
62.	58	85.375	0.000	0.000
63.	*58	85.750	0.000	0.000
64.	59	87.937	0.000	0.000
65.	60	90.125	0.000	0.000
66.	61	92.312	0.000	0.000
67.	62	95.375	0.000	0.000
68.	*62	94.500	0.000	0.000
69.	63	96.687	0.000	0.000
70.	64	98.875	0.000	0.000
71.	65	101.062	0.000	0.000
72.	66	103.250	0.000	0.000
73.	67	104.875	0.000	0.000
74.	* 67	105.437	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	75	122.937	0.000	0.000
83.	76	125.125	0.000	0.000
84.	77	127.312	0.000	0.000
85.	78	129.000	0.000	0.000
86.	79	131.687	0.000	0.000
87.	80	133.875	0.000	0.000
88.	81	136.062	0.000	0.000
89.	82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	78	42	43
169.	79	43	44
170.	80	44	45
171.	81	45	46
172.	82	46	47
173.	83	47	48
174.	84	48	49
175.	85	49	50
176.	86	50	51
177.	87	51	52
178.	88	52	53
179.	89	53	54
180.	90	54	55
181.	91	55	56
182.	92	56	57
183.	93	57	58
184.	94	58	59
185.	95	59	60
186.	96	60	61
187.	97	61	62
188.	98	62	63
189.	99	63	64
190.	100	64	65
191.	101	65	66
192.	102	66	67
193.	103	67	68
194.	104	68	69
195.	105	69	70
196.	106	70	71
197.	107	71	72
198.	108	72	73
199.	109	73	74
200.	110	74	75
201.	111	75	76
202.	112	76	77
203.	113	77	78
204.	114	78	79
205.	115	79	80
206.	116	80	81
207.	117	81	82

208. MEMBER PROPERTY

209. * CORDON INFERIOR

210. 1	PR AX	0.0500	IZ	0.00151406
211. 2	PR AX	0.0500	IZ	0.00151406
212. 3	PR AX	0.0532	IZ	0.00156748
213. 4	PR AX	0.0532	IZ	0.00156748
214. 5	PR AX	0.0670	IZ	0.00233098
215. 6	PR AX	0.0670	IZ	0.00233098
216. 7	PR AX	0.0750	IZ	0.00271328
217. 8	PR AX	0.0750	IZ	0.00271328
218. 9	PR AX	0.0900	IZ	0.00380584
219. 10	PR AX	0.0900	IZ	0.00380584
220. 11	PR AX	0.1070	IZ	0.00464364
221. 12	PR AX	0.1070	IZ	0.00464364
222. 13	PR AX	0.1180	IZ	0.00593306
223. 14	PR AX	0.1180	IZ	0.00593306
224. 15	PR AX	0.1410	IZ	0.00804164
225. 16	PR AX	0.1410	IZ	0.00804164
226. 17	PR AX	0.1520	IZ	0.00926892
227. 18	PR AX	0.1520	IZ	0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. * CORDON SUPERIOR
229. 19              PR AX  0.0280   IZ 0.00046454
230. 20              PR AX  0.0280   IZ 0.00046454
231. 21              PR AX  0.0280   IZ 0.00046454
232. 22              PR AX  0.0320   IZ 0.00072626
233. 23              PR AX  0.0320   IZ 0.00072626
234. 24              PR AX  0.0450   IZ 0.00164273
235. 25              PR AX  0.0600   IZ 0.00261476
236. 26              PR AX  0.0720   IZ 0.00316788
237. 27              PR AX  0.0840   IZ 0.00380920
238. * MONTANTES PRINCIPALES
239. 28              PR AX  0.0068   IZ 0.00000001
240. 30              PR AX  0.0082   IZ 0.00000001
241. 32              PR AX  0.0148   IZ 0.00000001
242. 34              PR AX  0.0212   IZ 0.00000001
243. 36              PR AX  0.0298   IZ 0.00000001
244. 38              PR AX  0.0298   IZ 0.00000001
245. 40              PR AX  0.0398   IZ 0.00000001
246. 42              PR AX  0.0498   IZ 0.00000001
247. 44              PR AX  0.0578   IZ 0.00000001
248. 46              PR AX  0.0578   IZ 10000.
249. * MONTANTES SECUNDARIOS
250. 29              PR AX  0.0068   IZ 0.00000001
251. 31              PR AX  0.0068   IZ 0.00000001
252. 33              PR AX  0.0068   IZ 0.00000001
253. 35              PR AX  0.0096   IZ 0.00000001
254. 37              PR AX  0.0112   IZ 0.00000001
255. 39              PR AX  0.0128   IZ 0.00000001
256. 41              PR AX  0.0168   IZ 0.00000001
257. 43              PR AX  0.0192   IZ 0.00000001
258. 45              PR AX  0.0298   IZ 0.00000001
259. * DIAGONALES 1
260. 47              PR AX  0.0068   IZ 0.00001456
261. 48              PR AX  0.0068   IZ 0.00001456
262. 49              PR AX  0.0096   IZ 0.00003700
263. 50              PR AX  0.0096   IZ 0.00003700
264. 51              PR AX  0.0128   IZ 0.00007640
265. 52              PR AX  0.0128   IZ 0.00007640
266. 53              PR AX  0.0212   IZ 0.00025120
267. 54              PR AX  0.0212   IZ 0.00025120
268. 55              PR AX  0.0298   IZ 0.00025166
269. 56              PR AX  0.0298   IZ 0.00025166
270. 57              PR AX  0.0398   IZ 0.00037183
271. 58              PR AX  0.0398   IZ 0.00037183
272. 59              PR AX  0.0498   IZ 0.00050799
273. 60              PR AX  0.0498   IZ 0.00050799
274. 61              PR AX  0.0578   IZ 0.00061053
275. 62              PR AX  0.0578   IZ 0.00061053
276. 63              PR AX  0.0648   IZ 0.00071462
277. 64              PR AX  0.0648   IZ 0.00071462
278. * DIAGONALES 2
279. 65              PR AX  0.0068   IZ 0.00000001
280. 66              PR AX  0.0068   IZ 0.00000001
281. 67              PR AX  0.0068   IZ 0.00000001
282. 68              PR AX  0.0056   IZ 0.00000001
283. 69              PR AX  0.0056   IZ 0.00000001
284. 70              PR AX  0.0150   IZ 0.00000001
285. 71              PR AX  0.0150   IZ 0.00000001
286. 72              PR AX  0.0193   IZ 0.00000001
287. 73              PR AX  0.0068   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
288. * SECCION DE HORMIGON
289. 74   TO   77     PR AX 13.4810   IZ 45.3025
290. 78   TO   81     PR AX 13.4810   IZ 45.3025
291. 82   TO   85     PR AX 13.4810   IZ 45.3025
292. 86   TO   89     PR AX 13.4810   IZ 45.3025
293. 90   TO   93     PR AX 13.4810   IZ 45.3025
294. 94   TO   97     PR AX 13.4810   IZ 45.3025
295. 98   TO   101    PR AX 13.4810   IZ 45.3025
296. 102  TO   105    PR AX 13.4810   IZ 45.3025
297. 106  TO   109    PR AX 13.4810   IZ 45.3025
298. 110  TO   113    PR AX  3.3600   IZ  0.1577
299. 114  TO   117    PR AX  3.3600   IZ  0.1577
300. MEMBER RELEASE
301. 29 TO 46 65 TO 73          STA MZ
302. 47 49 51 53 55 57 59 61 63 STA MZ
303. 29 TO 46 65 TO 73          END MZ
304. 48 50 52 54 56 58 60 62 64 END MZ
305. CONSTANT
306. E 21000.       MEMB 1  TO  73
307. E  3250.       MEMB 74 TO 117
308. POI   0.15     MEMB 1  TO  73
309. POI   0.2      MEMB 74 TO 117
310. DEN  10.15     MEMB 1  TO  73
311. DEN   2.5      MEMB 74 TO 117
312. SUPPORT
313. 17 PINNED
314. 58 FIXED BUT FX MZ
315. *62 FIXED BUT FX MZ
316. *67 FIXED BUT FX MZ
317. *68 FIXED BUT FX MZ
318. *69 FIXED BUT FX MZ
319. *70 FIXED BUT FX MZ
320. *71 FIXED BUT FX MZ
321. *72 FIXED BUT FX MZ
322. 73 FIXED BUT FX MZ
323. 74 FIXED BUT FX MZ
324. 75 FIXED BUT FX MZ
325. 76 FIXED BUT FX MZ
326. 77 FIXED BUT FX MZ
327. 78 FIXED BUT FX MZ
328. 79 FIXED BUT FX MZ
329. 80 FIXED BUT FX MZ
330. 81 FIXED BUT FX MZ
331. 82 FIXED BUT FX MZ
332. LOAD 1 PESO PROPIO
333. SELFWEIGHT Y   -1.
334. 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 =    82/  117/   12
ORIGINAL/FINAL BAND-WIDTH =   28/    6
TOTAL PRIMARY LOAD CASES  =    1, TOTAL DEGREES OF FREEDOM =   233
SIZE OF STIFFNESS MATRIX =    4893 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE =   12.25 MEGA-BYTES
```

++ PROCESSING ELEMENT STIFFNESS MATRIX. 8: 5: 7
++ PROCESSING GLOBAL STIFFNESS MATRIX. 8: 5: 7
++ PROCESSING TRIANGULAR FACTORIZATION. 8: 5: 7
++ CALCULATING JOINT DISPLACEMENTS. 8: 5: 8
++ CALCULATING MEMBER FORCES. 8: 5: 8

335. LOAD LIS 1
336. PRINT MEMBER FORCES LIST 74 TO 117

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	464.50	0.00	0.00	0.00	-1135.30
		39	0.00	-390.79	0.00	0.00	0.00	2070.27
75	1	39	0.00	390.54	0.00	0.00	0.00	-2070.77
		40	0.00	316.80	0.00	0.00	0.00	2844.21
76	1	40	0.00	316.63	0.00	0.00	0.00	-2844.89
		41	0.00	-242.92	0.00	0.00	0.00	3457.14
77	1	41	0.00	243.15	0.00	0.00	0.00	-3457.74
		42	0.00	-169.41	0.00	0.00	0.00	3909.01
78	1	42	0.00	169.90	0.00	0.00	0.00	-3909.12
		43	0.00	-96.19	0.00	0.00	0.00	4199.50
79	1	43	0.00	95.69	0.00	0.00	0.00	-4199.72
		44	0.00	-21.95	0.00	0.00	0.00	4328.40
80	1	44	0.00	22.00	0.00	0.00	0.00	-4328.32
		45	0.00	51.71	0.00	0.00	0.00	4296.28
81	1	45	0.00	-51.48	0.00	0.00	0.00	-4296.31
		46	0.00	125.22	0.00	0.00	0.00	4102.60
82	1	46	0.00	-125.50	0.00	0.00	0.00	-4103.16
		47	0.00	199.21	0.00	0.00	0.00	3747.64
83	1	47	0.00	-199.12	0.00	0.00	0.00	-3748.15
		48	0.00	272.86	0.00	0.00	0.00	3232.05
84	1	48	0.00	-272.81	0.00	0.00	0.00	-3232.15
		49	0.00	346.52	0.00	0.00	0.00	2554.82
85	1	49	0.00	-346.38	0.00	0.00	0.00	-2554.96
		50	0.00	420.13	0.00	0.00	0.00	1716.11
86	1	50	0.00	-420.28	0.00	0.00	0.00	-1716.19
		51	0.00	493.99	0.00	0.00	0.00	716.57
87	1	51	0.00	-494.08	0.00	0.00	0.00	-716.67
		52	0.00	567.82	0.00	0.00	0.00	444.84
88	1	52	0.00	-567.68	0.00	0.00	0.00	444.65
		53	0.00	641.38	0.00	0.00	0.00	-1766.96
89	1	53	0.00	-641.29	0.00	0.00	0.00	1766.88
		54	0.00	715.03	0.00	0.00	0.00	-3250.77

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-715.10	0.00	0.00	0.00	3250.83
		55	0.00	788.81	0.00	0.00	0.00	-4895.38
91	1	55	0.00	-788.79	0.00	0.00	0.00	4895.36
		56	0.00	862.53	0.00	0.00	0.00	-6701.93
92	1	56	0.00	-862.53	0.00	0.00	0.00	6701.98
		57	0.00	936.23	0.00	0.00	0.00	-8668.91
93	1	57	0.00	-936.27	0.00	0.00	0.00	8668.94
		58	0.00	997.37	0.00	0.00	0.00	-10421.77
94	1	58	0.00	889.39	0.00	0.00	0.00	10421.77
		59	0.00	-803.04	0.00	0.00	0.00	-8253.79
95	1	59	0.00	803.03	0.00	0.00	0.00	8253.77
		60	0.00	-729.29	0.00	0.00	0.00	-6577.43
96	1	60	0.00	729.31	0.00	0.00	0.00	6577.44
		61	0.00	-655.60	0.00	0.00	0.00	-5063.03
97	1	61	0.00	655.58	0.00	0.00	0.00	5063.04
		62	0.00	-552.35	0.00	0.00	0.00	-3213.09
98	1	62	0.00	552.35	0.00	0.00	0.00	3213.10
		63	0.00	-508.14	0.00	0.00	0.00	-2517.40
99	1	63	0.00	508.14	0.00	0.00	0.00	2517.39
		64	0.00	-434.40	0.00	0.00	0.00	-1486.27
100	1	64	0.00	434.39	0.00	0.00	0.00	1486.27
		65	0.00	-360.68	0.00	0.00	0.00	-616.83
101	1	65	0.00	360.68	0.00	0.00	0.00	616.83
		66	0.00	-286.94	0.00	0.00	0.00	91.68
102	1	66	0.00	286.97	0.00	0.00	0.00	-91.70
		67	0.00	-232.20	0.00	0.00	0.00	513.49
103	1	67	0.00	232.19	0.00	0.00	0.00	-513.49
		68	0.00	-139.51	0.00	0.00	0.00	1024.56
104	1	68	0.00	139.51	0.00	0.00	0.00	-1024.55
		69	0.00	-65.80	0.00	0.00	0.00	1249.05
105	1	69	0.00	65.79	0.00	0.00	0.00	1249.04
		70	0.00	7.95	0.00	0.00	0.00	1312.33
106	1	70	0.00	-7.95	0.00	0.00	0.00	-1312.33
		71	0.00	81.65	0.00	0.00	0.00	1214.35

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	-81.65	0.00	0.00	0.00	-1214.35
		72	0.00	155.39	0.00	0.00	0.00	955.02
108	1	72	0.00	-155.40	0.00	0.00	0.00	-955.02
		73	0.00	229.10	0.00	0.00	0.00	534.57
109	1	73	0.00	-209.52	0.00	0.00	0.00	-534.57
		74	0.00	283.26	0.00	0.00	0.00	-4.53
110	1	74	0.00	9.90	0.00	0.00	0.00	4.53
		75	0.00	8.47	0.00	0.00	0.00	-2.96
111	1	75	0.00	8.84	0.00	0.00	0.00	2.96
		76	0.00	9.54	0.00	0.00	0.00	-3.73
112	1	76	0.00	9.87	0.00	0.00	0.00	3.73
		77	0.00	8.50	0.00	0.00	0.00	-2.23
113	1	77	0.00	6.09	0.00	0.00	0.00	2.23
		78	0.00	8.09	0.00	0.00	0.00	-3.93
114	1	78	0.00	10.98	0.00	0.00	0.00	3.93
		79	0.00	11.59	0.00	0.00	0.00	-4.73
115	1	79	0.00	10.09	0.00	0.00	0.00	4.73
		80	0.00	8.29	0.00	0.00	0.00	-2.76
116	1	80	0.00	8.46	0.00	0.00	0.00	2.76
		81	0.00	9.91	0.00	0.00	0.00	-4.34
117	1	81	0.00	11.17	0.00	0.00	0.00	4.34
		82	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

337. PRINT JOINT DISPLACEMENT LIST 19 39 TO 82

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.22561
39	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.24962
40	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.28634
41	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.33334
42	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.38828
43	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.44870
44	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.51227
45	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.57652
46	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.63913
47	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.69764
48	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.74971
49	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.79289
50	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.82482
51	1	-1.67375**********	0.00000	0.00000	0.00000	0.00000	0.84309
52	1	-1.67375-894.82080	0.00000	0.00000	0.00000	0.00000	0.84531
53	1	-1.67375-711.36896	0.00000	0.00000	0.00000	0.00000	0.82908
54	1	-1.67375-533.62042	0.00000	0.00000	0.00000	0.00000	0.79200
55	1	-1.67375-366.55975	0.00000	0.00000	0.00000	0.00000	0.73170
56	1	-1.67375-215.38063	0.00000	0.00000	0.00000	0.00000	0.64572
57	1	-1.67375 -86.09026	0.00000	0.00000	0.00000	0.00000	0.53176
58	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	0.41434
59	1	-1.67375 84.57426	0.00000	0.00000	0.00000	0.00000	0.25217
60	1	-1.67375 127.26124	0.00000	0.00000	0.00000	0.00000	0.14217
61	1	-1.67375 148.51201	0.00000	0.00000	0.00000	0.00000	0.05592
62	1	-1.67375 151.55655	0.00000	0.00000	0.00000	0.00000	-0.02962
63	1	-1.67375 145.93022	0.00000	0.00000	0.00000	0.00000	-0.05511
64	1	-1.67375 130.35971	0.00000	0.00000	0.00000	0.00000	-0.08466
65	1	-1.67375 109.92294	0.00000	0.00000	0.00000	0.00000	-0.10008
66	1	-1.67375 87.42831	0.00000	0.00000	0.00000	0.00000	-0.10378
67	1	-1.67375 70.77856	0.00000	0.00000	0.00000	0.00000	-0.10036
68	1	-1.67375 44.99001	0.00000	0.00000	0.00000	0.00000	-0.08560
69	1	-1.67375 28.07667	0.00000	0.00000	0.00000	0.00000	-0.06852
70	1	-1.67375 15.17231	0.00000	0.00000	0.00000	0.00000	-0.04928
71	1	-1.67375 6.49438	0.00000	0.00000	0.00000	0.00000	-0.03032
72	1	-1.67375 1.71627	0.00000	0.00000	0.00000	0.00000	-0.01400
73	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00274
74	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	0.00140
75	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00029
76	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00026
77	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	0.00132
78	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00225
79	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	0.00154
80	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00014
81	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	-0.00098
82	1	-1.67375 0.00000	0.00000	0.00000	0.00000	0.00000	0.00407

********** END OF LATEST ANALYSIS RESULT **********

338 PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE X	FORCE Y	FORCE Z	MOM X	MOM Y	MOM Z
17	1	0.00	561.53	0.00	0.00	0.00	0.00
58	1	0.00	1886.75	0.00	0.00	0.00	0.00
73	1	0.00	19.59	0.00	0.00	0.00	0.00
74	1	0.00	293.16	0.00	0.00	0.00	0.00
75	1	0.00	17.31	0.00	0.00	0.00	0.00
76	1	0.00	19.41	0.00	0.00	0.00	0.00
77	1	0.00	14.59	0.00	0.00	0.00	0.00
78	1	0.00	19.08	0.00	0.00	0.00	0.00
79	1	0.00	21.68	0.00	0.00	0.00	0.00
80	1	0.00	16.75	0.00	0.00	0.00	0.00
81	1	0.00	21.08	0.00	0.00	0.00	0.00
82	1	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

339. PLOT DISPLACEMENT FILE
340. PLOT BENDING FILE
341. FINISH

********** END OF STAAD-III **********
**** DATE= JUL 9,1997 TIME= 8: 5:12 ****

****
* 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 *
****

Posición 45

****
* *
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 9, 1997 *
* Time= 7:56:41 *
* *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	42	50.750	0.000	0.000
47.	43	52.937	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	44	55.125	0.000	0.000
49.	45	57.312	0.000	0.000
50.	46	59.500	0.000	0.000
51.	47	61.687	0.000	0.000
52.	48	63.875	0.000	0.000
53.	49	66.062	0.000	0.000
54.	50	68.250	0.000	0.000
55.	51	70.437	0.000	0.000
56.	52	72.625	0.000	0.000
57.	53	74.812	0.000	0.000
58.	54	77.000	0.000	0.000
59.	55	79.187	0.000	0.000
60.	56	81.375	0.000	0.000
61.	57	83.562	0.000	0.000
62.	58	85.750	0.000	0.000
63.	59	87.937	0.000	0.000
64.	60	89.750	0.000	0.000
65.	* 60	90.125	0.000	0.000
66.	61	92.312	0.000	0.000
67.	62	94.500	0.000	0.000
68.	63	96.687	0.000	0.000
69.	64	99.750	0.000	0.000
70.	* 64	98.875	0.000	0.000
71.	65	101.062	0.000	0.000
72.	66	103.250	0.000	0.000
73.	67	105.437	0.000	0.000
74.	68	107.625	0.000	0.000
75.	69	109.250	0.000	0.000
76.	* 69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	73	118.562	0.000	0.000
81.	74	120.750	0.000	0.000
82.	75	122.937	0.000	0.000
83.	76	125.125	0.000	0.000
84.	77	127.312	0.000	0.000
85.	78	129.000	0.000	0.000
86.	79	131.687	0.000	0.000
87.	80	133.875	0.000	0.000
88.	81	136.062	0.000	0.000
89.	82	138.250	0.000	0.000

90. MEMBER INCIDENCES

91.	1	1	2
92.	2	2	3
93.	3	3	4
94.	4	4	5
95.	5	5	6
96.	6	6	7
97.	7	7	8
98.	8	8	9
99.	9	9	10
100.	10	10	11
101.	11	11	12
102.	12	12	13
103.	13	13	14
104.	14	14	15
105.	15	15	16
106.	16	16	17
107.	17	17	18

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	18	18	19
109.	19	29	30
110.	20	30	31
111.	21	31	32
112.	22	32	33
113.	23	33	34
114.	24	34	35
115.	25	35	36
116.	26	36	37
117.	27	37	38
118.	28	1	29
119.	29	2	20
120.	30	3	30
121.	31	4	21
122.	32	5	31
123.	33	6	22
124.	34	7	32
125.	35	8	23
126.	36	9	33
127.	37	10	24
128.	38	11	34
129.	39	12	25
130.	40	13	35
131.	41	14	26
132.	42	15	36
133.	43	16	27
134.	44	17	37
135.	45	18	28
136.	46	19	38
137.	47	29	20
138.	48	20	3
139.	49	30	21
140.	50	21	5
141.	51	31	22
142.	52	22	7
143.	53	32	23
144.	54	23	9
145.	55	33	24
146.	56	24	11
147.	57	34	25
148.	58	25	13
149.	59	35	26
150.	60	26	15
151.	61	36	27
152.	62	27	17
153.	63	37	28
154.	64	28	19
155.	65	3	21
156.	66	5	22
157.	67	7	23
158.	68	9	24
159.	69	11	25
160.	70	13	26
161.	71	15	27
162.	72	17	28
163.	73	1	20
164.	74	19	39
165.	75	39	40
166.	76	40	41
167.	77	41	42

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	78	42	43
169.	79	43	44
170.	80	44	45
171.	81	45	46
172.	82	46	47
173.	83	47	48
174.	84	48	49
175.	85	49	50
176.	86	50	51
177.	87	51	52
178.	88	52	53
179.	89	53	54
180.	90	54	55
181.	91	55	56
182.	92	56	57
183.	93	57	58
184.	94	58	59
185.	95	59	60
186.	96	60	61
187.	97	61	62
188.	98	62	63
189.	99	63	64
190.	100	64	65
191.	101	65	66
192.	102	66	67
193.	103	67	68
194.	104	68	69
195.	105	69	70
196.	106	70	71
197.	107	71	72
198.	108	72	73
199.	109	73	74
200.	110	74	75
201.	111	75	76
202.	112	76	77
203.	113	77	78
204.	114	78	79
205.	115	79	80
206.	116	80	81
207.	117	81	82

208. MEMBER PROPERTY

209. * CORDON INFERIOR

210.	1	PR	AX	0.0500	IZ 0.00151406
211.	2	PR	AX	0.0500	IZ 0.00151406
212.	3	PR	AX	0.0532	IZ 0.00156748
213.	4	PR	AX	0.0532	IZ 0.00156748
214.	5	PR	AX	0.0670	IZ 0.00233098
215.	6	PR	AX	0.0670	IZ 0.00233098
216.	7	PR	AX	0.0750	IZ 0.00271328
217.	8	PR	AX	0.0750	IZ 0.00271328
218.	9	PR	AX	0.0900	IZ 0.00380584
219.	10	PR	AX	0.0900	IZ 0.00380584
220.	11	PR	AX	0.1070	IZ 0.00464364
221.	12	PR	AX	0.1070	IZ 0.00464364
222.	13	PR	AX	0.1180	IZ 0.00593306
223.	14	PR	AX	0.1180	IZ 0.00593306
224.	15	PR	AX	0.1410	IZ 0.00804164
225.	16	PR	AX	0.1410	IZ 0.00804164
226.	17	PR	AX	0.1520	IZ 0.00926892
227.	18	PR	AX	0.1520	IZ 0.00926892

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

228. * CORDON SUPERIOR

229.	19	PR	AX	0.0280	IZ 0.00046454
230.	20	PR	AX	0.0280	IZ 0.00046454
231.	21	PR	AX	0.0280	IZ 0.00046454
232.	22	PR	AX	0.0320	IZ 0.00072626
233.	23	PR	AX	0.0320	IZ 0.00072626
234.	24	PR	AX	0.0450	IZ 0.00164273
235.	25	PR	AX	0.0600	IZ 0.00261476
236.	26	PR	AX	0.0720	IZ 0.00316788
237.	27	PR	AX	0.0840	IZ 0.00380920

238. * MONTANTES PRINCIPALES

239.	28	PR	AX	0.0068	IZ 0.00000001
240.	30	PR	AX	0.0082	IZ 0.00000001
241.	32	PR	AX	0.0148	IZ 0.00000001
242.	34	PR	AX	0.0212	IZ 0.00000001
243.	36	PR	AX	0.0298	IZ 0.00000001
244.	38	PR	AX	0.0298	IZ 0.00000001
245.	40	PR	AX	0.0398	IZ 0.00000001
246.	42	PR	AX	0.0498	IZ 0.00000001
247.	44	PR	AX	0.0578	IZ 0.00000001
248.	46	PR	AX	0.0578	IZ 10000.

249. * MONTANTES SECUNDARIOS

250.	29	PR	AX	0.0068	IZ 0.00000001
251.	31	PR	AX	0.0068	IZ 0.00000001
252.	33	PR	AX	0.0068	IZ 0.00000001
253.	35	PR	AX	0.0096	IZ 0.00000001
254.	37	PR	AX	0.0112	IZ 0.00000001
255.	39	PR	AX	0.0128	IZ 0.00000001
256.	41	PR	AX	0.0168	IZ 0.00000001
257.	43	PR	AX	0.0192	IZ 0.00000001
258.	45	PR	AX	0.0298	IZ 0.00000001

259. * DIAGONALES 1

260.	47	PR	AX	0.0068	IZ 0.00001456
261.	48	PR	AX	0.0068	IZ 0.00001456
262.	49	PR	AX	0.0096	IZ 0.00003700
263.	50	PR	AX	0.0096	IZ 0.00003700
264.	51	PR	AX	0.0128	IZ 0.00007640
265.	52	PR	AX	0.0128	IZ 0.00007640
266.	53	PR	AX	0.0212	IZ 0.00025120
267.	54	PR	AX	0.0212	IZ 0.00025120
268.	55	PR	AX	0.0298	IZ 0.00025166
269.	56	PR	AX	0.0298	IZ 0.00025166
270.	57	PR	AX	0.0398	IZ 0.00037183
271.	58	PR	AX	0.0398	IZ 0.00037183
272.	59	PR	AX	0.0498	IZ 0.00050799
273.	60	PR	AX	0.0498	IZ 0.00050799
274.	61	PR	AX	0.0578	IZ 0.00061053
275.	62	PR	AX	0.0578	IZ 0.00061053
276.	63	PR	AX	0.0648	IZ 0.00071462
277.	64	PR	AX	0.0648	IZ 0.00071462

278. * DIAGONALES 2

279.	65	PR	AX	0.0068	IZ 0.00000001
280.	66	PR	AX	0.0068	IZ 0.00000001
281.	67	PR	AX	0.0068	IZ 0.00000001
282.	68	PR	AX	0.0056	IZ 0.00000001
283.	69	PR	AX	0.0056	IZ 0.00000001
284.	70	PR	AX	0.0150	IZ 0.00000001
285.	71	PR	AX	0.0150	IZ 0.00000001
286.	72	PR	AX	0.0193	IZ 0.00000001
287.	73	PR	AX	0.0068	IZ 0.00000001

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288. * SECCION DE HORMIGON
289. 74   TO  77     PR AX 13.4810   IZ 45.3025
290. 78   TO  81     PR AX 13.4810   IZ 45.3025
291. 82   TO  85     PR AX 13.4810   IZ 45.3025
292. 86   TO  89     PR AX 13.4810   IZ 45.3025
293. 90   TO  93     PR AX 13.4810   IZ 45.3025
294. 94   TO  97     PR AX 13.4810   IZ 45.3025
295. 98   TO  101    PR AX 13.4810   IZ 45.3025
296. 102  TO  105    PR AX 13.4810   IZ 45.3025
297. 106  TO  109    PR AX 13.4810   IZ 45.3025
298. 110  TO  113    PR AX  3.3600   IZ  0.1577
299. 114  TO  117    PR AX  3.3600   IZ  0.1577
300. MEMBER RELEASE
301. 29 TO 46 65 TO 73          STA MZ
302. 47 49 51 53 55 57 59 61 63 STA MZ
303. 29 TO 46 65 TO 73          END MZ
304. 48 50 52 54 56 58 60 62 64 END MZ
305. CONSTANT
306. E 21000.      MEMB 1  TO  73
307. E  3250.      MEMB 74 TO  117
308. POI   0.15    MEMB 1  TO  73
309. POI   0.2     MEMB 74 TO  117
310. DEN  10.15    MEMB 1  TO  73
311. DEN   2.5     MEMB 74 TO  117
312. SUPPORT
313. 19 PINNED
314. 60 FIXED BUT FX MZ
315. *64 FIXED BUT FX MZ
316. *69 FIXED BUT FX MZ
317. *70 FIXED BUT FX MZ
318. *71 FIXED BUT FX MZ
319. *72 FIXED BUT FX MZ
320. 73 FIXED BUT FX MZ
321. 74 FIXED BUT FX MZ
322. 75 FIXED BUT FX MZ
323. 76 FIXED BUT FX MZ
324. 77 FIXED BUT FX MZ
325. 78 FIXED BUT FX MZ
326. 79 FIXED BUT FX MZ
327. 80 FIXED BUT FX MZ
328. 81 FIXED BUT FX MZ
329. 82 FIXED BUT FX MZ
330. LOAD 1 PESO PROPIO
331. SELFWEIGHT Y   -1.
332. 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 = 82/ 117/ 12
ORIGINAL/FINAL BAND-WIDTH = 28/ 6
TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 233
SIZE OF STIFFNESS MATRIX = 4893 DOUBLE PREC. WORDS
TOTAL REQUIRED DISK SPACE = 12.25 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX. 7:56:45

++ PROCESSING GLOBAL STIFFNESS MATRIX. 7:56:46
++ PROCESSING TRIANGULAR FACTORIZATION. 7:56:46
++ CALCULATING JOINT DISPLACEMENTS. 7:56:46
++ CALCULATING MEMBER FORCES. 7:56:46

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333. LOAD LIS  1
334. PRINT MEMBER FORCES LIS1 74 TO 117
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MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	692.72	0.00	0.00	0.00	1484.84
		39	0.00	-619.01	0.00	0.00	0.00	-50.45
75	1	39	0.00	619.02	0.00	0.00	0.00	50.43
		40	0.00	-545.28	0.00	0.00	0.00	1223.28
76	1	40	0.00	545.28	0.00	0.00	0.00	-1223.30
		41	0.00	-471.57	0.00	0.00	0.00	2335.19
77	1	41	0.00	471.61	0.00	0.00	0.00	-2335.21
		42	0.00	-397.87	0.00	0.00	0.00	3286.38
78	1	42	0.00	397.85	0.00	0.00	0.00	-3286.32
		43	0.00	-324.15	0.00	0.00	0.00	4075.81
79	1	43	0.00	324.14	0.00	0.00	0.00	-4075.82
		44	0.00	-250.40	0.00	0.00	0.00	4704.28
80	1	44	0.00	250.45	0.00	0.00	0.00	-4704.25
		45	0.00	-176.74	0.00	0.00	0.00	5171.28
81	1	45	0.00	176.64	0.00	0.00	0.00	-5171.38
		46	0.00	-102.89	0.00	0.00	0.00	5477.15
82	1	46	0.00	102.97	0.00	0.00	0.00	-5477.09
		47	0.00	-29.26	0.00	0.00	0.00	5621.79
83	1	47	0.00	29.29	0.00	0.00	0.00	-5621.54
		48	0.00	44.45	0.00	0.00	0.00	5605.06
84	1	48	0.00	-44.63	0.00	0.00	0.00	-5604.93
		49	0.00	118.34	0.00	0.00	0.00	5427.02
85	1	49	0.00	-118.11	0.00	0.00	0.00	-5426.94
		50	0.00	191.85	0.00	0.00	0.00	5087.78
86	1	50	0.00	-192.02	0.00	0.00	0.00	-5087.69
		51	0.00	265.73	0.00	0.00	0.00	4587.20
87	1	51	0.00	-265.69	0.00	0.00	0.00	-4587.19
		52	0.00	339.43	0.00	0.00	0.00	3925.26
88	1	52	0.00	-339.34	0.00	0.00	0.00	-3925.25
		53	0.00	413.04	0.00	0.00	0.00	3102.42
89	1	53	0.00	-413.10	0.00	0.00	0.00	-3102.38
		54	0.00	486.84	0.00	0.00	0.00	2117.81

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-486.79	0.00	0.00	0.00	-2117.72
		55	0.00	560.50	0.00	0.00	0.00	972.54
91	1	55	0.00	-560.56	0.00	0.00	0.00	-972.38
		56	0.00	634.30	0.00	0.00	0.00	-334.70
92	1	56	0.00	-634.36	0.00	0.00	0.00	334.76
		57	0.00	708.06	0.00	0.00	0.00	-1802.59
93	1	57	0.00	-708.01	0.00	0.00	0.00	1802.57
		58	0.00	781.75	0.00	0.00	0.00	-3432.41
94	1	58	0.00	-781.76	0.00	0.00	0.00	3432.39
		59	0.00	855.46	0.00	0.00	0.00	-5222.70
95	1	59	0.00	-855.47	0.00	0.00	0.00	5222.70
		60	0.00	916.58	0.00	0.00	0.00	-6829.06
96	1	60	0.00	719.83	0.00	0.00	0.00	6829.06
		61	0.00	-633.48	0.00	0.00	0.00	-5095.47
97	1	61	0.00	633.48	0.00	0.00	0.00	5095.47
		62	0.00	-559.74	0.00	0.00	0.00	-3790.09
98	1	62	0.00	559.74	0.00	0.00	0.00	3790.10
		63	0.00	-486.04	0.00	0.00	0.00	-2646.52
99	1	63	0.00	486.03	0.00	0.00	0.00	2646.53
		64	0.00	-382.80	0.00	0.00	0.00	-1315.91
100	1	64	0.00	382.82	0.00	0.00	0.00	1315.90
		65	0.00	-338.61	0.00	0.00	0.00	-842.69
101	1	65	0.00	338.59	0.00	0.00	0.00	842.68
		66	0.00	-264.84	0.00	0.00	0.00	-182.52
102	1	66	0.00	264.84	0.00	0.00	0.00	182.52
		67	0.00	-191.13	0.00	0.00	0.00	316.08
103	1	67	0.00	191.14	0.00	0.00	0.00	-316.08
		68	0.00	117.40	0.00	0.00	0.00	653.63
104	1	68	0.00	117.39	0.00	0.00	0.00	-653.62
		69	0.00	-62.63	0.00	0.00	0.00	799.90
105	1	69	0.00	62.63	0.00	0.00	0.00	799.89
		70	0.00	30.05	0.00	0.00	0.00	844.69
106	1	70	0.00	-30.05	0.00	0.00	0.00	-844.69
		71	0.00	103.76	0.00	0.00	0.00	698.36

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	-103.76	0.00	0.00	0.00	-698.36
		72	0.00	177.50	0.00	0.00	0.00	390.66
108	1	72	0.00	-177.50	0.00	0.00	0.00	-390.66
		73	0.00	251.21	0.00	0.00	0.00	-78.13
109	1	73	0.00	71.07	0.00	0.00	0.00	78.13
		74	0.00	2.67	0.00	0.00	0.00	-3.30
110	1	74	0.00	9.19	0.00	0.00	0.00	3.30
		75	0.00	9.18	0.00	0.00	0.00	-3.29
111	1	75	0.00	9.03	0.00	0.00	0.00	3.29
		76	0.00	9.35	0.00	0.00	0.00	-3.64
112	1	76	0.00	9.82	0.00	0.00	0.00	3.64
		77	0.00	8.55	0.00	0.00	0.00	-2.26
113	1	77	0.00	6.10	0.00	0.00	0.00	2.26
		78	0.00	8.08	0.00	0.00	0.00	-3.92
114	1	78	0.00	10.98	0.00	0.00	0.00	3.92
		79	0.00	11.59	0.00	0.00	0.00	-4.74
115	1	79	0.00	10.09	0.00	0.00	0.00	4.74
		80	0.00	8.29	0.00	0.00	0.00	-2.76
116	1	80	0.00	8.46	0.00	0.00	0.00	2.76
		81	0.00	9.91	0.00	0.00	0.00	-4.34
117	1	81	0.00	11.17	0.00	0.00	0.00	4.34
		82	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

335. PRINT JOINT DISPLACEMENT LIST 19 39 TO 82

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.50875
39	1	0.00000	-112.87789	0.00000	0.00000	0.00000	-0.51996
40	1	0.00000	226.01416	0.00000	0.00000	0.00000	-0.51104
41	1	0.00000	-335.16821	0.00000	0.00000	0.00000	-0.48441
42	1	0.00000	-436.82416	0.00000	0.00000	0.00000	-0.44244
43	1	0.00000	-527.79932	0.00000	0.00000	0.00000	-0.38757
44	1	0.00000	-605.60986	0.00000	0.00000	0.00000	-0.32213
45	1	0.00000	-668.14301	0.00000	0.00000	0.00000	-0.24858
46	1	0.00000	-713.93756	0.00000	0.00000	0.00000	-0.16926
47	1	0.00000	-741.95801	0.00000	0.00000	0.00000	-0.08663
48	1	0.00000	-751.76001	0.00000	0.00000	0.00000	-0.00301
49	1	0.00000	-743.38879	0.00000	0.00000	0.00000	0.07912
50	1	0.00000	-717.41559	0.00000	0.00000	0.00000	0.15745
51	1	0.00000	-674.96631	0.00000	0.00000	0.00000	0.22951
52	1	0.00000	-617.62939	0.00000	0.00000	0.00000	0.29296
53	1	0.00000	-547.60779	0.00000	0.00000	0.00000	0.34535
54	1	0.00000	-467.51266	0.00000	0.00000	0.00000	0.38434
55	1	0.00000	-380.61630	0.00000	0.00000	0.00000	0.40749
56	1	0.00000	-290.56311	0.00000	0.00000	0.00000	0.41243
57	1	0.00000	-201.68195	0.00000	0.00000	0.00000	0.39675
58	1	0.00000	-118.66425	0.00000	0.00000	0.00000	0.35806
59	1	0.00000	-46.88039	0.00000	0.00000	0.00000	0.29397
60	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.21989
61	1	0.00000	42.44137	0.00000	0.00000	0.00000	0.11646
62	1	0.00000	60.36748	0.00000	0.00000	0.00000	0.05063
63	1	0.00000	65.92595	0.00000	0.00000	0.00000	0.00303
64	1	0.00000	59.91875	0.00000	0.00000	0.00000	-0.03764
65	1	0.00000	54.30626	0.00000	0.00000	0.00000	-0.04721
66	1	0.00000	42.98543	0.00000	0.00000	0.00000	-0.05463
67	1	0.00000	31.03280	0.00000	0.00000	0.00000	-0.05344
68	1	0.00000	20.05864	0.00000	0.00000	0.00000	-0.04604
69	1	0.00000	13.21445	0.00000	0.00000	0.00000	-0.03793
70	1	0.00000	4.93028	0.00000	0.00000	0.00000	-0.02218
71	1	0.00000	1.39481	0.00000	0.00000	0.00000	-0.01052
72	1	0.00000	0.08415	0.00000	0.00000	0.00000	-0.00223
73	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00030
74	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00011
75	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00012
76	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00036
77	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00135
78	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00226
79	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00155
80	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00014
81	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00098
82	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00407

********** END OF LATEST ANALYSIS RESULT **********

336. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

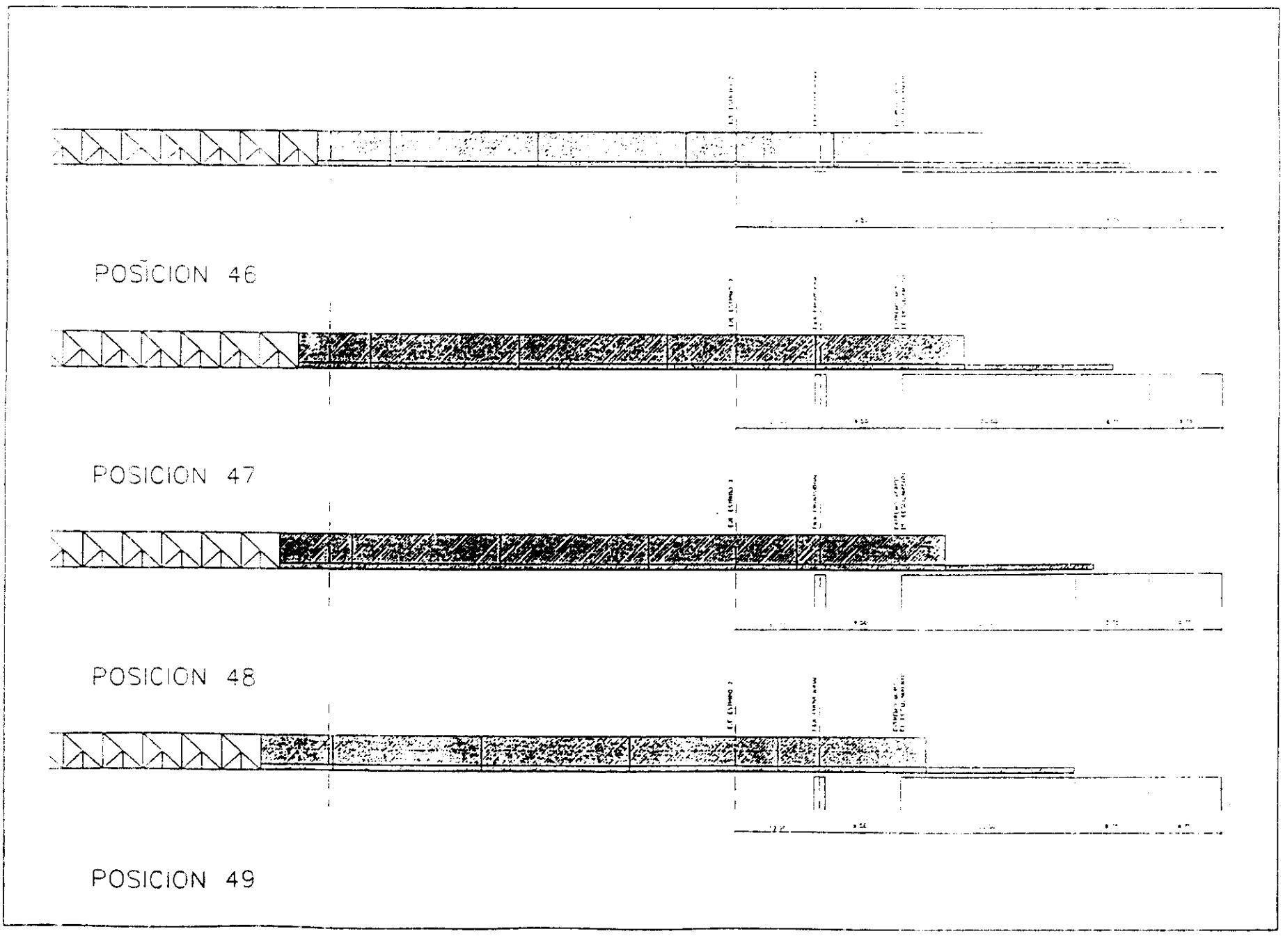
JOINT	LOAD	FORCE-X	FORCE-Y	FORCE Z	MOM-X	MOM-Y	MOM Z
19	1	0.00	789.77	0.00	0.00	0.00	0.00
60	1	0.00	1636.40	0.00	0.00	0.00	0.00
73	1	0.00	322.28	0.00	0.00	0.00	0.00
74	1	0.00	11.86	0.00	0.00	0.00	0.00
75	1	0.00	18.21	0.00	0.00	0.00	0.00
76	1	0.00	19.16	0.00	0.00	0.00	0.00
77	1	0.00	14.66	0.00	0.00	0.00	0.00
78	1	0.00	19.06	0.00	0.00	0.00	0.00
79	1	0.00	21.68	0.00	0.00	0.00	0.00
80	1	0.00	16.75	0.00	0.00	0.00	0.00
81	1	0.00	21.08	0.00	0.00	0.00	0.00
82	1	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

337. PLOT DISPLACEMENT FILE
338. PLOT BENDING FILE
339. FINISH

********** END OF STAAD-III **********
**** DATE= JUL 9,1997 TIME= 7:56:51 ****

****
* 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 *
****


POSICION 46
POSICION 47
POSICION 48
POSICION 49

Posición Lif

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*****************************************
*                                       *
*          S T A A D - III              *
*          Revision 17.0a               *
*          Proprietary Program of       *
*          RESEARCH ENGINEERS, Inc.     *
*          Date=    JUL  9, 1997        *
*          Time=     7:47:39            *
*                                       *
*****************************************
```

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	* 40	46.375	0.000	0.000
45.	40	46.125	0.000	0.000
46.	41	48.562	0.000	0.000
47.	42	50.750	0.000	0.000

48.	43	52.937	0.000	0.000
49.	44	55.125	0.000	0.000
50.	45	57.312	0.000	0.000
51.	46	59.500	0.000	0.000
52.	47	61.687	0.000	0.000
53.	48	63.875	0.000	0.000
54.	49	66.062	0.000	0.000
55.	50	68.250	0.000	0.000
56.	51	70.437	0.000	0.000
57.	52	72.625	0.000	0.000
58.	53	74.812	0.000	0.000
59.	54	77.000	0.000	0.000
60.	55	79.187	0.000	0.000
61.	56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	85.750	0.000	0.000
64.	59	87.937	0.000	0.000
65.	60	90.125	0.000	0.000
66.	61	92.312	0.000	0.000
67.	*62	94.500	0.000	0.000
68.	62	94.125	0.000	0.000
69.	63	96.687	0.000	0.000
70.	64	98.875	0.000	0.000
71.	65	101.062	0.000	0.000
72.	66	103.250	0.000	0.000
73.	*67	105.437	0.000	0.000
74.	67	104.125	0.000	0.000
75.	68	107.625	0.000	0.000
76.	69	109.812	0.000	0.000
77.	70	112.000	0.000	0.000
78.	*71	114.187	0.000	0.000
79.	71	113.625	0.000	0.000
80.	72	116.375	0.000	0.000
81.	73	118.562	0.000	0.000
82.	74	120.750	0.000	0.000
83.	75	122.937	0.000	0.000
84.	76	125.125	0.000	0.000
85.	77	127.312	0.000	0.000
86.	78	129.000	0.000	0.000
87.	79	131.687	0.000	0.000
88.	80	133.875	0.000	0.000
89.	81	136.062	0.000	0.000
90.	82	138.250	0.000	0.000

91. MEMBER INCIDENCES

92.	1	1	2
93.	2	2	3
94.	3	3	4
95.	4	4	5
96.	5	5	6
97.	6	6	7
98.	7	7	8
99.	8	8	9
100.	9	9	10
101.	10	10	11
102.	11	11	12
103.	12	12	13
104.	13	13	14
105.	14	14	15
106.	15	15	16
107.	16	16	17

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	17	17	18
109.	18	18	19
110.	19	29	30
111.	20	30	31
112.	21	31	32
113.	22	32	33
114.	23	33	34
115.	24	34	35
116.	25	35	36
117.	26	36	37
118.	27	37	38
119.	28	1	29
120.	29	2	20
121.	30	3	30
122.	31	4	21
123.	32	5	31
124.	33	6	22
125.	34	7	32
126	35	8	23
127.	36	9	33
128.	37	10	24
129.	38	11	34
130.	39	12	25
131.	40	13	35
132.	41	14	26
133.	42	15	36
134.	43	16	27
135.	44	17	37
136.	45	18	28
137.	46	19	38
138.	47	29	20
139.	48	20	3
140.	49	30	21
141.	50	21	5
142.	51	31	22
143.	52	22	7
144.	53	32	23
145.	54	23	9
146.	55	33	24
147.	56	24	11
148.	57	34	25
149.	58	25	13
150.	59	35	26
151.	60	26	15
152.	61	36	27
153.	62	27	17
154.	63	37	28
155.	64	28	19
156.	65	3	21
157.	66	5	22
158.	67	7	23
159.	68	9	24
160.	69	11	25
161.	70	13	26
162.	71	15	27
163.	72	17	28
164.	73	1	20
165.	74	19	39
166.	75	39	40
167.	76	40	41

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

168.	77	41	42
169.	78	42	43
170.	79	43	44
171.	80	44	45
172.	81	45	46
173.	82	46	47
174.	83	47	48
175.	84	48	49
176.	85	49	50
177.	86	50	51
178.	87	51	52
179.	88	52	53
180.	89	53	54
181	90	54	55
182.	91	55	56
183.	92	56	57
184.	93	57	58
185.	94	58	59
186.	95	59	60
187.	96	60	61
188.	97	61	62
189.	98	62	63
190.	99	63	64
191.	100	64	65
192.	101	65	66
193.	102	66	67
194.	103	67	68
195.	104	68	69
196.	105	69	70
197.	106	70	71
198.	107	71	72
199.	108	72	73
200.	109	73	74
201.	110	74	75
202.	111	75	76
203.	112	76	77
204.	113	77	78
205.	114	78	79
206.	115	79	80
207.	116	80	81
208.	117	81	82

209. MEMBER PROPERTY

210. * CORDON INFERIOR

211.	1	PR	AX	0.0500	IZ 0.00151406
212.	2	PR	AX	0.0500	IZ 0.00151406
213.	3	PR	AX	0.0532	IZ 0.00156748
214.	4	PR	AX	0.0532	IZ 0.00156748
215.	5	PR	AX	0.0670	IZ 0.00233098
216.	6	PR	AX	0.0670	IZ 0.00233098
217.	7	PR	AX	0.0750	IZ 0.00271328
218.	8	PR	AX	0.0750	IZ 0.00271328
219.	9	PR	AX	0.0900	IZ 0.00380584
220.	10	PR	AX	0.0900	IZ 0.00380584
221.	11	PR	AX	0.1070	IZ 0.00464364
222.	12	PR	AX	0.1070	IZ 0.00464364
223.	13	PR	AX	0.1180	IZ 0.00593306
224.	14	PR	AX	0.1180	IZ 0.00593306
225.	15	PR	AX	0.1410	IZ 0.00804164
226.	16	PR	AX	0.1410	IZ 0.00804164
227.	17	PR	AX	0.1520	IZ 0.00926892

```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 18              PR AX  0.1520   IZ 0.00926892
229. * CORDON SUPERIOR
230. 19              PR AX  0.0280   IZ 0.00046454
231. 20              PR AX  0.0280   IZ 0.00046454
232. 21              PR AX  0.0280   IZ 0.00046454
233  22              PR AX  0.0320   IZ 0.00072626
234. 23              PR AX  0.0320   IZ 0.00072626
235. 24              PR AX  0.0450   IZ 0.00164273
236. 25              PR AX  0.0600   IZ 0.00261476
237. 26              PR AX  0.0720   IZ 0.00316788
238. 27              PR AX  0.0840   IZ 0.00380920
239. * MONTANTES PRINCIPALES
240. 28              PR AX  0.0068   IZ 0.00000001
241. 30              PR AX  0.0082   IZ 0.00000001
242. 32              PR AX  0.0148   IZ 0.00000001
243. 34              PR AX  0.0212   IZ 0.00000001
244. 36              PR AX  0.0298   IZ 0.00000001
245. 38              PR AX  0.0298   IZ 0.00000001
246. 40              PR AX  0.0398   IZ 0.00000001
247. 42              PR AX  0.0498   IZ 0.00000001
248. 44              PR AX  0.0578   IZ 0.00000001
249. 46              PR AX  0.0578   IZ 10000.
250. * MONTANTES SECUNDARIOS
251. 29              PR AX  0.0068   IZ 0.00000001
252. 31              PR AX  0.0068   IZ 0.00000001
253. 33              PR AX  0.0068   IZ 0.00000001
254. 35              PR AX  0.0096   IZ 0.00000001
255. 37              PR AX  0.0112   IZ 0.00000001
256. 39              PR AX  0.0128   IZ 0.00000001
257. 41              PR AX  0.0168   IZ 0.00000001
258. 43              PR AX  0.0192   IZ 0.00000001
259. 45              PR AX  0.0298   IZ 0.00000001
260. * DIAGONALES 1
261. 47              PR AX  0.0068   IZ 0.00001456
262. 48              PR AX  0.0068   IZ 0.00001456
263. 49              PR AX  0.0096   IZ 0.00003700
264. 50              PR AX  0.0096   IZ 0.00003700
265. 51              PR AX  0.0128   IZ 0.00007640
266. 52              PR AX  0.0128   IZ 0.00007640
267. 53              PR AX  0.0212   IZ 0.00025120
268. 54              PR AX  0.0212   IZ 0.00025120
269. 55              PR AX  0.0298   IZ 0.00025166
270. 56              PR AX  0.0298   IZ 0.00025166
271. 57              PR AX  0.0398   IZ 0.00037183
272. 58              PR AX  0.0398   IZ 0.00037183
273. 59              PR AX  0.0498   IZ 0.00050799
274. 60              PR AX  0.0498   IZ 0.00050799
275. 61              PR AX  0.0578   IZ 0.00061053
276. 62              PR AX  0.0578   IZ 0.00061053
277. 63              PR AX  0.0648   IZ 0.00071462
278. 64              PR AX  0.0648   IZ 0.00071462
279. * DIAGONALES 2
280. 65              PR AX  0.0068   IZ 0.00000001
281. 66              PR AX  0.0068   IZ 0.00000001
282. 67              PR AX  0.0068   IZ 0.00000001
283. 68              PR AX  0.0056   IZ 0.00000001
284. 69              PR AX  0.0056   IZ 0.00000001
285. 70              PR AX  0.0150   IZ 0.00000001
286. 71              PR AX  0.0150   IZ 0.00000001
287. 72              PR AX  0.0193   IZ 0.00000001
```



```
 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
288. 73              PR AX  0.0068   IZ 0.00000001
289. * SECCION DE HORMIGON
290. 74   TO  77     PR AX 13.4810   IZ 45.3025
291. 78   TO  81     PR AX 13.4810   IZ 45.3025
292. 82   TO  85     PR AX 13.4810   IZ 45.3025
293. 86   TO  89     PR AX 13.4810   IZ 45.3025
294  90   TO  93     PR AX 13.4810   IZ 45.3025
295. 94   TO  97     PR AX 13.4810   IZ 45.3025
296. 98   TO  101    PR AX 13.4810   IZ 45.3025
297. 102  TO  105    PR AX 13.4810   IZ 45.3025
298. 106  TO  109    PR AX 13.4810   IZ 45.3025
299. 110  TO  113    PR AX  3.3600   IZ  0.1577
300. 114  TO  117    PR AX  3.3600   IZ  0.1577
301. MEMBER RELEASE
302. 29 TO 46 65 TO 73          STA MZ
303. 47 49 51 53 55 57 59 61 63 STA MZ
304. 29 TO 46 65 TO 73          END MZ
305  48 50 52 54 56 58 60 62 64 END MZ
306. CONSTANT
307. E 21000.       MEMB 1  TO  73
308. E  3250.       MEMB 74 TO  117
309. POI   0.15     MEMB 1  TO  73
310. POI   0.2      MEMB 74 TO  117
311. DEN  10.15     MEMB 1  TO  73
312. DEN   2.5      MEMB 74 TO  117
313. SUPPORT
314. 40 PINNED
315. 62 FIXED BUT FX MZ
316. *67 FIXED BUT FX MZ
317. *71 FIXED BUT FX MZ
318. *72 FIXED BUT FX MZ
319. *73 FIXED BUT FX MZ
320. 74 FIXED BUT FX MZ
321. 75 FIXED BUT FX MZ
322. 76 FIXED BUT FX MZ
323. 77 FIXED BUT FX MZ
324. 78 FIXED BUT FX MZ
325. 79 FIXED BUT FX MZ
326. 80 FIXED BUT FX MZ
327. 81 FIXED BUT FX MZ
328. 82 FIXED BUT FX MZ
329. LOAD 1 PESO PROPIO
330. SELFWEIGHT Y   -1.
331. 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 = 82/ 117/ 11

ORIGINAL/FINAL BAND-WIDTH = 28/ 6

TOTAL PRIMARY LOAD CASES = 1, TOTAL DEGREES OF FREEDOM = 234

SIZE OF STIFFNESS MATRIX = 4914 DOUBLE PREC. WORDS

TOTAL REQUIRED DISK SPACE = 12.26 MEGA-BYTES

```
++ PROCESSING ELEMENT STIFFNESS MATRIX.          7:47:44
++ PROCESSING GLOBAL STIFFNESS MATRIX.           7:47:45
```

++ PROCESSING TRIANGULAR FACTORIZATION. 7:47:45
++ CALCULATING JOINT DISPLACEMENTS. 7:47:45
++ CALCULATING MEMBER FORCES. 7:47:45

332. LOAD LIS 1
333. PRINT MEMBER FORCES LIST 74 TO 117

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-97.05	0.00	0.00	0.00	1484.81
		39	0.00	170.76	0.00	0.00	0.00	-1777.72
75	1	39	0.00	-170.76	0.00	0.00	0.00	1777.69
		40	0.00	236.07	0.00	0.00	0.00	-2171.91
76	1	40	0.00	716.35	0.00	0.00	0.00	2171.90
		41	0.00	-634.21	0.00	0.00	0.00	-526.23
77	1	41	0.00	634.23	0.00	0.00	0.00	526.25
		42	0.00	-560.48	0.00	0.00	0.00	780.78
78	1	42	0.00	560.46	0.00	0.00	0.00	-780.78
		43	0.00	-486.75	0.00	0.00	0.00	1925.89
79	1	43	0.00	486.71	0.00	0.00	0.00	-1925.96
		44	0.00	-412.97	0.00	0.00	0.00	2910.27
80	1	44	0.00	413.05	0.00	0.00	0.00	-2910.35
		45	0.00	-339.34	0.00	0.00	0.00	3732.97
81	1	45	0.00	339.38	0.00	0.00	0.00	-3732.97
		46	0.00	-265.64	0.00	0.00	0.00	4394.85
82	1	46	0.00	265.58	0.00	0.00	0.00	-4394.79
		47	0.00	-191.87	0.00	0.00	0.00	4894.95
83	1	47	0.00	191.73	0.00	0.00	0.00	-4895.06
		48	0.00	-117.99	0.00	0.00	0.00	5234.05
84	1	48	0.00	118.21	0.00	0.00	0.00	-5234.12
		49	0.00	-44.50	0.00	0.00	0.00	5411.95
85	1	49	0.00	44.28	0.00	0.00	0.00	-5411.99
		50	0.00	29.46	0.00	0.00	0.00	5428.36
86	1	50	0.00	-29.33	0.00	0.00	0.00	-5428.41
		51	0.00	103.04	0.00	0.00	0.00	5283.74
87	1	51	0.00	-103.13	0.00	0.00	0.00	-5283.80
		52	0.00	176.87	0.00	0.00	0.00	4977.49
88	1	52	0.00	-176.80	0.00	0.00	0.00	-4977.54
		53	0.00	250.51	0.00	0.00	0.00	4510.47
89	1	53	0.00	-250.49	0.00	0.00	0.00	-4510.45
		54	0.00	324.23	0.00	0.00	0.00	3881.67

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-324.19	0.00	0.00	0.00	-3881.70
		55	0.00	397.89	0.00	0.00	0.00	3092.04
91	1	55	0.00	397.93	0.00	0.00	0.00	3092.11
		56	0.00	471.68	0.00	0.00	0.00	2140.73
92	1	56	0.00	-471.70	0.00	0.00	0.00	-2140.76
		57	0.00	545.40	0.00	0.00	0.00	1028.58
93	1	57	0.00	-545.38	0.00	0.00	0.00	-1028.64
		58	0.00	619.12	0.00	0.00	0.00	-245.37
94	1	58	0.00	-619.09	0.00	0.00	0.00	245.32
		59	0.00	692.80	0.00	0.00	0.00	-1679.95
95	1	59	0.00	-692.81	0.00	0.00	0.00	1679.95
		60	0.00	766.55	0.00	0.00	0.00	-3276.48
96	1	60	0.00	-766.56	0.00	0.00	0.00	3276.51
		61	0.00	840.27	0.00	0.00	0.00	-5033.54
97	1	61	0.00	-840.27	0.00	0.00	0.00	5033.56
		62	0.00	901.37	0.00	0.00	0.00	-6612.36
98	1	62	0.00	697.46	0.00	0.00	0.00	6612.35
		63	0.00	-611.11	0.00	0.00	0.00	-4936.09
99	1	63	0.00	611.10	0.00	0.00	0.00	4936.08
		64	0.00	-537.36	0.00	0.00	0.00	-3679.66
100	1	64	0.00	537.36	0.00	0.00	0.00	3679.65
		65	0.00	-463.65	0.00	0.00	0.00	-2585.04
101	1	65	0.00	463.66	0.00	0.00	0.00	2585.02
		66	0.00	-389.92	0.00	0.00	0.00	-1651.21
102	1	66	0.00	389.89	0.00	0.00	0.00	1651.22
		67	0.00	-360.40	0.00	0.00	0.00	-1322.92
103	1	67	0.00	360.43	0.00	0.00	0.00	1322.93
		68	0.00	-242.47	0.00	0.00	0.00	-267.85
104	1	68	0.00	242.47	0.00	0.00	0.00	267.86
		69	0.00	-168.77	0.00	0.00	0.00	181.83
105	1	69	0.00	168.76	0.00	0.00	0.00	-181.83
		70	0.00	-95.02	0.00	0.00	0.00	470.42
106	1	70	0.00	95.02	0.00	0.00	0.00	-470.42
		71	0.00	40.25	0.00	0.00	0.00	580.32

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	40.26	0.00	0.00	0.00	-580.33
		72	0.00	52.43	0.00	0.00	0.00	563.59
108	1	72	0.00	52.43	0.00	0.00	0.00	-563.59
		73	0.00	126.13	0.00	0.00	0.00	368.34
109	1	73	0.00	-126.13	0.00	0.00	0.00	-368.34
		74	0.00	199.87	0.00	0.00	0.00	11.69
110	1	74	0.00	0.50	0.00	0.00	0.00	-11.69
		75	0.00	17.87	0.00	0.00	0.00	-7.31
111	1	75	0.00	11.36	0.00	0.00	0.00	7.31
		76	0.00	7.02	0.00	0.00	0.00	-2.55
112	1	76	0.00	9.17	0.00	0.00	0.00	2.55
		77	0.00	9.20	0.00	0.00	0.00	-2.58
113	1	77	0.00	6.33	0.00	0.00	0.00	2.58
		78	0.00	7.84	0.00	0.00	0.00	-3.85
114	1	78	0.00	10.95	0.00	0.00	0.00	3.85
		79	0.00	11.62	0.00	0.00	0.00	-4.76
115	1	79	0.00	10.11	0.00	0.00	0.00	4.76
		80	0.00	8.27	0.00	0.00	0.00	-2.75
116	1	80	0.00	8.46	0.00	0.00	0.00	2.75
		81	0.00	9.91	0.00	0.00	0.00	-4.34
117	1	81	0.00	11.17	0.00	0.00	0.00	4.34
		82	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

334. PRINT JOINT DISPLACEMENT LIST 19 39 TO 82

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00004	178.58789	0.00000	0.00000	0.00000	-0.40960
39	1	0.00002	86.45942	0.00000	0.00000	0.00000	-0.43363
40	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.45949
41	1	0.00000	-115.21754	0.00000	0.00000	0.00000	-0.48154
42	1	0.00000	-220.70418	0.00000	0.00000	0.00000	-0.47945
43	1	0.00000	-323.64984	0.00000	0.00000	0.00000	-0.45915
44	1	0.00000	-420.42502	0.00000	0.00000	0.00000	-0.42301
45	1	0.00000	-507.74347	0.00000	0.00000	0.00000	-0.37347
46	1	0.00000	-583.01013	0.00000	0.00000	0.00000	-0.31288
47	1	0.00000	-644.00647	0.00000	0.00000	0.00000	-0.24369
48	1	0.00000	-689.16150	0.00000	0.00000	0.00000	-0.16822
49	1	0.00000	-717.33240	0.00000	0.00000	0.00000	0.08896
50	1	0.00000	-727.96698	0.00000	0.00000	0.00000	-0.00821
51	1	0.00000	-721.00177	0.00000	0.00000	0.00000	0.07155
52	1	0.00000	-696.90100	0.00000	0.00000	0.00000	0.14799
53	1	0.00000	-656.68115	0.00000	0.00000	0.00000	0.21866
54	1	0.00000	-601.82416	0.00000	0.00000	0.00000	0.28122
55	1	0.00000	-534.42297	0.00000	0.00000	0.00000	0.33321
56	1	0.00000	-456.98331	0.00000	0.00000	0.00000	0.37229
57	1	0.00000	-372.66650	0.00000	0.00000	0.00000	0.39603
58	1	0.00000	-285.01151	0.00000	0.00000	0.00000	0.40205
59	1	0.00000	-198.23691	0.00000	0.00000	0.00000	0.38795
60	1	0.00000	-116.92780	0.00000	0.00000	0.00000	0.35132
61	1	0.00000	-46.34540	0.00000	0.00000	0.00000	0.28980
62	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.21821
63	1	0.00000	42.45341	0.00000	0.00000	0.00000	0.11806
64	1	0.00000	60.96223	0.00000	0.00000	0.00000	0.05424
65	1	0.00000	67.46194	0.00000	0.00000	0.00000	0.00791
66	1	0.00000	65.51807	0.00000	0.00000	0.00000	-0.02337
67	1	0.00000	63.07319	0.00000	0.00000	0.00000	-0.03219
68	1	0.00000	47.90901	0.00000	0.00000	0.00000	-0.05028
69	1	0.00000	36.74276	0.00000	0.00000	0.00000	-0.05072
70	1	0.00000	26.11896	0.00000	0.00000	0.00000	-0.04567
71	1	0.00000	19.15825	0.00000	0.00000	0.00000	-0.03979
72	1	0.00000	9.74550	0.00000	0.00000	0.00000	-0.02871
73	1	0.00000	4.29722	0.00000	0.00000	0.00000	-0.02159
74	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.01857
75	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00506
76	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00168
77	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00166
78	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00236
79	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00157
80	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00015
81	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00098
82	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00407

********** END OF LATEST ANALYSIS RESULT **********

555. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
40	1	0.00	952.42	0.00	0.00	0.00	0.00
62	1	0.00	1598.82	0.00	0.00	0.00	0.00
74	1	0.00	200.37	0.00	0.00	0.00	0.00
75	1	0.00	29.23	0.00	0.00	0.00	0.00
76	1	0.00	16.19	0.00	0.00	0.00	0.00
77	1	0.00	15.53	0.00	0.00	0.00	0.00
78	1	0.00	18.79	0.00	0.00	0.00	0.00
79	1	0.00	21.73	0.00	0.00	0.00	0.00
80	1	0.00	16.73	0.00	0.00	0.00	0.00
81	1	0.00	21.08	0.00	0.00	0.00	0.00
82	1	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

336. PLOT DISPLACEMENT FILE
337. PLOT BENDING FILE
338. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 7:47:49 ****

****
* 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 *
****

Dotación 49

****
* S T A A D - III *
* Revision 17.0a *
* Proprietary Program of *
* RESEARCH ENGINEERS, Inc. *
* Date= JUL 9, 1997 *
* Time= 7:36:25 *
****

1. STAAD PLANE PUENTE SOBRE EL CINCA - PESCANTE PRIMERAS POSICIONES
2. * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
3. UNIT MTO MET
4. JOINT COORDINATES

5.	1	0.000	0.000	0.000
6.	2	2.333	0.000	0.000
7.	3	4.667	0.000	0.000
8.	4	7.000	0.000	0.000
9.	5	9.333	0.000	0.000
10.	6	11.667	0.000	0.000
11.	7	14.000	0.000	0.000
12.	8	16.333	0.000	0.000
13.	9	18.667	0.000	0.000
14.	10	21.000	0.000	0.000
15.	11	23.333	0.000	0.000
16.	12	25.667	0.000	0.000
17.	13	28.000	0.000	0.000
18.	14	30.333	0.000	0.000
19.	15	32.667	0.000	0.000
20.	16	35.000	0.000	0.000
21.	17	37.333	0.000	0.000
22.	18	39.667	0.000	0.000
23.	19	42.000	0.000	0.000
24.	20	2.333	1.063	0.000
25.	21	6.999	1.594	0.000
26.	22	11.666	2.125	0.000
27.	23	16.333	2.125	0.000
28.	24	20.999	2.125	0.000
29.	25	25.666	2.125	0.000
30.	26	30.333	2.125	0.000
31.	27	34.999	2.125	0.000
32.	28	39.666	2.125	0.000
33.	29	0.000	2.125	0.000
34.	30	4.666	3.188	0.000
35.	31	9.333	4.250	0.000
36.	32	14.000	4.250	0.000
37.	33	18.666	4.250	0.000
38.	34	23.333	4.250	0.000
39.	35	28.000	4.250	0.000
40.	36	32.667	4.250	0.000
41.	37	37.333	4.250	0.000
42.	38	42.000	4.250	0.000
43.	39	44.187	0.000	0.000
44.	40	46.375	0.000	0.000
45.	41	48.562	0.000	0.000
46.	*42	50.750	0.000	0.000
47.	42	50.500	0.000	0.000

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

48.	43	52.937	0.000	0.000
49.	44	55.125	0.000	0.000
50.	45	57.312	0.000	0.000
51.	46	59.500	0.000	0.000
52.	47	61.687	0.000	0.000
53.	48	63.875	0.000	0.000
54.	49	66.062	0.000	0.000
55.	50	68.250	0.000	0.000
56.	51	70.437	0.000	0.000
57.	52	72.625	0.000	0.000
58.	53	74.812	0.000	0.000
59.	54	77.000	0.000	0.000
60.	55	79.187	0.000	0.000
61.	56	81.375	0.000	0.000
62.	57	83.562	0.000	0.000
63.	58	85.750	0.000	0.000
64.	59	87.937	0.000	0.000
65.	60	90.125	0.000	0.000
66.	61	92.312	0.000	0.000
67.	62	94.500	0.000	0.000
68.	63	96.687	0.000	0.000
69.	*64	98.875	0.000	0.000
70.	64	98.500	0.000	0.000
71.	65	101.062	0.000	0.000
72.	66	103.250	0.000	0.000
73.	67	105.437	0.000	0.000
74.	68	107.625	0.000	0.000
75.	*69	109.812	0.000	0.000
76.	69	108.500	0.000	0.000
77.	70	112.000	0.000	0.000
78.	71	114.187	0.000	0.000
79.	72	116.375	0.000	0.000
80.	*73	118.562	0.000	0.000
81.	73	118.000	0.000	0.000
82.	74	120.750	0.000	0.000
83.	75	122.937	0.000	0.000
84.	76	125.125	0.000	0.000
85.	77	127.312	0.000	0.000
86.	78	129.000	0.000	0.000
87.	79	131.687	0.000	0.000
88.	80	133.875	0.000	0.000
89.	81	136.062	0.000	0.000
90.	82	138.250	0.000	0.000

91. MEMBER INCIDENCES

92.	1	1	2
93.	2	2	3
94.	3	3	4
95.	4	4	5
96.	5	5	6
97.	6	6	7
98.	7	7	8
99.	8	8	9
100.	9	9	10
101.	10	10	11
102.	11	11	12
103.	12	12	13
104.	13	13	14
105.	14	14	15
106.	15	15	16
107.	16	16	17

* LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON

108.	17	17	18
109.	18	18	19
110.	19	29	30
111.	20	30	31
112.	21	31	32
113.	22	32	33
114.	23	33	34
115.	24	34	35
116.	25	35	36
117.	26	36	37
118.	27	37	38
119.	28	1	29
120.	29	2	20
121.	30	3	30
122.	31	4	21
123.	32	5	31
124.	33	6	22
125.	34	7	32
126.	35	8	23
127.	36	9	33
128.	37	10	24
129.	38	11	34
130.	39	12	25
131.	40	13	35
132.	41	14	26
133.	42	15	36
134.	43	16	27
135.	44	17	37
136.	45	18	28
137.	46	19	38
138.	47	29	20
139.	48	20	3
140.	49	30	21
141.	50	21	5
142.	51	31	22
143.	52	22	7
144.	53	32	23
145.	54	23	9
146.	55	33	24
147.	56	24	11
148.	57	34	25
149.	58	25	13
150.	59	35	26
151.	60	26	15
152.	61	36	27
153.	62	27	17
154.	63	37	28
155.	64	28	19
156.	65	3	21
157.	66	5	22
158.	67	7	23
159.	68	9	24
160.	69	11	25
161.	70	13	26
162.	71	15	27
163.	72	17	28
164.	73	1	20
165.	74	19	39
166.	75	39	40
167.	76	40	41

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 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
168.    77    41    42
169.    78    42    43
170.    79    43    44
171.    80    44    45
172.    81    45    46
173.    82    46    47
174.    83    47    48
175.    84    48    49
176.    85    49    50
177.    86    50    51
178.    87    51    52
179.    88    52    53
180.    89    53    54
181.    90    54    55
182.    91    55    56
183.    92    56    57
184.    93    57    58
185.    94    58    59
186.    95    59    60
187.    96    60    61
188.    97    61    62
189.    98    62    63
190.    99    63    64
191.   100    64    65
192.   101    65    66
193.   102    66    67
194.   103    67    68
195.   104    68    69
196.   105    69    70
197.   106    70    71
198.   107    71    72
199.   108    72    73
200.   109    73    74
201.   110    74    75
202.   111    75    76
203.   112    76    77
204.   113    77    78
205.   114    78    79
206.   115    79    80
207.   116    80    81
208.   117    81    82
209. MEMBER PROPERTY
210. * CORDON INFERIOR
211. 1                PR AX  0.0500   IZ 0.00151406
212. 2                PR AX  0.0500   IZ 0.00151406
213. 3                PR AX  0.0532   IZ 0.00156748
214. 4                PR AX  0.0532   IZ 0.00156748
215. 5                PR AX  0.0670   IZ 0.00233098
216. 6                PR AX  0.0670   IZ 0.00233098
217. 7                PR AX  0.0750   IZ 0.00271328
218. 8                PR AX  0.0750   IZ 0.00271328
219. 9                PR AX  0.0900   IZ 0.00380584
220. 10               PR AX  0.0900   IZ 0.00380584
221. 11               PR AX  0.1070   IZ 0.00464364
222. 12               PR AX  0.1070   IZ 0.00464364
223. 13               PR AX  0.1180   IZ 0.00593306
224. 14               PR AX  0.1180   IZ 0.00593306
225. 15               PR AX  0.1410   IZ 0.00804164
226. 16               PR AX  0.1410   IZ 0.00804164
227. 17               PR AX  0.1520   IZ 0.00926892
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 * LOS DOS CUCHILLOS + SECCION COMPLETA DE HORMIGON
228. 18               PR AX  0.1520   IZ 0.00926892
229. * CORDON SUPERIOR
230. 19               PR AX  0.0280   IZ 0.00046454
231. 20               PR AX  0.0280   IZ 0.00046454
232. 21               PR AX  0.0280   IZ 0.00046454
233. 22               PR AX  0.0320   IZ 0.00072626
234. 23               PR AX  0.0320   IZ 0.00072626
235. 24               PR AX  0.0450   IZ 0.00164273
236. 25               PR AX  0.0600   IZ 0.00261476
237. 26               PR AX  0.0720   IZ 0.00316788
238. 27               PR AX  0.0840   IZ 0.00380920
239. * MONTANTES PRINCIPALES
240. 28               PR AX  0.0068   IZ 0.00000001
241. 30               PR AX  0.0082   IZ 0.00000001
242. 32               PR AX  0.0148   IZ 0.00000001
243. 34               PR AX  0.0212   IZ 0.00000001
244. 36               PR AX  0.0298   IZ 0.00000001
245. 38               PR AX  0.0298   IZ 0.00000001
246. 40               PR AX  0.0398   IZ 0.00000001
247. 42               PR AX  0.0498   IZ 0.00000001
248. 44               PR AX  0.0578   IZ 0.00000001
249. 46               PR AX  0.0578   IZ 10000.
250. * MONTANTES SECUNDARIOS
251. 29               PR AX  0.0068   IZ 0.00000001
252. 31               PR AX  0.0068   IZ 0.00000001
253. 33               PR AX  0.0068   IZ 0.00000001
254. 35               PR AX  0.0096   IZ 0.00000001
255. 37               PR AX  0.0112   IZ 0.00000001
256. 39               PR AX  0.0128   IZ 0.00000001
257. 41               PR AX  0.0168   IZ 0.00000001
258. 43               PR AX  0.0192   IZ 0.00000001
259. 45               PR AX  0.0298   IZ 0.00000001
260. * DIAGONALES 1
261. 47               PR AX  0.0068   IZ 0.00001456
262. 48               PR AX  0.0068   IZ 0.00001456
263. 49               PR AX  0.0096   IZ 0.00003700
264. 50               PR AX  0.0096   IZ 0.00003700
265. 51               PR AX  0.0128   IZ 0.00007640
266. 52               PR AX  0.0128   IZ 0.00007640
267. 53               PR AX  0.0212   IZ 0.00025120
268. 54               PR AX  0.0212   IZ 0.00025120
269. 55               PR AX  0.0298   IZ 0.00025166
270. 56               PR AX  0.0298   IZ 0.00025166
271. 57               PR AX  0.0398   IZ 0.00037183
272. 58               PR AX  0.0398   IZ 0.00037183
273. 59               PR AX  0.0498   IZ 0.00050799
274. 60               PR AX  0.0498   IZ 0.00050799
275. 61               PR AX  0.0578   IZ 0.00061053
276. 62               PR AX  0.0578   IZ 0.00061053
277. 63               PR AX  0.0648   IZ 0.00071462
278. 64               PR AX  0.0648   IZ 0.00071462
279. * DIAGONALES 2
280. 65               PR AX  0.0068   IZ 0.00000001
281. 66               PR AX  0.0068   IZ 0.00000001
282. 67               PR AX  0.0068   IZ 0.00000001
283. 68               PR AX  0.0056   IZ 0.00000001
284. 69               PR AX  0.0056   IZ 0.00000001
285. 70               PR AX  0.0150   IZ 0.00000001
286. 71               PR AX  0.0150   IZ 0.00000001
287. 72               PR AX  0.0193   IZ 0.00000001
```

```
288. 73                PR AX  0.0068   IZ 0.00000001
289. * SECCION DE HORMIGON
290. 74   TO   77      PR AX 13.4810   IZ 45.3025
291. 78   TO   81      PR AX 13.4810   IZ 45.3025
292. 82   TO   85      PR AX 13.4810   IZ 45.3025
293. 86   TO   89      PR AX 13.4810   IZ 45.3025
294. 90   TO   93      PR AX 13.4810   IZ 45.3025
295. 94   TO   97      PR AX 13.4810   IZ 45.3025
296. 98   TO   101     PR AX 13.4810   IZ 45.3025
297. 102  TO   105     PR AX 13.4810   IZ 45.3025
298. 106  TO   109     PR AX 13.4810   IZ 45.3025
299. 110  TO   113     PR AX  3.3600   IZ  0.1577
300. 114  TO   117     PR AX  3.3600   IZ  0.1577
301. MEMBER RELEASE
302. 29 TO 46 65 TO 73           STA MZ
303. 47 49 51 53 55 57 59 61 63 STA MZ
304. 29 TO 46 65 TO 73           END MZ
305. 48 50 52 54 56 58 60 62 64 END MZ
306. CONSTANT
307. E 21000.       MEMB 1  TO  73
308. E  3250.       MEMB 74 TO  117
309. POI   0.15     MEMB 1  TO  73
310. POI   0.2      MEMB 74 TO  117
311. DEN  10.15     MEMB 1  TO  73
312. DEN   2.5      MEMB 74 TO  117
313. SUPPORT
314. 42 PINNED
315. 64 FIXED BUT FX MZ
316. *69 FIXED BUT FX MZ
317. *73 FIXED BUT FX MZ
318. 74 FIXED BUT FX MZ
319. 75 FIXED BUT FX MZ
320. 76 FIXED BUT FX MZ
321. 77 FIXED BUT FX MZ
322. 78 FIXED BUT FX MZ
323. 79 FIXED BUT FX MZ
324. 80 FIXED BUT FX MZ
325. 81 FIXED BUT FX MZ
326. 82 FIXED BUT FX MZ
327. LOAD 1 PESO PROPIO
328. SELFWEIGHT Y   -1.
329. 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 =    82/  117/   11
 ORIGINAL/FINAL BAND-WIDTH =   28/    6
 TOTAL PRIMARY LOAD CASES  =    1  TOTAL DEGREES OF FREEDOM =   234
 SIZE OF STIFFNESS MATRIX =    4914 DOUBLE PREC. WORDS
 TOTAL REQUIRED DISK SPACE =   12.26 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX.              7:36:30
++ PROCESSING GLOBAL STIFFNESS MATRIX.               7:36:30
++ PROCESSING TRIANGULAR FACTORIZATION.              7:36:31
++ CALCULATING JOINT DISPLACEMENTS.                  7:36:31
```



```
++ CALCULATING MEMBER  FORCES.                       7:36:31

330. LOAD LIS  1
331. PRINT MEMBER FORCES LIST 74 TO 117
```

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
74	1	19	0.00	-97.08	0.00	0.00	0.00	1484.79
		39	0.00	170.79	0.00	0.00	0.00	-1777.72
75	1	39	0.00	-170.79	0.00	0.00	0.00	1777.66
		40	0.00	244.53	0.00	0.00	0.00	-2231.98
76	1	40	0.00	-244.49	0.00	0.00	0.00	2231.98
		41	0.00	318.20	0.00	0.00	0.00	-2847.27
77	1	41	0.00	-318.20	0.00	0.00	0.00	2847.29
		42	0.00	383.52	0.00	0.00	0.00	-3527.26
78	1	42	0.00	755.41	0.00	0.00	0.00	3527.26
		43	0.00	-673.27	0.00	0.00	0.00	-1786.41
79	1	43	0.00	673.29	0.00	0.00	0.00	1786.42
		44	0.00	-599.54	0.00	0.00	0.00	-393.97
80	1	44	0.00	599.54	0.00	0.00	0.00	393.99
		45	0.00	-525.83	0.00	0.00	0.00	836.63
81	1	45	0.00	525.83	0.00	0.00	0.00	-836.61
		46	0.00	-452.09	0.00	0.00	0.00	1906.42
82	1	46	0.00	452.07	0.00	0.00	0.00	-1906.45
		47	0.00	-378.36	0.00	0.00	0.00	2814.54
83	1	47	0.00	378.45	0.00	0.00	0.00	-2814.52
		48	0.00	-304.71	0.00	0.00	0.00	3561.85
84	1	48	0.00	304.63	0.00	0.00	0.00	-3561.78
		49	0.00	-230.93	0.00	0.00	0.00	4147.43
85	1	49	0.00	230.84	0.00	0.00	0.00	-4147.47
		50	0.00	-157.10	0.00	0.00	0.00	4571.99
86	1	50	0.00	157.19	0.00	0.00	0.00	-4572.02
		51	0.00	-83.48	0.00	0.00	0.00	4835.14
87	1	51	0.00	83.54	0.00	0.00	0.00	-4835.15
		52	0.00	-9.80	0.00	0.00	0.00	4937.16
88	1	52	0.00	9.82	0.00	0.00	0.00	4937.18
		53	0.00	63.89	0.00	0.00	0.00	4877.87
89	1	53	0.00	-63.89	0.00	0.00	0.00	-4877.77
		54	0.00	137.63	0.00	0.00	0.00	4657.22

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
90	1	54	0.00	-137.73	0.00	0.00	0.00	-4657.17
		55	0.00	211.44	0.00	0.00	0.00	4275.47
91	1	55	0.00	-211.30	0.00	0.00	0.00	-4275.39
		56	0.00	285.04	0.00	0.00	0.00	3732.27
92	1	56	0.00	-285.17	0.00	0.00	0.00	-3732.15
		57	0.00	358.88	0.00	0.00	0.00	3027.91
93	1	57	0.00	358.84	0.00	0.00	0.00	-3027.93
		58	0.00	432.59	0.00	0.00	0.00	2162.00
94	1	58	0.00	-432.59	0.00	0.00	0.00	-2162.03
		59	0.00	506.30	0.00	0.00	0.00	1135.38
95	1	59	0.00	-506.27	0.00	0.00	0.00	-1135.31
		60	0.00	580.01	0.00	0.00	0.00	-53.12
96	1	60	0.00	-580.04	0.00	0.00	0.00	53.13
		61	0.00	653.74	0.00	0.00	0.00	-1402.32
97	1	61	0.00	-653.79	0.00	0.00	0.00	1402.30
		62	0.00	727.53	0.00	0.00	0.00	-2913.46
98	1	62	0.00	-727.50	0.00	0.00	0.00	2913.43
		63	0.00	801.21	0.00	0.00	0.00	-4585.07
99	1	63	0.00	-801.22	0.00	0.00	0.00	4585.07
		64	0.00	862.32	0.00	0.00	0.00	-6093.07
100	1	64	0.00	650.33	0.00	0.00	0.00	6093.06
		65	0.00	-563.99	0.00	0.00	0.00	-4537.51
101	1	65	0.00	563.99	0.00	0.00	0.00	4537.51
		66	0.00	-490.25	0.00	0.00	0.00	-3384.18
102	1	66	0.00	490.25	0.00	0.00	0.00	3384.17
		67	0.00	-416.54	0.00	0.00	0.00	-2392.60
103	1	67	0.00	416.54	0.00	0.00	0.00	2392.60
		68	0.00	-342.80	0.00	0.00	0.00	-1561.87
104	1	68	0.00	342.67	0.00	0.00	0.00	1561.85
		69	0.00	-313.18	0.00	0.00	0.00	-1274.85
105	1	69	0.00	313.31	0.00	0.00	0.00	1274.82
		70	0.00	-195.35	0.00	0.00	0.00	-384.66
106	1	70	0.00	195.35	0.00	0.00	0.00	384.67
		71	0.00	-121.64	0.00	0.00	0.00	-38.03

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTO MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
107	1	71	0.00	121.64	0.00	0.00	0.00	38.05
		72	0.00	-47.90	0.00	0.00	0.00	147.46
108	1	72	0.00	47.91	0.00	0.00	0.00	-147.46
		73	0.00	6.86	0.00	0.00	0.00	180.81
109	1	73	0.00	-6.86	0.00	0.00	0.00	-180.81
		74	0.00	99.54	0.00	0.00	0.00	34.50
110	1	74	0.00	-12.73	0.00	0.00	0.00	-34.50
		75	0.00	31.10	0.00	0.00	0.00	-13.42
111	1	75	0.00	14.91	0.00	0.00	0.00	13.42
		76	0.00	3.47	0.00	0.00	0.00	-0.90
112	1	76	0.00	8.20	0.00	0.00	0.00	0.90
		77	0.00	10.18	0.00	0.00	0.00	-3.07
113	1	77	0.00	6.69	0.00	0.00	0.00	3.07
		78	0.00	7.49	0.00	0.00	0.00	-3.75
114	1	78	0.00	10.90	0.00	0.00	0.00	3.75
		79	0.00	11.67	0.00	0.00	0.00	-4.79
115	1	79	0.00	10.12	0.00	0.00	0.00	4.79
		80	0.00	8.26	0.00	0.00	0.00	-2.74
116	1	80	0.00	8.46	0.00	0.00	0.00	2.74
		81	0.00	9.91	0.00	0.00	0.00	-4.34
117	1	81	0.00	11.17	0.00	0.00	0.00	4.34
		82	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

332. PRINT JOINT DISPLACEMENT LIST 19 39 TO 82

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
19	1	0.00009	224.49149	0.00000	0.00000	0.00000	-0.20745
39	1	0.00007	176.57315	0.00000	0.00000	0.00000	-0.23148
40	1	0.00005	122.81024	0.00000	0.00000	0.00000	-0.26108
41	1	0.00002	61.77610	0.00000	0.00000	0.00000	-0.29860
42	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.34042
43	1	0.00000	-88.86918	0.00000	0.00000	0.00000	-0.38412
44	1	0.00000	-175.04141	0.00000	0.00000	0.00000	-0.40012
45	1	0.00000	-262.49850	0.00000	0.00000	0.00000	-0.39663
46	1	0.00000	-347.31921	0.00000	0.00000	0.00000	-0.37605
47	1	0.00000	-425.95078	0.00000	0.00000	0.00000	-0.34079
48	1	0.00000	-495.51199	0.00000	0.00000	0.00000	-0.29321
49	1	0.00000	-553.51202	0.00000	0.00000	0.00000	-0.23575
50	1	0.00000	-598.09979	0.00000	0.00000	0.00000	-0.17076
51	1	0.00000	-627.85510	0.00000	0.00000	0.00000	-0.10070
52	1	0.00000	-641.94965	0.00000	0.00000	0.00000	-0.02789
53	1	0.00000	-640.03912	0.00000	0.00000	0.00000	0.04521
54	1	0.00000	-622.31458	0.00000	0.00000	0.00000	0.11626
55	1	0.00000	-589.50909	0.00000	0.00000	0.00000	0.18280
56	1	0.00000	-542.83392	0.00000	0.00000	0.00000	0.24250
57	1	0.00000	-484.09656	0.00000	0.00000	0.00000	0.29291
58	1	0.00000	-415.53311	0.00000	0.00000	0.00000	0.33167
59	1	0.00000	-340.01917	0.00000	0.00000	0.00000	0.35636
60	1	0.00000	-260.82376	0.00000	0.00000	0.00000	0.36460
61	1	0.00000	-181.88060	0.00000	0.00000	0.00000	0.35399
62	1	0.00000	-107.50423	0.00000	0.00000	0.00000	0.32212
63	1	0.00000	-42.67149	0.00000	0.00000	0.00000	0.26663
64	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.20100
65	1	0.00000	39.11153	0.00000	0.00000	0.00000	0.10883
66	1	0.00000	56.19363	0.00000	0.00000	0.00000	0.05017
67	1	0.00000	62.22749	0.00000	0.00000	0.00000	0.00747
68	1	0.00000	60.44306	0.00000	0.00000	0.00000	-0.02172
69	1	0.00000	58.16204	0.00000	0.00000	0.00000	-0.03013
70	1	0.00000	43.68901	0.00000	0.00000	0.00000	-0.04904
71	1	0.00000	32.54836	0.00000	0.00000	0.00000	-0.05198
72	1	0.00000	21.23542	0.00000	0.00000	0.00000	-0.05097
73	1	0.00000	13.10195	0.00000	0.00000	0.00000	-0.04907
74	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.04667
75	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.01259
76	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00368
77	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00214
78	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00251
79	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00161
80	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00016
81	1	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00098
82	1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00407

********** END OF LATEST ANALYSIS RESULT **********

333. PRINT SUPPORT REACTIONS ALL

SUPPORT REACTIONS -UNIT MTO MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
42	1	0.00	1138.93	0.00	0.00	0.00	0.00
64	1	0.00	1512.66	0.00	0.00	0.00	0.00
74	1	0.00	86.82	0.00	0.00	0.00	0.00
75	1	0.00	46.01	0.00	0.00	0.00	0.00
76	1	0.00	11.66	0.00	0.00	0.00	0.00
77	1	0.00	16.86	0.00	0.00	0.00	0.00
78	1	0.00	18.39	0.00	0.00	0.00	0.00
79	1	0.00	21.79	0.00	0.00	0.00	0.00
80	1	0.00	16.71	0.00	0.00	0.00	0.00
81	1	0.00	21.09	0.00	0.00	0.00	0.00
82	1	0.00	7.21	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

334. PLOT DISPLACEMENT FILE
335. PLOT BENDING FILE
336. FINISH

********** END OF STAAD-III **********

**** DATE= JUL 9,1997 TIME= 7:36:35 ****

****
* 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 *
****

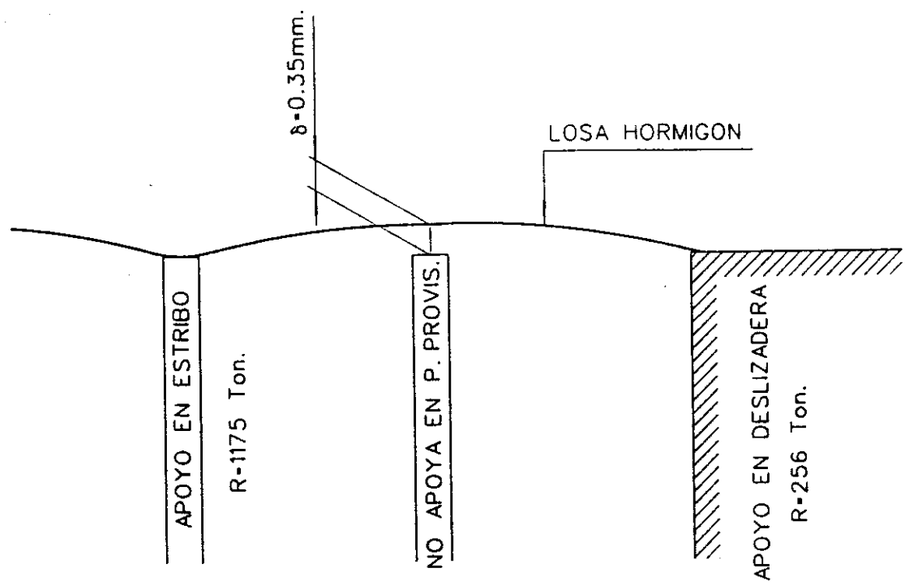
ESTUDIO DE SALIDA DEL TABLERO DURANTE FASE FINAL DEL LANZAMIENTO

COMPORTAMIENTO DEL APOYO SOBRE PILA PROVISIONAL EN LAS ÚLTIMAS FASES DEL EMPUJE DEL TABLERO

25 Septiembre 1997

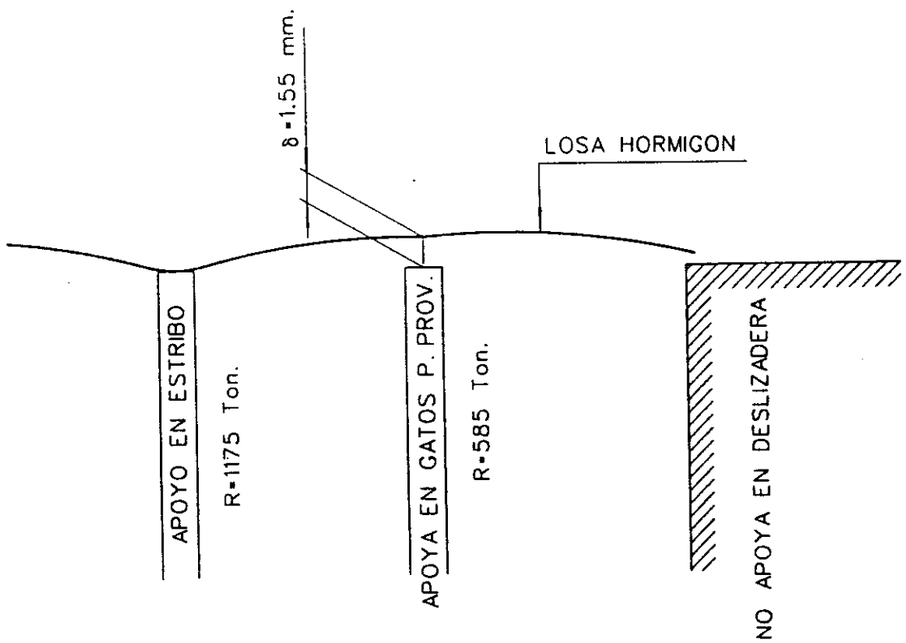
En el presente documento se estudia el paso de la última sección del tablero por el extremo de las deslizaderas y su posible apoyo en la pila provisional.

a) Según el cálculo de ordenador, en la situación límite antes definida, la estructura se encuentra en la posición indicada en el esquema.



b) En esta posición, y mediante dos gatos hidráulicos situados en la pila provisional se levantará el tablero hasta que se despegue el extremo que apoya en la deslizadera.

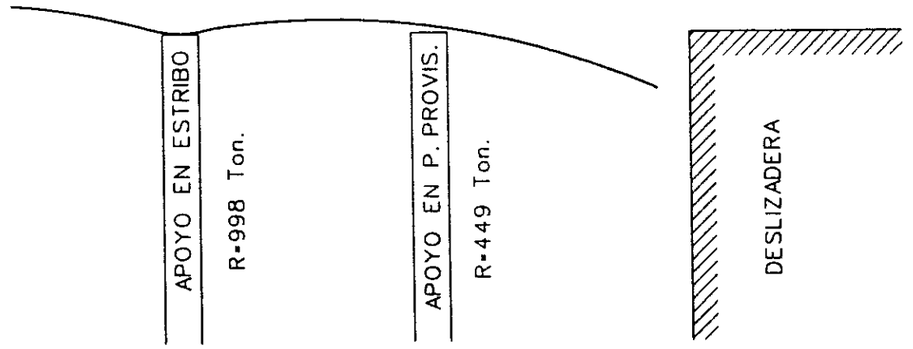
Esto se producirá con una reacción entre los dos gatos de 585 t en total.



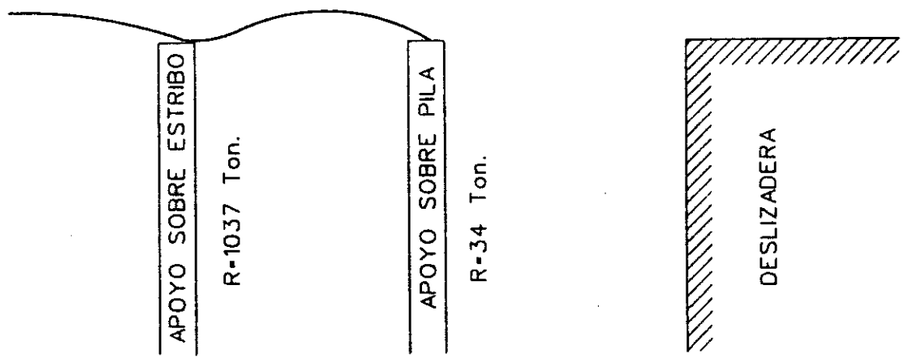
c) Estos gatos, que irán provistos del teflón correspondiente permitirán el deslizamiento del tablero hacia la izquierda hasta liberar la deslizadera.

d) A continuación se bajarán los gatos hasta que el tablero apoye en la pila provisional. En este momento, la reacción sobre los apoyos de la pila provisional sea de 449 t (total entre las dos almas).

El tablero quedará en la posición indicada en el esquema.



e) Cuando la sección extrema del tablero pase por encima de la pila provisional la situación y cargas de apoyo serán las indicadas en el esquema.

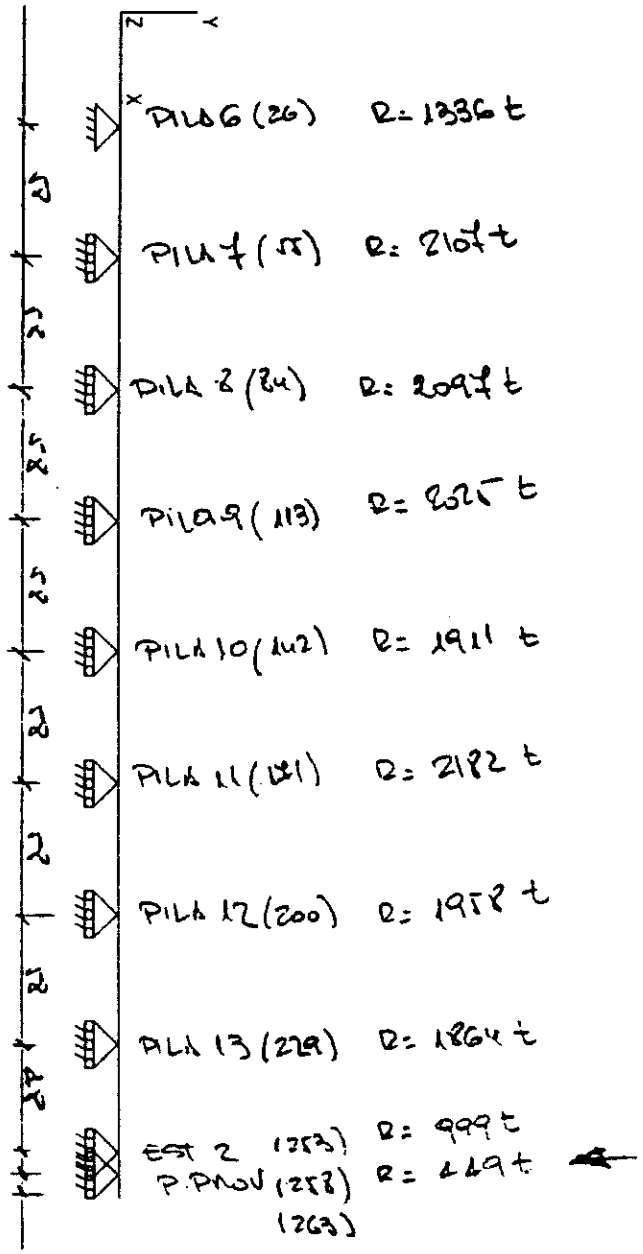


f) En esta posición, empujará el tablero hasta su posición definitiva.

STRUCTURE DATA:

TYPE = PLANE

NJ =	263
NM =	262
NE =	0
NS =	10
NL =	6
XMAX=	524.0
YMAX=	0.0
ZMAX=	0.0



1

PRODUCTO DE PRODUCCIONAL
NO ADOPTA EL DESPLAZADO.

COMPANY: INTECSA

STAADPD - PLOT (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

METE MTON

DATE: SEP 11, 1997

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 **************************************************
 *                                                *
 *          S T A A D - III                       *
 *          Revision 17.0a                        *
 *          Proprietary Program of                *
 *          RESEARCH ENGINEERS, Inc.              *
 *          Date=    SEP 12, 1997                 *
 *          Time=     8:10:35                     *
 *                                                *
 **************************************************

 2. STAAD PLANE PUENTE SOBRE EL CINCA - LANZAMIENTO
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000  0.000  263   524.000  0.000  0.000
 6. MEMBER INCIDENCES
 7.   1    1    2
 8.   R    261  1    1
 9. MEMBER PROPERTY
10.   1  TO  18                        PR   AX  0.318   IZ  0.8709
11.   19 TO  21                        PR   AX  0.432   IZ  1.1844
12.   22 TO  42  51 TO 77   86 TO 112  PR   AX 13.481   IZ 45.3025
13.   43 TO  50  78 TO 85   113 TO 120 PR   AX 15.001   IZ 47.4753
14.  121 TO 147 156 TO 262             PR   AX 13.481   IZ 45.3025
15.  148 TO 155                        PR   AX 15.001   IZ 47.4753
16. CONSTANTS
17. E   21000000.  MEMBER  1 TO  21
18. E    3350000.  MEMBER 22 TO 262
19. DEN  7.85      MEMBER  1 TO  21
20. DEN  2.55      MEMBER 22 TO 262
21. POISSON        0.2  ALL
22. SUPPORTS
23. *POSICION 1
24. *30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
25. *POSICION 2
26. *1 30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
27. *POSICION 3
28. *5 34 63 92 121 150 179 208 237 261 FIXED BUT FX MZ
29. *POSICION 4
30. *9 38 67 96 125 154 183 212 241     FIXED BUT FX MZ
31. *POSICION 5
32. *13 42 71 100 129 158 187 216 245   FIXED BUT FX MZ
33. *POSICION 6
34. *17 46 75 104 133 162 191 220 249   FIXED BUT FX MZ
35. *POSICION 7
36. *21 50 79 108 137 166 195 224 253   FIXED BUT FX MZ
37. *POSICION 8
38. *25 54 83 112 141 170 199 228 257   FIXED BUT FX MZ
39. *POSICION 9
40. *29 58 87 116 145 174 203 232 261   FIXED BUT FX MZ
41. *POSICION 10
42. *33 62 91 120 149 178 207 236 260   FIXED BUT FX MZ
43. *POSICION 11
44. *36 65 94 123 152 181 210 239       FIXED BUT FX MZ
45. *POSICION 12
46. *2 37 66 95 124 153 182 211 240     FIXED BUT FX MZ
47. *POSICION 13
48. *6 41 70 99 128 157 186 215 244     FIXED BUT FX MZ
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49. *POSICION 14
50. *10 45 74 103 132 161 190 219 248   FIXED BUT FX MZ
51. *POSICION 15
52. *14 49 78 107 136 165 194 223 252   FIXED BUT FX MZ
53. *POSICION 16
54. *18 53 82 111 140 169 198 227 256   FIXED BUT FX MZ
55. *POSICION 17
56. *22 57 86 115 144 173 202 231 260   FIXED BUT FX MZ
57. *POSICION 18
58. *26 61 90 119 148 177 206 235 259   FIXED BUT FX MZ
59. *POSICION 19
60. *30 65 94 123 152 181 210 239       FIXED BUT FX MZ
61. *POSICION 20
62. *34 69 98 127 156 185 214 243       FIXED BUT FX MZ
63. *POSICION 21
64. *36 71 100 129 158 187 216 245      FIXED BUT FX MZ
65. *POSICION 22
66. *3 38 73 102 131 160 189 218 247    FIXED BUT FX MZ
67. *POSICION 23
68. *7 42 77 106 135 164 193 222 251    FIXED BUT FX MZ
69. *POSICION 24
70. *11 46 81 110 139 168 197 226 255   FIXED BUT FX MZ
71. *POSICION 25
72. *15 50 85 114 143 172 201 230 259   FIXED BUT FX MZ
73. *POSICION 26
74. *19 54 89 118 147 176 205 234 258   FIXED BUT FX MZ
75. *POSICION 27
76. *23 58 93 122 151 180 209 238 262   FIXED BUT FX MZ
77. *POSICION 28
78. *27 62 97 126 155 184 213 242       FIXED BUT FX MZ
79. *POSICION 29
80. *31 66 101 130 159 188 217 246      FIXED BUT FX MZ
81. *POSICION 30
82. *35 70 105 134 163 192 221 250      FIXED BUT FX MZ
83. *POSICION 31
84. *36 71 106 135 164 193 222 251      FIXED BUT FX MZ
85. *POSICION 32
86. *4 39 74 109 138 167 196 225 254    FIXED BUT FX MZ
87. *POSICION 33
88. *8 43 78 113 142 171 200 229 258    FIXED BUT FX MZ
89. *POSICION 34
90. *12 47 82 117 146 175 204 233 262   FIXED BUT FX MZ
91. *POSICION 35
92. *16 51 86 121 150 179 208 237       FIXED BUT FX MZ
93. *POSICION 36
94. *20 55 90 125 154 183 212 241       FIXED BUT FX MZ
95. *POSICION 37
96. *24 59 94 129 158 187 216 245       FIXED BUT FX MZ
97. *POSICION 38
98. *26 61 96 131 160 189 218 251       FIXED BUT FX MZ
99. *POSICION 39
100. *3 28 63 98 133 162 191 220 249    FIXED BUT FX MZ
101. *POSICION 40
102. *7 32 67 102 137 166 195 224 253   FIXED BUT FX MZ
103. *POSICION 41
104. *11 36 71 106 141 170 199 228 257  FIXED BUT FX MZ
105. *POSICION 42
106. *15 40 75 110 145 174 203 232 261  FIXED BUT FX MZ
107. *POSICION 43
108. *19 44 79 114 149 178 207 236 260  FIXED BUT FX MZ
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*09. *POSICION 44
.10. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
111. *POSICION 45 (IGUAL 44 SIN PESO DE PESCANTE)
112. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
113. *POSICION EXTREMA
114. 26 PINNED
115. 55 84 113 142 171 200 229 253 258 FIXED BUT FX MZ
116. *COMUN A TODAS LAS POSICIONES EXCEPTO EXTREMA
117. *263  PINED
118. LOADING 1 PESO PROPIO
119. SELFWEIGHT   Y   -1
120. LOADING 2 PRETENSADO 1
121. MEMBER LOAD
122. *CABLE CONTINUO SUPERIOR EXC +1.697
123. 22     CON  GX  2880   0.000
124. 22     CMOM GZ -4887   0.000
125. 262    CON  GX -2880   2.000
126. 262    CMOM GZ  4887   2.000
127. 22     CON  GX  1680   0.000
128. 22     CMOM GZ -2850   0.000
 29. 185    CON  GX  -560   1.666
130. 185    CMOM GZ   950   1.666
131. 195    CON  GX  -560   1.000
132. 195    CMOM GZ   950   1.000
133. 202    CON  GX  -560   0.334
134. 202    CMOM GZ   950   0.334
135. 22     CON  GX  1200   0.000
136. 22     CMOM GZ -2036   0.000
137. 86     CON  GX  -400   0.750
138. 86     CMOM GZ   679   0.750
139. 95     CON  GX  -400   0.250
140. 95     CMOM GZ   679   0.250
141. 103    CON  GX  -400   1.750
142. 103    CMOM GZ   678   1.750
143. *CABLE CONTINUO INFERIOR  EXC -2.786
144. 22     CON  GX  1440   0.000
145. 22     CMOM GZ  4012   0.000
146. 262    CON  GX -1440   2.000
147. 262    CMOM GZ -4012   2.000
 48. 22     CON  GX   840   0.000
149. 22     CMOM GZ  2340   0.000
150. 185    CON  GX  -280   1.666
151. 185    CMOM GZ  -780   1.666
152. 195    CON  GX  -280   1.000
153. 195    CMOM GZ  -780   1.000
154. 202    CON  GX  -280   0.334
155. 202    CMOM GZ  -780   0.334
156. 22     CON  GX   600   0.000
157. 22     CMOM GZ  1671   0.000
158. 147    CON  GX  -200   1.250
159. 147    CMOM GZ  -557   1.250
160. 156    CON  GX  -200   1.666
161. 156    CMOM GZ  -557   1.666
162. 166    CON  GX  -200   1.000
163. 166    CMOM GZ  -557   1.000
164. *CABLE CONTINUO CENTRAL  EXC -0.500
165. 22     CON  GX  1920   0.000
166. 22     CMOM GZ   960   0.000
167. 214    CON  GX   960   1.666
168. 214    CMOM GZ   480   1.666
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169. 262    CON  GX -2880   2.000
 70. 262    CMOM GZ -1440   2.000
171. LOADING 3 CABLES SOMBRERO  E 1.697
172. MEMBER LOAD
173. 42     CON  GX  1140   1.250
174. 42     CMOM GZ -1933   1.250
175. 51     CON  GX -1140   0.750
176. 51     CMOM GZ  1933   0.750
177. 77     CON  GX  3420   1.250
178. 77     CMOM GZ -5804   1.250
179. 86     CON  GX -3420   0.750
180. 86     CMOM GZ  5804   0.750
181. 112    CON  GX  3420   1.250
182. 112    CMOM GZ -5804   1.250
183. 121    CON  GX -3420   0.750
184. 121    CMOM GZ  5804   0.750
185. 147    CON  GX  2658   1.250
186. 147    CMOM GZ -4510   1.250
187. 156    CON  GX -2658   1.666
188. 156    CMOM GZ  4510   1.666
 89. 176    CON  GX  1520   0.333
190. 176    CMOM GZ -2579   0.333
191. 185    CON  GX -1520   1.666
192. 185    CMOM GZ  2579   1.666
193. 205    CON  GX  1520   0.333
194. 205    CMOM GZ -2579   0.333
195. 214    CON  GX -1520   1.666
196. 214    CMOM GZ  2579   1.666
197. 234    CON  GX  1140   0.333
198. 234    CMOM GZ -1934   0.333
199. 243    CON  GX -1140   1.666
200. 243    CMOM GZ  1934   1.666
201. LOADING 4 CABLES DE VANO E -2.786
202. MEMBER LOAD
203. 22     CON  GX  1900   0.000
204. 22     CMOM GZ  5293   0.000
205. 42     CON  GX -1900   1.250
206. 42     CMOM GZ -5293   1.250
207. 51     CON  GX  1900   0.750
 08. 51     CMOM GZ  5293   0.750
209. 77     CON  GX -1900   1.250
210. 77     CMOM GZ -5293   1.250
211. 86     CON  GX  2280   0.750
212. 86     CMOM GZ  6352   0.750
213. 112    CON  GX -2280   1.250
214. 112    CMOM GZ -6352   1.250
215. 121    CON  GX  2660   0.750
216. 121    CMOM GZ  7410   0.750
217. 147    CON  GX -2660   1.250
218. 147    CMOM GZ -7410   1.250
219. 156    CON  GX  1140   1.666
220. 156    CMOM GZ  3176   1.666
221. 176    CON  GX -1140   0.333
222. 176    CMOM GZ -3176   0.333
223. 185    CON  GX  1900   1.666
224. 185    CMOM GZ  5293   1.666
225. 205    CON  GX -1900   0.333
 26. 205    CMOM GZ -5293   0.333
 27. 214    CON  GX  1900   1.666
228. 214    CMOM GZ  5293   1.666
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729. 234    CON  GX -1900   0.333
730. 234    CMOM GZ -5293   0.333
231. 243    CON  GX  1140   1.666
232. 243    CMOM GZ  3176   1.666
233. 262    CON  GX -1140   2.000
234. 262    CMOM GZ -3176   2.000
235. LOADING COMBINATION 5
236. 2  1.0   3  1.0   4  1.0
237. LOADING COMBINATION 6
238. 1  1.0   2  0.96  3  0.96   4  0.96
239. PERFORM ANALISIS

      P R O B L E M   S T A T I S T I C S
      -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =   263/  262/   10
  ORIGINAL/FINAL BAND-WIDTH =    1/    1
  TOTAL PRIMARY LOAD CASES  =    4, TOTAL DEGREES OF FREEDOM =   778
  SIZE OF STIFFNESS MATRIX =    4668 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.53 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              8:10:40
++ PROCESSING GLOBAL STIFFNESS MATRIX.               8:10:40
++ PROCESSING TRIANGULAR FACTORIZATION.              8:10:41
++ CALCULATING JOINT DISPLACEMENTS.                  8:10:41
++ CALCULATING MEMBER  FORCES.                       8:10:42

240. PRINT JOINT COORDINATES
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JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
1	0.000	0.000	0.000
2	2.000	0.000	0.000
3	4.000	0.000	0.000
4	6.000	0.000	0.000
5	8.000	0.000	0.000
6	10.000	0.000	0.000
7	12.000	0.000	0.000
8	14.000	0.000	0.000
9	16.000	0.000	0.000
10	18.000	0.000	0.000
11	20.000	0.000	0.000
12	22.000	0.000	0.000
13	24.000	0.000	0.000
14	26.000	0.000	0.000
15	28.000	0.000	0.000
16	30.000	0.000	0.000
17	32.000	0.000	0.000
18	34.000	0.000	0.000
19	36.000	0.000	0.000
20	38.000	0.000	0.000
21	40.000	0.000	0.000
22	42.000	0.000	0.000
23	44.000	0.000	0.000
24	46.000	0.000	0.000
25	48.000	0.000	0.000
26	50.000	0.000	0.000
27	52.000	0.000	0.000
28	54.000	0.000	0.000
29	56.000	0.000	0.000
30	58.000	0.000	0.000
31	60.000	0.000	0.000
32	62.000	0.000	0.000
33	64.000	0.000	0.000
34	66.000	0.000	0.000
35	68.000	0.000	0.000
36	70.000	0.000	0.000
37	72.000	0.000	0.000
38	74.000	0.000	0.000
39	76.000	0.000	0.000
40	78.000	0.000	0.000
41	80.000	0.000	0.000
42	82.000	0.000	0.000
43	84.000	0.000	0.000
44	86.000	0.000	0.000
45	88.000	0.000	0.000
46	90.000	0.000	0.000
47	92.000	0.000	0.000
48	94.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
49	96.000	0.000	0.000
50	98.000	0.000	0.000
51	100.000	0.000	0.000
52	102.000	0.000	0.000
53	104.000	0.000	0.000
54	106.000	0.000	0.000
55	108.000	0.000	0.000
56	110.000	0.000	0.000
57	112.000	0.000	0.000
58	114.000	0.000	0.000
59	116.000	0.000	0.000
60	118.000	0.000	0.000
61	120.000	0.000	0.000
62	122.000	0.000	0.000
63	124.000	0.000	0.000
64	126.000	0.000	0.000
65	128.000	0.000	0.000
66	130.000	0.000	0.000
67	132.000	0.000	0.000
68	134.000	0.000	0.000
69	136.000	0.000	0.000
70	138.000	0.000	0.000
71	140.000	0.000	0.000
72	142.000	0.000	0.000
73	144.000	0.000	0.000
74	146.000	0.000	0.000
75	148.000	0.000	0.000
76	150.000	0.000	0.000
77	152.000	0.000	0.000
78	154.000	0.000	0.000
79	156.000	0.000	0.000
80	158.000	0.000	0.000
81	160.000	0.000	0.000
82	162.000	0.000	0.000
83	164.000	0.000	0.000
84	166.000	0.000	0.000
85	168.000	0.000	0.000
86	170.000	0.000	0.000
87	172.000	0.000	0.000
88	174.000	0.000	0.000
89	176.000	0.000	0.000
90	178.000	0.000	0.000
91	180.000	0.000	0.000
92	182.000	0.000	0.000
93	184.000	0.000	0.000
94	186.000	0.000	0.000
95	188.000	0.000	0.000
96	190.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
97	192.000	0.000	0.000
98	194.000	0.000	0.000
99	196.000	0.000	0.000
100	198.000	0.000	0.000
101	200.000	0.000	0.000
102	202.000	0.000	0.000
103	204.000	0.000	0.000
104	206.000	0.000	0.000
105	208.000	0.000	0.000
106	210.000	0.000	0.000
107	212.000	0.000	0.000
108	214.000	0.000	0.000
109	216.000	0.000	0.000
110	218.000	0.000	0.000
111	220.000	0.000	0.000
112	222.000	0.000	0.000
113	224.000	0.000	0.000
114	226.000	0.000	0.000
115	228.000	0.000	0.000
116	230.000	0.000	0.000
117	232.000	0.000	0.000
118	234.000	0.000	0.000
119	236.000	0.000	0.000
120	238.000	0.000	0.000
121	240.000	0.000	0.000
122	242.000	0.000	0.000
123	244.000	0.000	0.000
124	246.000	0.000	0.000
125	248.000	0.000	0.000
126	250.000	0.000	0.000
127	252.000	0.000	0.000
128	254.000	0.000	0.000
129	256.000	0.000	0.000
130	258.000	0.000	0.000
131	260.000	0.000	0.000
132	262.000	0.000	0.000
133	264.000	0.000	0.000
134	266.000	0.000	0.000
135	268.000	0.000	0.000
136	270.000	0.000	0.000
137	272.000	0.000	0.000
138	274.000	0.000	0.000
139	276.000	0.000	0.000
140	278.000	0.000	0.000
141	280.000	0.000	0.000
142	282.000	0.000	0.000
143	284.000	0.000	0.000
144	286.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
145	288.000	0.000	0.000
146	290.000	0.000	0.000
147	292.000	0.000	0.000
148	294.000	0.000	0.000
149	296.000	0.000	0.000
150	298.000	0.000	0.000
151	300.000	0.000	0.000
152	302.000	0.000	0.000
153	304.000	0.000	0.000
154	306.000	0.000	0.000
155	308.000	0.000	0.000
156	310.000	0.000	0.000
157	312.000	0.000	0.000
158	314.000	0.000	0.000
159	316.000	0.000	0.000
160	318.000	0.000	0.000
161	320.000	0.000	0.000
162	322.000	0.000	0.000
163	324.000	0.000	0.000
164	326.000	0.000	0.000
165	328.000	0.000	0.000
166	330.000	0.000	0.000
167	332.000	0.000	0.000
168	334.000	0.000	0.000
169	336.000	0.000	0.000
170	338.000	0.000	0.000
171	340.000	0.000	0.000
172	342.000	0.000	0.000
173	344.000	0.000	0.000
174	346.000	0.000	0.000
175	348.000	0.000	0.000
176	350.000	0.000	0.000
177	352.000	0.000	0.000
178	354.000	0.000	0.000
179	356.000	0.000	0.000
180	358.000	0.000	0.000
181	360.000	0.000	0.000
182	362.000	0.000	0.000
183	364.000	0.000	0.000
184	366.000	0.000	0.000
185	368.000	0.000	0.000
186	370.000	0.000	0.000
187	372.000	0.000	0.000
188	374.000	0.000	0.000
189	376.000	0.000	0.000
190	378.000	0.000	0.000
191	380.000	0.000	0.000
192	382.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
193	384.000	0.000	0.000
194	386.000	0.000	0.000
195	388.000	0.000	0.000
196	390.000	0.000	0.000
197	392.000	0.000	0.000
198	394.000	0.000	0.000
199	396.000	0.000	0.000
200	398.000	0.000	0.000
201	400.000	0.000	0.000
202	402.000	0.000	0.000
203	404.000	0.000	0.000
204	406.000	0.000	0.000
205	408.000	0.000	0.000
206	410.000	0.000	0.000
207	412.000	0.000	0.000
208	414.000	0.000	0.000
209	416.000	0.000	0.000
210	418.000	0.000	0.000
211	420.000	0.000	0.000
212	422.000	0.000	0.000
213	424.000	0.000	0.000
214	426.000	0.000	0.000
215	428.000	0.000	0.000
216	430.000	0.000	0.000
217	432.000	0.000	0.000
218	434.000	0.000	0.000
219	436.000	0.000	0.000
220	438.000	0.000	0.000
221	440.000	0.000	0.000
222	442.000	0.000	0.000
223	444.000	0.000	0.000
224	446.000	0.000	0.000
225	448.000	0.000	0.000
226	450.000	0.000	0.000
227	452.000	0.000	0.000
228	454.000	0.000	0.000
229	456.000	0.000	0.000
230	458.000	0.000	0.000
231	460.000	0.000	0.000
232	462.000	0.000	0.000
233	464.000	0.000	0.000
234	466.000	0.000	0.000
235	468.000	0.000	0.000
236	470.000	0.000	0.000
237	472.000	0.000	0.000
238	474.000	0.000	0.000
239	476.000	0.000	0.000
240	478.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
241	480.000	0.000	0.000
242	482.000	0.000	0.000
243	484.000	0.000	0.000
244	486.000	0.000	0.000
245	488.000	0.000	0.000
246	490.000	0.000	0.000
247	492.000	0.000	0.000
248	494.000	0.000	0.000
249	496.000	0.000	0.000
250	498.000	0.000	0.000
251	500.000	0.000	0.000
252	502.000	0.000	0.000
253	504.000	0.000	0.000
254	506.000	0.000	0.000
255	508.000	0.000	0.000
256	510.000	0.000	0.000
257	512.000	0.000	0.000
258	514.000	0.000	0.000
259	516.000	0.000	0.000
260	518.000	0.000	0.000
261	520.000	0.000	0.000
262	522.000	0.000	0.000
263	524.000	0.000	0.000

********** END OF DATA FROM INTERNAL STORAGE **********

241. LOAD LIST 6
242. *PRINT MEMBER FORCES ALL
243. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	6	0.18540	-5.10491	0.00000	0.00000	0.00000	0.00163
2	6	0.18540	-4.77806	0.00000	0.00000	0.00000	0.00163
3	6	0.18540	-4.45133	0.00000	0.00000	0.00000	0.00163
4	6	0.18540	-4.12506	0.00000	0.00000	0.00000	0.00163
5	6	0.18540	-3.79978	0.00000	0.00000	0.00000	0.00162
6	6	0.18540	-3.47628	0.00000	0.00000	0.00000	0.00161
7	6	0.18540	-3.15552	0.00000	0.00000	0.00000	0.00160
8	6	0.18540	-2.83871	0.00000	0.00000	0.00000	0.00157
9	6	0.18540	-2.52727	0.00000	0.00000	0.00000	0.00154
10	6	0.18540	-2.22284	0.00000	0.00000	0.00000	0.00150
11	6	0.18540	-1.92727	0.00000	0.00000	0.00000	0.00145
12	6	0.18540	-1.64263	0.00000	0.00000	0.00000	0.00139
13	6	0.18540	-1.37123	0.00000	0.00000	0.00000	0.00132
14	6	0.18540	-1.11557	0.00000	0.00000	0.00000	0.00123
15	6	0.18540	-0.87838	0.00000	0.00000	0.00000	0.00113
16	6	0.18540	-0.66261	0.00000	0.00000	0.00000	0.00102
17	6	0.18540	-0.47143	0.00000	0.00000	0.00000	0.00089
18	6	0.18540	-0.30822	0.00000	0.00000	0.00000	0.00074
19	6	0.18540	-0.17659	0.00000	0.00000	0.00000	0.00057
20	6	0.18540	-0.07549	0.00000	0.00000	0.00000	0.00044
21	6	0.18540	-0.00343	0.00000	0.00000	0.00000	0.00028
22	6	0.18540	0.03638	0.00000	0.00000	0.00000	0.00011
23	6	0.15892	0.05448	0.00000	0.00000	0.00000	0.00005
24	6	0.10595	0.05597	0.00000	0.00000	0.00000	-0.00004
25	6	0.05297	0.03831	0.00000	0.00000	0.00000	-0.00014
26	6	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00025
27	6	-0.05297	-0.05963	0.00000	0.00000	0.00000	-0.00035
28	6	-0.10595	-0.13691	0.00000	0.00000	0.00000	-0.00042
29	6	-0.15892	-0.22740	0.00000	0.00000	0.00000	-0.00048
30	6	-0.21189	-0.32697	0.00000	0.00000	0.00000	-0.00051
31	6	-0.26486	-0.43188	0.00000	0.00000	0.00000	-0.00053
32	6	-0.31784	-0.53876	0.00000	0.00000	0.00000	-0.00053
33	6	-0.37081	-0.64459	0.00000	0.00000	0.00000	-0.00052
34	6	-0.42378	-0.74671	0.00000	0.00000	0.00000	-0.00050
35	6	-0.47675	-0.84282	0.00000	0.00000	0.00000	-0.00046
36	6	-0.52973	-0.93100	0.00000	0.00000	0.00000	-0.00042
37	6	-0.58270	-1.00968	0.00000	0.00000	0.00000	-0.00037
38	6	-0.63567	-1.07765	0.00000	0.00000	0.00000	-0.00031
39	6	-0.68864	-1.13407	0.00000	0.00000	0.00000	-0.00025
40	6	-0.74162	-1.17845	0.00000	0.00000	0.00000	-0.00019
41	6	-0.79459	-1.21068	0.00000	0.00000	0.00000	-0.00013
42	6	-0.84756	-1.23100	0.00000	0.00000	0.00000	-0.00007
43	6	-0.89932	-1.23873	0.00000	0.00000	0.00000	0.00002
44	6	-0.94402	-1.22206	0.00000	0.00000	0.00000	0.00015
45	6	-0.98873	-1.17937	0.00000	0.00000	0.00000	0.00028
46	6	-1.03343	-1.11234	0.00000	0.00000	0.00000	0.00039
47	6	-1.07813	-1.02302	0.00000	0.00000	0.00000	0.00050
48	6	-1.12283	-0.91387	0.00000	0.00000	0.00000	0.00059

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
49	6	-1.16753	-0.78770	0.00000	0.00000	0.00000	0.00067
50	6	-1.21223	-0.64774	0.00000	0.00000	0.00000	0.00073
51	6	-1.25693	-0.49758	0.00000	0.00000	0.00000	0.00077
52	6	-1.30869	-0.34465	0.00000	0.00000	0.00000	0.00073
53	6	-1.36167	-0.20677	0.00000	0.00000	0.00000	0.00064
54	6	-1.41464	-0.09012	0.00000	0.00000	0.00000	0.00052
55	6	-1.46761	0.00000	0.00000	0.00000	0.00000	0.00038
56	6	-1.52059	0.05980	0.00000	0.00000	0.00000	0.00023
57	6	-1.57356	0.09254	0.00000	0.00000	0.00000	0.00010
58	6	-1.62653	0.10294	0.00000	0.00000	0.00000	0.00000
59	6	-1.67950	0.09538	0.00000	0.00000	0.00000	-0.00008
60	6	-1.73248	0.07388	0.00000	0.00000	0.00000	-0.00014
61	6	-1.78545	0.04208	0.00000	0.00000	0.00000	-0.00018
62	6	-1.83842	0.00327	0.00000	0.00000	0.00000	-0.00021
63	6	-1.89139	-0.03963	0.00000	0.00000	0.00000	-0.00022
64	6	-1.94437	-0.08406	0.00000	0.00000	0.00000	-0.00022
65	6	-1.99734	-0.12781	0.00000	0.00000	0.00000	-0.00021
66	6	-2.05031	-0.16905	0.00000	0.00000	0.00000	-0.00020
67	6	-2.10328	-0.20630	0.00000	0.00000	0.00000	-0.00017
68	6	-2.15626	-0.23845	0.00000	0.00000	0.00000	-0.00015
69	6	-2.20923	-0.26476	0.00000	0.00000	0.00000	-0.00012
70	6	-2.26220	-0.28483	0.00000	0.00000	0.00000	-0.00008
71	6	-2.31517	-0.29864	0.00000	0.00000	0.00000	-0.00005
72	6	-2.36815	-0.30652	0.00000	0.00000	0.00000	-0.00003
73	6	-2.42112	-0.30918	0.00000	0.00000	0.00000	0.00000
74	6	-2.47409	-0.30768	0.00000	0.00000	0.00000	0.00002
75	6	-2.52706	-0.30345	0.00000	0.00000	0.00000	0.00003
76	6	-2.58004	-0.29826	0.00000	0.00000	0.00000	0.00002
77	6	-2.63301	-0.29428	0.00000	0.00000	0.00000	0.00001
78	6	-2.68841	-0.29203	0.00000	0.00000	0.00000	0.00004
79	6	-2.74182	-0.27424	0.00000	0.00000	0.00000	0.00014
80	6	-2.79523	-0.23906	0.00000	0.00000	0.00000	0.00021
81	6	-2.84864	-0.18998	0.00000	0.00000	0.00000	0.00027
82	6	-2.90206	-0.13087	0.00000	0.00000	0.00000	0.00031
83	6	-2.95547	-0.06599	0.00000	0.00000	0.00000	0.00033
84	6	-3.00888	0.00000	0.00000	0.00000	0.00000	0.00032
85	6	-3.06229	0.06383	0.00000	0.00000	0.00000	0.00032
86	6	-3.11571	0.12888	0.00000	0.00000	0.00000	0.00034
87	6	-3.17105	0.19371	0.00000	0.00000	0.00000	0.00028
88	6	-3.22394	0.23919	0.00000	0.00000	0.00000	0.00018
89	6	-3.27682	0.26726	0.00000	0.00000	0.00000	0.00010
90	6	-3.32971	0.28177	0.00000	0.00000	0.00000	0.00004
91	6	-3.38260	0.28623	0.00000	0.00000	0.00000	0.00000
92	6	-3.43549	0.28378	0.00000	0.00000	0.00000	-0.00002
93	6	-3.48837	0.27719	0.00000	0.00000	0.00000	-0.00004
94	6	-3.54126	0.26889	0.00000	0.00000	0.00000	-0.00004
95	6	-3.59415	0.26091	0.00000	0.00000	0.00000	-0.00004
96	6	-3.64555	0.25430	0.00000	0.00000	0.00000	-0.00003

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
97	6	-3.69[illegible]	0.24933	0.00000	0.00000	0.00000	-0.00002
98	6	-3.74792	.24695	0.00000	0.00000	0.00000	0.00000
99	6	-3.79911	0.[illegible]777	0.00000	0.00000	0.00000	0.00001
100	6	-3.85030	0.25[illegible]2	0.00000	0.00000	0.00000	0.00003
101	6	-3.90148	0.25958	0.00000	0.00000	0.00000	0.00005
102	6	-3.95267	0.26997	0.00000	0.00000	0.00000	0.00006
103	6	-4.00386	0.28234	0.00000	0.00000	0.00000	0.00006
104	6	-4.05483	0.29547	0.00000	0.00000	0.00000	0.00006
105	6	-4.10432	0.30673	0.00000	0.00000	0.00000	0.00005
106	6	-4.15381	0.31354	0.00000	0.00000	0.00000	0.00002
107	6	-4.20329	0.31360	0.00000	0.00000	0.00000	-0.00002
108	6	-4.25278	0.30424	0.00000	0.00000	0.00000	-0.00008
109	6	-4.30226	0.28245	0.00000	0.00000	0.00000	-0.00015
10	6	-4.35175	0.24485	0.00000	0.00000	0.00000	-0.00023
111	6	-4.40124	0.18768	0.00000	0.00000	0.00000	-0.00034
112	6	-4.45072	0.10683	0.00000	0.00000	0.00000	-0.00047
113	6	-4.50203	0.00000	0.00000	0.00000	0.00000	-0.00057
114	6	-4.55086	-0.11328	0.00000	0.00000	0.00000	-0.00056
115	6	-4.59968	-0.22347	0.00000	0.00000	0.00000	-0.00054
116	6	-4.64851	-0.32575	0.00000	0.00000	0.00000	-0.00048
117	6	-4.69734	-0.41569	0.00000	0.00000	0.00000	-0.00041
118	6	-4.74617	-0.48922	0.00000	0.00000	0.00000	-0.00032
119	6	-4.79499	-0.54269	0.00000	0.00000	0.00000	-0.00021
120	6	-4.84382	-0.57280	0.00000	0.00000	0.00000	-0.00009
121	6	-4.89265	-0.57666	0.00000	0.00000	0.00000	0.00005
122	6	-4.94496	-0.55757	0.00000	0.00000	0.00000	0.00010
123	6	-4.99606	-0.53715	0.00000	0.00000	0.00000	0.00010
124	6	-5.04717	-0.51588	0.00000	0.00000	0.00000	0.00011
125	6	-5.09827	-0.49221	0.00000	0.00000	0.00000	0.00013
126	6	-5.14937	-0.46500	0.00000	0.00000	0.00000	0.00015
127	6	-5.20047	-0.43342	0.00000	0.00000	0.00000	0.00017
128	6	-5.25157	-0.39705	0.00000	0.00000	0.00000	0.00019
29	6	-5.30268	-0.35580	0.00000	0.00000	0.00000	0.00022
130	6	-5.35378	-0.30997	0.00000	0.00000	0.00000	0.00024
131	6	-5.40488	-0.26018	0.00000	0.00000	0.00000	0.00026
132	6	-5.45598	-0.20747	0.00000	0.00000	0.00000	0.00027
133	6	-5.50708	-0.15319	0.00000	0.00000	0.00000	0.00027
134	6	-5.55819	-0.09907	0.00000	0.00000	0.00000	0.00027
135	6	-5.60929	-0.04723	0.00000	0.00000	0.00000	0.00025
136	6	-5.66039	-0.00011	0.00000	0.00000	0.00000	0.00022
137	6	-5.71149	0.03946	0.00000	0.00000	0.00000	0.00017
138	6	-5.76259	0.06830	0.00000	0.00000	0.00000	0.00011
139	6	-5.81370	0.08287	0.00000	0.00000	0.00000	0.00003
140	6	-5.86480	0.07924	0.00000	0.00000	0.00000	-0.00007
141	6	-5.91590	0.05317	0.00000	0.00000	0.00000	-0.00019
142	6	-5.96700	0.00000	0.00000	0.00000	0.00000	-0.00034
143	6	-6.01810	-0.08357	0.00000	0.00000	0.00000	-0.00049
144	6	-6.06920	-0.19452	0.00000	0.00000	0.00000	-0.00062

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
145	6	-6.12031	-0.32848	0.00000	0.00000	0.00000	-0.00072
146	6	-6.17141	-0.48147	0.00000	0.00000	0.00000	-0.00081
147	6	-6.22251	-0.64986	0.00000	0.00000	0.00000	-0.00087
148	6	-6.27329	-0.82816	0.00000	0.00000	0.00000	-0.00087
149	6	-6.31844	-0.99082	0.00000	0.00000	0.00000	-0.00076
150	6	-6.36360	-1.12977	0.00000	0.00000	0.00000	-0.00063
151	6	-6.40875	-1.24298	0.00000	0.00000	0.00000	-0.00050
152	6	-6.45390	-1.32881	0.00000	0.00000	0.00000	-0.00036
153	6	-6.49905	-1.38603	0.00000	0.00000	0.00000	-0.00021
154	6	-6.54421	-1.41375	0.00000	0.00000	0.00000	-0.00006
155	6	-6.58936	-1.41151	0.00000	0.00000	0.00000	0.00009
156	6	-6.63451	-1.37920	0.00000	0.00000	0.00000	0.00024
157	6	-6.68353	-1.31665	0.00000	0.00000	0.00000	0.00038
58	6	-6.72647	-1.23537	0.00000	0.00000	0.00000	0.00044
159	6	-6.76941	-1.14264	0.00000	0.00000	0.00000	0.00049
160	6	-6.81235	-1.03990	0.00000	0.00000	0.00000	0.00054
161	6	-6.85529	-0.92890	0.00000	0.00000	0.00000	0.00057
162	6	-6.89823	-0.81178	0.00000	0.00000	0.00000	0.00060
163	6	-6.94117	-0.69105	0.00000	0.00000	0.00000	0.00061
164	6	-6.98411	-0.56956	0.00000	0.00000	0.00000	0.00060
165	6	-7.02705	-0.45053	0.00000	0.00000	0.00000	0.00058
166	6	-7.06999	-0.33756	0.00000	0.00000	0.00000	0.00054
167	6	-7.11250	-0.23440	0.00000	0.00000	0.00000	0.00049
168	6	-7.15459	-0.14432	0.00000	0.00000	0.00000	0.00041
169	6	-7.19668	-0.07181	0.00000	0.00000	0.00000	0.00031
170	6	-7.23877	-0.02190	0.00000	0.00000	0.00000	0.00018
171	6	-7.28086	0.00000	0.00000	0.00000	0.00000	0.00003
172	6	-7.32295	-0.00994	0.00000	0.00000	0.00000	-0.00013
173	6	-7.36504	-0.04827	0.00000	0.00000	0.00000	-0.00025
174	6	-7.40713	-0.10996	0.00000	0.00000	0.00000	-0.00036
175	6	-7.44921	-0.19036	0.00000	0.00000	0.00000	-0.00044
176	6	-7.49130	-0.28519	0.00000	0.00000	0.00000	-0.00050
77	6	-7.53474	-0.38545	0.00000	0.00000	0.00000	-0.00049
178	6	-7.57844	-0.47827	0.00000	0.00000	0.00000	-0.00044
179	6	-7.62215	-0.56025	0.00000	0.00000	0.00000	-0.00038
180	6	-7.66585	-0.62855	0.00000	0.00000	0.00000	-0.00030
181	6	-7.70956	-0.68069	0.00000	0.00000	0.00000	-0.00022
182	6	-7.75326	-0.71455	0.00000	0.00000	0.00000	-0.00012
183	6	-7.79697	-0.72837	0.00000	0.00000	0.00000	-0.00002
184	6	-7.84067	-0.72077	0.00000	0.00000	0.00000	0.00009
185	6	-7.88438	-0.69070	0.00000	0.00000	0.00000	0.00021
186	6	-7.92775	-0.63780	0.00000	0.00000	0.00000	0.00031
187	6	-7.96950	-0.57476	0.00000	0.00000	0.00000	0.00032
188	6	-8.01125	-0.50869	0.00000	0.00000	0.00000	0.00034
189	6	-8.05300	-0.44002	0.00000	0.00000	0.00000	0.00035
190	6	-8.09475	-0.36953	0.00000	0.00000	0.00000	0.00036
191	6	-8.13650	-0.29836	0.00000	0.00000	0.00000	0.00036
192	6	-8.17825	-0.22802	0.00000	0.00000	0.00000	0.00035

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
193	6	-8.21999	-0.16038	0.00000	0.00000	0.00000	0.00033
194	6	-8.26174	-0.09768	0.00000	0.00000	0.00000	0.00030
195	6	-8.30349	-0.04249	0.00000	0.00000	0.00000	0.00025
196	6	-8.34346	0.00215	0.00000	0.00000	0.00000	0.00019
197	6	-8.38163	0.03262	0.00000	0.00000	0.00000	0.00011
198	6	-8.41981	0.04517	0.00000	0.00000	0.00000	0.00001
199	6	-8.45799	0.03577	0.00000	0.00000	0.00000	-0.00011
200	6	-8.49617	0.00000	0.00000	0.00000	0.00000	-0.00025
201	6	-8.53434	-0.06518	0.00000	0.00000	0.00000	-0.00039
202	6	-8.57252	-0.15630	0.00000	0.00000	0.00000	-0.00051
203	6	-8.60772	-0.26868	0.00000	0.00000	0.00000	-0.00061
204	6	-8.64233	-0.39813	0.00000	0.00000	0.00000	-0.00068
205	6	-8.67694	-0.54055	0.00000	0.00000	0.00000	-0.00074
06	6	-8.71020	-0.68527	0.00000	0.00000	0.00000	-0.00069
207	6	-8.74319	-0.81619	0.00000	0.00000	0.00000	-0.00061
208	6	-8.77618	-0.93003	0.00000	0.00000	0.00000	-0.00052
209	6	-8.80917	-1.02412	0.00000	0.00000	0.00000	-0.00042
210	6	-8.84216	-1.09617	0.00000	0.00000	0.00000	-0.00030
211	6	-8.87515	-1.14426	0.00000	0.00000	0.00000	-0.00018
212	6	-8.90814	-1.16680	0.00000	0.00000	0.00000	-0.00005
213	6	-8.94113	-1.16260	0.00000	0.00000	0.00000	0.00009
214	6	-8.97412	-1.13082	0.00000	0.00000	0.00000	0.00023
215	6	-9.00806	-1.07126	0.00000	0.00000	0.00000	0.00035
216	6	-9.04675	-0.99732	0.00000	0.00000	0.00000	0.00039
217	6	-9.08544	-0.91657	0.00000	0.00000	0.00000	0.00042
218	6	-9.12413	-0.82962	0.00000	0.00000	0.00000	0.00045
219	6	-9.16282	-0.73743	0.00000	0.00000	0.00000	0.00047
220	6	-9.20150	-0.64134	0.00000	0.00000	0.00000	0.00049
221	6	-9.24019	-0.54305	0.00000	0.00000	0.00000	0.00049
222	6	-9.27888	-0.44460	0.00000	0.00000	0.00000	0.00049
223	6	-9.31757	-0.34841	0.00000	0.00000	0.00000	0.00047
224	6	-9.35626	-0.25727	0.00000	0.00000	0.00000	0.00044
25	6	-9.39494	-0.17433	0.00000	0.00000	0.00000	0.00039
226	6	-9.43363	-0.10308	0.00000	0.00000	0.00000	0.00032
227	6	-9.47232	-0.04739	0.00000	0.00000	0.00000	0.00023
228	6	-9.51101	-0.01150	0.00000	0.00000	0.00000	0.00012
229	6	-9.54970	0.00000	0.00000	0.00000	0.00000	-0.00001
230	6	-9.58838	-0.01620	0.00000	0.00000	0.00000	-0.00015
231	6	-9.62707	-0.05724	0.00000	0.00000	0.00000	-0.00026
232	6	-9.66576	-0.11896	0.00000	0.00000	0.00000	-0.00035
233	6	-9.70445	-0.19759	0.00000	0.00000	0.00000	-0.00043
234	6	-9.74314	-0.28969	0.00000	0.00000	0.00000	-0.00049
235	6	-9.77913	-0.38586	0.00000	0.00000	0.00000	-0.00046
236	6	-9.81459	-0.47172	0.00000	0.00000	0.00000	-0.00040
237	6	-9.85004	-0.54468	0.00000	0.00000	0.00000	-0.00033
238	6	-9.88550	-0.60277	0.00000	0.00000	0.00000	-0.00025
239	6	-9.92096	-0.64437	0.00000	0.00000	0.00000	-0.00016
240	6	-9.95642	-0.66824	0.00000	0.00000	0.00000	-0.00007

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
241	6	-9.99187	-0.67349	0.00000	0.00000	0.00000	0.00002
242	6	-10.02733	-0.65961	0.00000	0.00000	0.00000	0.00012
243	6	-10.06279	-0.62642	0.00000	0.00000	0.00000	0.00021
244	6	-10.09824	-0.57431	0.00000	0.00000	0.00000	0.00030
245	6	-10.13370	-0.51211	0.00000	0.00000	0.00000	0.00032
246	6	-10.16916	-0.44523	0.00000	0.00000	0.00000	0.00034
247	6	-10.20461	-0.37496	0.00000	0.00000	0.00000	0.00036
248	6	-10.24007	-0.30296	0.00000	0.00000	0.00000	0.00036
249	6	-10.27553	-0.23122	0.00000	0.00000	0.00000	0.00035
250	6	-10.31098	-0.16214	0.00000	0.00000	0.00000	0.00033
251	6	-10.34644	-0.09845	0.00000	0.00000	0.00000	0.00030
252	6	-10.38190	-0.04325	0.00000	0.00000	0.00000	0.00025
253	6	-10.41735	0.00000	0.00000	0.00000	0.00000	0.00018
254	6	-10.45281	0.02834	0.00000	0.00000	0.00000	0.00010
255	6	-10.48827	0.04199	0.00000	0.00000	0.00000	0.00003
256	6	-10.52373	0.04163	0.00000	0.00000	0.00000	-0.00004
257	6	-10.55918	0.02764	0.00000	0.00000	0.00000	-0.00010
258	6	-10.59464	0.00000	0.00000	0.00000	0.00000	-0.00017
259	6	-10.63010	-0.04128	0.00000	0.00000	0.00000	-0.00024
260	6	-10.66555	-0.09495	0.00000	0.00000	0.00000	-0.00030
261	6	-10.70101	-0.15974	0.00000	0.00000	0.00000	-0.00035
262	6	-10.73647	-0.23476	0.00000	0.00000	0.00000	-0.00040
263	6	-10.77192	-0.31945	0.00000	0.00000	0.00000	-0.00045

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
26	6	0.00	1335.96	0.00	0.00	0.00	0.00
55	6	0.00	2106.78	0.00	0.00	0.00	0.00
84	6	0.00	1896.56	0.00	0.00	0.00	0.00
113	6	0.00	2025.22	0.00	0.00	0.00	0.00
142	6	0.00	1910.96	0.00	0.00	0.00	0.00
171	6	0.00	2181.80	0.00	0.00	0.00	0.00
200	6	0.00	1958.44	0.00	0.00	0.00	0.00
229	6	0.00	1864.37	0.00	0.00	0.00	0.00
253	6	0.00	998.60	0.00	0.00	0.00	0.00
258	6	0.00	449.10	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

245. *LOAD LIST 1 4 6
246. *PLOT BEND FILE
247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

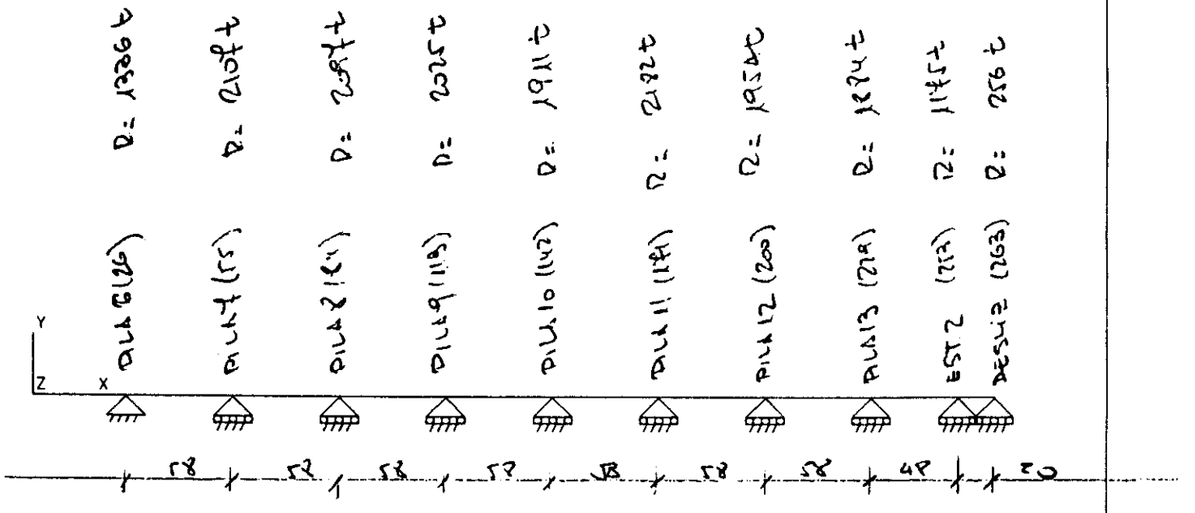
**** DATE= SEP 12,1997 TIME= 8:10:48 ****

****
* 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 *
****

STRUCTURE DATA:

TYPE = PLANE
NJ = 263
NM = 262
NE = 0
NS = 10
NL = 6
XMAX= 524.0
YMAX= 0.0
ZMAX= 0.0

1



APOYADO EN DESLIZADERA
NO APOYA EN PILA PROVISIONAL

METE MTON

COMPANY INTECSA

STAADPD - PLOT (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: SEP 11, 1997

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 **************************************************
 *                                                *
 *          S T A A D - III                       *
 *          Revision 17.0a                        *
 *          Proprietary Program of                *
 *          RESEARCH ENGINEERS, Inc.              *
 *          Date=    SEP 12, 1997                 *
 *          Time=     8:11:55                     *
 *                                                *
 **************************************************


 2. STAAD PLANE PUENTE SOBRE EL CINCA - LANZAMIENTO
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000  0.000  263   524.000  0.000  0.000
 6. MEMBER INCIDENCES
 7.   1    1    2
 8.   R    261  1    1
 9. MEMBER PROPERTY
10.   1  TO  18                        PR   AX  0.318   IZ  0.8709
11.   19 TO  21                        PR   AX  0.432   IZ  1.1844
12.   22 TO  42  51 TO 77   86 TO 112  PR   AX 13.481   IZ 45.3025
13.   43 TO  50  78 TO 85  113 TO 120  PR   AX 15.001   IZ 47.4753
14.  121 TO 147 156 TO 262             PR   AX 13.481   IZ 45.3025
15.  148 TO 155                        PR   AX 15.001   IZ 47.4753
16. CONSTANTS
17. E   21000000.  MEMBER  1 TO  21
18. E    3350000.  MEMBER 22 TO 262
19. DEN  7.85      MEMBER  1 TO  21
20. DEN  2.55      MEMBER 22 TO 262
21. POISSON        0.2  ALL
22. SUPPORTS
23. *POSICION 1
24. *30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
25. *POSICION 2
26. *1 30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
27. *POSICION 3
28. *5 34 63 92 121 150 179 208 237 261 FIXED BUT FX MZ
29. *POSICION 4
30. *9 38 67 96 125 154 183 212 241     FIXED BUT FX MZ
31. *POSICION 5
32. *13 42 71 100 129 158 187 216 245   FIXED BUT FX MZ
33. *POSICION 6
34. *17 46 75 104 133 162 191 220 249   FIXED BUT FX MZ
35. *POSICION 7
36. *21 50 79 108 137 166 195 224 253   FIXED BUT FX MZ
37. *POSICION 8
38. *25 54 83 112 141 170 199 228 257   FIXED BUT FX MZ
39. *POSICION 9
40. *29 58 87 116 145 174 203 232 261   FIXED BUT FX MZ
41. *POSICION 10
42. *33 62 91 120 149 178 207 236 260   FIXED BUT FX MZ
43. *POSICION 11
44. *36 65 94 123 152 181 210 239       FIXED BUT FX MZ
45. *POSICION 12
46. *2 37 66 95 124 153 182 211 240     FIXED BUT FX MZ
47. *POSICION 13
48. *6 41 70 99 128 157 186 215 244     FIXED BUT FX MZ
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49. *POSICION 14
50. *10 45 74 103 132 161 190 219 248   FIXED BUT FX MZ
51. *POSICION 15
52. *14 49 78 107 136 165 194 223 252   FIXED BUT FX MZ
53. *POSICION 16
54. *18 53 82 111 140 169 198 227 256   FIXED BUT FX MZ
55. *POSICION 17
56. *22 57 86 115 144 173 202 231 260   FIXED BUT FX MZ
57. *POSICION 18
58. *26 61 90 119 148 177 206 235 259   FIXED BUT FX MZ
59. *POSICION 19
60. *30 65 94 123 152 181 210 239       FIXED BUT FX MZ
61. *POSICION 20
62. *34 69 98 127 156 185 214 243       FIXED BUT FX MZ
63. *POSICION 21
64. *36 71 100 129 158 187 216 245      FIXED BUT FX MZ
65. *POSICION 22
66. *3 38 73 102 131 160 189 218 247    FIXED BUT FX MZ
67. *POSICION 23
68. *7 42 77 106 135 164 193 222 251    FIXED BUT FX MZ
69. *POSICION 24
70. *11 46 81 110 139 168 197 226 255   FIXED BUT FX MZ
71. *POSICION 25
72. *15 50 85 114 143 172 201 230 259   FIXED BUT FX MZ
73. *POSICION 26
74. *19 54 89 118 147 176 205 234 258   FIXED BUT FX MZ
75. *POSICION 27
76. *23 58 93 122 151 180 209 238 262   FIXED BUT FX MZ
77. *POSICION 28
78. *27 62 97 126 155 184 213 242       FIXED BUT FX MZ
79. *POSICION 29
80. *31 66 101 130 159 188 217 246      FIXED BUT FX MZ
81. *POSICION 30
82. *35 70 105 134 163 192 221 250      FIXED BUT FX MZ
83. *POSICION 31
84. *36 71 106 135 164 193 222 251      FIXED BUT FX MZ
85. *POSICION 32
86. *4 39 74 109 138 167 196 225 254    FIXED BUT FX MZ
87. *POSICION 33
88. *8 43 78 113 142 171 200 229 258    FIXED BUT FX MZ
89. *POSICION 34
90. *12 47 82 117 146 175 204 233 262   FIXED BUT FX MZ
91. *POSICION 35
92. *16 51 86 121 150 179 208 237       FIXED BUT FX MZ
93. *POSICION 36
94. *20 55 90 125 154 183 212 241       FIXED BUT FX MZ
95. *POSICION 37
96. *24 59 94 129 158 187 216 245       FIXED BUT FX MZ
97. *POSICION 38
98. *26 61 96 131 160 189 218 251       FIXED BUT FX MZ
99. *POSICION 39
100. *3 28 63 98 133 162 191 220 249    FIXED BUT FX MZ
101. *POSICION 40
102. *7 32 67 102 137 166 195 224 253   FIXED BUT FX MZ
103. *POSICION 41
104. *11 36 71 106 141 170 199 228 257  FIXED BUT FX MZ
105. *POSICION 42
106. *15 40 75 110 145 174 203 232 261  FIXED BUT FX MZ
107. *POSICION 43
108. *19 44 79 114 149 178 207 236 260  FIXED BUT FX MZ
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109. *POSICION 44
110. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
111. *POSICION 45 (IGUAL 44 SIN PESO DE PESCANTE)
112. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
113. *POSICION EXTREMA
114. 26 PINNED
115. 55 84 113 142 171 200 229 253 263 FIXED BUT FX MZ
116. *COMUN A TODAS LAS POSICIONES EXCEPTO EXTREMA
117. *263  PINED
118. LOADING 1 PESO PROPIO
119. SELFWEIGHT   Y   -1
120. LOADING 2 PRETENSADO 1
121. MEMBER LOAD
122. *CABLE CONTINUO SUPERIOR EXC +1.697
123. 22     CON  GX  2880   0.000
124. 22     CMOM GZ -4887   0.000
125. 262    CON  GX -2880   2.000
126. 262    CMOM GZ  4887   2.000
127. 22     CON  GX  1680   0.000
128. 22     CMOM GZ -2850   0.000
 29. 185    CON  GX  -560   1.666
130. 185    CMOM GZ   950   1.666
131. 195    CON  GX  -560   1.000
132. 195    CMOM GZ   950   1.000
133. 202    CON  GX  -560   0.334
134. 202    CMOM GZ   950   0.334
135. 22     CON  GX  1200   0.000
136. 22     CMOM GZ -2036   0.000
137. 86     CON  GX  -400   0.750
138. 86     CMOM GZ   679   0.750
139. 95     CON  GX  -400   0.250
140. 95     CMOM GZ   679   0.250
141. 103    CON  GX  -400   1.750
142. 103    CMOM GZ   678   1.750
143. *CABLE CONTINUO INFERIOR  EXC -2.786
144. 22     CON  GX  1440   0.000
145. 22     CMOM GZ  4012   0.000
146. 262    CON  GX -1440   2.000
147. 262    CMOM GZ -4012   2.000
 48. 22     CON  GX   840   0.000
149. 22     CMOM GZ  2340   0.000
150. 185    CON  GX  -280   1.666
151. 185    CMOM GZ  -780   1.666
152. 195    CON  GX  -280   1.000
153. 195    CMOM GZ  -780   1.000
154. 202    CON  GX  -280   0.334
155. 202    CMOM GZ  -780   0.334
156. 22     CON  GX   600   0.000
157. 22     CMOM GZ  1671   0.000
158. 147    CON  GX  -200   1.250
159. 147    CMOM GZ  -557   1.250
160. 156    CON  GX  -200   1.666
161. 156    CMOM GZ  -557   1.666
162. 166    CON  GX  -200   1.000
163. 166    CMOM GZ  -557   1.000
164. *CABLE CONTINUO CENTRAL  EXC -0.500
165. 22     CON  GX  1920   0.000
166. 22     CMOM GZ   960   0.000
167. 214    CON  GX   960   1.666
168. 214    CMOM GZ   480   1.666
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169. 262    CON  GX -2880   2.000
170. 262    CMOM GZ -1440   2.000
171. LOADING 3 CABLES SOMBRERO  E 1.697
172. MEMBER LOAD
173. 42     CON  GX  1140   1.250
174. 42     CMOM GZ -1933   1.250
175. 51     CON  GX -1140   0.750
176. 51     CMOM GZ  1933   0.750
177. 77     CON  GX  3420   1.250
178. 77     CMOM GZ -5804   1.250
179. 86     CON  GX -3420   0.750
180. 86     CMOM GZ  5804   0.750
181. 112    CON  GX  3420   1.250
182. 112    CMOM GZ -5804   1.250
183. 121    CON  GX -3420   0.750
184. 121    CMOM GZ  5804   0.750
185. 147    CON  GX  2658   1.250
186. 147    CMOM GZ -4510   1.250
187. 156    CON  GX -2658   1.666
188. 156    CMOM GZ  4510   1.666
 89. 176    CON  GX  1520   0.333
190. 176    CMOM GZ -2579   0.333
191. 185    CON  GX -1520   1.666
192. 185    CMOM GZ  2579   1.666
193. 205    CON  GX  1520   0.333
194. 205    CMOM GZ -2579   0.333
195. 214    CON  GX -1520   1.666
196. 214    CMOM GZ  2579   1.666
197. 234    CON  GX  1140   0.333
198. 234    CMOM GZ -1934   0.333
199. 243    CON  GX -1140   1.666
200. 243    CMOM GZ  1934   1.666
201. LOADING 4 CABLES DE VANO E -2.786
202. MEMBER LOAD
203. 22     CON  GX  1900   0.000
204. 22     CMOM GZ  5293   0.000
205. 42     CON  GX -1900   1.250
206. 42     CMOM GZ -5293   1.250
207. 51     CON  GX  1900   0.750
 08. 51     CMOM GZ  5293   0.750
209. 77     CON  GX -1900   1.250
210. 77     CMOM GZ -5293   1.250
211. 86     CON  GX  2280   0.750
212. 86     CMOM GZ  6352   0.750
213. 112    CON  GX -2280   1.250
214. 112    CMOM GZ -6352   1.250
215. 121    CON  GX  2660   0.750
216. 121    CMOM GZ  7410   0.750
217. 147    CON  GX -2660   1.250
218. 147    CMOM GZ -7410   1.250
219. 156    CON  GX  1140   1.666
220. 156    CMOM GZ  3176   1.666
221. 176    CON  GX -1140   0.333
222. 176    CMOM GZ -3176   0.333
223. 185    CON  GX  1900   1.666
224. 185    CMOM GZ  5293   1.666
225. 205    CON  GX -1900   0.333
 26. 205    CMOM GZ -5293   0.333
227. 214    CON  GX  1900   1.666
228. 214    CMOM GZ  5293   1.666
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229. 234    CON  GX -1900   0.333
230. 234    CMOM GZ -5293   0.333
231. 243    CON  GX  1140   1.666
232. 243    CMOM GZ  3176   1.666
233. 262    CON  GX -1140   2.000
234. 262    CMOM GZ -3176   2.000
235. LOADING COMBINATION 5
236. 2  1.0   3  1.0   4  1.0
237. LOADING COMBINATION 6
238. 1  1.0   2  0.96  3  0.96   4  0.96
239. PERFORM ANALISIS


      P R O B L E M   S T A T I S T I C S
      -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =   263/  262/   10
  ORIGINAL/FINAL BAND-WIDTH =    1/    1
  TOTAL PRIMARY LOAD CASES  =    4, TOTAL DEGREES OF FREEDOM =   778
  SIZE OF STIFFNESS MATRIX =    4668 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.53 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              8:12: 0
++ PROCESSING GLOBAL STIFFNESS MATRIX.               8:12: 1
++ PROCESSING TRIANGULAR FACTORIZATION.              8:12: 1
++ CALCULATING JOINT DISPLACEMENTS.                  8:12: 1
++ CALCULATING MEMBER  FORCES.                       8:12: 2

240. PRINT JOINT COORDINATES
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JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
1	0.000	0.000	0.000
2	2.000	0.000	0.000
3	4.000	0.000	0.000
4	6.000	0.000	0.000
5	8.000	0.000	0.000
6	10.000	0.000	0.000
7	12.000	0.000	0.000
8	14.000	0.000	0.000
9	16.000	0.000	0.000
10	18.000	0.000	0.000
11	20.000	0.000	0.000
12	22.000	0.000	0.000
13	24.000	0.000	0.000
14	26.000	0.000	0.000
15	28.000	0.000	0.000
16	30.000	0.000	0.000
17	32.000	0.000	0.000
18	34.000	0.000	0.000
19	36.000	0.000	0.000
20	38.000	0.000	0.000
21	40.000	0.000	0.000
22	42.000	0.000	0.000
23	44.000	0.000	0.000
24	46.000	0.000	0.000
25	48.000	0.000	0.000
26	50.000	0.000	0.000
27	52.000	0.000	0.000
28	54.000	0.000	0.000
29	56.000	0.000	0.000
30	58.000	0.000	0.000
31	60.000	0.000	0.000
32	62.000	0.000	0.000
33	64.000	0.000	0.000
34	66.000	0.000	0.000
35	68.000	0.000	0.000
36	70.000	0.000	0.000
37	72.000	0.000	0.000
38	74.000	0.000	0.000
39	76.000	0.000	0.000
40	78.000	0.000	0.000
41	80.000	0.000	0.000
42	82.000	0.000	0.000
43	84.000	0.000	0.000
44	86.000	0.000	0.000
45	88.000	0.000	0.000
46	90.000	0.000	0.000
47	92.000	0.000	0.000
48	94.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
49	96.000	0.000	0.000
50	98.000	0.000	0.000
51	100.000	0.000	0.000
52	102.000	0.000	0.000
53	104.000	0.000	0.000
54	106.000	0.000	0.000
55	108.000	0.000	0.000
56	110.000	0.000	0.000
57	112.000	0.000	0.000
58	114.000	0.000	0.000
59	116.000	0.000	0.000
60	118.000	0.000	0.000
61	120.000	0.000	0.000
62	122.000	0.000	0.000
63	124.000	0.000	0.000
64	126.000	0.000	0.000
65	128.000	0.000	0.000
66	130.000	0.000	0.000
67	132.000	0.000	0.000
68	134.000	0.000	0.000
69	136.000	0.000	0.000
70	138.000	0.000	0.000
71	140.000	0.000	0.000
72	142.000	0.000	0.000
73	144.000	0.000	0.000
74	146.000	0.000	0.000
75	148.000	0.000	0.000
76	150.000	0.000	0.000
77	152.000	0.000	0.000
78	154.000	0.000	0.000
79	156.000	0.000	0.000
80	158.000	0.000	0.000
81	160.000	0.000	0.000
82	162.000	0.000	0.000
83	164.000	0.000	0.000
84	166.000	0.000	0.000
85	168.000	0.000	0.000
86	170.000	0.000	0.000
87	172.000	0.000	0.000
88	174.000	0.000	0.000
89	176.000	0.000	0.000
90	178.000	0.000	0.000
91	180.000	0.000	0.000
92	182.000	0.000	0.000
93	184.000	0.000	0.000
94	186.000	0.000	0.000
95	188.000	0.000	0.000
96	190.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
97	192.000	0.000	0.000
98	194.000	0.000	0.000
99	196.000	0.000	0.000
100	198.000	0.000	0.000
101	200.000	0.000	0.000
102	202.000	0.000	0.000
103	204.000	0.000	0.000
104	206.000	0.000	0.000
105	208.000	0.000	0.000
106	210.000	0.000	0.000
107	212.000	0.000	0.000
108	214.000	0.000	0.000
109	216.000	0.000	0.000
110	218.000	0.000	0.000
111	220.000	0.000	0.000
112	222.000	0.000	0.000
113	224.000	0.000	0.000
114	226.000	0.000	0.000
115	228.000	0.000	0.000
116	230.000	0.000	0.000
117	232.000	0.000	0.000
118	234.000	0.000	0.000
119	236.000	0.000	0.000
120	238.000	0.000	0.000
121	240.000	0.000	0.000
122	242.000	0.000	0.000
123	244.000	0.000	0.000
124	246.000	0.000	0.000
125	248.000	0.000	0.000
126	250.000	0.000	0.000
127	252.000	0.000	0.000
128	254.000	0.000	0.000
129	256.000	0.000	0.000
130	258.000	0.000	0.000
131	260.000	0.000	0.000
132	262.000	0.000	0.000
133	264.000	0.000	0.000
134	266.000	0.000	0.000
135	268.000	0.000	0.000
136	270.000	0.000	0.000
137	272.000	0.000	0.000
138	274.000	0.000	0.000
139	276.000	0.000	0.000
140	278.000	0.000	0.000
141	280.000	0.000	0.000
142	282.000	0.000	0.000
143	284.000	0.000	0.000
144	286.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
145	288.000	0.000	0.000
146	290.000	0.000	0.000
147	292.000	0.000	0.000
148	294.000	0.000	0.000
149	296.000	0.000	0.000
150	298.000	0.000	0.000
151	300.000	0.000	0.000
152	302.000	0.000	0.000
153	304.000	0.000	0.000
154	306.000	0.000	0.000
155	308.000	0.000	0.000
156	310.000	0.000	0.000
157	312.000	0.000	0.000
158	314.000	0.000	0.000
159	316.000	0.000	0.000
160	318.000	0.000	0.000
161	320.000	0.000	0.000
162	322.000	0.000	0.000
163	324.000	0.000	0.000
164	326.000	0.000	0.000
165	328.000	0.000	0.000
166	330.000	0.000	0.000
167	332.000	0.000	0.000
168	334.000	0.000	0.000
169	336.000	0.000	0.000
170	338.000	0.000	0.000
171	340.000	0.000	0.000
172	342.000	0.000	0.000
173	344.000	0.000	0.000
174	346.000	0.000	0.000
175	348.000	0.000	0.000
176	350.000	0.000	0.000
177	352.000	0.000	0.000
178	354.000	0.000	0.000
179	356.000	0.000	0.000
180	358.000	0.000	0.000
181	360.000	0.000	0.000
182	362.000	0.000	0.000
183	364.000	0.000	0.000
184	366.000	0.000	0.000
185	368.000	0.000	0.000
186	370.000	0.000	0.000
187	372.000	0.000	0.000
188	374.000	0.000	0.000
189	376.000	0.000	0.000
190	378.000	0.000	0.000
191	380.000	0.000	0.000
192	382.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
193	384.000	0.000	0.000
194	386.000	0.000	0.000
195	388.000	0.000	0.000
196	390.000	0.000	0.000
197	392.000	0.000	0.000
198	394.000	0.000	0.000
199	396.000	0.000	0.000
200	398.000	0.000	0.000
201	400.000	0.000	0.000
202	402.000	0.000	0.000
203	404.000	0.000	0.000
204	406.000	0.000	0.000
205	408.000	0.000	0.000
206	410.000	0.000	0.000
207	412.000	0.000	0.000
208	414.000	0.000	0.000
209	416.000	0.000	0.000
210	418.000	0.000	0.000
211	420.000	0.000	0.000
212	422.000	0.000	0.000
213	424.000	0.000	0.000
214	426.000	0.000	0.000
215	428.000	0.000	0.000
216	430.000	0.000	0.000
217	432.000	0.000	0.000
218	434.000	0.000	0.000
219	436.000	0.000	0.000
220	438.000	0.000	0.000
221	440.000	0.000	0.000
222	442.000	0.000	0.000
223	444.000	0.000	0.000
224	446.000	0.000	0.000
225	448.000	0.000	0.000
226	450.000	0.000	0.000
227	452.000	0.000	0.000
228	454.000	0.000	0.000
229	456.000	0.000	0.000
230	458.000	0.000	0.000
231	460.000	0.000	0.000
232	462.000	0.000	0.000
233	464.000	0.000	0.000
234	466.000	0.000	0.000
235	468.000	0.000	0.000
236	470.000	0.000	0.000
237	472.000	0.000	0.000
238	474.000	0.000	0.000
239	476.000	0.000	0.000
240	478.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
241	480.000	0.000	0.000
242	482.000	0.000	0.000
243	484.000	0.000	0.000
244	486.000	0.000	0.000
245	488.000	0.000	0.000
246	490.000	0.000	0.000
247	492.000	0.000	0.000
248	494.000	0.000	0.000
249	496.000	0.000	0.000
250	498.000	0.000	0.000
251	500.000	0.000	0.000
252	502.000	0.000	0.000
253	504.000	0.000	0.000
254	506.000	0.000	0.000
255	508.000	0.000	0.000
256	510.000	0.000	0.000
257	512.000	0.000	0.000
258	514.000	0.000	0.000
259	516.000	0.000	0.000
260	518.000	0.000	0.000
261	520.000	0.000	0.000
262	522.000	0.000	0.000
263	524.000	0.000	0.000

********** END OF DATA FROM INTERNAL STORAGE **********

241. LOAD LIST 6
242. *PRINT MEMBER FORCES ALL
243. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	6	0.18540	-5.10493	0.00000	0.00000	0.00000	0.00163
2	6	0.18540	-4.77807	0.00000	0.00000	0.00000	0.00163
3	6	0.18540	-4.45134	0.00000	0.00000	0.00000	0.00163
4	6	0.18540	-4.12507	0.00000	0.00000	0.00000	0.00163
5	6	0.18540	-3.79980	0.00000	0.00000	0.00000	0.00162
6	6	0.18540	-3.47629	0.00000	0.00000	0.00000	0.00161
7	6	0.18540	-3.15553	0.00000	0.00000	0.00000	0.00160
8	6	0.18540	-2.83872	0.00000	0.00000	0.00000	0.00157
9	6	0.18540	-2.52728	0.00000	0.00000	0.00000	0.00154
10	6	0.18540	-2.22285	0.00000	0.00000	0.00000	0.00150
11	6	0.18540	-1.92728	0.00000	0.00000	0.00000	0.00145
12	6	0.18540	-1.64264	0.00000	0.00000	0.00000	0.00139
13	6	0.18540	-1.37124	0.00000	0.00000	0.00000	0.00132
14	6	0.18540	-1.11558	0.00000	0.00000	0.00000	0.00123
15	6	0.18540	-0.87839	0.00000	0.00000	0.00000	0.00113
16	6	0.18540	-0.66262	0.00000	0.00000	0.00000	0.00102
17	6	0.18540	-0.47144	0.00000	0.00000	0.00000	0.00089
18	6	0.18540	-0.30823	0.00000	0.00000	0.00000	0.00074
19	6	0.18540	-0.17659	0.00000	0.00000	0.00000	0.00057
20	6	0.18540	-0.07550	0.00000	0.00000	0.00000	0.00044
21	6	0.18540	-0.00344	0.00000	0.00000	0.00000	0.00028
22	6	0.18540	0.03637	0.00000	0.00000	0.00000	0.00011
23	6	0.15892	0.05448	0.00000	0.00000	0.00000	0.00005
24	6	0.10595	0.05597	0.00000	0.00000	0.00000	-0.00004
25	6	0.05297	0.03831	0.00000	0.00000	0.00000	-0.00014
26	6	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00025
27	6	-0.05297	-0.05963	0.00000	0.00000	0.00000	-0.00035
28	6	-0.10595	-0.13691	0.00000	0.00000	0.00000	-0.00042
29	6	-0.15892	-0.22739	0.00000	0.00000	0.00000	-0.00048
30	6	-0.21189	-0.32696	0.00000	0.00000	0.00000	-0.00051
31	6	-0.26486	-0.43188	0.00000	0.00000	0.00000	-0.00053
32	6	-0.31784	-0.53876	0.00000	0.00000	0.00000	-0.00053
33	6	-0.37081	-0.64459	0.00000	0.00000	0.00000	-0.00052
34	6	-0.42378	-0.74670	0.00000	0.00000	0.00000	-0.00050
35	6	-0.47675	-0.84282	0.00000	0.00000	0.00000	-0.00046
36	6	-0.52973	-0.93100	0.00000	0.00000	0.00000	-0.00042
37	6	-0.58270	-1.00968	0.00000	0.00000	0.00000	-0.00037
38	6	-0.63567	-1.07764	0.00000	0.00000	0.00000	-0.00031
39	6	-0.68864	-1.13406	0.00000	0.00000	0.00000	-0.00025
40	6	-0.74162	-1.17844	0.00000	0.00000	0.00000	-0.00019
41	6	-0.79459	-1.21067	0.00000	0.00000	0.00000	-0.00013
42	6	-0.84756	-1.23099	0.00000	0.00000	0.00000	-0.00007
43	6	-0.89932	-1.23872	0.00000	0.00000	0.00000	0.00002
44	6	-0.94402	-1.22205	0.00000	0.00000	0.00000	0.00015
45	6	-0.98873	-1.17936	0.00000	0.00000	0.00000	0.00028
46	6	-1.03343	-1.11233	0.00000	0.00000	0.00000	0.00039
47	6	-1.07813	-1.02302	0.00000	0.00000	0.00000	0.00050
48	6	-1.12283	-0.91386	0.00000	0.00000	0.00000	0.00059

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
49	6	-1.16753	-0.78770	0.00000	0.00000	0.00000	0.00067
50	6	-1.21223	-0.64774	0.00000	0.00000	0.00000	0.00073
51	6	-1.25693	-0.49758	0.00000	0.00000	0.00000	0.00077
52	6	-1.30869	-0.34465	0.00000	0.00000	0.00000	0.00073
53	6	-1.36167	-0.20676	0.00000	0.00000	0.00000	0.00064
54	6	-1.41464	-0.09012	0.00000	0.00000	0.00000	0.00052
55	6	-1.46761	0.00000	0.00000	0.00000	0.00000	0.00038
56	6	-1.52059	0.05980	0.00000	0.00000	0.00000	0.00023
57	6	-1.57356	0.09254	0.00000	0.00000	0.00000	0.00010
58	6	-1.62653	0.10294	0.00000	0.00000	0.00000	0.00000
59	6	-1.67950	0.09538	0.00000	0.00000	0.00000	-0.00008
60	6	-1.73248	0.07387	0.00000	0.00000	0.00000	-0.00014
61	6	-1.78545	0.04207	0.00000	0.00000	0.00000	-0.00018
52	6	-1.83842	0.00325	0.00000	0.00000	0.00000	-0.00021
63	6	-1.89139	-0.03965	0.00000	0.00000	0.00000	-0.00022
64	6	-1.94437	-0.08407	0.00000	0.00000	0.00000	-0.00022
65	6	-1.99734	-0.12783	0.00000	0.00000	0.00000	-0.00021
66	6	-2.05031	-0.16907	0.00000	0.00000	0.00000	-0.00020
67	6	-2.10328	-0.20632	0.00000	0.00000	0.00000	-0.00017
68	6	-2.15626	-0.23847	0.00000	0.00000	0.00000	-0.00015
69	6	-2.20923	-0.26478	0.00000	0.00000	0.00000	-0.00012
70	6	-2.26220	-0.28485	0.00000	0.00000	0.00000	-0.00008
71	6	-2.31517	-0.29866	0.00000	0.00000	0.00000	-0.00005
72	6	-2.36815	-0.30655	0.00000	0.00000	0.00000	-0.00003
73	6	-2.42112	-0.30921	0.00000	0.00000	0.00000	0.00000
74	6	-2.47409	-0.30771	0.00000	0.00000	0.00000	0.00002
75	6	-2.52706	-0.30347	0.00000	0.00000	0.00000	0.00003
76	6	-2.58004	-0.29828	0.00000	0.00000	0.00000	0.00002
77	6	-2.63301	-0.29430	0.00000	0.00000	0.00000	0.00001
78	6	-2.68841	-0.29205	0.00000	0.00000	0.00000	0.00004
79	6	-2.74182	-0.27426	0.00000	0.00000	0.00000	0.00014
80	6	-2.79523	-0.23908	0.00000	0.00000	0.00000	0.00021
31	6	-2.84864	-0.18999	0.00000	0.00000	0.00000	0.00027
82	6	-2.90206	-0.13087	0.00000	0.00000	0.00000	0.00031
83	6	-2.95547	-0.06599	0.00000	0.00000	0.00000	0.00033
84	6	-3.00888	0.00000	0.00000	0.00000	0.00000	0.00032
85	6	-3.06229	0.06384	0.00000	0.00000	0.00000	0.00032
86	6	-3.11571	0.12889	0.00000	0.00000	0.00000	0.00034
87	6	-3.17105	0.19373	0.00000	0.00000	0.00000	0.00028
88	6	-3.22394	0.23921	0.00000	0.00000	0.00000	0.00018
89	6	-3.27682	0.26728	0.00000	0.00000	0.00000	0.00010
90	6	-3.32971	0.28180	0.00000	0.00000	0.00000	0.00004
91	6	-3.38260	0.28627	0.00000	0.00000	0.00000	0.00000
92	6	-3.43549	0.28383	0.00000	0.00000	0.00000	-0.00002
93	6	-3.48837	0.27725	0.00000	0.00000	0.00000	-0.00004
94	6	-3.54126	0.26895	0.00000	0.00000	0.00000	-0.00004
95	6	-3.59415	0.26098	0.00000	0.00000	0.00000	-0.00004
96	6	-3.64555	0.25437	0.00000	0.00000	0.00000	-0.00003

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
97	6	-3.69674	0.24940	0.00000	0.00000	0.00000	-0.00002
98	6	-3.74792	0.24703	0.00000	0.00000	0.00000	0.00000
99	6	-3.79911	0.24785	0.00000	0.00000	0.00000	0.00001
100	6	-3.85030	0.25210	0.00000	0.00000	0.00000	0.00003
101	6	-3.90148	0.25967	0.00000	0.00000	0.00000	0.00005
102	6	-3.95267	0.27006	0.00000	0.00000	0.00000	0.00006
103	6	-4.00386	0.28243	0.00000	0.00000	0.00000	0.00006
104	6	-4.05483	0.29555	0.00000	0.00000	0.00000	0.00006
105	6	-4.10432	0.30681	0.00000	0.00000	0.00000	0.00005
106	6	-4.15381	0.31362	0.00000	0.00000	0.00000	0.00002
107	6	-4.20329	0.31367	0.00000	0.00000	0.00000	-0.00002
108	6	-4.25278	0.30430	0.00000	0.00000	0.00000	-0.00008
109	6	-4.30226	0.28251	0.00000	0.00000	0.00000	-0.00015
10	6	-4.35175	0.24489	0.00000	0.00000	0.00000	-0.00023
111	6	-4.40124	0.18771	0.00000	0.00000	0.00000	-0.00034
112	6	-4.45072	0.10685	0.00000	0.00000	0.00000	-0.00047
113	6	-4.50203	0.00000	0.00000	0.00000	0.00000	-0.00057
114	6	-4.55086	-0.11329	0.00000	0.00000	0.00000	-0.00056
115	6	-4.59968	-0.22350	0.00000	0.00000	0.00000	-0.00054
116	6	-4.64851	-0.32581	0.00000	0.00000	0.00000	-0.00048
117	6	-4.69734	-0.41577	0.00000	0.00000	0.00000	-0.00041
118	6	-4.74617	-0.48933	0.00000	0.00000	0.00000	-0.00032
119	6	-4.79499	-0.54282	0.00000	0.00000	0.00000	-0.00021
120	6	-4.84382	-0.57295	0.00000	0.00000	0.00000	-0.00009
121	6	-4.89265	-0.57683	0.00000	0.00000	0.00000	0.00005
122	6	-4.94496	-0.55776	0.00000	0.00000	0.00000	0.00010
123	6	-4.99606	-0.53737	0.00000	0.00000	0.00000	0.00010
124	6	-5.04717	-0.51612	0.00000	0.00000	0.00000	0.00011
125	6	-5.09827	-0.49247	0.00000	0.00000	0.00000	0.00013
126	6	-5.14937	-0.46527	0.00000	0.00000	0.00000	0.00015
127	6	-5.20047	-0.43371	0.00000	0.00000	0.00000	0.00017
128	6	-5.25157	-0.39735	0.00000	0.00000	0.00000	0.00019
29	6	-5.30268	-0.35612	0.00000	0.00000	0.00000	0.00022
130	6	-5.35378	-0.31028	0.00000	0.00000	0.00000	0.00024
131	6	-5.40488	-0.26050	0.00000	0.00000	0.00000	0.00026
132	6	-5.45598	-0.20778	0.00000	0.00000	0.00000	0.00027
133	6	-5.50708	-0.15350	0.00000	0.00000	0.00000	0.00027
134	6	-5.55819	-0.09937	0.00000	0.00000	0.00000	0.00027
135	6	-5.60929	-0.04751	0.00000	0.00000	0.00000	0.00025
136	6	-5.66039	-0.00037	0.00000	0.00000	0.00000	0.00022
137	6	-5.71149	0.03923	0.00000	0.00000	0.00000	0.00017
138	6	-5.76259	0.06810	0.00000	0.00000	0.00000	0.00011
139	6	-5.81370	0.08270	0.00000	0.00000	0.00000	0.00003
140	6	-5.86480	0.07913	0.00000	0.00000	0.00000	-0.00007
141	6	-5.91590	0.05311	0.00000	0.00000	0.00000	-0.00019
142	6	-5.96700	0.00000	0.00000	0.00000	0.00000	-0.00034
143	6	-6.01810	-0.08351	0.00000	0.00000	0.00000	-0.00049
144	6	-6.06920	-0.19437	0.00000	0.00000	0.00000	-0.00062

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
145	6	-6.12031	-0.32825	0.00000	0.00000	0.00000	-0.00072
146	6	-6.17141	-0.48116	0.00000	0.00000	0.00000	-0.00081
147	6	-6.22251	-0.64946	0.00000	0.00000	0.00000	-0.00087
148	6	-6.27329	-0.82768	0.00000	0.00000	0.00000	-0.00087
149	6	-6.31844	-0.99025	0.00000	0.00000	0.00000	-0.00076
150	6	-6.36360	-1.12911	0.00000	0.00000	0.00000	-0.00063
151	6	-6.40875	-1.24224	0.00000	0.00000	0.00000	-0.00050
152	6	-6.45390	-1.32799	0.00000	0.00000	0.00000	-0.00036
153	6	-6.49905	-1.38513	0.00000	0.00000	0.00000	-0.00021
154	6	-6.54421	-1.41278	0.00000	0.00000	0.00000	-0.00006
155	6	-6.58936	-1.41047	0.00000	0.00000	0.00000	0.00009
156	6	-6.63451	-1.37811	0.00000	0.00000	0.00000	0.00024
157	6	-6.68353	-1.31552	0.00000	0.00000	0.00000	0.00038
58	6	-6.72647	-1.23420	0.00000	0.00000	0.00000	0.00044
159	6	-6.76941	-1.14146	0.00000	0.00000	0.00000	0.00049
160	6	-6.81235	-1.03870	0.00000	0.00000	0.00000	0.00054
161	6	-6.85529	-0.92771	0.00000	0.00000	0.00000	0.00057
162	6	-6.89823	-0.81062	0.00000	0.00000	0.00000	0.00060
163	6	-6.94117	-0.68993	0.00000	0.00000	0.00000	0.00061
164	6	-6.98411	-0.56850	0.00000	0.00000	0.00000	0.00060
165	6	-7.02705	-0.44955	0.00000	0.00000	0.00000	0.00058
166	6	-7.06999	-0.33668	0.00000	0.00000	0.00000	0.00054
167	6	-7.11250	-0.23365	0.00000	0.00000	0.00000	0.00049
168	6	-7.15459	-0.14372	0.00000	0.00000	0.00000	0.00041
169	6	-7.19668	-0.07138	0.00000	0.00000	0.00000	0.00031
170	6	-7.23877	-0.02167	0.00000	0.00000	0.00000	0.00018
171	6	-7.28086	0.00000	0.00000	0.00000	0.00000	0.00003
172	6	-7.32295	-0.01020	0.00000	0.00000	0.00000	-0.00013
173	6	-7.36504	-0.04880	0.00000	0.00000	0.00000	-0.00026
174	6	-7.40713	-0.11080	0.00000	0.00000	0.00000	-0.00036
175	6	-7.44921	-0.19152	0.00000	0.00000	0.00000	-0.00044
176	6	-7.49130	-0.28667	0.00000	0.00000	0.00000	-0.00051
77	6	-7.53474	-0.38726	0.00000	0.00000	0.00000	-0.00049
178	6	-7.57844	-0.48041	0.00000	0.00000	0.00000	-0.00044
179	6	-7.62215	-0.56272	0.00000	0.00000	0.00000	-0.00038
180	6	-7.66585	-0.63134	0.00000	0.00000	0.00000	-0.00030
181	6	-7.70956	-0.68378	0.00000	0.00000	0.00000	-0.00022
182	6	-7.75326	-0.71793	0.00000	0.00000	0.00000	-0.00012
183	6	-7.79697	-0.73201	0.00000	0.00000	0.00000	-0.00002
184	6	-7.84067	-0.72464	0.00000	0.00000	0.00000	0.00009
185	6	-7.88438	-0.69479	0.00000	0.00000	0.00000	0.00021
186	6	-7.92775	-0.64205	0.00000	0.00000	0.00000	0.00031
187	6	-7.96950	-0.57913	0.00000	0.00000	0.00000	0.00032
188	6	-8.01125	-0.51314	0.00000	0.00000	0.00000	0.00034
189	6	-8.05300	-0.44450	0.00000	0.00000	0.00000	0.00035
190	6	-8.09475	-0.37398	0.00000	0.00000	0.00000	0.00036
191	6	-8.13650	-0.30271	0.00000	0.00000	0.00000	0.00036
192	6	-8.17825	-0.23222	0.00000	0.00000	0.00000	0.00035

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
193	6	-8.21999	-0.16435	0.00000	0.00000	0.00000	0.00033
194	6	-8.26174	-0.10134	0.00000	0.00000	0.00000	0.00030
195	6	-8.30349	-0.04578	0.00000	0.00000	0.00000	0.00025
196	6	-8.34346	-0.00066	0.00000	0.00000	0.00000	0.00019
197	6	-8.38163	0.03036	0.00000	0.00000	0.00000	0.00011
198	6	-8.41981	0.04357	0.00000	0.00000	0.00000	0.00001
199	6	-8.45799	0.03491	0.00000	0.00000	0.00000	-0.00011
200	6	-8.49617	0.00000	0.00000	0.00000	0.00000	-0.00025
201	6	-8.53434	-0.06422	0.00000	0.00000	0.00000	-0.00039
202	6	-8.57252	-0.15429	0.00000	0.00000	0.00000	-0.00051
203	6	-8.60772	-0.26555	0.00000	0.00000	0.00000	-0.00060
204	6	-8.64233	-0.39382	0.00000	0.00000	0.00000	-0.00068
705	6	-8.67694	-0.53502	0.00000	0.00000	0.00000	-0.00073
.06	6	-8.71020	-0.67851	0.00000	0.00000	0.00000	-0.00069
207	6	-8.74319	-0.80820	0.00000	0.00000	0.00000	-0.00061
208	6	-8.77618	-0.92081	0.00000	0.00000	0.00000	-0.00052
209	6	-8.80917	-1.01371	0.00000	0.00000	0.00000	-0.00041
210	6	-8.84216	-1.08463	0.00000	0.00000	0.00000	-0.00030
211	6	-8.87515	-1.13164	0.00000	0.00000	0.00000	-0.00017
212	6	-8.90814	-1.15320	0.00000	0.00000	0.00000	-0.00004
213	6	-8.94113	-1.14812	0.00000	0.00000	0.00000	0.00009
214	6	-8.97412	-1.11558	0.00000	0.00000	0.00000	0.00023
215	6	-9.00806	-1.05540	0.00000	0.00000	0.00000	0.00035
216	6	-9.04675	-0.98100	0.00000	0.00000	0.00000	0.00039
217	6	-9.08544	-0.89996	0.00000	0.00000	0.00000	0.00042
218	6	-9.12413	-0.81291	0.00000	0.00000	0.00000	0.00045
219	6	-9.16282	-0.72084	0.00000	0.00000	0.00000	0.00047
220	6	-9.20150	-0.62510	0.00000	0.00000	0.00000	0.00049
221	6	-9.24019	-0.52739	0.00000	0.00000	0.00000	0.00049
222	6	-9.27888	-0.42979	0.00000	0.00000	0.00000	0.00048
223	6	-9.31757	-0.33473	0.00000	0.00000	0.00000	0.00046
224	6	-9.35626	-0.24503	0.00000	0.00000	0.00000	0.00043
.25	6	-9.39494	-0.16383	0.00000	0.00000	0.00000	0.00038
226	6	-9.43363	-0.09466	0.00000	0.00000	0.00000	0.00031
227	6	-9.47232	-0.04140	0.00000	0.00000	0.00000	0.00022
228	6	-9.51101	-0.00831	0.00000	0.00000	0.00000	0.00011
229	6	-9.54970	0.00000	0.00000	0.00000	0.00000	-0.00003
230	6	-9.58838	-0.01978	0.00000	0.00000	0.00000	-0.00017
231	6	-9.62707	-0.06471	0.00000	0.00000	0.00000	-0.00028
232	6	-9.66576	-0.13056	0.00000	0.00000	0.00000	-0.00037
233	6	-9.70445	-0.21346	0.00000	0.00000	0.00000	-0.00045
234	6	-9.74314	-0.30990	0.00000	0.00000	0.00000	-0.00051
235	6	-9.77913	-0.41038	0.00000	0.00000	0.00000	-0.00048
236	6	-9.81459	-0.50044	0.00000	0.00000	0.00000	-0.00042
237	6	-9.85004	-0.57740	0.00000	0.00000	0.00000	-0.00035
238	6	-9.88550	-0.63921	0.00000	0.00000	0.00000	-0.00027
239	6	-9.92096	-0.68416	0.00000	0.00000	0.00000	-0.00018
240	6	-9.95642	-0.71093	0.00000	0.00000	0.00000	-0.00009

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
241	6	-9.99187	-0.71854	0.00000	0.00000	0.00000	0.00001
242	6	-10.02733	-0.70639	0.00000	0.00000	0.00000	0.00011
243	6	-10.06279	-0.67422	0.00000	0.00000	0.00000	0.00021
244	6	-10.09824	-0.62234	0.00000	0.00000	0.00000	0.00030
245	6	-10.13370	-0.55948	0.00000	0.00000	0.00000	0.00033
246	6	-10.16916	-0.49098	0.00000	0.00000	0.00000	0.00035
247	6	-10.20461	-0.41802	0.00000	0.00000	0.00000	0.00037
248	6	-10.24007	-0.34219	0.00000	0.00000	0.00000	0.00038
249	6	-10.27553	-0.26541	0.00000	0.00000	0.00000	0.00038
250	6	-10.31098	-0.18996	0.00000	0.00000	0.00000	0.00037
251	6	-10.34644	-0.11851	0.00000	0.00000	0.00000	0.00034
252	6	-10.38190	-0.05406	0.00000	0.00000	0.00000	0.00030
253	6	-10.41735	0.00000	0.00000	0.00000	0.00000	0.00024
34	6	-10.45281	0.04097	0.00000	0.00000	0.00000	0.00017
255	6	-10.48827	0.06991	0.00000	0.00000	0.00000	0.00012
256	6	-10.52373	0.08856	0.00000	0.00000	0.00000	0.00007
257	6	-10.55918	0.09827	0.00000	0.00000	0.00000	0.00003
258	6	-10.59464	0.10006	0.00000	0.00000	0.00000	-0.00001
259	6	-10.63010	0.09457	0.00000	0.00000	0.00000	-0.00005
260	6	-10.66555	0.08208	0.00000	0.00000	0.00000	-0.00008
261	6	-10.70101	0.06251	0.00000	0.00000	0.00000	-0.00012
262	6	-10.73647	0.03542	0.00000	0.00000	0.00000	-0.00016
263	6	-10.77192	0.00000	0.00000	0.00000	0.00000	-0.00020

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
26	6	0.00	1335.93	0.00	0.00	0.00	0.00
55	6	0.00	2106.78	0.00	0.00	0.00	0.00
84	6	0.00	2096.54	0.00	0.00	0.00	0.00
113	6	0.00	2025.32	0.00	0.00	0.00	0.00
142	6	0.00	1910.64	0.00	0.00	0.00	0.00
171	6	0.00	2182.94	0.00	0.00	0.00	0.00
200	6	0.00	1954.19	0.00	0.00	0.00	0.00
229	6	0.00	1884.01	0.00	0.00	0.00	0.00
253	6	0.00	1175.45	0.00	0.00	0.00	0.00
263	6	0.00	255.97	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

245. *LOAD LIST 1 4 6
246. *PLOT BEND FILE
247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

**** DATE= SEP 12,1997 TIME= 8:12: 9 ****

****
* 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 *
****

STRUCTURE DATA:

TYPE = PLANE
NJ = 263
NM = 262
NE = 0
NS = 11
NL = 6
XMAX= 524.0
YMAX= 0.0
ZMAX= 0.0

CON EL EXTREMO TENSADO DE LA PILA PROVISIONAL HAY APOYO SOBRE DICHA PILA.

METE MTON

COMPANY: INTECSA

S T A A D P D - P L O T (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: SEP 12, 1997

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 ************************************************
 *                                              *
 *          S T A A D - III                     *
 *          Revision 17.0a                      *
 *          Proprietary Program of              *
 *          RESEARCH ENGINEERS, Inc.            *
 *          Date=    SEP 12, 1997               *
 *          Time=     8:27:39                   *
 *                                              *
 ************************************************
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 2. STAAD PLANE PUENTE SOBRE EL CINCA - LANZAMIENTO
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000  0.000  263   524.000  0.000  0.000
 6. MEMBER INCIDENCES
 7.   1    1    2
 8.   R    261  1    1
 9. MEMBER PROPERTY
10.   1  TO  18                        PR   AX  0.318   IZ  0.8709
11.   19 TO  21                        PR   AX  0.432   IZ  1.1844
12.   22 TO  42  51 TO 77   86 TO 112  PR   AX 13.481   IZ 45.3025
13.   43 TO  50  78 TO 85   113 TO 120 PR   AX 15.001   IZ 47.4753
14.  121 TO 147 156 TO 262             PR   AX 13.481   IZ 45.3025
15.  148 TO 155                        PR   AX 15.001   IZ 47.4753
16. CONSTANTS
17. E   21000000.  MEMBER  1 TO  21
18. E    3350000.  MEMBER 22 TO 262
19. DEN  7.85      MEMBER  1 TO  21
20. DEN  2.55      MEMBER 22 TO 262
21. POISSON        0.2  ALL
22. SUPPORTS
23. *POSICION 1
24. *30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
25. *POSICION 2
26. *1 30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
27. *POSICION 3
28. *5 34 63 92 121 150 179 208 237 261 FIXED BUT FX MZ
29. *POSICION 4
30. *9 38 67 96 125 154 183 212 241     FIXED BUT FX MZ
31. *POSICION 5
32. *13 42 71 100 129 158 187 216 245   FIXED BUT FX MZ
33. *POSICION 6
34. *17 46 75 104 133 162 191 220 249   FIXED BUT FX MZ
35. *POSICION 7
36. *21 50 79 108 137 166 195 224 253   FIXED BUT FX MZ
37. *POSICION 8
38. *25 54 83 112 141 170 199 228 257   FIXED BUT FX MZ
39. *POSICION 9
40. *29 58 87 116 145 174 203 232 261   FIXED BUT FX MZ
41. *POSICION 10
42. *33 62 91 120 149 178 207 236 260   FIXED BUT FX MZ
43. *POSICION 11
44. *36 65 94 123 152 181 210 239       FIXED BUT FX MZ
45. *POSICION 12
46. *2 37 66 95 124 153 182 211 240     FIXED BUT FX MZ
47. *POSICION 13
48. *6 41 70 99 128 157 186 215 244     FIXED BUT FX MZ
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49. *POSICION 14
50. *10 45 74 103 132 161 190 219 248   FIXED BUT FX MZ
51. *POSICION 15
52. *14 49 78 107 136 165 194 223 252   FIXED BUT FX MZ
53. *POSICION 16
54. *18 53 82 111 140 169 198 227 256   FIXED BUT FX MZ
55. *POSICION 17
56. *22 57 86 115 144 173 202 231 260   FIXED BUT FX MZ
57. *POSICION 18
58. *26 61 90 119 148 177 206 235 259   FIXED BUT FX MZ
59. *POSICION 19
60. *30 65 94 123 152 181 210 239       FIXED BUT FX MZ
61. *POSICION 20
62. *34 69 98 127 156 185 214 243       FIXED BUT FX MZ
63. *POSICION 21
64. *36 71 100 129 158 187 216 245      FIXED BUT FX MZ
65. *POSICION 22
66. *3 38 73 102 131 160 189 218 247    FIXED BUT FX MZ
67. *POSICION 23
68. *7 42 77 106 135 164 193 222 251    FIXED BUT FX MZ
69. *POSICION 24
70. *11 46 81 110 139 168 197 226 255   FIXED BUT FX MZ
71. *POSICION 25
72. *15 50 85 114 143 172 201 230 259   FIXED BUT FX MZ
73. *POSICION 26
74. *19 54 89 118 147 176 205 234 258   FIXED BUT FX MZ
75. *POSICION 27
76. *23 58 93 122 151 180 209 238 262   FIXED BUT FX MZ
77. *POSICION 28
78. *27 62 97 126 155 184 213 242       FIXED BUT FX MZ
79. *POSICION 29
80. *31 66 101 130 159 188 217 246      FIXED BUT FX MZ
81. *POSICION 30
82. *35 70 105 134 163 192 221 250      FIXED BUT FX MZ
83. *POSICION 31
84. *36 71 106 135 164 193 222 251      FIXED BUT FX MZ
85. *POSICION 32
86. *4 39 74 109 138 167 196 225 254    FIXED BUT FX MZ
87. *POSICION 33
88. *8 43 78 113 142 171 200 229 258    FIXED BUT FX MZ
89. *POSICION 34
90. *12 47 82 117 146 175 204 233 262   FIXED BUT FX MZ
91. *POSICION 35
92. *16 51 86 121 150 179 208 237       FIXED BUT FX MZ
93. *POSICION 36
94. *20 55 90 125 154 183 212 241       FIXED BUT FX MZ
95. *POSICION 37
96. *24 59 94 129 158 187 216 245       FIXED BUT FX MZ
97. *POSICION 38
98. *26 61 96 131 160 189 218 251       FIXED BUT FX MZ
99. *POSICION 39
100. *3 28 63 98 133 162 191 220 249    FIXED BUT FX MZ
101. *POSICION 40
102. *7 32 67 102 137 166 195 224 253   FIXED BUT FX MZ
103. *POSICION 41
104. *11 36 71 106 141 170 199 228 257  FIXED BUT FX MZ
105. *POSICION 42
106. *15 40 75 110 145 174 203 232 261  FIXED BUT FX MZ
 07. *POSICION 43
108. *19 44 79 114 149 178 207 236 260  FIXED BUT FX MZ
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109. *POSICION 44
110. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
111. *POSICION 45 (IGUAL 44 SIN PESO DE PESCANTE)
112. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
113. *POSICION EXTREMA
114. 2  PINNED
115. 31 60 89 118 147 176 205 234 258 263 FIXED BUT FX MZ
116. *COMUN A TODAS LAS POSICIONES EXCEPTO EXTREMA
117. *263  PINED
118. LOADING 1 PESO PROPIO
119. SELFWEIGHT   Y   -1
120. LOADING 2 PRETENSADO 1
121. MEMBER LOAD
122. *CABLE CONTINUO SUPERIOR EXC +1.697
123. 22     CON  GX  2880   0.000
124. 22     CMOM GZ -4887   0.000
125. 262    CON  GX -2880   2.000
126. 262    CMOM GZ  4887   2.000
127. 22     CON  GX  1680   0.000
128. 22     CMOM GZ -2850   0.000
 29. 185    CON  GX  -560   1.666
130. 185    CMOM GZ   950   1.666
131. 195    CON  GX  -560   1.000
132. 195    CMOM GZ   950   1.000
133. 202    CON  GX  -560   0.334
134. 202    CMOM GZ   950   0.334
135. 22     CON  GX  1200   0.000
136. 22     CMOM GZ -2036   0.000
137. 86     CON  GX  -400   0.750
138. 86     CMOM GZ   679   0.750
139. 95     CON  GX  -400   0.250
140. 95     CMOM GZ   679   0.250
141. 103    CON  GX  -400   1.750
142. 103    CMOM GZ   678   1.750
143. *CABLE CONTINUO INFERIOR  EXC -2.786
144. 22     CON  GX  1440   0.000
145. 22     CMOM GZ  4012   0.000
146. 262    CON  GX -1440   2.000
147. 262    CMOM GZ -4012   2.000
 48. 22     CON  GX   840   0.000
149. 22     CMOM GZ  2340   0.000
150. 185    CON  GX  -280   1.666
151. 185    CMOM GZ  -780   1.666
152. 195    CON  GX  -280   1.000
153. 195    CMOM GZ  -780   1.000
154. 202    CON  GX  -280   0.334
155. 202    CMOM GZ  -780   0.334
156. 22     CON  GX   600   0.000
157. 22     CMOM GZ  1671   0.000
158. 147    CON  GX  -200   1.250
159. 147    CMOM GZ  -557   1.250
160. 156    CON  GX  -200   1.666
161. 156    CMOM GZ  -557   1.666
162. 166    CON  GX  -200   1.000
163. 166    CMOM GZ  -557   1.000
164. *CABLE CONTINUO CENTRAL  EXC -0.500
165. 22     CON  GX  1920   0.000
 66. 22     CMOM GZ   960   0.000
 67. 214    CON  GX   960   1.666
168. 214    CMOM GZ   480   1.666
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169. 262    CON  GX -2880   2.000
 70. 262    CMOM GZ -1440   2.000
171. LOADING 3 CABLES SOMBRERO  E 1.697
172. MEMBER LOAD
173. 42     CON  GX  1140   1.250
174. 42     CMOM GZ -1933   1.250
175. 51     CON  GX -1140   0.750
176. 51     CMOM GZ  1933   0.750
177. 77     CON  GX  3420   1.250
178. 77     CMOM GZ -5804   1.250
179. 86     CON  GX -3420   0.750
180. 86     CMOM GZ  5804   0.750
181. 112    CON  GX  3420   1.250
182. 112    CMOM GZ -5804   1.250
183. 121    CON  GX -3420   0.750
184. 121    CMOM GZ  5804   0.750
185. 147    CON  GX  2658   1.250
186. 147    CMOM GZ -4510   1.250
187. 156    CON  GX -2658   1.666
188. 156    CMOM GZ  4510   1.666
 39. 176    CON  GX  1520   0.333
190. 176    CMOM GZ -2579   0.333
191. 185    CON  GX -1520   1.666
192. 185    CMOM GZ  2579   1.666
193. 205    CON  GX  1520   0.333
194. 205    CMOM GZ -2579   0.333
195. 214    CON  GX -1520   1.666
196. 214    CMOM GZ  2579   1.666
197. 234    CON  GX  1140   0.333
198. 234    CMOM GZ -1934   0.333
199. 243    CON  GX -1140   1.666
200. 243    CMOM GZ  1934   1.666
201. LOADING 4 CABLES DE VANO E -2.786
202. MEMBER LOAD
203. 22     CON  GX  1900   0.000
204. 22     CMOM GZ  5293   0.000
205. 42     CON  GX -1900   1.250
206. 42     CMOM GZ -5293   1.250
207. 51     CON  GX  1900   0.750
 08. 51     CMOM GZ  5293   0.750
209. 77     CON  GX -1900   1.250
210. 77     CMOM GZ -5293   1.250
211. 86     CON  GX  2280   0.750
212. 86     CMOM GZ  6352   0.750
213. 112    CON  GX -2280   1.250
214. 112    CMOM GZ -6352   1.250
215. 121    CON  GX  2660   0.750
216. 121    CMOM GZ  7410   0.750
217. 147    CON  GX -2660   1.250
218. 147    CMOM GZ -7410   1.250
219. 156    CON  GX  1140   1.666
220. 156    CMOM GZ  3176   1.666
221. 176    CON  GX -1140   0.333
222. 176    CMOM GZ -3176   0.333
223. 185    CON  GX  1900   1.666
224. 185    CMOM GZ  5293   1.666
225. 205    CON  GX -1900   0.333
 26. 205    CMOM GZ -5293   0.333
 27. 214    CON  GX  1900   1.666
228. 214    CMOM GZ  5293   1.666
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*29. 234    CON  GX -1900   0.333
 30. 234    CMOM GZ -5293   0.333
231. 243    CON  GX  1140   1.666
232. 243    CMOM GZ  3176   1.666
233. 262    CON  GX -1140   2.000
234. 262    CMOM GZ -3176   2.000
235. LOADING COMBINATION 5
236. 2  1.0   3  1.0   4  1.0
237. LOADING COMBINATION 6
238. 1  1.0   2  0.96  3  0.96   4  0.96
239. PERFORM ANALISIS


      P R O B L E M   S T A T I S T I C S
      -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =  263/  262/   11
  ORIGINAL/FINAL BAND-WIDTH =    1/    1
  TOTAL PRIMARY LOAD CASES  =    4, TOTAL DEGREES OF FREEDOM =   777
  SIZE OF STIFFNESS MATRIX =   4662 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =  12.53 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.          8:27:44
++ PROCESSING GLOBAL STIFFNESS MATRIX.           8:27:45
++ PROCESSING TRIANGULAR FACTORIZATION.          8:27:45
++ CALCULATING JOINT DISPLACEMENTS.              8:27:45
++ CALCULATING MEMBER  FORCES.                   8:27:46

240. PRINT JOINT COORDINATES
```


JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
1	0.000	0.000	0.000
2	2.000	0.000	0.000
3	4.000	0.000	0.000
4	6.000	0.000	0.000
5	8.000	0.000	0.000
6	10.000	0.000	0.000
7	12.000	0.000	0.000
8	14.000	0.000	0.000
9	16.000	0.000	0.000
10	18.000	0.000	0.000
11	20.000	0.000	0.000
12	22.000	0.000	0.000
13	24.000	0.000	0.000
14	26.000	0.000	0.000
15	28.000	0.000	0.000
16	30.000	0.000	0.000
17	32.000	0.000	0.000
18	34.000	0.000	0.000
19	36.000	0.000	0.000
20	38.000	0.000	0.000
21	40.000	0.000	0.000
22	42.000	0.000	0.000
23	44.000	0.000	0.000
24	46.000	0.000	0.000
25	48.000	0.000	0.000
26	50.000	0.000	0.000
27	52.000	0.000	0.000
28	54.000	0.000	0.000
29	56.000	0.000	0.000
30	58.000	0.000	0.000
31	60.000	0.000	0.000
32	62.000	0.000	0.000
33	64.000	0.000	0.000
34	66.000	0.000	0.000
35	68.000	0.000	0.000
36	70.000	0.000	0.000
37	72.000	0.000	0.000
38	74.000	0.000	0.000
39	76.000	0.000	0.000
40	78.000	0.000	0.000
41	80.000	0.000	0.000
42	82.000	0.000	0.000
43	84.000	0.000	0.000
44	86.000	0.000	0.000
45	88.000	0.000	0.000
46	90.000	0.000	0.000
47	92.000	0.000	0.000
48	94.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
49	96.000	0.000	0.000
50	98.000	0.000	0.000
51	100.000	0.000	0.000
52	102.000	0.000	0.000
53	104.000	0.000	0.000
54	106.000	0.000	0.000
55	108.000	0.000	0.000
56	110.000	0.000	0.000
57	112.000	0.000	0.000
58	114.000	0.000	0.000
59	116.000	0.000	0.000
60	118.000	0.000	0.000
61	120.000	0.000	0.000
62	122.000	0.000	0.000
63	124.000	0.000	0.000
64	126.000	0.000	0.000
65	128.000	0.000	0.000
66	130.000	0.000	0.000
67	132.000	0.000	0.000
68	134.000	0.000	0.000
69	136.000	0.000	0.000
70	138.000	0.000	0.000
71	140.000	0.000	0.000
72	142.000	0.000	0.000
73	144.000	0.000	0.000
74	146.000	0.000	0.000
75	148.000	0.000	0.000
76	150.000	0.000	0.000
77	152.000	0.000	0.000
78	154.000	0.000	0.000
79	156.000	0.000	0.000
80	158.000	0.000	0.000
81	160.000	0.000	0.000
82	162.000	0.000	0.000
83	164.000	0.000	0.000
84	166.000	0.000	0.000
85	168.000	0.000	0.000
86	170.000	0.000	0.000
87	172.000	0.000	0.000
88	174.000	0.000	0.000
89	176.000	0.000	0.000
90	178.000	0.000	0.000
91	180.000	0.000	0.000
92	182.000	0.000	0.000
93	184.000	0.000	0.000
94	186.000	0.000	0.000
95	188.000	0.000	0.000
96	190.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
97	192.000	0.000	0.000
98	194.000	0.000	0.000
99	196.000	0.000	0.000
100	198.000	0.000	0.000
101	200.000	0.000	0.000
102	202.000	0.000	0.000
103	204.000	0.000	0.000
104	206.000	0.000	0.000
105	208.000	0.000	0.000
106	210.000	0.000	0.000
107	212.000	0.000	0.000
108	214.000	0.000	0.000
109	216.000	0.000	0.000
110	218.000	0.000	0.000
111	220.000	0.000	0.000
112	222.000	0.000	0.000
113	224.000	0.000	0.000
114	226.000	0.000	0.000
115	228.000	0.000	0.000
116	230.000	0.000	0.000
117	232.000	0.000	0.000
118	234.000	0.000	0.000
119	236.000	0.000	0.000
120	238.000	0.000	0.000
121	240.000	0.000	0.000
122	242.000	0.000	0.000
123	244.000	0.000	0.000
124	246.000	0.000	0.000
125	248.000	0.000	0.000
126	250.000	0.000	0.000
127	252.000	0.000	0.000
128	254.000	0.000	0.000
129	256.000	0.000	0.000
130	258.000	0.000	0.000
131	260.000	0.000	0.000
132	262.000	0.000	0.000
133	264.000	0.000	0.000
134	266.000	0.000	0.000
135	268.000	0.000	0.000
136	270.000	0.000	0.000
137	272.000	0.000	0.000
138	274.000	0.000	0.000
139	276.000	0.000	0.000
140	278.000	0.000	0.000
141	280.000	0.000	0.000
142	282.000	0.000	0.000
143	284.000	0.000	0.000
144	286.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
145	288.000	0.000	0.000
146	290.000	0.000	0.000
147	292.000	0.000	0.000
148	294.000	0.000	0.000
149	296.000	0.000	0.000
150	298.000	0.000	0.000
151	300.000	0.000	0.000
152	302.000	0.000	0.000
153	304.000	0.000	0.000
154	306.000	0.000	0.000
155	308.000	0.000	0.000
156	310.000	0.000	0.000
157	312.000	0.000	0.000
158	314.000	0.000	0.000
159	316.000	0.000	0.000
160	318.000	0.000	0.000
161	320.000	0.000	0.000
162	322.000	0.000	0.000
163	324.000	0.000	0.000
164	326.000	0.000	0.000
165	328.000	0.000	0.000
166	330.000	0.000	0.000
167	332.000	0.000	0.000
168	334.000	0.000	0.000
169	336.000	0.000	0.000
170	338.000	0.000	0.000
171	340.000	0.000	0.000
172	342.000	0.000	0.000
173	344.000	0.000	0.000
174	346.000	0.000	0.000
175	348.000	0.000	0.000
176	350.000	0.000	0.000
177	352.000	0.000	0.000
178	354.000	0.000	0.000
179	356.000	0.000	0.000
180	358.000	0.000	0.000
181	360.000	0.000	0.000
182	362.000	0.000	0.000
183	364.000	0.000	0.000
184	366.000	0.000	0.000
185	368.000	0.000	0.000
186	370.000	0.000	0.000
187	372.000	0.000	0.000
188	374.000	0.000	0.000
189	376.000	0.000	0.000
190	378.000	0.000	0.000
191	380.000	0.000	0.000
192	382.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
193	384.000	0.000	0.000
194	386.000	0.000	0.000
195	388.000	0.000	0.000
196	390.000	0.000	0.000
197	392.000	0.000	0.000
198	394.000	0.000	0.000
199	396.000	0.000	0.000
200	398.000	0.000	0.000
201	400.000	0.000	0.000
202	402.000	0.000	0.000
203	404.000	0.000	0.000
204	406.000	0.000	0.000
205	408.000	0.000	0.000
206	410.000	0.000	0.000
207	412.000	0.000	0.000
208	414.000	0.000	0.000
209	416.000	0.000	0.000
210	418.000	0.000	0.000
211	420.000	0.000	0.000
212	422.000	0.000	0.000
213	424.000	0.000	0.000
214	426.000	0.000	0.000
215	428.000	0.000	0.000
216	430.000	0.000	0.000
217	432.000	0.000	0.000
218	434.000	0.000	0.000
219	436.000	0.000	0.000
220	438.000	0.000	0.000
221	440.000	0.000	0.000
222	442.000	0.000	0.000
223	444.000	0.000	0.000
224	446.000	0.000	0.000
225	448.000	0.000	0.000
226	450.000	0.000	0.000
227	452.000	0.000	0.000
228	454.000	0.000	0.000
229	456.000	0.000	0.000
230	458.000	0.000	0.000
231	460.000	0.000	0.000
232	462.000	0.000	0.000
233	464.000	0.000	0.000
234	466.000	0.000	0.000
235	468.000	0.000	0.000
236	470.000	0.000	0.000
237	472.000	0.000	0.000
238	474.000	0.000	0.000
239	476.000	0.000	0.000
240	478.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
241	480.000	0.000	0.000
242	482.000	0.000	0.000
243	484.000	0.000	0.000
244	486.000	0.000	0.000
245	488.000	0.000	0.000
246	490.000	0.000	0.000
247	492.000	0.000	0.000
248	494.000	0.000	0.000
249	496.000	0.000	0.000
250	498.000	0.000	0.000
251	500.000	0.000	0.000
252	502.000	0.000	0.000
253	504.000	0.000	0.000
254	506.000	0.000	0.000
255	508.000	0.000	0.000
256	510.000	0.000	0.000
257	512.000	0.000	0.000
258	514.000	0.000	0.000
259	516.000	0.000	0.000
260	518.000	0.000	0.000
261	520.000	0.000	0.000
262	522.000	0.000	0.000
263	524.000	0.000	0.000

********** END OF DATA FROM INTERNAL STORAGE **********

241. LOAD LIST 6
242. *PRINT MEMBER FORCES ALL
243. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	6	0.00000	0.12771	0.00000	0.00000	0.00000	-0.00064
2	6	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00064
3	6	0.00000	-0.12736	0.00000	0.00000	0.00000	-0.00063
4	6	0.00000	-0.25226	0.00000	0.00000	0.00000	-0.00061
5	6	0.00000	-0.37236	0.00000	0.00000	0.00000	-0.00058
6	6	0.00000	-0.48551	0.00000	0.00000	0.00000	-0.00055
7	6	0.00000	-0.58978	0.00000	0.00000	0.00000	-0.00050
8	6	0.00000	-0.68347	0.00000	0.00000	0.00000	-0.00044
9	6	0.00000	-0.76511	0.00000	0.00000	0.00000	-0.00038
10	6	0.00000	-0.83341	0.00000	0.00000	0.00000	-0.00031
11	6	0.00000	-0.88733	0.00000	0.00000	0.00000	-0.00023
12	6	0.00000	-0.92604	0.00000	0.00000	0.00000	-0.00015
13	6	0.00000	-0.94893	0.00000	0.00000	0.00000	-0.00007
14	6	0.00000	-0.95561	0.00000	0.00000	0.00000	0.00001
15	6	0.00000	-0.94589	0.00000	0.00000	0.00000	0.00009
16	6	0.00000	-0.91982	0.00000	0.00000	0.00000	0.00017
17	6	0.00000	-0.87766	0.00000	0.00000	0.00000	0.00025
18	6	0.00000	-0.81990	0.00000	0.00000	0.00000	0.00033
19	6	0.00000	-0.74723	0.00000	0.00000	0.00000	0.00040
20	6	0.00000	-0.66237	0.00000	0.00000	0.00000	0.00045
21	6	0.00000	-0.56810	0.00000	0.00000	0.00000	0.00049
22	6	0.00000	-0.46548	0.00000	0.00000	0.00000	0.00053
23	6	-0.02648	-0.36001	0.00000	0.00000	0.00000	0.00051
24	6	-0.07946	-0.26379	0.00000	0.00000	0.00000	0.00045
25	6	-0.13243	-0.17902	0.00000	0.00000	0.00000	0.00039
26	6	-0.18540	-0.10685	0.00000	0.00000	0.00000	0.00033
27	6	-0.23837	-0.04876	0.00000	0.00000	0.00000	0.00025
28	6	-0.29135	-0.00663	0.00000	0.00000	0.00000	0.00017
29	6	-0.34432	0.01732	0.00000	0.00000	0.00000	0.00007
30	6	-0.39729	0.02052	0.00000	0.00000	0.00000	-0.00004
31	6	-0.45026	0.00000	0.00000	0.00000	0.00000	-0.00017
32	6	-0.50324	-0.04609	0.00000	0.00000	0.00000	-0.00029
33	6	-0.55621	-0.11417	0.00000	0.00000	0.00000	-0.00039
34	6	-0.60918	-0.19958	0.00000	0.00000	0.00000	-0.00046
35	6	-0.66215	-0.29801	0.00000	0.00000	0.00000	-0.00052
36	6	-0.71513	-0.40552	0.00000	0.00000	0.00000	-0.00055
37	6	-0.76810	-0.51853	0.00000	0.00000	0.00000	-0.00057
38	6	-0.82107	-0.63381	0.00000	0.00000	0.00000	-0.00058
39	6	-0.87404	-0.74853	0.00000	0.00000	0.00000	-0.00057
40	6	-0.92702	-0.86017	0.00000	0.00000	0.00000	-0.00055
41	6	-0.97999	-0.96662	0.00000	0.00000	0.00000	-0.00052
42	6	-1.03296	-1.06611	0.00000	0.00000	0.00000	-0.00048
43	6	-1.08472	-1.15593	0.00000	0.00000	0.00000	-0.00040
44	6	-1.12942	-1.22227	0.00000	0.00000	0.00000	-0.00026
45	6	-1.17413	-1.26156	0.00000	0.00000	0.00000	-0.00013
46	6	-1.21883	-1.27354	0.00000	0.00000	0.00000	0.00001
47	6	-1.26353	-1.25836	0.00000	0.00000	0.00000	0.00014
48	6	-1.30823	-1.21655	0.00000	0.00000	0.00000	0.00027

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
49	6	-1.35293	-1.14900	0.00000	0.00000	0.00000	0.00040
50	6	-1.39763	-1.05702	0.00000	0.00000	0.00000	0.00052
51	6	-1.44233	-0.94228	0.00000	0.00000	0.00000	0.00063
52	6	-1.49410	-0.80995	0.00000	0.00000	0.00000	0.00067
53	6	-1.54707	-0.67546	0.00000	0.00000	0.00000	0.00067
54	6	-1.60004	-0.54303	0.00000	0.00000	0.00000	0.00065
55	6	-1.65301	-0.41592	0.00000	0.00000	0.00000	0.00062
56	6	-1.70599	-0.29776	0.00000	0.00000	0.00000	0.00056
57	6	-1.75896	-0.19255	0.00000	0.00000	0.00000	0.00049
58	6	-1.81193	-0.10465	0.00000	0.00000	0.00000	0.00039
59	6	-1.86490	-0.03877	0.00000	0.00000	0.00000	0.00027
60	6	-1.91788	0.00000	0.00000	0.00000	0.00000	0.00012
61	6	-1.97085	0.00806	0.00000	0.00000	0.00000	-0.00003
62	6	-2.02382	-0.01119	0.00000	0.00000	0.00000	-0.00016
63	6	-2.07679	-0.05285	0.00000	0.00000	0.00000	-0.00026
64	6	-2.12977	-0.11242	0.00000	0.00000	0.00000	-0.00034
65	6	-2.18274	-0.18572	0.00000	0.00000	0.00000	-0.00039
66	6	-2.23571	-0.26895	0.00000	0.00000	0.00000	-0.00044
67	6	-2.28869	-0.35869	0.00000	0.00000	0.00000	-0.00046
68	6	-2.34166	-0.45186	0.00000	0.00000	0.00000	-0.00047
69	6	-2.39463	-0.54574	0.00000	0.00000	0.00000	-0.00047
70	6	-2.44760	-0.63800	0.00000	0.00000	0.00000	-0.00045
71	6	-2.50058	-0.72663	0.00000	0.00000	0.00000	-0.00043
72	6	-2.55355	-0.81002	0.00000	0.00000	0.00000	-0.00040
73	6	-2.60652	-0.88691	0.00000	0.00000	0.00000	-0.00037
74	6	-2.65949	-0.95640	0.00000	0.00000	0.00000	-0.00033
75	6	-2.71247	-1.01795	0.00000	0.00000	0.00000	-0.00029
76	6	-2.76544	-1.07139	0.00000	0.00000	0.00000	-0.00025
77	6	-2.81841	-1.11690	0.00000	0.00000	0.00000	-0.00021
78	6	-2.87381	-1.15306	0.00000	0.00000	0.00000	-0.00012
79	6	-2.92722	-1.16096	0.00000	0.00000	0.00000	0.00004
80	6	-2.98063	-1.13713	0.00000	0.00000	0.00000	0.00020
81	6	-3.03404	-1.08321	0.00000	0.00000	0.00000	0.00034
82	6	-3.08746	-1.00120	0.00000	0.00000	0.00000	0.00048
83	6	-3.14087	-0.89350	0.00000	0.00000	0.00000	0.00060
84	6	-3.19428	-0.76286	0.00000	0.00000	0.00000	0.00071
85	6	-3.24769	-0.61247	0.00000	0.00000	0.00000	0.00080
86	6	-3.30111	-0.44586	0.00000	0.00000	0.00000	0.00087
87	6	-3.35645	-0.27304	0.00000	0.00000	0.00000	0.00082
88	6	-3.40934	-0.12204	0.00000	0.00000	0.00000	0.00069
89	6	-3.46222	0.00000	0.00000	0.00000	0.00000	0.00053
90	6	-3.51511	0.08966	0.00000	0.00000	0.00000	0.00037
91	6	-3.56800	0.15040	0.00000	0.00000	0.00000	0.00024
92	6	-3.62089	0.18713	0.00000	0.00000	0.00000	0.00013
93	6	-3.67377	0.20439	0.00000	0.00000	0.00000	0.00004
94	6	-3.72666	0.20637	0.00000	0.00000	0.00000	-0.00002
95	6	-3.77955	0.19689	0.00000	0.00000	0.00000	-0.00007
96	6	-3.83095	0.17874	0.00000	0.00000	0.00000	-0.00011

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
97	6	-3.88214	0.15399	0.00000	0.00000	0.00000	-0.00014
98	6	-3.93332	0.12534	0.00000	0.00000	0.00000	-0.00015
99	6	-3.98451	0.09517	0.00000	0.00000	0.00000	-0.00015
100	6	-4.03570	0.06549	0.00000	0.00000	0.00000	-0.00014
101	6	-4.08688	0.03795	0.00000	0.00000	0.00000	-0.00013
102	6	-4.13807	0.01382	0.00000	0.00000	0.00000	-0.00011
103	6	-4.18926	-0.00596	0.00000	0.00000	0.00000	-0.00009
104	6	-4.24023	-0.02087	0.00000	0.00000	0.00000	-0.00006
105	6	-4.28972	-0.03173	0.00000	0.00000	0.00000	-0.00005
106	6	-4.33921	-0.03938	0.00000	0.00000	0.00000	-0.00003
107	6	-4.38869	-0.04435	0.00000	0.00000	0.00000	-0.00002
108	6	-4.43818	-0.04752	0.00000	0.00000	0.00000	-0.00001
109	6	-4.48767	-0.05015	0.00000	0.00000	0.00000	-0.00001
10	6	-4.53715	-0.05385	0.00000	0.00000	0.00000	-0.00002
111	6	-4.58664	-0.06061	0.00000	0.00000	0.00000	-0.00005
112	6	-4.63612	-0.07275	0.00000	0.00000	0.00000	-0.00008
113	6	-4.68743	-0.09033	0.00000	0.00000	0.00000	-0.00007
114	6	-4.73626	-0.09774	0.00000	0.00000	0.00000	0.00002
115	6	-4.78508	-0.08525	0.00000	0.00000	0.00000	0.00009
116	6	-4.83391	-0.06302	0.00000	0.00000	0.00000	0.00013
117	6	-4.88274	-0.03313	0.00000	0.00000	0.00000	0.00016
118	6	-4.93157	0.00000	0.00000	0.00000	0.00000	0.00017
119	6	-4.98039	0.03322	0.00000	0.00000	0.00000	0.00017
120	6	-5.02922	0.06976	0.00000	0.00000	0.00000	0.00020
121	6	-5.07805	0.11419	0.00000	0.00000	0.00000	0.00025
122	6	-5.13036	0.16445	0.00000	0.00000	0.00000	0.00022
123	6	-5.18147	0.20024	0.00000	0.00000	0.00000	0.00014
124	6	-5.23257	0.22281	0.00000	0.00000	0.00000	0.00009
125	6	-5.28367	0.23544	0.00000	0.00000	0.00000	0.00004
126	6	-5.33477	0.24100	0.00000	0.00000	0.00000	0.00001
127	6	-5.38587	0.24203	0.00000	0.00000	0.00000	0.00000
128	6	-5.43698	0.24070	0.00000	0.00000	0.00000	-0.00001
29	6	-5.48808	0.23881	0.00000	0.00000	0.00000	-0.00001
130	6	-5.53918	0.23781	0.00000	0.00000	0.00000	0.00000
131	6	-5.59028	0.23879	0.00000	0.00000	0.00000	0.00001
132	6	-5.64138	0.24245	0.00000	0.00000	0.00000	0.00003
133	6	-5.69248	0.24916	0.00000	0.00000	0.00000	0.00004
134	6	-5.74359	0.25891	0.00000	0.00000	0.00000	0.00006
135	6	-5.79469	0.27133	0.00000	0.00000	0.00000	0.00007
136	6	-5.84579	0.28569	0.00000	0.00000	0.00000	0.00007
137	6	-5.89689	0.30090	0.00000	0.00000	0.00000	0.00008
138	6	-5.94799	0.31550	0.00000	0.00000	0.00000	0.00007
139	6	-5.99910	0.32768	0.00000	0.00000	0.00000	0.00005
140	6	-6.05020	0.33525	0.00000	0.00000	0.00000	0.00002
141	6	-6.10130	0.33567	0.00000	0.00000	0.00000	-0.00002
142	6	-6.15240	0.32603	0.00000	0.00000	0.00000	-0.00008
143	6	-6.20351	0.30308	0.00000	0.00000	0.00000	-0.00015
144	6	-6.25461	0.26317	0.00000	0.00000	0.00000	-0.00025

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
145	6	-6.30571	0.20232	0.00000	0.00000	0.00000	-0.00036
146	6	-6.35681	0.11617	0.00000	0.00000	0.00000	-0.00050
147	6	-6.40791	0.00000	0.00000	0.00000	0.00000	-0.00066
148	6	-6.45869	-0.14732	0.00000	0.00000	0.00000	-0.00077
149	6	-6.50385	-0.29948	0.00000	0.00000	0.00000	-0.00075
150	6	-6.54900	-0.44599	0.00000	0.00000	0.00000	-0.00071
151	6	-6.59415	-0.58290	0.00000	0.00000	0.00000	-0.00065
152	6	-6.63930	-0.70666	0.00000	0.00000	0.00000	-0.00058
153	6	-6.68445	-0.81410	0.00000	0.00000	0.00000	-0.00049
154	6	-6.72961	-0.90242	0.00000	0.00000	0.00000	-0.00039
155	6	-6.77476	-0.96922	0.00000	0.00000	0.00000	-0.00028
156	6	-6.81991	-1.01248	0.00000	0.00000	0.00000	-0.00015
157	6	-6.86894	-1.03020	0.00000	0.00000	0.00000	-0.00003
58	6	-6.91188	-1.03200	0.00000	0.00000	0.00000	0.00002
159	6	-6.95481	-1.02315	0.00000	0.00000	0.00000	0.00007
160	6	-6.99775	-1.00306	0.00000	0.00000	0.00000	0.00013
161	6	-7.04069	-0.97148	0.00000	0.00000	0.00000	0.00019
162	6	-7.08363	-0.92853	0.00000	0.00000	0.00000	0.00024
163	6	-7.12657	-0.87470	0.00000	0.00000	0.00000	0.00030
164	6	-7.16951	-0.81083	0.00000	0.00000	0.00000	0.00034
165	6	-7.21245	-0.73813	0.00000	0.00000	0.00000	0.00038
166	6	-7.25539	-0.65816	0.00000	0.00000	0.00000	0.00041
167	6	-7.29790	-0.57269	0.00000	0.00000	0.00000	0.00044
168	6	-7.33999	-0.48295	0.00000	0.00000	0.00000	0.00046
169	6	-7.38208	-0.39143	0.00000	0.00000	0.00000	0.00046
170	6	-7.42417	-0.30113	0.00000	0.00000	0.00000	0.00044
171	6	-7.46626	-0.21545	0.00000	0.00000	0.00000	0.00041
172	6	-7.50835	-0.13813	0.00000	0.00000	0.00000	0.00036
173	6	-7.55044	-0.07327	0.00000	0.00000	0.00000	0.00029
174	6	-7.59253	-0.02535	0.00000	0.00000	0.00000	0.00019
175	6	-7.63462	0.00081	0.00000	0.00000	0.00000	0.00007
176	6	-7.67671	0.00000	0.00000	0.00000	0.00000	-0.00008
77	6	-7.72014	-0.02638	0.00000	0.00000	0.00000	-0.00017
178	6	-7.76385	-0.06557	0.00000	0.00000	0.00000	-0.00022
179	6	-7.80755	-0.11236	0.00000	0.00000	0.00000	-0.00025
180	6	-7.85125	-0.16212	0.00000	0.00000	0.00000	-0.00025
181	6	-7.89496	-0.21057	0.00000	0.00000	0.00000	-0.00023
182	6	-7.93866	-0.25382	0.00000	0.00000	0.00000	-0.00020
183	6	-7.98237	-0.28832	0.00000	0.00000	0.00000	-0.00015
184	6	-8.02607	-0.31088	0.00000	0.00000	0.00000	-0.00008
185	6	-8.06978	-0.31868	0.00000	0.00000	0.00000	0.00000
186	6	-8.11315	-0.30955	0.00000	0.00000	0.00000	0.00008
187	6	-8.15490	-0.29440	0.00000	0.00000	0.00000	0.00008
188	6	-8.19665	-0.27855	0.00000	0.00000	0.00000	0.00008
189	6	-8.23840	-0.26063	0.00000	0.00000	0.00000	0.00010
190	6	-8.28015	-0.23964	0.00000	0.00000	0.00000	0.00011
191	6	-8.32190	-0.21493	0.00000	0.00000	0.00000	0.00013
192	6	-8.36365	-0.18621	0.00000	0.00000	0.00000	0.00015

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
193	6	-8.40540	-0.15356	0.00000	0.00000	0.00000	0.00017
194	6	-8.44715	-0.11743	0.00000	0.00000	0.00000	0.00019
195	6	-8.48889	-0.07861	0.00000	0.00000	0.00000	0.00020
196	6	-8.52886	-0.03833	0.00000	0.00000	0.00000	0.00020
197	6	-8.56703	0.00155	0.00000	0.00000	0.00000	0.00020
198	6	-8.60521	0.03911	0.00000	0.00000	0.00000	0.00018
199	6	-8.64339	0.07208	0.00000	0.00000	0.00000	0.00015
200	6	-8.68157	0.09785	0.00000	0.00000	0.00000	0.00011
201	6	-8.71975	0.11343	0.00000	0.00000	0.00000	0.00005
202	6	-8.75792	0.11550	0.00000	0.00000	0.00000	-0.00003
203	6	-8.79313	0.10019	0.00000	0.00000	0.00000	-0.00013
204	6	-8.82773	0.06317	0.00000	0.00000	0.00000	-0.00025
205	6	-8.86234	0.00000	0.00000	0.00000	0.00000	-0.00039
06	6	-8.89560	-0.08547	0.00000	0.00000	0.00000	-0.00045
207	6	-8.92859	-0.17713	0.00000	0.00000	0.00000	-0.00046
208	6	-8.96158	-0.26993	0.00000	0.00000	0.00000	-0.00046
209	6	-8.99457	-0.35949	0.00000	0.00000	0.00000	-0.00043
210	6	-9.02756	-0.44177	0.00000	0.00000	0.00000	-0.00039
211	6	-9.06055	-0.51312	0.00000	0.00000	0.00000	-0.00032
212	6	-9.09354	-0.57021	0.00000	0.00000	0.00000	-0.00024
213	6	-9.12653	-0.61013	0.00000	0.00000	0.00000	-0.00015
214	6	-9.15952	-0.63027	0.00000	0.00000	0.00000	-0.00005
215	6	-9.19347	-0.62872	0.00000	0.00000	0.00000	0.00005
216	6	-9.23215	-0.61714	0.00000	0.00000	0.00000	0.00007
217	6	-9.27084	-0.60135	0.00000	0.00000	0.00000	0.00009
218	6	-9.30953	-0.58024	0.00000	0.00000	0.00000	0.00012
219	6	-9.34822	-0.55302	0.00000	0.00000	0.00000	0.00015
220	6	-9.38691	-0.51931	0.00000	0.00000	0.00000	0.00019
221	6	-9.42559	-0.47904	0.00000	0.00000	0.00000	0.00022
222	6	-9.46428	-0.43255	0.00000	0.00000	0.00000	0.00025
223	6	-9.50297	-0.38052	0.00000	0.00000	0.00000	0.00027
224	6	-9.54166	-0.32398	0.00000	0.00000	0.00000	0.00029
25	6	-9.58035	-0.26435	0.00000	0.00000	0.00000	0.00030
226	6	-9.61903	-0.20340	0.00000	0.00000	0.00000	0.00030
227	6	-9.65772	-0.14325	0.00000	0.00000	0.00000	0.00029
228	6	-9.69641	-0.08641	0.00000	0.00000	0.00000	0.00027
229	6	-9.73510	-0.03572	0.00000	0.00000	0.00000	0.00023
230	6	-9.77379	0.00559	0.00000	0.00000	0.00000	0.00018
231	6	-9.81247	0.03394	0.00000	0.00000	0.00000	0.00010
232	6	-9.85116	0.04539	0.00000	0.00000	0.00000	0.00001
233	6	-9.88985	0.03563	0.00000	0.00000	0.00000	-0.00011
234	6	-9.92854	0.00000	0.00000	0.00000	0.00000	-0.00025
235	6	-9.96453	-0.05851	0.00000	0.00000	0.00000	-0.00032
236	6	-9.99999	-0.12521	0.00000	0.00000	0.00000	-0.00035
237	6	-10.03545	-0.19552	0.00000	0.00000	0.00000	-0.00035
238	6	-10.07090	-0.26548	0.00000	0.00000	0.00000	-0.00034
239	6	-10.10636	-0.33151	0.00000	0.00000	0.00000	-0.00031
240	6	-10.14182	-0.39035	0.00000	0.00000	0.00000	-0.00027

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
241	6	-10.17727	-0.43913	0.00000	0.00000	0.00000	-0.00021
242	6	-10.21273	-0.47536	0.00000	0.00000	0.00000	-0.00015
243	6	-10.24819	-0.49687	0.00000	0.00000	0.00000	-0.00007
244	6	-10.28364	-0.50207	0.00000	0.00000	0.00000	0.00001
245	6	-10.31910	-0.49779	0.00000	0.00000	0.00000	0.00004
246	6	-10.35456	-0.48746	0.00000	0.00000	0.00000	0.00007
247	6	-10.39001	-0.47038	0.00000	0.00000	0.00000	0.00010
248	6	-10.42547	-0.44621	0.00000	0.00000	0.00000	0.00014
249	6	-10.46093	-0.41498	0.00000	0.00000	0.00000	0.00017
250	6	-10.49639	-0.37708	0.00000	0.00000	0.00000	0.00021
251	6	-10.53184	-0.33326	0.00000	0.00000	0.00000	0.00023
252	6	-10.56730	-0.28464	0.00000	0.00000	0.00000	0.00025
253	6	-10.60276	-0.23268	0.00000	0.00000	0.00000	0.00027
254	6	-10.63821	-0.17924	0.00000	0.00000	0.00000	0.00027
255	6	-10.67367	-0.12650	0.00000	0.00000	0.00000	0.00026
256	6	-10.70913	-0.07704	0.00000	0.00000	0.00000	0.00023
257	6	-10.74458	-0.03378	0.00000	0.00000	0.00000	0.00020
258	6	-10.78004	0.00000	0.00000	0.00000	0.00000	0.00014
259	6	-10.81550	0.02155	0.00000	0.00000	0.00000	0.00008
260	6	-10.85095	0.03142	0.00000	0.00000	0.00000	0.00002
261	6	-10.88641	0.03069	0.00000	0.00000	0.00000	-0.00003
262	6	-10.92187	0.02009	0.00000	0.00000	0.00000	-0.00008
263	6	-10.95732	0.00000	0.00000	0.00000	0.00000	-0.00012

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
2	6	-0.01	66.42	0.00	0.00	0.00	0.00
31	6	0.00	1651.11	0.00	0.00	0.00	0.00
60	6	0.00	2097.27	0.00	0.00	0.00	0.00
89	6	0.00	2060.11	0.00	0.00	0.00	0.00
118	6	0.00	2017.45	0.00	0.00	0.00	0.00
147	6	0.00	1965.43	0.00	0.00	0.00	0.00
176	6	0.00	2139.21	0.00	0.00	0.00	0.00
205	6	0.00	1948.18	0.00	0.00	0.00	0.00
234	6	0.00	1911.93	0.00	0.00	0.00	0.00
258	6	0.00	1036.98	0.00	0.00	0.00	0.00
263	6	0.00	33.71	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

245. *LOAD LIST 1 4 6
246. *PLOT BEND FILE
247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

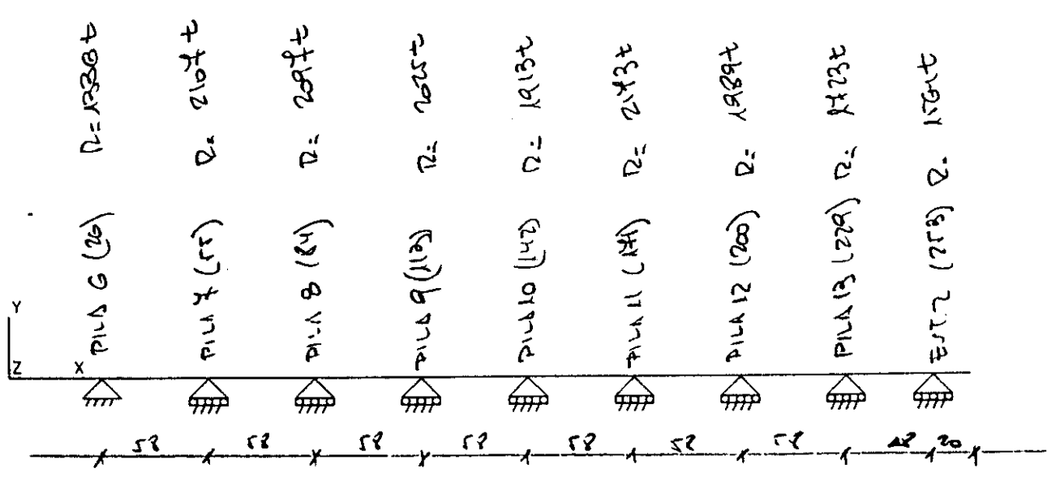
**** DATE= SEP 12,1997 TIME= 8:27:53 ****

****
* 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 *
****

STRUCTURE DATA:

TYPE = PLANE
NJ = 263
NM = 262
NE = 0
NS = 9
NL = 6
XMAX= 524.0
YMAX= 0.0
ZMAX= 0.0

1



SI PROVISIONALMENTE A LA SALIDA DELA DESLIZADERA SE HUBIESE "CORTADO" LA PILA PROVISIONAL

METE MTON

COMPANY: INTECSA

S T A A D P D - P L O T (REV: 17.0a)

TITLE: PUENTE SOBRE EL CINCA - LANZAMIENTO

DATE: SEP 11, 1997

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 **************************************************
 *                                                *
 *          S T A A D - III                       *
 *          Revision 17.0a                        *
 *          Proprietary Program of                *
 *          RESEARCH ENGINEERS, Inc.              *
 *          Date=    SEP 12, 1997                 *
 *          Time=     8: 7:53                     *
 *                                                *
 **************************************************


 2. STAAD PLANE PUENTE SOBRE EL CINCA - LANZAMIENTO
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000  0.000  263   524.000  0.000  0.000
 6. MEMBER INCIDENCES
 7.   1    1    2
 8.   R    261  1   1
 9. MEMBER PROPERTY
10.   1 TO  18                        PR   AX  0.318   IZ  0.8709
11.   19 TO  21                       PR   AX  0.432   IZ  1.1844
12.   22 TO  42  51 TO 77   86 TO 112 PR   AX 13.481   IZ 45.3025
13.   43 TO  50  78 TO 85  113 TO 120 PR   AX 15.001   IZ 47.4753
14.  121 TO 147 156 TO 262            PR   AX 13.481   IZ 45.3025
15.  148 TO 155                       PR   AX 15.001   IZ 47.4753
16. CONSTANTS
17. E   21000000.  MEMBER  1 TO  21
18. E    3350000.  MEMBER 22 TO 262
19. DEN  7.85      MEMBER  1 TO  21
20. DEN  2.55      MEMBER 22 TO 262
21. POISSON        0.2  ALL
22. SUPPORTS
23. *POSICION 1
24. *30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
25. *POSICION 2
26. *1 30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
27. *POSICION 3
28. *5 34 63 92 121 150 179 208 237 261 FIXED BUT FX MZ
29. *POSICION 4
30. *9 38 67 96 125 154 183 212 241     FIXED BUT FX MZ
31. *POSICION 5
32. *13 42 71 100 129 158 187 216 245   FIXED BUT FX MZ
33. *POSICION 6
34. *17 46 75 104 133 162 191 220 249   FIXED BUT FX MZ
35. *POSICION 7
36. *21 50 79 108 137 166 195 224 253   FIXED BUT FX MZ
37. *POSICION 8
38. *25 54 83 112 141 170 199 228 257   FIXED BUT FX MZ
39. *POSICION 9
40. *29 58 87 116 145 174 203 232 261   FIXED BUT FX MZ
41. *POSICION 10
42. *33 62 91 120 149 178 207 236 260   FIXED BUT FX MZ
43. *POSICION 11
44. *36 65 94 123 152 181 210 239       FIXED BUT FX MZ
45. *POSICION 12
46. *2 37 66 95 124 153 182 211 240     FIXED BUT FX MZ
47. *POSICION 13
48. *6 41 70 99 128 157 186 215 244     FIXED BUT FX MZ
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49. *POSICION 14
50. *10 45 74 103 132 161 190 219 248   FIXED BUT FX MZ
51. *POSICION 15
52. *14 49 78 107 136 165 194 223 252   FIXED BUT FX MZ
53. *POSICION 16
54. *18 53 82 111 140 169 198 227 256   FIXED BUT FX MZ
55. *POSICION 17
56. *22 57 86 115 144 173 202 231 260   FIXED BUT FX MZ
57. *POSICION 18
58. *26 61 90 119 148 177 206 235 259   FIXED BUT FX MZ
59. *POSICION 19
60. *30 65 94 123 152 181 210 239       FIXED BUT FX MZ
61. *POSICION 20
62. *34 69 98 127 156 185 214 243       FIXED BUT FX MZ
63. *POSICION 21
64. *36 71 100 129 158 187 216 245      FIXED BUT FX MZ
65. *POSICION 22
66. *3 38 73 102 131 160 189 218 247    FIXED BUT FX MZ
67. *POSICION 23
68. *7 42 77 106 135 164 193 222 251    FIXED BUT FX MZ
69. *POSICION 24
70. *11 46 81 110 139 168 197 226 255   FIXED BUT FX MZ
71. *POSICION 25
72. *15 50 85 114 143 172 201 230 259   FIXED BUT FX MZ
73. *POSICION 26
74. *19 54 89 118 147 176 205 234 258   FIXED BUT FX MZ
75. *POSICION 27
76. *23 58 93 122 151 180 209 238 262   FIXED BUT FX MZ
77. *POSICION 28
78. *27 62 97 126 155 184 213 242       FIXED BUT FX MZ
79. *POSICION 29
80. *31 66 101 130 159 188 217 246      FIXED BUT FX MZ
81. *POSICION 30
82. *35 70 105 134 163 192 221 250      FIXED BUT FX MZ
83. *POSICION 31
84. *36 71 106 135 164 193 222 251      FIXED BUT FX MZ
85. *POSICION 32
86. *4 39 74 109 138 167 196 225 254    FIXED BUT FX MZ
87. *POSICION 33
88. *8 43 78 113 142 171 200 229 258    FIXED BUT FX MZ
89. *POSICION 34
90. *12 47 82 117 146 175 204 233 262   FIXED BUT FX MZ
91. *POSICION 35
92. *16 51 86 121 150 179 208 237       FIXED BUT FX MZ
93. *POSICION 36
94. *20 55 90 125 154 183 212 241       FIXED BUT FX MZ
95. *POSICION 37
96. *24 59 94 129 158 187 216 245       FIXED BUT FX MZ
97. *POSICION 38
98. *26 61 96 131 160 189 218 251       FIXED BUT FX MZ
99. *POSICION 39
100. *3 28 63 98 133 162 191 220 249    FIXED BUT FX MZ
101. *POSICION 40
102. *7 32 67 102 137 166 195 224 253   FIXED BUT FX MZ
103. *POSICION 41
104. *11 36 71 106 141 170 199 228 257  FIXED BUT FX MZ
105. *POSICION 42
 06. *15 40 75 110 145 174 203 232 261  FIXED BUT FX MZ
107. *POSICION 43
108. *19 44 79 114 149 178 207 236 260  FIXED BUT FX MZ
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 09. *POSICION 44
 10. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
 11. *POSICION 45 (IGUAL 44 SIN PESO DE PESCANTE)
 12. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
 13. *POSICION EXTREMA
 14. 26 PINNED
 15. 55 84 113 142 171 200 229 253       FIXED BUT FX MZ
 16. *COMUN A TODAS LAS POSICIONES EXCEPTO EXTREMA
 17. *263  PINED
 18. LOADING 1 PESO PROPIO
 19. SELFWEIGHT   Y   -1
 20. LOADING 2 PRETENSADO 1
 21. MEMBER LOAD
 22. *CABLE CONTINUO SUPERIOR EXC +1.697
 23. 22     CON  GX  2880   0.000
 24. 22     CMOM GZ -4887   0.000
 25. 262    CON  GX -2880   2.000
 26. 262    CMOM GZ  4887   2.000
 27. 22     CON  GX  1680   0.000
 28. 22     CMOM GZ -2850   0.000
 29. 185    CON  GX  -560   1.666
 30. 185    CMOM GZ   950   1.666
 31. 195    CON  GX  -560   1.000
 32. 195    CMOM GZ   950   1.000
 33. 202    CON  GX  -560   0.334
 34. 202    CMOM GZ   950   0.334
 35. 22     CON  GX  1200   0.000
 36. 22     CMOM GZ -2036   0.000
 37. 86     CON  GX  -400   0.750
 38. 86     CMOM GZ   679   0.750
 39. 95     CON  GX  -400   0.250
 40. 95     CMOM GZ   679   0.250
 41. 103    CON  GX  -400   1.750
 42. 103    CMOM GZ   678   1.750
 43. *CABLE CONTINUO INFERIOR  EXC -2.786
 44. 22     CON  GX  1440   0.000
 45. 22     CMOM GZ  4012   0.000
 46. 262    CON  GX -1440   2.000
 47. 262    CMOM GZ -4012   2.000
 48. 22     CON  GX   840   0.000
 49. 22     CMOM GZ  2340   0.000
 50. 185    CON  GX  -280   1.666
 51. 185    CMOM GZ  -780   1.666
 52. 195    CON  GX  -280   1.000
 53. 195    CMOM GZ  -780   1.000
 54. 202    CON  GX  -280   0.334
 55. 202    CMOM GZ  -780   0.334
 56. 22     CON  GX   600   0.000
 57. 22     CMOM GZ  1671   0.000
 58. 147    CON  GX  -200   1.250
 59. 147    CMOM GZ  -557   1.250
 60. 156    CON  GX  -200   1.666
 61. 156    CMOM GZ  -557   1.666
 62. 166    CON  GX  -200   1.000
 63. 166    CMOM GZ  -557   1.000
 64. *CABLE CONTINUO CENTRAL  EXC -0.500
 65. 22     CON  GX  1920   0.000
 66. 22     CMOM GZ   960   0.000
 67. 214    CON  GX   960   1.666
 68. 214    CMOM GZ   480   1.666
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 69. 262    CON  GX -2880   2.000
 70. 262    CMOM GZ -1440   2.000
171. LOADING 3 CABLES SOMBRERO  E 1.697
172. MEMBER LOAD
173. 42     CON  GX  1140   1.250
174. 42     CMOM GZ -1933   1.250
175. 51     CON  GX -1140   0.750
176. 51     CMOM GZ  1933   0.750
177. 77     CON  GX  3420   1.250
178. 77     CMOM GZ -5804   1.250
179. 86     CON  GX -3420   0.750
180. 86     CMOM GZ  5804   0.750
181. 112    CON  GX  3420   1.250
182. 112    CMOM GZ -5804   1.250
183. 121    CON  GX -3420   0.750
184. 121    CMOM GZ  5804   0.750
185. 147    CON  GX  2658   1.250
186. 147    CMOM GZ -4510   1.250
187. 156    CON  GX -2658   1.666
188. 156    CMOM GZ  4510   1.666
189. 176    CON  GX  1520   0.333
190. 176    CMOM GZ -2579   0.333
191. 185    CON  GX -1520   1.666
192. 185    CMOM GZ  2579   1.666
193. 205    CON  GX  1520   0.333
194. 205    CMOM GZ -2579   0.333
195. 214    CON  GX -1520   1.666
196. 214    CMOM GZ  2579   1.666
197. 234    CON  GX  1140   0.333
198. 234    CMOM GZ -1934   0.333
199. 243    CON  GX -1140   1.666
200. 243    CMOM GZ  1934   1.666
201. LOADING 4 CABLES DE VANO E -2.786
202. MEMBER LOAD
203. 22     CON  GX  1900   0.000
204. 22     CMOM GZ  5293   0.000
205. 42     CON  GX -1900   1.250
206. 42     CMOM GZ -5293   1.250
207. 51     CON  GX  1900   0.750
208. 51     CMOM GZ  5293   0.750
209. 77     CON  GX -1900   1.250
210. 77     CMOM GZ -5293   1.250
211. 86     CON  GX  2280   0.750
212. 86     CMOM GZ  6352   0.750
213. 112    CON  GX -2280   1.250
214. 112    CMOM GZ -6352   1.250
215. 121    CON  GX  2660   0.750
216. 121    CMOM GZ  7410   0.750
217. 147    CON  GX -2660   1.250
218. 147    CMOM GZ -7410   1.250
219. 156    CON  GX  1140   1.666
220. 156    CMOM GZ  3176   1.666
221. 176    CON  GX -1140   0.333
222. 176    CMOM GZ -3176   0.333
223. 185    CON  GX  1900   1.666
224. 185    CMOM GZ  5293   1.666
225. 205    CON  GX -1900   0.333
226. 205    CMOM GZ -5293   0.333
227. 214    CON  GX  1900   1.666
228. 214    CMOM GZ  5293   1.666
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229. 234    CON  GX -1900   0.333
230. 234    CMOM GZ -5293   0.333
231. 243    CON  GX  1140   1.666
232. 243    CMOM GZ  3176   1.666
233. 262    CON  GX -1140   2.000
234. 262    CMOM GZ -3176   2.000
235. LOADING COMBINATION 5
236. 2  1.0   3  1.0   4  1.0
237. LOADING COMBINATION 6
238. 1  1.0   2  0.96  3  0.96   4  0.96
239. PERFORM ANALISIS


      P R O B L E M   S T A T I S T I C S
      -----------------------------------

  NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =   263/  262/    9
  ORIGINAL/FINAL BAND-WIDTH =    1/    1
  TOTAL PRIMARY LOAD CASES  =    4, TOTAL DEGREES OF FREEDOM =   779
  SIZE OF STIFFNESS MATRIX =    4674 DOUBLE PREC. WORDS
  TOTAL REQUIRED DISK SPACE =   12.53 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.              8: 7:58
++ PROCESSING GLOBAL STIFFNESS MATRIX.               8: 7:59
++ PROCESSING TRIANGULAR FACTORIZATION.              8: 7:59
++ CALCULATING JOINT DISPLACEMENTS.                  8: 7:59
++ CALCULATING MEMBER  FORCES.                       8: 8: 0

240. PRINT JOINT COORDINATES
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JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
1	0.000	0.000	0.000
2	2.000	0.000	0.000
3	4.000	0.000	0.000
4	6.000	0.000	0.000
5	8.000	0.000	0.000
6	10.000	0.000	0.000
7	12.000	0.000	0.000
8	14.000	0.000	0.000
9	16.000	0.000	0.000
10	18.000	0.000	0.000
11	20.000	0.000	0.000
12	22.000	0.000	0.000
13	24.000	0.000	0.000
14	26.000	0.000	0.000
15	28.000	0.000	0.000
16	30.000	0.000	0.000
17	32.000	0.000	0.000
18	34.000	0.000	0.000
19	36.000	0.000	0.000
20	38.000	0.000	0.000
21	40.000	0.000	0.000
22	42.000	0.000	0.000
23	44.000	0.000	0.000
24	46.000	0.000	0.000
25	48.000	0.000	0.000
26	50.000	0.000	0.000
27	52.000	0.000	0.000
28	54.000	0.000	0.000
29	56.000	0.000	0.000
30	58.000	0.000	0.000
31	60.000	0.000	0.000
32	62.000	0.000	0.000
33	64.000	0.000	0.000
34	66.000	0.000	0.000
35	68.000	0.000	0.000
36	70.000	0.000	0.000
37	72.000	0.000	0.000
38	74.000	0.000	0.000
39	76.000	0.000	0.000
40	78.000	0.000	0.000
41	80.000	0.000	0.000
42	82.000	0.000	0.000
43	84.000	0.000	0.000
44	86.000	0.000	0.000
45	88.000	0.000	0.000
46	90.000	0.000	0.000
47	92.000	0.000	0.000
48	94.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
49	96.000	0.000	0.000
50	98.000	0.000	0.000
51	100.000	0.000	0.000
52	102.000	0.000	0.000
53	104.000	0.000	0.000
54	106.000	0.000	0.000
55	108.000	0.000	0.000
56	110.000	0.000	0.000
57	112.000	0.000	0.000
58	114.000	0.000	0.000
59	116.000	0.000	0.000
60	118.000	0.000	0.000
61	120.000	0.000	0.000
62	122.000	0.000	0.000
63	124.000	0.000	0.000
64	126.000	0.000	0.000
65	128.000	0.000	0.000
66	130.000	0.000	0.000
67	132.000	0.000	0.000
68	134.000	0.000	0.000
69	136.000	0.000	0.000
70	138.000	0.000	0.000
71	140.000	0.000	0.000
72	142.000	0.000	0.000
73	144.000	0.000	0.000
74	146.000	0.000	0.000
75	148.000	0.000	0.000
76	150.000	0.000	0.000
77	152.000	0.000	0.000
78	154.000	0.000	0.000
79	156.000	0.000	0.000
80	158.000	0.000	0.000
81	160.000	0.000	0.000
82	162.000	0.000	0.000
83	164.000	0.000	0.000
84	166.000	0.000	0.000
85	168.000	0.000	0.000
86	170.000	0.000	0.000
87	172.000	0.000	0.000
88	174.000	0.000	0.000
89	176.000	0.000	0.000
90	178.000	0.000	0.000
91	180.000	0.000	0.000
92	182.000	0.000	0.000
93	184.000	0.000	0.000
94	186.000	0.000	0.000
95	188.000	0.000	0.000
96	190.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
97	192.000	0.000	0.000
98	194.000	0.000	0.000
99	196.000	0.000	0.000
100	198.000	0.000	0.000
101	200.000	0.000	0.000
102	202.000	0.000	0.000
103	204.000	0.000	0.000
104	206.000	0.000	0.000
105	208.000	0.000	0.000
106	210.000	0.000	0.000
107	212.000	0.000	0.000
108	214.000	0.000	0.000
109	216.000	0.000	0.000
110	218.000	0.000	0.000
111	220.000	0.000	0.000
112	222.000	0.000	0.000
113	224.000	0.000	0.000
114	226.000	0.000	0.000
115	228.000	0.000	0.000
116	230.000	0.000	0.000
117	232.000	0.000	0.000
118	234.000	0.000	0.000
119	236.000	0.000	0.000
120	238.000	0.000	0.000
121	240.000	0.000	0.000
122	242.000	0.000	0.000
123	244.000	0.000	0.000
124	246.000	0.000	0.000
125	248.000	0.000	0.000
126	250.000	0.000	0.000
127	252.000	0.000	0.000
128	254.000	0.000	0.000
129	256.000	0.000	0.000
130	258.000	0.000	0.000
131	260.000	0.000	0.000
132	262.000	0.000	0.000
133	264.000	0.000	0.000
134	266.000	0.000	0.000
135	268.000	0.000	0.000
136	270.000	0.000	0.000
137	272.000	0.000	0.000
138	274.000	0.000	0.000
139	276.000	0.000	0.000
140	278.000	0.000	0.000
141	280.000	0.000	0.000
142	282.000	0.000	0.000
143	284.000	0.000	0.000
144	286.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
145	288.000	0.000	0.000
146	290.000	0.000	0.000
147	292.000	0.000	0.000
148	294.000	0.000	0.000
149	296.000	0.000	0.000
150	298.000	0.000	0.000
151	300.000	0.000	0.000
152	302.000	0.000	0.000
153	304.000	0.000	0.000
154	306.000	0.000	0.000
155	308.000	0.000	0.000
156	310.000	0.000	0.000
157	312.000	0.000	0.000
158	314.000	0.000	0.000
159	316.000	0.000	0.000
160	318.000	0.000	0.000
161	320.000	0.000	0.000
162	322.000	0.000	0.000
163	324.000	0.000	0.000
164	326.000	0.000	0.000
165	328.000	0.000	0.000
166	330.000	0.000	0.000
167	332.000	0.000	0.000
168	334.000	0.000	0.000
169	336.000	0.000	0.000
170	338.000	0.000	0.000
171	340.000	0.000	0.000
172	342.000	0.000	0.000
173	344.000	0.000	0.000
174	346.000	0.000	0.000
175	348.000	0.000	0.000
176	350.000	0.000	0.000
177	352.000	0.000	0.000
178	354.000	0.000	0.000
179	356.000	0.000	0.000
180	358.000	0.000	0.000
181	360.000	0.000	0.000
182	362.000	0.000	0.000
183	364.000	0.000	0.000
184	366.000	0.000	0.000
185	368.000	0.000	0.000
186	370.000	0.000	0.000
187	372.000	0.000	0.000
188	374.000	0.000	0.000
189	376.000	0.000	0.000
190	378.000	0.000	0.000
191	380.000	0.000	0.000
192	382.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
193	384.000	0.000	0.000
194	386.000	0.000	0.000
195	388.000	0.000	0.000
196	390.000	0.000	0.000
197	392.000	0.000	0.000
198	394.000	0.000	0.000
199	396.000	0.000	0.000
200	398.000	0.000	0.000
201	400.000	0.000	0.000
202	402.000	0.000	0.000
203	404.000	0.000	0.000
204	406.000	0.000	0.000
205	408.000	0.000	0.000
206	410.000	0.000	0.000
207	412.000	0.000	0.000
208	414.000	0.000	0.000
209	416.000	0.000	0.000
210	418.000	0.000	0.000
211	420.000	0.000	0.000
212	422.000	0.000	0.000
213	424.000	0.000	0.000
214	426.000	0.000	0.000
215	428.000	0.000	0.000
216	430.000	0.000	0.000
217	432.000	0.000	0.000
218	434.000	0.000	0.000
219	436.000	0.000	0.000
220	438.000	0.000	0.000
221	440.000	0.000	0.000
222	442.000	0.000	0.000
223	444.000	0.000	0.000
224	446.000	0.000	0.000
225	448.000	0.000	0.000
226	450.000	0.000	0.000
227	452.000	0.000	0.000
228	454.000	0.000	0.000
229	456.000	0.000	0.000
230	458.000	0.000	0.000
231	460.000	0.000	0.000
232	462.000	0.000	0.000
233	464.000	0.000	0.000
234	466.000	0.000	0.000
235	468.000	0.000	0.000
236	470.000	0.000	0.000
237	472.000	0.000	0.000
238	474.000	0.000	0.000
239	476.000	0.000	0.000
240	478.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
241	480.000	0.000	0.000
242	482.000	0.000	0.000
243	484.000	0.000	0.000
244	486.000	0.000	0.000
245	488.000	0.000	0.000
246	490.000	0.000	0.000
247	492.000	0.000	0.000
248	494.000	0.000	0.000
249	496.000	0.000	0.000
250	498.000	0.000	0.000
251	500.000	0.000	0.000
252	502.000	0.000	0.000
253	504.000	0.000	0.000
254	506.000	0.000	0.000
255	508.000	0.000	0.000
256	510.000	0.000	0.000
257	512.000	0.000	0.000
258	514.000	0.000	0.000
259	516.000	0.000	0.000
260	518.000	0.000	0.000
261	520.000	0.000	0.000
262	522.000	0.000	0.000
263	524.000	0.000	0.000

********** END OF DATA FROM INTERNAL STORAGE **********

241. LOAD LIST 6
242. *PRINT MEMBER FORCES ALL
243. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	6	0.18540	-5.10479	0.00000	0.00000	0.00000	0.00163
2	6	0.18540	-4.77794	0.00000	0.00000	0.00000	0.00163
3	6	0.18540	-4.45122	0.00000	0.00000	0.00000	0.00163
4	6	0.18540	-4.12495	0.00000	0.00000	0.00000	0.00163
5	6	0.18540	-3.79968	0.00000	0.00000	0.00000	0.00162
6	6	0.18540	-3.47618	0.00000	0.00000	0.00000	0.00161
7	6	0.18540	-3.15543	0.00000	0.00000	0.00000	0.00159
8	6	0.18540	-2.83862	0.00000	0.00000	0.00000	0.00157
9	6	0.18540	-2.52719	0.00000	0.00000	0.00000	0.00154
10	6	0.18540	-2.22276	0.00000	0.00000	0.00000	0.00150
11	6	0.18540	-1.92719	0.00000	0.00000	0.00000	0.00145
12	6	0.18540	-1.64256	0.00000	0.00000	0.00000	0.00139
13	6	0.18540	-1.37117	0.00000	0.00000	0.00000	0.00132
14	6	0.18540	-1.11551	0.00000	0.00000	0.00000	0.00123
15	6	0.18540	-0.87833	0.00000	0.00000	0.00000	0.00113
16	6	0.18540	-0.66256	0.00000	0.00000	0.00000	0.00102
17	6	0.18540	-0.47139	0.00000	0.00000	0.00000	0.00089
18	6	0.18540	-0.30818	0.00000	0.00000	0.00000	0.00074
19	6	0.18540	-0.17655	0.00000	0.00000	0.00000	0.00057
20	6	0.18540	-0.07547	0.00000	0.00000	0.00000	0.00044
21	6	0.18540	-0.00341	0.00000	0.00000	0.00000	0.00028
22	6	0.18540	0.03640	0.00000	0.00000	0.00000	0.00011
23	6	0.15892	0.05449	0.00000	0.00000	0.00000	0.00005
24	6	0.10595	0.05598	0.00000	0.00000	0.00000	-0.00004
25	6	0.05297	0.03831	0.00000	0.00000	0.00000	-0.00014
26	6	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00025
27	6	-0.05297	-0.05963	0.00000	0.00000	0.00000	-0.00035
28	6	-0.10595	-0.13692	0.00000	0.00000	0.00000	-0.00042
29	6	-0.15892	-0.22741	0.00000	0.00000	0.00000	-0.00048
30	6	-0.21189	-0.32699	0.00000	0.00000	0.00000	-0.00051
31	6	-0.26486	-0.43191	0.00000	0.00000	0.00000	-0.00053
32	6	-0.31784	-0.53879	0.00000	0.00000	0.00000	-0.00053
33	6	-0.37081	-0.64462	0.00000	0.00000	0.00000	-0.00052
34	6	-0.42378	-0.74675	0.00000	0.00000	0.00000	-0.00050
35	6	-0.47675	-0.84286	0.00000	0.00000	0.00000	-0.00046
36	6	-0.52973	-0.93105	0.00000	0.00000	0.00000	-0.00042
37	6	-0.58270	-1.00973	0.00000	0.00000	0.00000	-0.00037
38	6	-0.63567	-1.07770	0.00000	0.00000	0.00000	-0.00031
39	6	-0.68864	-1.13412	0.00000	0.00000	0.00000	-0.00025
40	6	-0.74162	-1.17850	0.00000	0.00000	0.00000	-0.00019
41	6	-0.79459	-1.21073	0.00000	0.00000	0.00000	-0.00013
42	6	-0.84756	-1.23105	0.00000	0.00000	0.00000	-0.00007
43	6	-0.89932	-1.23878	0.00000	0.00000	0.00000	0.00002
44	6	-0.94402	-1.22211	0.00000	0.00000	0.00000	0.00015
45	6	-0.98873	-1.17942	0.00000	0.00000	0.00000	0.00028
46	6	-1.03343	-1.11239	0.00000	0.00000	0.00000	0.00039
47	6	-1.07813	-1.02307	0.00000	0.00000	0.00000	0.00050
48	6	-1.12283	-0.91391	0.00000	0.00000	0.00000	0.00059

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
49	6	-1.16753	-0.78775	0.00000	0.00000	0.00000	0.00067
50	6	-1.21223	-0.64778	0.00000	0.00000	0.00000	0.00073
51	6	-1.25693	-0.49761	0.00000	0.00000	0.00000	0.00077
52	6	-1.30869	-0.34468	0.00000	0.00000	0.00000	0.00073
53	6	-1.36167	-0.20678	0.00000	0.00000	0.00000	0.00064
54	6	-1.41464	-0.09013	0.00000	0.00000	0.00000	0.00052
55	6	-1.46761	0.00000	0.00000	0.00000	0.00000	0.00038
56	6	-1.52059	0.05981	0.00000	0.00000	0.00000	0.00023
57	6	-1.57356	0.09256	0.00000	0.00000	0.00000	0.00010
58	6	-1.62653	0.10297	0.00000	0.00000	0.00000	0.00000
59	6	-1.67950	0.09543	0.00000	0.00000	0.00000	-0.00008
60	6	-1.73248	0.07394	0.00000	0.00000	0.00000	-0.00014
61	6	-1.78545	0.04215	0.00000	0.00000	0.00000	-0.00018
62	6	-1.83842	0.00335	0.00000	0.00000	0.00000	-0.00021
63	6	-1.89139	-0.03954	0.00000	0.00000	0.00000	-0.00022
64	6	-1.94437	-0.08395	0.00000	0.00000	0.00000	-0.00022
65	6	-1.99734	-0.12769	0.00000	0.00000	0.00000	-0.00021
66	6	-2.05031	-0.16892	0.00000	0.00000	0.00000	-0.00020
67	6	-2.10328	-0.20616	0.00000	0.00000	0.00000	-0.00017
68	6	-2.15626	-0.23831	0.00000	0.00000	0.00000	-0.00015
69	6	-2.20923	-0.26460	0.00000	0.00000	0.00000	-0.00012
70	6	-2.26220	-0.28467	0.00000	0.00000	0.00000	-0.00008
71	6	-2.31517	-0.29847	0.00000	0.00000	0.00000	-0.00005
72	6	-2.36815	-0.30635	0.00000	0.00000	0.00000	-0.00003
73	6	-2.42112	-0.30902	0.00000	0.00000	0.00000	0.00000
74	6	-2.47409	-0.30752	0.00000	0.00000	0.00000	0.00002
75	6	-2.52706	-0.30328	0.00000	0.00000	0.00000	0.00003
76	6	-2.58004	-0.29811	0.00000	0.00000	0.00000	0.00002
77	6	-2.63301	-0.29413	0.00000	0.00000	0.00000	0.00001
78	6	-2.68841	-0.29189	0.00000	0.00000	0.00000	0.00004
79	6	-2.74182	-0.27412	0.00000	0.00000	0.00000	0.00014
80	6	-2.79523	-0.23896	0.00000	0.00000	0.00000	0.00021
81	6	-2.84864	-0.18989	0.00000	0.00000	0.00000	0.00027
82	6	-2.90206	-0.13081	0.00000	0.00000	0.00000	0.00031
83	6	-2.95547	-0.06596	0.00000	0.00000	0.00000	0.00033
84	6	-3.00888	0.00000	0.00000	0.00000	0.00000	0.00032
85	6	-3.06229	0.06380	0.00000	0.00000	0.00000	0.00032
86	6	-3.11571	0.12880	0.00000	0.00000	0.00000	0.00034
87	6	-3.17105	0.19360	0.00000	0.00000	0.00000	0.00028
88	6	-3.22394	0.23903	0.00000	0.00000	0.00000	0.00018
89	6	-3.27682	0.26705	0.00000	0.00000	0.00000	0.00010
90	6	-3.32971	0.28152	0.00000	0.00000	0.00000	0.00004
91	6	-3.38260	0.28594	0.00000	0.00000	0.00000	0.00000
92	6	-3.43549	0.28344	0.00000	0.00000	0.00000	-0.00002
93	6	-3.48837	0.27681	0.00000	0.00000	0.00000	-0.00004
94	6	-3.54126	0.26846	0.00000	0.00000	0.00000	-0.00004
95	6	-3.59415	0.26045	0.00000	0.00000	0.00000	-0.00004
96	6	-3.64555	0.25380	0.00000	0.00000	0.00000	-0.00003

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
97	6	-3.69674	0.24879	0.00000	0.00000	0.00000	-0.00002
98	6	-3.74792	0.24639	0.00000	0.00000	0.00000	0.00000
99	6	-3.79911	0.24718	0.00000	0.00000	0.00000	0.00001
100	6	-3.85030	0.25142	0.00000	0.00000	0.00000	0.00003
101	6	-3.90148	0.25897	0.00000	0.00000	0.00000	0.00005
102	6	-3.95267	0.26936	0.00000	0.00000	0.00000	0.00006
103	6	-4.00386	0.28173	0.00000	0.00000	0.00000	0.00006
104	6	-4.05483	0.29487	0.00000	0.00000	0.00000	0.00006
105	6	-4.10432	0.30615	0.00000	0.00000	0.00000	0.00005
106	6	-4.15381	0.31299	0.00000	0.00000	0.00000	0.00002
107	6	-4.20329	0.31309	0.00000	0.00000	0.00000	-0.00002
108	6	-4.25278	0.30379	0.00000	0.00000	0.00000	-0.00007
109	6	-4.30226	0.28207	0.00000	0.00000	0.00000	-0.00015
10	6	-4.35175	0.24454	0.00000	0.00000	0.00000	-0.00023
111	6	-4.40124	0.18746	0.00000	0.00000	0.00000	-0.00034
112	6	-4.45072	0.10671	0.00000	0.00000	0.00000	-0.00047
113	6	-4.50203	0.00000	0.00000	0.00000	0.00000	-0.00056
114	6	-4.55086	-0.11314	0.00000	0.00000	0.00000	-0.00056
115	6	-4.59968	-0.22319	0.00000	0.00000	0.00000	-0.00053
116	6	-4.64851	-0.32532	0.00000	0.00000	0.00000	-0.00048
117	6	-4.69734	-0.41510	0.00000	0.00000	0.00000	-0.00041
118	6	-4.74617	-0.48847	0.00000	0.00000	0.00000	-0.00032
119	6	-4.79499	-0.54177	0.00000	0.00000	0.00000	-0.00021
120	6	-4.84382	-0.57171	0.00000	0.00000	0.00000	-0.00009
121	6	-4.89265	-0.57540	0.00000	0.00000	0.00000	0.00005
122	6	-4.94496	-0.55615	0.00000	0.00000	0.00000	0.00010
123	6	-4.99606	-0.53558	0.00000	0.00000	0.00000	0.00010
124	6	-5.04717	-0.51416	0.00000	0.00000	0.00000	0.00011
125	6	-5.09827	-0.49036	0.00000	0.00000	0.00000	0.00013
126	6	-5.14937	-0.46302	0.00000	0.00000	0.00000	0.00015
127	6	-5.20047	-0.43134	0.00000	0.00000	0.00000	0.00017
128	6	-5.25157	-0.39489	0.00000	0.00000	0.00000	0.00019
29	6	-5.30268	-0.35358	0.00000	0.00000	0.00000	0.00022
130	6	-5.35378	-0.30770	0.00000	0.00000	0.00000	0.00024
131	6	-5.40488	-0.25791	0.00000	0.00000	0.00000	0.00026
132	6	-5.45598	-0.20520	0.00000	0.00000	0.00000	0.00027
133	6	-5.50708	-0.15097	0.00000	0.00000	0.00000	0.00027
134	6	-5.55819	-0.09694	0.00000	0.00000	0.00000	0.00027
135	6	-5.60929	-0.04521	0.00000	0.00000	0.00000	0.00025
136	6	-5.66039	0.00175	0.00000	0.00000	0.00000	0.00022
137	6	-5.71149	0.04113	0.00000	0.00000	0.00000	0.00017
138	6	-5.76259	0.06973	0.00000	0.00000	0.00000	0.00011
139	6	-5.81370	0.08401	0.00000	0.00000	0.00000	0.00003
140	6	-5.86480	0.08006	0.00000	0.00000	0.00000	-0.00007
141	6	-5.91590	0.05360	0.00000	0.00000	0.00000	-0.00020
142	6	-5.96700	0.00000	0.00000	0.00000	0.00000	-0.00034
143	6	-6.01810	-0.08406	0.00000	0.00000	0.00000	-0.00049
144	6	-6.06920	-0.19554	0.00000	0.00000	0.00000	-0.00062

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
145	6	-6.12031	-0.33007	0.00000	0.00000	0.00000	-0.00072
146	6	-6.17141	-0.48366	0.00000	0.00000	0.00000	-0.00081
147	6	-6.22251	-0.65267	0.00000	0.00000	0.00000	-0.00088
148	6	-6.27329	-0.83160	0.00000	0.00000	0.00000	-0.00087
149	6	-6.31844	-0.99489	0.00000	0.00000	0.00000	-0.00076
150	6	-6.36360	-1.13446	0.00000	0.00000	0.00000	-0.00063
151	6	-6.40875	-1.24828	0.00000	0.00000	0.00000	-0.00050
152	6	-6.45390	-1.33469	0.00000	0.00000	0.00000	-0.00036
153	6	-6.49905	-1.39245	0.00000	0.00000	0.00000	-0.00022
154	6	-6.54421	-1.42068	0.00000	0.00000	0.00000	-0.00007
155	6	-6.58936	-1.41889	0.00000	0.00000	0.00000	0.00008
156	6	-6.63451	-1.38697	0.00000	0.00000	0.00000	0.00023
157	6	-6.68353	-1.32475	0.00000	0.00000	0.00000	0.00037
158	6	-6.72647	-1.24370	0.00000	0.00000	0.00000	0.00044
159	6	-6.76941	-1.15113	0.00000	0.00000	0.00000	0.00049
160	6	-6.81235	-1.04844	0.00000	0.00000	0.00000	0.00054
161	6	-6.85529	-0.93739	0.00000	0.00000	0.00000	0.00057
162	6	-6.89823	-0.82010	0.00000	0.00000	0.00000	0.00060
163	6	-6.94117	-0.69907	0.00000	0.00000	0.00000	0.00061
164	6	-6.98411	-0.57714	0.00000	0.00000	0.00000	0.00061
165	6	-7.02705	-0.45754	0.00000	0.00000	0.00000	0.00059
166	6	-7.06999	-0.34383	0.00000	0.00000	0.00000	0.00055
167	6	-7.11250	-0.23978	0.00000	0.00000	0.00000	0.00049
168	6	-7.15459	-0.14864	0.00000	0.00000	0.00000	0.00042
169	6	-7.19668	-0.07488	0.00000	0.00000	0.00000	0.00032
170	6	-7.23877	-0.02354	0.00000	0.00000	0.00000	0.00019
171	6	-7.28086	0.00000	0.00000	0.00000	0.00000	0.00004
172	6	-7.32295	-0.00811	0.00000	0.00000	0.00000	-0.00012
173	6	-7.36504	-0.04442	0.00000	0.00000	0.00000	-0.00024
174	6	-7.40713	-0.10397	0.00000	0.00000	0.00000	-0.00035
175	6	-7.44921	-0.18212	0.00000	0.00000	0.00000	-0.00043
176	6	-7.49130	-0.27461	0.00000	0.00000	0.00000	-0.00049
177	6	-7.53474	-0.37251	0.00000	0.00000	0.00000	-0.00047
178	6	-7.57844	-0.46296	0.00000	0.00000	0.00000	-0.00043
179	6	-7.62215	-0.54260	0.00000	0.00000	0.00000	-0.00037
180	6	-7.66585	-0.60862	0.00000	0.00000	0.00000	-0.00029
181	6	-7.70956	-0.65858	0.00000	0.00000	0.00000	-0.00021
182	6	-7.75326	-0.69039	0.00000	0.00000	0.00000	-0.00011
183	6	-7.79697	-0.70233	0.00000	0.00000	0.00000	-0.00001
184	6	-7.84067	-0.69304	0.00000	0.00000	0.00000	0.00010
185	6	-7.88438	-0.66152	0.00000	0.00000	0.00000	0.00021
186	6	-7.92775	-0.60743	0.00000	0.00000	0.00000	0.00031
187	6	-7.96950	-0.54351	0.00000	0.00000	0.00000	0.00033
188	6	-8.01125	-0.47689	0.00000	0.00000	0.00000	0.00034
189	6	-8.05300	-0.40803	0.00000	0.00000	0.00000	0.00035
190	6	-8.09475	-0.33776	0.00000	0.00000	0.00000	0.00035
191	6	-8.13650	-0.26725	0.00000	0.00000	0.00000	0.00035
192	6	-8.17825	-0.19803	0.00000	0.00000	0.00000	0.00034

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
193	6	-8.21999	-0.13202	0.00000	0.00000	0.00000	0.00032
194	6	-8.26174	-0.07148	0.00000	0.00000	0.00000	0.00028
195	6	-8.30349	-0.01904	0.00000	0.00000	0.00000	0.00024
196	6	-8.34346	0.02226	0.00000	0.00000	0.00000	0.00017
197	6	-8.38163	0.04874	0.00000	0.00000	0.00000	0.00009
198	6	-8.41981	0.05664	0.00000	0.00000	0.00000	-0.00001
199	6	-8.45799	0.04187	0.00000	0.00000	0.00000	-0.00014
200	6	-8.49617	0.00000	0.00000	0.00000	0.00000	-0.00028
201	6	-8.53434	-0.07203	0.00000	0.00000	0.00000	-0.00043
202	6	-8.57252	-0.17066	0.00000	0.00000	0.00000	-0.00055
203	6	-8.60772	-0.29106	0.00000	0.00000	0.00000	-0.00065
204	6	-8.64233	-0.42893	0.00000	0.00000	0.00000	-0.00073
205	6	-8.67694	-0.58003	0.00000	0.00000	0.00000	-0.00078
206	6	-8.71020	-0.73359	0.00000	0.00000	0.00000	-0.00074
207	6	-8.74319	-0.87336	0.00000	0.00000	0.00000	-0.00066
208	6	-8.77618	-0.99594	0.00000	0.00000	0.00000	-0.00057
209	6	-8.80917	-1.09853	0.00000	0.00000	0.00000	-0.00046
210	6	-8.84216	-1.17872	0.00000	0.00000	0.00000	-0.00034
211	6	-8.87515	-1.23445	0.00000	0.00000	0.00000	-0.00021
212	6	-8.90814	-1.26402	0.00000	0.00000	0.00000	-0.00008
213	6	-8.94113	-1.26612	0.00000	0.00000	0.00000	0.00006
214	6	-8.97412	-1.23975	0.00000	0.00000	0.00000	0.00020
215	6	-9.00806	-1.18462	0.00000	0.00000	0.00000	0.00033
216	6	-9.04675	-1.11398	0.00000	0.00000	0.00000	0.00037
217	6	-9.08544	-1.03529	0.00000	0.00000	0.00000	0.00041
218	6	-9.12413	-0.94902	0.00000	0.00000	0.00000	0.00045
219	6	-9.16282	-0.85601	0.00000	0.00000	0.00000	0.00048
220	6	-9.20150	-0.75748	0.00000	0.00000	0.00000	0.00050
221	6	-9.24019	-0.65498	0.00000	0.00000	0.00000	0.00052
222	6	-9.27888	-0.55045	0.00000	0.00000	0.00000	0.00052
223	6	-9.31757	-0.44617	0.00000	0.00000	0.00000	0.00052
224	6	-9.35626	-0.34481	0.00000	0.00000	0.00000	0.00049
225	6	-9.39494	-0.24938	0.00000	0.00000	0.00000	0.00046
226	6	-9.43363	-0.16327	0.00000	0.00000	0.00000	0.00040
227	6	-9.47232	-0.09020	0.00000	0.00000	0.00000	0.00033
228	6	-9.51101	-0.03429	0.00000	0.00000	0.00000	0.00023
229	6	-9.54970	0.00000	0.00000	0.00000	0.00000	0.00011
230	6	-9.58838	0.00935	0.00000	0.00000	0.00000	-0.00001
231	6	-9.62707	-0.00385	0.00000	0.00000	0.00000	-0.00012
232	6	-9.66576	-0.03608	0.00000	0.00000	0.00000	-0.00020
233	6	-9.70445	-0.08415	0.00000	0.00000	0.00000	-0.00028
234	6	-9.74314	-0.14527	0.00000	0.00000	0.00000	-0.00033
235	6	-9.77913	-0.21063	0.00000	0.00000	0.00000	-0.00031
236	6	-9.81459	-0.26647	0.00000	0.00000	0.00000	-0.00025
237	6	-9.85004	-0.31082	0.00000	0.00000	0.00000	-0.00019
238	6	-9.88550	-0.34230	0.00000	0.00000	0.00000	-0.00012
239	6	-9.92096	-0.35994	0.00000	0.00000	0.00000	-0.00005
240	6	-9.95642	-0.36309	0.00000	0.00000	0.00000	0.00002

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
241	6	-9.99187	-0.35148	0.00000	0.00000	0.00000	0.00009
242	6	-10.02733	-0.32520	0.00000	0.00000	0.00000	0.00017
243	6	-10.06279	-0.28471	0.00000	0.00000	0.00000	0.00024
244	6	-10.09824	-0.23099	0.00000	0.00000	0.00000	0.00029
245	6	-10.13370	-0.17351	0.00000	0.00000	0.00000	0.00028
246	6	-10.16916	-0.11826	0.00000	0.00000	0.00000	0.00027
247	6	-10.20461	-0.06717	0.00000	0.00000	0.00000	0.00024
248	6	-10.24007	-0.02250	0.00000	0.00000	0.00000	0.00020
249	6	-10.27553	0.01314	0.00000	0.00000	0.00000	0.00015
250	6	-10.31098	0.03674	0.00000	0.00000	0.00000	0.00008
251	6	-10.34644	0.04495	0.00000	0.00000	0.00000	0.00000
252	6	-10.38190	0.03406	0.00000	0.00000	0.00000	-0.00011
253	6	-10.41735	0.00000	0.00000	0.00000	0.00000	-0.00024
54	6	-10.45281	-0.06031	0.00000	0.00000	0.00000	-0.00036
255	6	-10.48827	-0.14479	0.00000	0.00000	0.00000	-0.00048
256	6	-10.52373	-0.25036	0.00000	0.00000	0.00000	-0.00058
257	6	-10.55918	-0.37431	0.00000	0.00000	0.00000	-0.00066
258	6	-10.59464	-0.51428	0.00000	0.00000	0.00000	-0.00074
259	6	-10.63010	-0.66827	0.00000	0.00000	0.00000	-0.00080
260	6	-10.66555	-0.83467	0.00000	0.00000	0.00000	-0.00086
261	6	-10.70101	-1.01218	0.00000	0.00000	0.00000	-0.00091
262	6	-10.73647	-1.19992	0.00000	0.00000	0.00000	-0.00096
263	6	-10.77192	-1.39733	0.00000	0.00000	0.00000	-0.00101

********** END OF LATEST ANALYSIS RESULT **********

244. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
26	6	0.00	1335.98	0.00	0.00	0.00	0.00
55	6	0.00	2106.74	0.00	0.00	0.00	0.00
84	6	0.00	2096.72	0.00	0.00	0.00	0.00
113	6	0.00	2024.64	0.00	0.00	0.00	0.00
142	6	0.00	1913.12	0.00	0.00	0.00	0.00
171	6	0.00	2173.65	0.00	0.00	0.00	0.00
200	6	0.00	1988.85	0.00	0.00	0.00	0.00
229	6	0.00	1723.95	0.00	0.00	0.00	0.00
253	6	0.00	1564.12	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

245. *LOAD LIST 1 4 6
246. *PLOT BEND FILE
247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

**** DATE= SEP 12,1997 TIME= 8: 8: 6 ****

****
* 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 *
****

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*************************************************
*                                               *
*          S T A A D - III                      *
*          Revision 17.0a                       *
*          Proprietary Program of               *
*          RESEARCH ENGINEERS, Inc.             *
*          Date=    SEP 23, 1997                *
*          Time=    10:42:43                    *
*                                               *
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 2. STAAD PLANE PUENTE SOBRE EL CINCA - LANZAMIENTO - ELEVACION GATOS
 3. UNIT METER MTON
 4. JOINT COORDINATES
 5.   1    0.000   0.000  0.000  263   524.000  0.000  0.000
 6. MEMBER INCIDENCES
 7.   1    1    2
 8.   R    261  1    1
 9. MEMBER PROPERTY
10.   1  TO  18                          PR   AX  0.318   IZ  0.8709
11.   19 TO  21                          PR   AX  0.432   IZ  1.1844
12.   22 TO  42  51 TO 77   86 TO 112    PR   AX 13.481   IZ 45.3025
13.   43 TO  50  78 TO 85   113 TO 120   PR   AX 15.001   IZ 47.4753
14.  121 TO 147 156 TO 262               PR   AX 13.481   IZ 45.3025
15.  148 TO 155                          PR   AX 15.001   IZ 47.4753
16. CONSTANTS
17. E   21000000.  MEMBER  1 TO  21
18. E    3350000.  MEMBER 22 TO 262
19. DEN  7.85      MEMBER  1 TO  21
20. DEN  2.55      MEMBER 22 TO 262
21. POISSON        0.2  ALL
22. SUPPORTS
23. *POSICION 1
24. *30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
25. *POSICION 2
26. *1 30 59 88 117 146 175 204 233 262 FIXED BUT FX MZ
27. *POSICION 3
28. *5 34 63 92 121 150 179 208 237 261 FIXED BUT FX MZ
29. *POSICION 4
30. *9 38 67 96 125 154 183 212 241     FIXED BUT FX MZ
31. *POSICION 5
32. *13 42 71 100 129 158 187 216 245   FIXED BUT FX MZ
33. *POSICION 6
34. *17 46 75 104 133 162 191 220 249   FIXED BUT FX MZ
35. *POSICION 7
36. *21 50 79 108 137 166 195 224 253   FIXED BUT FX MZ
37. *POSICION 8
38. *25 54 83 112 141 170 199 228 257   FIXED BUT FX MZ
39. *POSICION 9
40. *29 58 87 116 145 174 203 232 261   FIXED BUT FX MZ
41. *POSICION 10
42. *33 62 91 120 149 178 207 236 260   FIXED BUT FX MZ
43. *POSICION 11
44. *36 65 94 123 152 181 210 239       FIXED BUT FX MZ
45. *POSICION 12
46. *2 37 66 95 124 153 182 211 240     FIXED BUT FX MZ
47. *POSICION 13
48. *6 41 70 99 128 157 186 215 244     FIXED BUT FX MZ
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49. *POSICION 14
50. *10 45 74 103 132 161 190 219 248   FIXED BUT FX MZ
51. *POSICION 15
52. *14 49 78 107 136 165 194 223 252   FIXED BUT FX MZ
53. *POSICION 16
54. *18 53 82 111 140 169 198 227 256   FIXED BUT FX MZ
55. *POSICION 17
56. *22 57 86 115 144 173 202 231 260   FIXED BUT FX MZ
57. *POSICION 18
58. *26 61 90 119 148 177 206 235 259   FIXED BUT FX MZ
59. *POSICION 19
60. *30 65 94 123 152 181 210 239       FIXED BUT FX MZ
61. *POSICION 20
62. *34 69 98 127 156 185 214 243       FIXED BUT FX MZ
63. *POSICION 21
64. *36 71 100 129 158 187 216 245      FIXED BUT FX MZ
65. *POSICION 22
66. *3 38 73 102 131 160 189 218 247    FIXED BUT FX MZ
67. *POSICION 23
68. *7 42 77 106 135 164 193 222 251    FIXED BUT FX MZ
69. *POSICION 24
70. *11 46 81 110 139 168 197 226 255   FIXED BUT FX MZ
71. *POSICION 25
72. *15 50 85 114 143 172 201 230 259   FIXED BUT FX MZ
73. *POSICION 26
74. *19 54 89 118 147 176 205 234 258   FIXED BUT FX MZ
75. *POSICION 27
76. *23 58 93 122 151 180 209 238 262   FIXED BUT FX MZ
77. *POSICION 28
78. *27 62 97 126 155 184 213 242       FIXED BUT FX MZ
79. *POSICION 29
80. *31 66 101 130 159 188 217 246      FIXED BUT FX MZ
81. *POSICION 30
82. *35 70 105 134 163 192 221 250      FIXED BUT FX MZ
83. *POSICION 31
84. *36 71 106 135 164 193 222 251      FIXED BUT FX MZ
85. *POSICION 32
86. *4 39 74 109 138 167 196 225 254    FIXED BUT FX MZ
87. *POSICION 33
88. *8 43 78 113 142 171 200 229 258    FIXED BUT FX MZ
89. *POSICION 34
90. *12 47 82 117 146 175 204 233 262   FIXED BUT FX MZ
91. *POSICION 35
92. *16 51 86 121 150 179 208 237       FIXED BUT FX MZ
93. *POSICION 36
94. *20 55 90 125 154 183 212 241       FIXED BUT FX MZ
95. *POSICION 37
96. *24 59 94 129 158 187 216 245       FIXED BUT FX MZ
97. *POSICION 38
98. *26 61 96 131 160 189 218 251       FIXED BUT FX MZ
99. *POSICION 39
100. *3 28 63 98 133 162 191 220 249    FIXED BUT FX MZ
101. *POSICION 40
102. *7 32 67 102 137 166 195 224 253   FIXED BUT FX MZ
103. *POSICION 41
104. *11 36 71 106 141 170 199 228 257  FIXED BUT FX MZ
105. *POSICION 42
106. *15 40 75 110 145 174 203 232 261  FIXED BUT FX MZ
107. *POSICION 43
108. *19 44 79 114 149 178 207 236 260  FIXED BUT FX MZ
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109. *POSICION 44
 .0. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
111. *POSICION 45 (IGUAL 44 SIN PESO DE PESCANTE)
112. *22 47 82 117 152 181 210 239       FIXED BUT FX MZ
113. *POSICION EXTREMA
114. 26  PINNED
115. 55 84 113 142 171 200 229 253 FIXED BUT FX MZ
116. *COMUN A TODAS LAS POSICIONES EXCEPTO EXTREMA
117. *263  PINED
118. LOADING 1 PESO PROPIO
119. SELFWEIGHT   Y   -1
120. LOADING 2 PRETENSADO 1
121. MEMBER LOAD
122. *CABLE CONTINUO SUPERIOR EXC +1.697
123. 22     CON  GX  2880   0.000
124. 22     CMOM GZ -4887   0.000
125. 262    CON  GX -2880   2.000
126. 262    CMOM GZ  4887   2.000
127. 22     CON  GX  1680   0.000
128. 22     CMOM GZ -2850   0.000
 !9. 185    CON  GX  -560   1.666
130. 185    CMOM GZ   950   1.666
131. 195    CON  GX  -560   1.000
132. 195    CMOM GZ   950   1.000
133. 202    CON  GX  -560   0.334
134. 202    CMOM GZ   950   0.334
135. 22     CON  GX  1200   0.000
136. 22     CMOM GZ -2036   0.000
137. 86     CON  GX  -400   0.750
138. 86     CMOM GZ   679   0.750
139. 95     CON  GX  -400   0.250
140. 95     CMOM GZ   679   0.250
141. 103    CON  GX  -400   1.750
142. 103    CMOM GZ   678   1.750
143. *CABLE CONTINUO INFERIOR  EXC -2.786
144. 22     CON  GX  1440   0.000
145. 22     CMOM GZ  4012   0.000
146. 262    CON  GX -1440   2.000
147. 262    CMOM GZ -4012   2.000
 ;8. 22     CON  GX   840   0.000
149. 22     CMOM GZ  2340   0.000
150. 185    CON  GX  -280   1.666
151. 185    CMOM GZ  -780   1.666
152. 195    CON  GX  -280   1.000
153. 195    CMOM GZ  -780   1.000
154. 202    CON  GX  -280   0.334
155. 202    CMOM GZ  -780   0.334
156. 22     CON  GX   600   0.000
157. 22     CMOM GZ  1671   0.000
158. 147    CON  GX  -200   1.250
159. 147    CMOM GZ  -557   1.250
160. 156    CON  GX  -200   1.666
161. 156    CMOM GZ  -557   1.666
162. 166    CON  GX  -200   1.000
163. 166    CMOM GZ  -557   1.000
164. *CABLE CONTINUO CENTRAL  EXC -0.500
165. 22     CON  GX  1920   0.000
166. 22     CMOM GZ   960   0.000
 57. 214    CON  GX   960   1.666
168. 214    CMOM GZ   480   1.666
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*69. 262    CON  GX -2880   2.000
 '0. 262    CMOM GZ -1440   2.000
171. LOADING 3 CABLES SOMBRERO  E 1.697
172. MEMBER LOAD
173. 42     CON  GX  1140   1.250
174. 42     CMOM GZ -1933   1.250
175. 51     CON  GX -1140   0.750
176. 51     CMOM GZ  1933   0.750
177. 77     CON  GX  3420   1.250
178. 77     CMOM GZ -5804   1.250
179. 86     CON  GX -3420   0.750
180. 86     CMOM GZ  5804   0.750
181. 112    CON  GX  3420   1.250
182. 112    CMOM GZ -5804   1.250
183. 121    CON  GX -3420   0.750
184. 121    CMOM GZ  5804   0.750
185. 147    CON  GX  2658   1.250
186. 147    CMOM GZ -4510   1.250
187. 156    CON  GX -2658   1.666
188. 156    CMOM GZ  4510   1.666
 )9. 176    CON  GX  1520   0.333
190. 176    CMOM GZ -2579   0.333
191. 185    CON  GX -1520   1.666
192. 185    CMOM GZ  2579   1.666
193. 205    CON  GX  1520   0.333
194. 205    CMOM GZ -2579   0.333
195. 214    CON  GX -1520   1.666
196. 214    CMOM GZ  2579   1.666
197. 234    CON  GX  1140   0.333
198. 234    CMOM GZ -1934   0.333
199. 243    CON  GX -1140   1.666
200. 243    CMOM GZ  1934   1.666
201. LOADING 4 CABLES DE VANO E -2.786
202. MEMBER LOAD
203. 22     CON  GX  1900   0.000
204. 22     CMOM GZ  5293   0.000
205. 42     CON  GX -1900   1.250
206. 42     CMOM GZ -5293   1.250
207. 51     CON  GX  1900   0.750
 )8. 51     CMOM GZ  5293   0.750
209. 77     CON  GX -1900   1.250
210. 77     CMOM GZ -5293   1.250
211. 86     CON  GX  2280   0.750
212. 86     CMOM GZ  6352   0.750
213. 112    CON  GX -2280   1.250
214. 112    CMOM GZ -6352   1.250
215. 121    CON  GX  2660   0.750
216. 121    CMOM GZ  7410   0.750
217. 147    CON  GX -2660   1.250
218. 147    CMOM GZ -7410   1.250
219. 156    CON  GX  1140   1.666
220. 156    CMOM GZ  3176   1.666
221. 176    CON  GX -1140   0.333
222. 176    CMOM GZ -3176   0.333
223. 185    CON  GX  1900   1.666
224. 185    CMOM GZ  5293   1.666
225. 205    CON  GX -1900   0.333
?26. 205    CMOM GZ -5293   0.333
 27. 214    CON  GX  1900   1.666
228. 214    CMOM GZ  5293   1.666
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229. 234    CON  GX -1900   0.333
230. 234    CMOM GZ -5293   0.333
231. 243    CON  GX  1140   1.666
232. 243    CMOM GZ  3176   1.666
233. 262    CON  GX -1140   2.000
234. 262    CMOM GZ -3176   2.000
235. LOADING 5 REACCION DE APOYO EN PILA PROVISIONAL
236. JOINT LOAD
237. 258    FY  585.00
238. LOADING COMBINATION 6
239. 2  1.0   3  1.0   4  1.0
240. LOADING COMBINATION 7
241. 1  1.0   2  0.96  3  0.96   4  0.96   5  1.00
242. PERFORM ANALISIS


      P R O B L E M   S T A T I S T I C S
      -----------------------------------

   NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =   263/  262/    9
   ORIGINAL/FINAL BAND-WIDTH =    1/    1
   TOTAL PRIMARY LOAD CASES  =    5, TOTAL DEGREES OF FREEDOM =   779
   SIZE OF STIFFNESS MATRIX =    4674 DOUBLE PREC. WORDS
   TOTAL REQUIRED DISK SPACE =   12.56 MEGA-BYTES


++ PROCESSING ELEMENT STIFFNESS MATRIX.            10:42:48
++ PROCESSING GLOBAL STIFFNESS MATRIX.             10:42:49
++ PROCESSING TRIANGULAR FACTORIZATION.            10:42:50
++ CALCULATING JOINT DISPLACEMENTS.                10:42:50
++ CALCULATING MEMBER  FORCES.                     10:42:51

 243. PRINT JOINT COORDINATES
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JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
1	0.000	0.000	0.000
2	2.000	0.000	0.000
3	4.000	0.000	0.000
4	6.000	0.000	0.000
5	8.000	0.000	0.000
6	10.000	0.000	0.000
7	12.000	0.000	0.000
8	14.000	0.000	0.000
9	16.000	0.000	0.000
10	18.000	0.000	0.000
11	20.000	0.000	0.000
12	22.000	0.000	0.000
13	24.000	0.000	0.000
14	26.000	0.000	0.000
15	28.000	0.000	0.000
16	30.000	0.000	0.000
17	32.000	0.000	0.000
18	34.000	0.000	0.000
19	36.000	0.000	0.000
20	38.000	0.000	0.000
21	40.000	0.000	0.000
22	42.000	0.000	0.000
23	44.000	0.000	0.000
24	46.000	0.000	0.000
25	48.000	0.000	0.000
26	50.000	0.000	0.000
27	52.000	0.000	0.000
28	54.000	0.000	0.000
29	56.000	0.000	0.000
30	58.000	0.000	0.000
31	60.000	0.000	0.000
32	62.000	0.000	0.000
33	64.000	0.000	0.000
34	66.000	0.000	0.000
35	68.000	0.000	0.000
36	70.000	0.000	0.000
37	72.000	0.000	0.000
38	74.000	0.000	0.000
39	76.000	0.000	0.000
40	78.000	0.000	0.000
41	80.000	0.000	0.000
42	82.000	0.000	0.000
43	84.000	0.000	0.000
44	86.000	0.000	0.000
45	88.000	0.000	0.000
46	90.000	0.000	0.000
47	92.000	0.000	0.000
48	94.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
49	96.000	0.000	0.000
50	98.000	0.000	0.000
51	100.000	0.000	0.000
52	102.000	0.000	0.000
53	104.000	0.000	0.000
54	106.000	0.000	0.000
55	108.000	0.000	0.000
56	110.000	0.000	0.000
57	112.000	0.000	0.000
58	114.000	0.000	0.000
59	116.000	0.000	0.000
60	118.000	0.000	0.000
61	120.000	0.000	0.000
62	122.000	0.000	0.000
63	124.000	0.000	0.000
64	126.000	0.000	0.000
65	128.000	0.000	0.000
66	130.000	0.000	0.000
67	132.000	0.000	0.000
68	134.000	0.000	0.000
69	136.000	0.000	0.000
70	138.000	0.000	0.000
71	140.000	0.000	0.000
72	142.000	0.000	0.000
73	144.000	0.000	0.000
74	146.000	0.000	0.000
75	148.000	0.000	0.000
76	150.000	0.000	0.000
77	152.000	0.000	0.000
78	154.000	0.000	0.000
79	156.000	0.000	0.000
80	158.000	0.000	0.000
81	160.000	0.000	0.000
82	162.000	0.000	0.000
83	164.000	0.000	0.000
84	166.000	0.000	0.000
85	168.000	0.000	0.000
86	170.000	0.000	0.000
87	172.000	0.000	0.000
88	174.000	0.000	0.000
89	176.000	0.000	0.000
90	178.000	0.000	0.000
91	180.000	0.000	0.000
92	182.000	0.000	0.000
93	184.000	0.000	0.000
94	186.000	0.000	0.000
95	188.000	0.000	0.000
96	190.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
97	192.000	0.000	0.000
98	194.000	0.000	0.000
99	196.000	0.000	0.000
100	198.000	0.000	0.000
101	200.000	0.000	0.000
102	202.000	0.000	0.000
103	204.000	0.000	0.000
104	206.000	0.000	0.000
105	208.000	0.000	0.000
106	210.000	0.000	0.000
107	212.000	0.000	0.000
108	214.000	0.000	0.000
109	216.000	0.000	0.000
110	218.000	0.000	0.000
111	220.000	0.000	0.000
112	222.000	0.000	0.000
113	224.000	0.000	0.000
114	226.000	0.000	0.000
115	228.000	0.000	0.000
116	230.000	0.000	0.000
117	232.000	0.000	0.000
118	234.000	0.000	0.000
119	236.000	0.000	0.000
120	238.000	0.000	0.000
121	240.000	0.000	0.000
122	242.000	0.000	0.000
123	244.000	0.000	0.000
124	246.000	0.000	0.000
125	248.000	0.000	0.000
126	250.000	0.000	0.000
127	252.000	0.000	0.000
128	254.000	0.000	0.000
129	256.000	0.000	0.000
130	258.000	0.000	0.000
131	260.000	0.000	0.000
132	262.000	0.000	0.000
133	264.000	0.000	0.000
134	266.000	0.000	0.000
135	268.000	0.000	0.000
136	270.000	0.000	0.000
137	272.000	0.000	0.000
138	274.000	0.000	0.000
139	276.000	0.000	0.000
140	278.000	0.000	0.000
141	280.000	0.000	0.000
142	282.000	0.000	0.000
143	284.000	0.000	0.000
144	286.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
145	288.000	0.000	0.000
146	290.000	0.000	0.000
147	292.000	0.000	0.000
148	294.000	0.000	0.000
149	296.000	0.000	0.000
150	298.000	0.000	0.000
151	300.000	0.000	0.000
152	302.000	0.000	0.000
153	304.000	0.000	0.000
154	306.000	0.000	0.000
155	308.000	0.000	0.000
156	310.000	0.000	0.000
157	312.000	0.000	0.000
158	314.000	0.000	0.000
159	316.000	0.000	0.000
160	318.000	0.000	0.000
161	320.000	0.000	0.000
162	322.000	0.000	0.000
163	324.000	0.000	0.000
164	326.000	0.000	0.000
165	328.000	0.000	0.000
166	330.000	0.000	0.000
167	332.000	0.000	0.000
168	334.000	0.000	0.000
169	336.000	0.000	0.000
170	338.000	0.000	0.000
171	340.000	0.000	0.000
172	342.000	0.000	0.000
173	344.000	0.000	0.000
174	346.000	0.000	0.000
175	348.000	0.000	0.000
176	350.000	0.000	0.000
177	352.000	0.000	0.000
178	354.000	0.000	0.000
179	356.000	0.000	0.000
180	358.000	0.000	0.000
181	360.000	0.000	0.000
182	362.000	0.000	0.000
183	364.000	0.000	0.000
184	366.000	0.000	0.000
185	368.000	0.000	0.000
186	370.000	0.000	0.000
187	372.000	0.000	0.000
188	374.000	0.000	0.000
189	376.000	0.000	0.000
190	378.000	0.000	0.000
191	380.000	0.000	0.000
192	382.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
193	384.000	0.000	0.000
194	386.000	0.000	0.000
195	388.000	0.000	0.000
196	390.000	0.000	0.000
197	392.000	0.000	0.000
198	394.000	0.000	0.000
199	396.000	0.000	0.000
200	398.000	0.000	0.000
201	400.000	0.000	0.000
202	402.000	0.000	0.000
203	404.000	0.000	0.000
204	406.000	0.000	0.000
205	408.000	0.000	0.000
206	410.000	0.000	0.000
207	412.000	0.000	0.000
208	414.000	0.000	0.000
209	416.000	0.000	0.000
210	418.000	0.000	0.000
211	420.000	0.000	0.000
212	422.000	0.000	0.000
213	424.000	0.000	0.000
214	426.000	0.000	0.000
215	428.000	0.000	0.000
216	430.000	0.000	0.000
217	432.000	0.000	0.000
218	434.000	0.000	0.000
219	436.000	0.000	0.000
220	438.000	0.000	0.000
221	440.000	0.000	0.000
222	442.000	0.000	0.000
223	444.000	0.000	0.000
224	446.000	0.000	0.000
225	448.000	0.000	0.000
226	450.000	0.000	0.000
227	452.000	0.000	0.000
228	454.000	0.000	0.000
229	456.000	0.000	0.000
230	458.000	0.000	0.000
231	460.000	0.000	0.000
232	462.000	0.000	0.000
233	464.000	0.000	0.000
234	466.000	0.000	0.000
235	468.000	0.000	0.000
236	470.000	0.000	0.000
237	472.000	0.000	0.000
238	474.000	0.000	0.000
239	476.000	0.000	0.000
240	478.000	0.000	0.000

JOINT COORDINATES

COORDINATES ARE METE UNIT

JOINT	X	Y	Z
241	480.000	0.000	0.000
242	482.000	0.000	0.000
243	484.000	0.000	0.000
244	486.000	0.000	0.000
245	488.000	0.000	0.000
246	490.000	0.000	0.000
247	492.000	0.000	0.000
248	494.000	0.000	0.000
249	496.000	0.000	0.000
250	498.000	0.000	0.000
251	500.000	0.000	0.000
252	502.000	0.000	0.000
253	504.000	0.000	0.000
254	506.000	0.000	0.000
255	508.000	0.000	0.000
256	510.000	0.000	0.000
257	512.000	0.000	0.000
258	514.000	0.000	0.000
259	516.000	0.000	0.000
260	518.000	0.000	0.000
261	520.000	0.000	0.000
262	522.000	0.000	0.000
263	524.000	0.000	0.000

********** END OF DATA FROM INTERNAL STORAGE **********

244. LOAD LIST 7
245. PRINT JOI DIS ALL

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	7	0.18540	-5.10495	0.00000	0.00000	0.00000	0.00163
2	7	0.18540	-4.77809	0.00000	0.00000	0.00000	0.00163
3	7	0.18540	-4.45136	0.00000	0.00000	0.00000	0.00163
4	7	0.18540	-4.12509	0.00000	0.00000	0.00000	0.00163
5	7	0.18540	-3.79981	0.00000	0.00000	0.00000	0.00162
6	7	0.18540	-3.47631	0.00000	0.00000	0.00000	0.00161
7	7	0.18540	-3.15555	0.00000	0.00000	0.00000	0.00160
8	7	0.18540	-2.83874	0.00000	0.00000	0.00000	0.00157
9	7	0.18540	-2.52729	0.00000	0.00000	0.00000	0.00154
10	7	0.18540	-2.22286	0.00000	0.00000	0.00000	0.00150
11	7	0.18540	-1.92729	0.00000	0.00000	0.00000	0.00145
12	7	0.18540	-1.64265	0.00000	0.00000	0.00000	0.00139
13	7	0.18540	-1.37125	0.00000	0.00000	0.00000	0.00132
14	7	0.18540	-1.11559	0.00000	0.00000	0.00000	0.00123
15	7	0.18540	-0.87840	0.00000	0.00000	0.00000	0.00113
16	7	0.18540	-0.66263	0.00000	0.00000	0.00000	0.00102
17	7	0.18540	-0.47145	0.00000	0.00000	0.00000	0.00089
18	7	0.18540	-0.30823	0.00000	0.00000	0.00000	0.00074
19	7	0.18540	-0.17660	0.00000	0.00000	0.00000	0.00057
20	7	0.18540	-0.07550	0.00000	0.00000	0.00000	0.00044
21	7	0.18540	-0.00344	0.00000	0.00000	0.00000	0.00028
22	7	0.18540	0.03637	0.00000	0.00000	0.00000	0.00011
23	7	0.15892	0.05447	0.00000	0.00000	0.00000	0.00005
24	7	0.10595	0.05597	0.00000	0.00000	0.00000	-0.00004
25	7	0.05297	0.03831	0.00000	0.00000	0.00000	-0.00014
26	7	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00025
27	7	-0.05297	-0.05962	0.00000	0.00000	0.00000	-0.00035
28	7	-0.10595	-0.13691	0.00000	0.00000	0.00000	-0.00042
29	7	-0.15892	-0.22739	0.00000	0.00000	0.00000	-0.00048
30	7	-0.21189	-0.32696	0.00000	0.00000	0.00000	-0.00051
31	7	-0.26486	-0.43188	0.00000	0.00000	0.00000	-0.00053
32	7	-0.31784	-0.53876	0.00000	0.00000	0.00000	-0.00053
33	7	-0.37081	-0.64458	0.00000	0.00000	0.00000	-0.00052
34	7	-0.42378	-0.74670	0.00000	0.00000	0.00000	-0.00050
35	7	-0.47675	-0.84281	0.00000	0.00000	0.00000	-0.00046
36	7	-0.52973	-0.93099	0.00000	0.00000	0.00000	-0.00042
37	7	-0.58270	-1.00967	0.00000	0.00000	0.00000	-0.00037
38	7	-0.63567	-1.07764	0.00000	0.00000	0.00000	-0.00031
39	7	-0.68864	-1.13405	0.00000	0.00000	0.00000	-0.00025
40	7	-0.74162	-1.17843	0.00000	0.00000	0.00000	-0.00019
41	7	-0.79459	-1.21066	0.00000	0.00000	0.00000	-0.00013
42	7	-0.84756	-1.23098	0.00000	0.00000	0.00000	-0.00007
43	7	-0.89932	-1.23871	0.00000	0.00000	0.00000	0.00002
44	7	-0.94402	-1.22204	0.00000	0.00000	0.00000	0.00015
45	7	-0.98873	-1.17935	0.00000	0.00000	0.00000	0.00028
46	7	-1.03343	-1.11232	0.00000	0.00000	0.00000	0.00039
47	7	-1.07813	-1.02301	0.00000	0.00000	0.00000	0.00050
48	7	-1.12283	-0.91386	0.00000	0.00000	0.00000	0.00059

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
49	7	-1.16753	-0.78769	0.00000	0.00000	0.00000	0.00067
50	7	-1.21223	-0.64773	0.00000	0.00000	0.00000	0.00073
51	7	-1.25693	-0.49757	0.00000	0.00000	0.00000	0.00077
52	7	-1.30869	-0.34465	0.00000	0.00000	0.00000	0.00073
53	7	-1.36167	-0.20676	0.00000	0.00000	0.00000	0.00064
54	7	-1.41464	-0.09012	0.00000	0.00000	0.00000	0.00052
55	7	-1.46761	0.00000	0.00000	0.00000	0.00000	0.00038
56	7	-1.52059	0.05980	0.00000	0.00000	0.00000	0.00023
57	7	-1.57356	0.09253	0.00000	0.00000	0.00000	0.00010
58	7	-1.62653	0.10293	0.00000	0.00000	0.00000	0.00000
59	7	-1.67950	0.09537	0.00000	0.00000	0.00000	-0.00008
60	7	-1.73248	0.07386	0.00000	0.00000	0.00000	-0.00014
61	7	-1.78545	0.04206	0.00000	0.00000	0.00000	-0.00018
,2	7	-1.83842	0.00324	0.00000	0.00000	0.00000	-0.00021
63	7	-1.89139	-0.03966	0.00000	0.00000	0.00000	-0.00022
64	7	-1.94437	-0.08409	0.00000	0.00000	0.00000	-0.00022
65	7	-1.99734	-0.12785	0.00000	0.00000	0.00000	-0.00021
66	7	-2.05031	-0.16909	0.00000	0.00000	0.00000	-0.00020
67	7	-2.10328	-0.20634	0.00000	0.00000	0.00000	-0.00017
68	7	-2.15626	-0.23850	0.00000	0.00000	0.00000	-0.00015
69	7	-2.20923	-0.26481	0.00000	0.00000	0.00000	-0.00012
70	7	-2.26220	-0.28488	0.00000	0.00000	0.00000	-0.00008
71	7	-2.31517	-0.29869	0.00000	0.00000	0.00000	-0.00005
72	7	-2.36815	-0.30657	0.00000	0.00000	0.00000	-0.00003
73	7	-2.42112	-0.30923	0.00000	0.00000	0.00000	0.00000
74	7	-2.47409	-0.30773	0.00000	0.00000	0.00000	0.00002
75	7	-2.52706	-0.30350	0.00000	0.00000	0.00000	0.00003
76	7	-2.58004	-0.29831	0.00000	0.00000	0.00000	0.00002
77	7	-2.63301	-0.29432	0.00000	0.00000	0.00000	0.00001
78	7	-2.68841	-0.29207	0.00000	0.00000	0.00000	0.00004
79	7	-2.74182	-0.27428	0.00000	0.00000	0.00000	0.00014
80	7	-2.79523	-0.23909	0.00000	0.00000	0.00000	0.00021
11	7	-2.84864	-0.19000	0.00000	0.00000	0.00000	0.00027
82	7	-2.90206	-0.13088	0.00000	0.00000	0.00000	0.00031
83	7	-2.95547	-0.06600	0.00000	0.00000	0.00000	0.00033
84	7	-3.00888	0.00000	0.00000	0.00000	0.00000	0.00032
85	7	-3.06229	0.06384	0.00000	0.00000	0.00000	0.00032
86	7	-3.11571	0.12890	0.00000	0.00000	0.00000	0.00034
87	7	-3.17105	0.19375	0.00000	0.00000	0.00000	0.00028
88	7	-3.22394	0.23924	0.00000	0.00000	0.00000	0.00018
89	7	-3.27682	0.26732	0.00000	0.00000	0.00000	0.00010
90	7	-3.32971	0.28184	0.00000	0.00000	0.00000	0.00004
91	7	-3.38260	0.28632	0.00000	0.00000	0.00000	0.00000
92	7	-3.43549	0.28388	0.00000	0.00000	0.00000	-0.00002
93	7	-3.48837	0.27731	0.00000	0.00000	0.00000	-0.00004
94	7	-3.54126	0.26901	0.00000	0.00000	0.00000	-0.00004
95	7	-3.59415	0.26105	0.00000	0.00000	0.00000	-0.00004
96	7	-3.64555	0.25445	0.00000	0.00000	0.00000	-0.00003

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
97	7	-3.69674	0.24949	0.00000	0.00000	0.00000	-0.00002
98	7	-3.74792	0.24712	0.00000	0.00000	0.00000	0.00000
99	7	-3.79911	0.24794	0.00000	0.00000	0.00000	0.00001
100	7	-3.85030	0.25220	0.00000	0.00000	0.00000	0.00003
101	7	-3.90148	0.25977	0.00000	0.00000	0.00000	0.00005
102	7	-3.95267	0.27016	0.00000	0.00000	0.00000	0.00006
103	7	-4.00386	0.28253	0.00000	0.00000	0.00000	0.00006
104	7	-4.05483	0.29565	0.00000	0.00000	0.00000	0.00006
105	7	-4.10432	0.30690	0.00000	0.00000	0.00000	0.00005
106	7	-4.15381	0.31370	0.00000	0.00000	0.00000	0.00002
107	7	-4.20329	0.31375	0.00000	0.00000	0.00000	-0.00002
108	7	-4.25278	0.30438	0.00000	0.00000	0.00000	-0.00008
109	7	-4.30226	0.28257	0.00000	0.00000	0.00000	-0.00015
10	7	-4.35175	0.24494	0.00000	0.00000	0.00000	-0.00023
111	7	-4.40124	0.18774	0.00000	0.00000	0.00000	-0.00034
112	7	-4.45072	0.10687	0.00000	0.00000	0.00000	-0.00047
113	7	-4.50203	0.00000	0.00000	0.00000	0.00000	-0.00057
114	7	-4.55086	-0.11332	0.00000	0.00000	0.00000	-0.00056
115	7	-4.59968	-0.22355	0.00000	0.00000	0.00000	-0.00054
116	7	-4.64851	-0.32588	0.00000	0.00000	0.00000	-0.00048
117	7	-4.69734	-0.41587	0.00000	0.00000	0.00000	-0.00041
118	7	-4.74617	-0.48945	0.00000	0.00000	0.00000	-0.00032
119	7	-4.79499	-0.54297	0.00000	0.00000	0.00000	-0.00021
120	7	-4.84382	-0.57313	0.00000	0.00000	0.00000	-0.00009
121	7	-4.89265	-0.57704	0.00000	0.00000	0.00000	0.00005
122	7	-4.94496	-0.55799	0.00000	0.00000	0.00000	0.00010
123	7	-4.99606	-0.53763	0.00000	0.00000	0.00000	0.00010
124	7	-5.04717	-0.51640	0.00000	0.00000	0.00000	0.00011
125	7	-5.09827	-0.49277	0.00000	0.00000	0.00000	0.00013
126	7	-5.14937	-0.46559	0.00000	0.00000	0.00000	0.00015
127	7	-5.20047	-0.43405	0.00000	0.00000	0.00000	0.00017
128	7	-5.25157	-0.39771	0.00000	0.00000	0.00000	0.00019
29	7	-5.30268	-0.35648	0.00000	0.00000	0.00000	0.00022
130	7	-5.35378	-0.31065	0.00000	0.00000	0.00000	0.00024
131	7	-5.40488	-0.26087	0.00000	0.00000	0.00000	0.00026
132	7	-5.45598	-0.20815	0.00000	0.00000	0.00000	0.00027
133	7	-5.50708	-0.15386	0.00000	0.00000	0.00000	0.00027
134	7	-5.55819	-0.09972	0.00000	0.00000	0.00000	0.00027
135	7	-5.60929	-0.04784	0.00000	0.00000	0.00000	0.00025
136	7	-5.66039	-0.00068	0.00000	0.00000	0.00000	0.00022
137	7	-5.71149	0.03895	0.00000	0.00000	0.00000	0.00017
138	7	-5.76259	0.06787	0.00000	0.00000	0.00000	0.00011
139	7	-5.81370	0.08252	0.00000	0.00000	0.00000	0.00003
140	7	-5.86480	0.07900	0.00000	0.00000	0.00000	-0.00007
141	7	-5.91590	0.05304	0.00000	0.00000	0.00000	-0.00019
142	7	-5.96700	0.00000	0.00000	0.00000	0.00000	-0.00034
143	7	-6.01810	-0.08343	0.00000	0.00000	0.00000	-0.00049
144	7	-6.06920	-0.19421	0.00000	0.00000	0.00000	-0.00061

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
145	7	-6.12031	-0.32800	0.00000	0.00000	0.00000	-0.00072
146	7	-6.17141	-0.48080	0.00000	0.00000	0.00000	-0.00081
147	7	-6.22251	-0.64900	0.00000	0.00000	0.00000	-0.00087
148	7	-6.27329	-0.82712	0.00000	0.00000	0.00000	-0.00087
149	7	-6.31844	-0.98959	0.00000	0.00000	0.00000	-0.00075
150	7	-6.36360	-1.12835	0.00000	0.00000	0.00000	-0.00063
151	7	-6.40875	-1.24137	0.00000	0.00000	0.00000	-0.00050
152	7	-6.45390	-1.32703	0.00000	0.00000	0.00000	-0.00036
153	7	-6.49905	-1.38408	0.00000	0.00000	0.00000	-0.00021
154	7	-6.54421	-1.41166	0.00000	0.00000	0.00000	-0.00006
155	7	-6.58936	-1.40927	0.00000	0.00000	0.00000	0.00009
156	7	-6.63451	-1.37685	0.00000	0.00000	0.00000	0.00024
157	7	-6.68353	-1.31420	0.00000	0.00000	0.00000	0.00038
58	7	-6.72647	-1.23284	0.00000	0.00000	0.00000	0.00044
159	7	-6.76941	-1.14007	0.00000	0.00000	0.00000	0.00049
160	7	-6.81235	-1.03731	0.00000	0.00000	0.00000	0.00054
161	7	-6.85529	-0.92633	0.00000	0.00000	0.00000	0.00057
162	7	-6.89823	-0.80927	0.00000	0.00000	0.00000	0.00060
163	7	-6.94117	-0.68862	0.00000	0.00000	0.00000	0.00061
164	7	-6.98411	-0.56726	0.00000	0.00000	0.00000	0.00060
165	7	-7.02705	-0.44841	0.00000	0.00000	0.00000	0.00058
166	7	-7.06999	-0.33566	0.00000	0.00000	0.00000	0.00054
167	7	-7.11250	-0.23277	0.00000	0.00000	0.00000	0.00048
168	7	-7.15459	-0.14301	0.00000	0.00000	0.00000	0.00041
169	7	-7.19668	-0.07088	0.00000	0.00000	0.00000	0.00031
170	7	-7.23877	-0.02141	0.00000	0.00000	0.00000	0.00018
171	7	-7.28086	0.00000	0.00000	0.00000	0.00000	0.00003
172	7	-7.32295	-0.01050	0.00000	0.00000	0.00000	-0.00013
173	7	-7.36504	-0.04943	0.00000	0.00000	0.00000	-0.00026
174	7	-7.40713	-0.11177	0.00000	0.00000	0.00000	-0.00036
175	7	-7.44921	-0.19286	0.00000	0.00000	0.00000	-0.00044
176	7	-7.49130	-0.28839	0.00000	0.00000	0.00000	-0.00051
77	7	-7.53474	-0.38936	0.00000	0.00000	0.00000	-0.00049
178	7	-7.57844	-0.48291	0.00000	0.00000	0.00000	-0.00044
179	7	-7.62215	-0.56560	0.00000	0.00000	0.00000	-0.00038
180	7	-7.66585	-0.63459	0.00000	0.00000	0.00000	-0.00031
181	7	-7.70956	-0.68738	0.00000	0.00000	0.00000	-0.00022
182	7	-7.75326	-0.72186	0.00000	0.00000	0.00000	-0.00012
183	7	-7.79697	-0.73625	0.00000	0.00000	0.00000	-0.00002
184	7	-7.84067	-0.72916	0.00000	0.00000	0.00000	0.00009
185	7	-7.88438	-0.69953	0.00000	0.00000	0.00000	0.00021
186	7	-7.92775	-0.64699	0.00000	0.00000	0.00000	0.00031
187	7	-7.96950	-0.58422	0.00000	0.00000	0.00000	0.00032
188	7	-8.01125	-0.51832	0.00000	0.00000	0.00000	0.00034
189	7	-8.05300	-0.44970	0.00000	0.00000	0.00000	0.00035
190	7	-8.09475	-0.37914	0.00000	0.00000	0.00000	0.00036
191	7	-8.13650	-0.30778	0.00000	0.00000	0.00000	0.00036
192	7	-8.17825	-0.23710	0.00000	0.00000	0.00000	0.00035

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
193	7	-8.21999	-0.16897	0.00000	0.00000	0.00000	0.00033
194	7	-8.26174	-0.10560	0.00000	0.00000	0.00000	0.00030
195	7	-8.30349	-0.04959	0.00000	0.00000	0.00000	0.00026
196	7	-8.34346	-0.00393	0.00000	0.00000	0.00000	0.00020
197	7	-8.38163	0.02774	0.00000	0.00000	0.00000	0.00012
198	7	-8.41981	0.04170	0.00000	0.00000	0.00000	0.00002
199	7	-8.45799	0.03392	0.00000	0.00000	0.00000	-0.00010
200	7	-8.49617	0.00000	0.00000	0.00000	0.00000	-0.00024
201	7	-8.53434	-0.06311	0.00000	0.00000	0.00000	-0.00038
202	7	-8.57252	-0.15196	0.00000	0.00000	0.00000	-0.00050
203	7	-8.60772	-0.26191	0.00000	0.00000	0.00000	-0.00060
204	7	-8.64233	-0.38881	0.00000	0.00000	0.00000	-0.00067
205	7	-8.67694	-0.52860	0.00000	0.00000	0.00000	-0.00072
06	7	-8.71020	-0.67065	0.00000	0.00000	0.00000	-0.00068
207	7	-8.74319	-0.79890	0.00000	0.00000	0.00000	-0.00060
208	7	-8.77618	-0.91009	0.00000	0.00000	0.00000	-0.00051
209	7	-8.80917	-1.00161	0.00000	0.00000	0.00000	-0.00040
210	7	-8.84216	-1.07120	0.00000	0.00000	0.00000	-0.00029
211	7	-8.87515	-1.11696	0.00000	0.00000	0.00000	-0.00017
212	7	-8.90814	-1.13738	0.00000	0.00000	0.00000	-0.00004
213	7	-8.94113	-1.13128	0.00000	0.00000	0.00000	0.00010
214	7	-8.97412	-1.09785	0.00000	0.00000	0.00000	0.00024
215	7	-9.00806	-1.03696	0.00000	0.00000	0.00000	0.00036
216	7	-9.04675	-0.96202	0.00000	0.00000	0.00000	0.00039
217	7	-9.08544	-0.88064	0.00000	0.00000	0.00000	0.00042
218	7	-9.12413	-0.79349	0.00000	0.00000	0.00000	0.00045
219	7	-9.16282	-0.70155	0.00000	0.00000	0.00000	0.00047
220	7	-9.20150	-0.60620	0.00000	0.00000	0.00000	0.00048
221	7	-9.24019	-0.50918	0.00000	0.00000	0.00000	0.00049
222	7	-9.27888	-0.41257	0.00000	0.00000	0.00000	0.00048
223	7	-9.31757	-0.31883	0.00000	0.00000	0.00000	0.00046
224	7	-9.35626	-0.23079	0.00000	0.00000	0.00000	0.00042
25	7	-9.39494	-0.15162	0.00000	0.00000	0.00000	0.00037
226	7	-9.43363	-0.08487	0.00000	0.00000	0.00000	0.00030
227	7	-9.47232	-0.03444	0.00000	0.00000	0.00000	0.00020
228	7	-9.51101	-0.00461	0.00000	0.00000	0.00000	0.00009
229	7	-9.54970	0.00000	0.00000	0.00000	0.00000	-0.00005
230	7	-9.58838	-0.02394	0.00000	0.00000	0.00000	-0.00019
231	7	-9.62707	-0.07340	0.00000	0.00000	0.00000	-0.00030
232	7	-9.66576	-0.14405	0.00000	0.00000	0.00000	-0.00040
233	7	-9.70445	-0.23191	0.00000	0.00000	0.00000	-0.00048
234	7	-9.74314	-0.33339	0.00000	0.00000	0.00000	-0.00054
235	7	-9.77913	-0.43889	0.00000	0.00000	0.00000	-0.00050
236	7	-9.81459	-0.53383	0.00000	0.00000	0.00000	-0.00044
237	7	-9.85004	-0.61545	0.00000	0.00000	0.00000	-0.00037
238	7	-9.88550	-0.68158	0.00000	0.00000	0.00000	-0.00029
239	7	-9.92096	-0.73044	0.00000	0.00000	0.00000	-0.00020
240	7	-9.95642	-0.76058	0.00000	0.00000	0.00000	-0.00010

JOINT DISPLACEMENT (CM RADIANS) STRUCTURE TYPE = PLANE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
241	7	-9.99187	-0.77093	0.00000	0.00000	0.00000	0.00000
242	7	-10.02733	-0.76080	0.00000	0.00000	0.00000	0.00010
243	7	-10.06279	-0.72982	0.00000	0.00000	0.00000	0.00021
244	7	-10.09824	-0.67819	0.00000	0.00000	0.00000	0.00030
245	7	-10.13370	-0.61457	0.00000	0.00000	0.00000	0.00034
246	7	-10.16916	-0.54417	0.00000	0.00000	0.00000	0.00037
247	7	-10.20461	-0.46810	0.00000	0.00000	0.00000	0.00039
248	7	-10.24007	-0.38782	0.00000	0.00000	0.00000	0.00041
249	7	-10.27553	-0.30516	0.00000	0.00000	0.00000	0.00042
250	7	-10.31098	-0.22232	0.00000	0.00000	0.00000	0.00041
251	7	-10.34644	-0.14184	0.00000	0.00000	0.00000	0.00039
252	7	-10.38190	-0.06664	0.00000	0.00000	0.00000	0.00036
253	7	-10.41735	0.00000	0.00000	0.00000	0.00000	0.00031
254	7	-10.45281	0.05517	0.00000	0.00000	0.00000	0.00025
255	7	-10.48827	0.09850	0.00000	0.00000	0.00000	0.00019
256	7	-10.52373	0.12999	0.00000	0.00000	0.00000	0.00013
257	7	-10.55918	0.14927	0.00000	0.00000	0.00000	0.00006
258	7	-10.59464	0.15562	0.00000	0.00000	0.00000	0.00000
259	7	-10.63010	0.14845	0.00000	0.00000	0.00000	-0.00007
260	7	-10.66555	0.12889	0.00000	0.00000	0.00000	-0.00013
261	7	-10.70101	0.09820	0.00000	0.00000	0.00000	-0.00018
262	7	-10.73647	0.05729	0.00000	0.00000	0.00000	-0.00023
263	7	-10.77192	0.00671	0.00000	0.00000	0.00000	-0.00028

********** END OF LATEST ANALYSIS RESULT **********

246. PRINT REACC ALL

SUPPORT REACTIONS -UNIT MTON METE STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
26	7	0.00	1335.97	0.00	0.00	0.00	0.00
55	7	0.00	2106.79	0.00	0.00	0.00	0.00
84	7	0.00	2096.51	0.00	0.00	0.00	0.00
113	7	0.00	2025.40	0.00	0.00	0.00	0.00
142	7	0.00	1910.28	0.00	0.00	0.00	0.00
171	7	0.00	2184.26	0.00	0.00	0.00	0.00
200	7	0.00	1949.23	0.00	0.00	0.00	0.00
229	7	0.00	1906.85	0.00	0.00	0.00	0.00
253	7	0.00	827.48	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

247. PLOT DISP FILE
248. FINISH

********** END OF STAAD-III **********

**** DATE= SEP 23,1997 TIME= 10:42:58 ****

****
* 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 *
****

ESTE ANEJO DE CALCULO DE LA ESTRUCTURA DE LA MODIFICACION Nº 1 DEL "PROYECTO DE ALTA VELOCIDAD MADRID-BARCELONA-FRONTERA FRANCESA. TRAMO ZARAGOZA-LERIDA. PUENTE SOBRE EL RIO CINCA" HA SIDO REALIZADO POR D. GUILLERMO ONTAÑON CARRERA.

Madrid, Abril de 1998

AUTOR PROYECTO MODIFICADO

inteçsa

GUILLERMO ONTAÑON

ESTUDIOS COMPLEMENTARIOS

ESTUDIO DE TOLERANCIAS ADMISIBLES EN LOS PARAMETROS DE CONTROL DEL EMPUJE DEL PUENTE SOBRE EL RÍO CINCA

INFORME SOBRE EL EMPUJE DEL PUENTE
SOBRE EL RIO CINCA

INTECSA. NOVIEMBRE 1998

1.- ANTECEDENTES

La presente nota se redacta con objeto de analizar y comentar el documento "Estudio de las tolerancias admisibles en los parámetros de control del empuje del Puente sobre el Río Cinca".

2.- COMENTARIOS A DICHO ESTUDIO

En el Capitulo 5 del Proyecto de ejecución del Puente sobre el Río Cinca, se presentó, en su día, en estudio detallado de las situaciones y condiciones de seguridad que iba a atravesar el cajón del puente durante toda la situación de empuje del mismo. Este estudio tiene un carácter general, de forma que refleja los diferentes estados tensionales a modo de base de control y que podría ser completado según se desarrollasen los acontecimientos.

El documento era un estudio exhaustivo del empuje ya que se analizaron los primeros 528,00 metros teóricos (en los que están incluidos los 42,00 m del pescante).

Las fases del empuje se estudiaron mediante el análisis de 45 posiciones de avance y en cada una de ellas se estudiaron un total de 262 secciones. El paso de avance en el estudio fue de 8 metros entre posiciones y la distancia entre secciones controladas de 2,00 metros.

Este estudio se completó con otro denominado **"Avance del pescante primeras posiciones"** que completó el anterior, donde se reflejaban las incidencias motivadas en la estructura por el sistema operativo del proceso de fabricación en la playa de montaje dispuesta en el estribo 2, y hormigonado en dos fases de la sección.

Posteriormente se emitió un tercer estudio denominado **"Comportamiento del apoyo sobre Pila Provisional en las últimas fases del empuje del tablero"**, también afectado por el proceso de fabricación del cajón.

Este estudio, como proceso de montaje, aceptaba situaciones de tracción controlada, bien en fibra superior o inferior, pero siempre tracciones transitorias ya que en la posición 45, que corresponde a posición definitiva del cajón, y una vez retirado el pescante, todo el cajón está comprimido, como corresponde a los requerimientos impuestos en las BASES DE CÁLCULO.

Las tracciones que aparecen están dentro de los límites admisibles y convenientemente armadas.

Si bien el estudio es exhaustivo, se realizó en la hipótesis de no considerar errores de montaje, asientos en pilas ni posibles influencias de calentamiento desigual de la estructura.

Esto fue objeto de varios estudios complementarios a lo largo de las fases de empuje y que fueron reflejando la fiabilidad de los parámetros de control establecidos en la obra.

En el estudio del avance se detectó un máximo en cuanto a flectores en la posición 15 (32,62 m de voladizo). Otros máximos se producen en posiciones análogas pero apoyando en Pilas 2 y 1 respectivamente, si bien dichos máximos son inferiores al máximo de Pila 3.

Aunque la inspección del pescante y cajón a lo largo de todas las fases anteriores ha sido, como es natural intensa, se produjo días pasados una preocupación lógica ya que en el empuje últimamente a realizar (ya completado en el momento de redactar esta nota técnica) se iban a producir los máximos esfuerzos en la estructura, especialmente en la zona de unión entre pescante y cajón de hormigón.

Paralelamente IDEAM redacto un informe acerca de la situación del tablero durante el proceso de empuje en el que se expresan ciertas dudas sobre el comportamiento estructura del conjunto tablero-pescante en algunas fases del proceso.

Estas dudas se centraban en dos puntos.

Por un lado se considera que para longitudes de voladizo del pescante sobre la pilas comprendidas entre 15 y 32 m se supera en el tablero los esfuerzos correspondientes al Estado límite de formación de fisuras.

Revisado el cálculo efectuado por INTECSA no aparecen esfuerzos que superen el citado Estado Límite, si bien las tensiones, que aparecen en el hormigón se acercan a la resistencia a tracción del mismo, y teniendo en cuenta la sensibilidad de este cálculo a parámetros de valor poco preciso como puede ser las pérdidas de pretensado consideradas es posible que se puedan producir alguna fisuración.

Esto, sin embargo, carece de importancia tanto desde el punto de vista de la seguridad estructural en el momento hipotético de producirse la fisura, como con relación al comportamiento de la estructura en el futuro.

En el primer caso la hipotética fisuración únicamente representaría una disminución de rigidez en la zona afectada, que daría lugar a una reducción de la reacción de la pila frontal con la consiguiente disminución de los momentos que la ha causado.

Con relación a la repercusión sobre el comportamiento futuro de la estructura, se trataría de una situación transitoria que una vez superada volvería a dejar a la sección totalmente comprimida, si bien sin capacidad de resistir tracciones en la zona previamente fisurada, lo que resulta irelevante, ya que el tablero se ha diseñado a Clase 1.

El segundo punto sobre el que el informe de IDEAM expresa cierta inquietud es la unión del pescante al cajón.

El diseño de esta unión se ha efectuado de forma que los esfuerzos axiles generados por los momentos en el voladizo sobre los cordones del pescante se transmiten a la sección de hormigón a través de placas de acero ancladas al hormigón mediante barras Macalloy pretensadas, mientras que la reacción vertical debida al esfuerzo cortante se transmite al hormigón mediante apoyo directo de las almas sobre la prolongación del cordón inferior del pescante conjuntamente con el rozamiento en la placa de contacto con el hormigón.

Señala el informe de IDEAM que el coeficiente de seguridad de los anclajes inferiores es solo de 1,30, por debajo del valor 1,35 considerado para el resto del pescante. De acuerdo con nuestros cálculos el valor obtenido por IDEAM es correcto si se parte de una resistencia nominal de las barras igual a la carga correspondiente a una deformación de 0,1 % dividida por el coeficiente $\gamma_s = 1,1$, lo que es correcto.

Sin embargo, en este caso podemos admitir esta reducción del coeficiente de seguridad teniendo en cuenta los siguientes aspectos favorables:

- El límite de carga correspondiente a la deformación de 0,1% es un límite convencional, que no representa un escalón de fluencia, que no existe en este tipo de acero, sino una disminución del módulo de elasticidad del material que sigue aumentando su carga con la deformación. El coeficiente de seguridad global frente a la rotura de los anclajes es 1,76.

Los anclajes se han tensado a una carga superior en un 30% a la máxima tracción prevista, aunque esta tensión inicial habrá disminuido ligeramente debido a las deformaciones diferidas en el hormigón.

En cuanto a la transmisión de cortante el informe de IDEAM se limita a expresar la imposibilidad de transmisión a través del rozamiento entre placa de acero y hormigón.

Para calcular la capacidad de transmisión a cortante se ha considerado por una parte la capacidad de transmisión por apoyo directo del alma de hormigón y por otra la capacidad de transmisión por rozamiento en función de la compresión remanente.

El cálculo de la capacidad de transmisión por apoyo se efectúa calculando una presión de contacto igual a fcd sobre una franja que vuela de los paramentos verticales de las chapas de apoyo una longitud tal que el momento en la chapa sea igual al momento elástico del acero.

La capacidad de transmisión por rozamiento se determina a partir del esfuerzo de compresión en los anclajes considerando unas perdidas de pretensado del 15% respecto al pretensado inicial con un coeficiente de rozamiento de 0,7.

Situación de máximo momento positivo

N = -110 tn
V = 2 x77 = 154 tn

Situación de máximo esfuerzo cortante

N = -1.020 tn
V = 2 x 714 = 1.428 tn

Los coeficientes de seguridad resultantes son de acuerdo con los esfuerzos que figuran en los cálculos del proyecto:

En situación de máximo momento	2,20
En situación de máximo cortante	2,32

Conclusiones

La estructura se comporta correctamente durante el proceso de empuje en que se produzcan situaciones que pueden suponer un riesgo estructural

Independientemente de estos resultados nos parece adecuada la redacción final del informe de IDEAM acerca de la vigilancia del proceso en obra que permita detectar cualquier comportamiento anómalo, aunque no consideramos necesario parar el proceso.

Madrid, 27 de Noviembre de 1998



Fdo.: Guillermo Ontañón Carrera
Director de Estructuras e
Ingeniería Marítima

COMPROBACION A ROTURA DEL TABLERO CON HORMIGON RK=350 KG/CM^2

PUENTE SOBRE EL RÍO CINCA

COMPROBACIÓN A ROTURA DEL TABLERO CON HORMIGÓN

R_K = 350 kg/cm^2

COMPROBACIÓN A ROTURA CON HORMIGÓN R_K = 350 kg/cm^2

A petición de la obra se repite la comprobación a rotura de las secciones del tablero, modificando las condiciones de resistencia del hormigón que según proyecto es de 400 kg/cm^2, pasando a 350 kg/cm^2.

La comprobación se hace utilizando el mismo modelo matemático del proyecto. Esto es, se trata el tablero como una viga continua de 8 vanos, con la siguiente disposición de luces y asignación de secciones de cálculo. (Ver esquema adjunto).

Según proceso constructivo la asignación de dovelas es la siguiente. (Ver esquema adjunto).

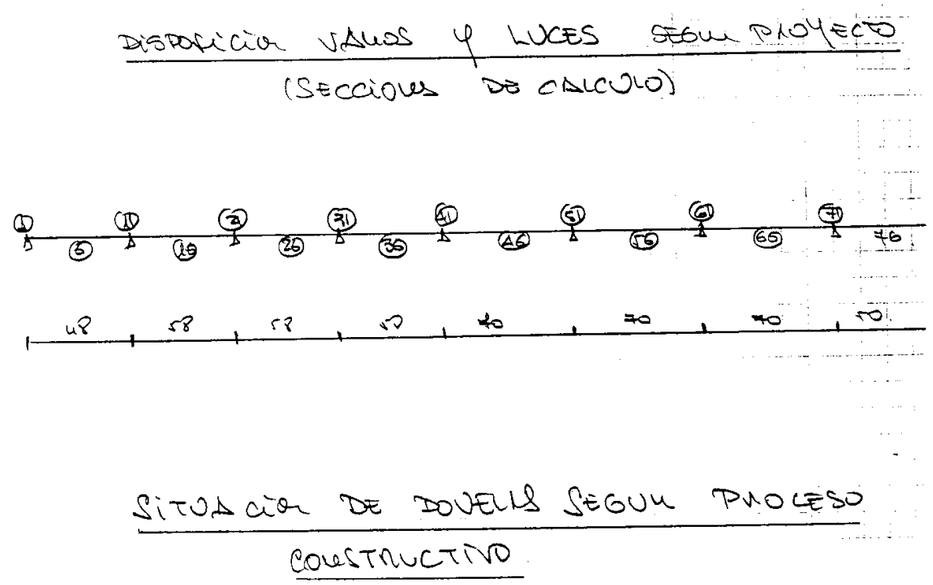
La caída de resistencia del hormigón detectada (de 400 kg/cm^2 a 350 kg/cm^2) corresponde al hormigón de las dovelas 13 a 16 que según los gráficos anteriores es prácticamente todo el vano de 70,0 metros comprendido, en posición definitiva del tablero, al vano entre pilas P3 y P4.

Las secciones de cálculo afectadas son las comprendidas entre la 41 y 5 1. Según ello, se ha repetido el cálculo en rotura siguiendo la misma metodología que en proyecto, pero utilizando un hormigón de 350 kg/cm^2. La comprobación se ha extendido a todo lo largo del tablero.

En el cuadro que se incluye a continuación, se representan los distintos parámetros de dicha comprobación figurando en la columna MRS (400) los valores de rotura de la sección para un hormigón de R_K = 400 kg/cm^2 (valor de proyecto) y en la columna MRS (350) los valores que corresponden a suponer un hormigón de 350 kg/cm^2 (objeto de esta comprobación).

Los valores obtenidos en las secciones 6 - 26 - 31 - 41 y 46 difieren poco de una a otra columna.

Los correspondientes a las secciones 40 y 50 difieren sensiblemente de una columna a otra. Son secciones de transición de espesor de tabla inferior (paso de 40 a 60 cm). En el cálculo se ha tomado 40 cm.



Finalmente, en la sección 51, también se observa una variación sensible. En el cálculo, se ha incorporado la presencia del paso de hombre cuya dimensión inicial era un paso ∅ 80 mientras que las dimensiones definitivas han sido de 80 x 180.

En las secciones 6 a 50 se han considerado los efectos de flexión del tablero combinados con los esfuerzos de tracción o compresión correspondientes a las solicitaciones longitudinales de frenado, rozamientos y coacciones carril-tablero. Ese valor ya mayorado es de valor

N' = ± 5184 t

En la sección 51, y como más desfavorable se ha considerado además del efecto del paso de hombre, el axil que realmente existe en esta sección y que después de mayorado alcanza el valor

N' = ± 2250 t

Como resultado de este análisis se comprueba que el comportamiento del tablero sigue siendo válido.

Cincaqwe

COMPROBACION A ROTURA

SECCION	MPP	MCP	MSC	M*	MPR	NPR	TFS	TFI	YP	YG	EXC	MIP	MHP	M*-MHP	MRS(400)	MRS(350)
6	6570	2115	6782	24747	-7525	-8067	-267	-1088	2.870	1.987	-0.883	-7123	-402	24386	28287	28230
26	5049	1928	7077	22486	-6939	-9424	-394	-1150	2.852	1.987	-0.865	-8152	1213	23820	28453	28406
31	-8912	-3396	-9326	-29422	7037	-10529	-1091	-324	1.399	1.987	0.588	6191	846	-28661	-36934	-36653
40	-7781	-2941	-7791	-29621	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-25508	-36958	-31693
41	-12735	-4739	-11810	-39826	11509	-11883	-1388	-133	1.403	1.987	0.584	6940	4569	-35714	-41753	-40224
46	7531	2862	9201	31350	-7377	-11920	-560	-1364	2.956	1.987	-0.969	-11550	4173	35941	36295	36203
50	-9799	-3701	-9344	-36550	15171	-12719	-1611	43	1.389	1.987	0.598	7606	7565	-29742	-37285	-31700
51	-15096	-5641	-13386	-46407	15297	-12693	-1615	53	1.389	1.987	0.598	7590	7707	-39471	-43700	-39444

MPP= MOMENTO FLECTOR POR PESO PROPIO
MCP= MOMENTO FLECTOR PORCARGAS PERMANENTES
MSC= MOMENTO FLECTOR POR SOBRECARGAS
M*= (MPP+MCP+MSC)*1.6
MPR= MOMENTO TOTAL DE PRETENSADO
NPR= AXIL DE PRETENSADO
TFS= TENSION EN FS DEBIDA AL PRETENSADO
TFI= TENSION EN FI DEBIDA AL PRETENSADO
YP= CDG DE CABLES
YG= CDG DE LA SECCION
EXC= EXCENTRICIDAD DEL PRETENSADO
MHP= MOMENTO HIPERESTATICO DE LAS SECCION
M*-MHP= MOMENTO REAL DE COMPARACION
MRS(400) MOMENTO DE ROTURA DE LA SECCION CON Rk=400 kg/cm2
MRS(350) MOMENTO DE ROTURA DE LA SECCION CON Rk=350 kg/cm2

```
PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 26
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.9000    -2.9430
 3.9000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 1.2000    -2.5430
 2.4000    -2.2430
 2.4000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.4000     1.3170
-2.4000    -2.2430
-1.2000    -2.5430
7   1
1  3  4  5  6  7  9
3  -1
1  3  2
3  -1
9  8  7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.   0.00  -5184.
-394.0   1.987
-11150.0  -2.957
0   3    0.0    0
0.0    1.697    28600.0      65.00
0.0    0.000    13728.0      65.00
0.0   -2.786    44187.0      65.00
9   7   -0.035  2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   8   0.035   2
10  11  12  13  14  15  16  17
10  11  1   4   1.12  0.  0.
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
16  17  1   4   1.12  0.  0.
17  10  2   10  1.12  0.  0.
```

```
Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 26
--------


Tension de calculo del hormigon ..... :     2333.00t/m2
Tension de calculo del acero activo ..... :   154545.50t/m2
Tension de calculo del acero pasivo ..... :    46363.60t/m2
Tension de calculo del acero estructural .. :        0.00t/m2

Modulo de elasticidad del hormigon ..... :  3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2



Numero total de vertices ..... :  17
Numero total de circuitos ..... :   4
Numero total de inclusiones circulares .... :   0

Definicion de armaduras activas
------------------------------

Numero total de tramos de armadura ..... :   1

Definicion de armaduras pasivas
-------------------------------

Numero total de tramos de armadura ..... :   2

Definicion de armadura estructural
----------------------------------

Numero total de chapas continuas ..... :   0
Numero total de chapas aisladas ..... :   0
```

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -394.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. ********* (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	28600.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	44187.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12

115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.141	1.008	0.603	5173.155	28406.69	0.00
180.0	-0.300	0.807	1.335	5191.640	-14926.26	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.225	1.009	0.900	-0.063	36779.74	0.00
180.0	-0.300	0.177	3.097	0.052	-17681.35	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.330	2.346	-5180.436	41446.44	0.00
180.0	-0.300	0.016	4.677	-5182.617	-14135.67	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA SECCION 31. ROTURA.
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.0000    -2.9430
 3.0000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 2.0000    -2.3430
 2.2000    -2.2430
 2.2000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.2000     1.3170
-2.2000    -2.2430
-2.0000    -2.3430
7   1
1  3  4  5  6  7  9
3  -1
1   3   2
3  -1
9   8   7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.   0.00  -5184.
-1091.0   1.987
-324.0  -2.957
0   3    0.0    0
0.0    1.697    60060.0       65.00
0.0    0.000    13728.0       65.00
0.0   -2.786    16302.0       65.00
9   7   -0.035  2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   6   0.035   2
10  11  12  13  14  15  16  17
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
17  10  2   20  1.12  0.  0.
```

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 31, ROTURA.

Tension de calculo del hormigon ..... : 2333.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	2.0000	-2.3430
11	2.2000	-2.2430	12	2.2000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.2000	1.3170	16	-2.2000	-2.2430
17	-2.0000	-2.3430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

efinicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1091.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -324.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	60060.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	16302.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	2.2350	-2.0392	1.12	180	2.2350	-1.8419	1.12
181	2.2350	-1.6446	1.12	182	2.2350	-1.4473	1.12
183	2.2350	-1.2500	1.12	184	2.2350	-1.0527	1.12
185	2.2350	-0.8554	1.12	186	2.2350	-0.6581	1.12
187	2.2350	-0.4608	1.12	188	2.2350	-0.2635	1.12
189	2.2350	-0.0662	1.12	190	2.2350	0.1311	1.12
191	2.2350	0.3284	1.12	192	2.2350	0.5257	1.12
193	2.2350	0.7230	1.12	194	2.2350	0.9203	1.12
195	2.2350	1.1176	1.12	196	2.2350	1.3430	1.12
197	1.9584	1.4260	1.12	198	1.6818	1.5090	1.12
199	1.4051	1.5920	1.12	200	1.1890	1.5920	1.12
201	1.0060	1.5920	1.12	202	0.8231	1.5920	1.12
203	0.6402	1.5920	1.12	204	0.4573	1.5920	1.12
205	0.2744	1.5920	1.12	206	0.0915	1.5920	1.12
207	-0.0915	1.5920	1.12	208	-0.2744	1.5920	1.12
209	-0.4573	1.5920	1.12	210	-0.6402	1.5920	1.12
211	-0.8231	1.5920	1.12	212	-1.0060	1.5920	1.12
213	-1.1890	1.5920	1.12	214	-1.4051	1.5920	1.12
215	-1.6818	1.5090	1.12	216	-1.9584	1.4260	1.12
217	-2.2350	1.3430	1.12	218	-2.2350	1.1176	1.12
219	-2.2350	0.9203	1.12	220	-2.2350	0.7230	1.12
221	-2.2350	0.5257	1.12	222	-2.2350	0.3284	1.12
223	-2.2350	0.1311	1.12	224	-2.2350	-0.0662	1.12
225	-2.2350	-0.2635	1.12	226	-2.2350	-0.4608	1.12
227	-2.2350	-0.6581	1.12	228	-2.2350	-0.8554	1.12
229	-2.2350	-1.0527	1.12	230	-2.2350	-1.2500	1.12
231	-2.2350	-1.4473	1.12	232	-2.2350	-1.6446	1.12
233	-2.2350	-1.8419	1.12	234	-2.2350	-2.0392	1.12
235	-1.7969	-2.3780	1.12	236	-1.6077	-2.3780	1.12
237	-1.4186	-2.3780	1.12	238	-1.2294	-2.3780	1.12
239	-1.0403	-2.3780	1.12	240	-0.8511	-2.3780	1.12
241	-0.6620	-2.3780	1.12	242	-0.4729	-2.3780	1.12
243	-0.2837	-2.3780	1.12	244	-0.0946	-2.3780	1.12
245	0.0946	-2.3780	1.12	246	0.2837	-2.3780	1.12

247	0.4729	-2.3780	1.12	248	0.6620	-2.3780	1.12
249	0.8511	-2.3780	1.12	250	1.0403	-2.3780	1.12
251	1.2294	-2.3780	1.12	252	1.4186	-2.3780	1.12
253	1.6077	-2.3780	1.12	254	1.7969	-2.3780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.123	1.008	0.536	5185.320	8912.81	0.00
180.0	-0.294	1.009	1.113	5169.788	-36653.66	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.187	1.008	0.772	-0.030	17460.00	0.00
180.0	-0.300	0.302	2.457	0.005	-40904.10	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.912	1.220	-5201.197	25200.82	0.00
180.0	-0.300	0.102	3.682	-5169.638	-39573.64	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 40
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.0000    -2.9430
 3.0000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 1.2000    -2.5430
 2.4000    -2.2430
 2.4000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.4000     1.3170
-2.4000    -2.2430
-1.2000    -2.5430
7   1
1  3  4  5  6  7  9
3  -1
1   3   2
3  -1
9   8   7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.    0.00  -5184.
-1328.    1.987
-133.0  -2.957
0   3     0.0     0
0.0     1.697     67925.0       65.00
0.0     0.000     13728.0       65.00
0.0    -2.786     19192.0       65.00
9   7    -0.035   2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   8   0.035   2
10  11  12  13  14  15  16  17
10  11  1   4   1.12  0.  0.
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
16  17  1   4   1.12  0.  0.
17  10  2   10  1.12  0.  0.
```

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 40

Tension de calculo del hormigon ..... : 2333.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ... 0.00 (sex)
Angulo final ... 180.00 (sex)
Variacion cada ... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1328.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -133.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	67925.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	19192.0	65.0

)

)

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12

115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.137	1.008	0.590	5177.922	10866.69	0.00
180.0	-0.300	0.421	2.052	5183.488	-38083.63	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.207	1.009	0.838	-0.057	19349.40	0.00
180.0	-0.300	0.137	3.381	0.050	-36529.94	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.611	1.624	-5199.559	26253.98	0.00
180.0	-0.300	0.015	4.701	-5183.168	-31693.36	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA SECCION 41. ROTURA.
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.0000    -2.9430
 3.0000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 2.0000    -2.3430
 2.2000    -2.2430
 2.2000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.2000     1.3170
-2.2000    -2.2430
-2.0000    -2.3430
7   1
1  3  4  5  6  7  9
3  -1
1   3   2
3  -1
9   8   7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.   0.00  -5184.
-1388.0   1.987
-133.0  -2.957
0   3    0.0    0
0.0    1.697    67925.0       65.00
0.0    0.000    13728.0       65.00
0.0   -2.786    19162.0       65.00
9   7   -0.035  2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   6   0.035   2
10  11  12  13  14  15  16  17
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
17  10  2   20  1.12  0.  0.
```

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 41. ROTURA.

Tension de calculo del hormigon ..... : 2333.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	2.0000	-2.3430
11	2.2000	-2.2430	12	2.2000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.2000	1.3170	16	-2.2000	-2.2430
17	-2.0000	-2.3430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

efinicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

efinicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -1388.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -133.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	67925.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	19162.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	2.2350	-2.0392	1.12	180	2.2350	-1.8419	1.12
181	2.2350	-1.6446	1.12	182	2.2350	-1.4473	1.12
183	2.2350	-1.2500	1.12	184	2.2350	-1.0527	1.12
185	2.2350	-0.8554	1.12	186	2.2350	-0.6581	1.12
187	2.2350	-0.4608	1.12	188	2.2350	-0.2635	1.12
189	2.2350	-0.0662	1.12	190	2.2350	0.1311	1.12
191	2.2350	0.3284	1.12	192	2.2350	0.5257	1.12
193	2.2350	0.7230	1.12	194	2.2350	0.9203	1.12
195	2.2350	1.1176	1.12	196	2.2350	1.3430	1.12
197	1.9584	1.4260	1.12	198	1.6818	1.5090	1.12
199	1.4051	1.5920	1.12	200	1.1890	1.5920	1.12
201	1.0060	1.5920	1.12	202	0.8231	1.5920	1.12
203	0.6402	1.5920	1.12	204	0.4573	1.5920	1.12
205	0.2744	1.5920	1.12	206	0.0915	1.5920	1.12
207	-0.0915	1.5920	1.12	208	-0.2744	1.5920	1.12
209	-0.4573	1.5920	1.12	210	-0.6402	1.5920	1.12
211	-0.8231	1.5920	1.12	212	-1.0060	1.5920	1.12
213	-1.1890	1.5920	1.12	214	-1.4051	1.5920	1.12
215	-1.6818	1.5090	1.12	216	-1.9584	1.4260	1.12
217	-2.2350	1.3430	1.12	218	-2.2350	1.1176	1.12
219	-2.2350	0.9203	1.12	220	-2.2350	0.7230	1.12
221	-2.2350	0.5257	1.12	222	-2.2350	0.3284	1.12
223	-2.2350	0.1311	1.12	224	-2.2350	-0.0662	1.12
225	-2.2350	-0.2635	1.12	226	-2.2350	-0.4608	1.12
227	-2.2350	-0.6581	1.12	228	-2.2350	-0.8554	1.12
229	-2.2350	-1.0527	1.12	230	-2.2350	-1.2500	1.12
231	-2.2350	-1.4473	1.12	232	-2.2350	-1.6446	1.12
233	-2.2350	-1.8419	1.12	234	-2.2350	-2.0392	1.12
235	-1.7969	-2.3780	1.12	236	-1.6077	-2.3780	1.12
237	-1.4186	-2.3780	1.12	238	-1.2294	-2.3780	1.12
239	-1.0403	-2.3780	1.12	240	-0.8511	-2.3780	1.12
241	-0.6620	-2.3780	1.12	242	-0.4729	-2.3780	1.12
243	-0.2837	-2.3780	1.12	244	-0.0946	-2.3780	1.12
245	0.0946	-2.3780	1.12	246	0.2837	-2.3780	1.12

247	0.4729	-2.3780	1.12	248	0.6620	-2.3780	1.12
249	0.8511	-2.3780	1.12	250	1.0403	-2.3780	1.12
251	1.2294	-2.3780	1.12	252	1.4186	-2.3780	1.12
253	1.6077	-2.3780	1.12	254	1.7969	-2.3780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.137	1.008	0.590	5179.261	10873.48	0.00
180.0	-0.300	0.700	1.479	5197.771	-40609.46	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.206	1.009	0.836	-0.033	19339.67	0.00
180.0	-0.300	0.240	2.739	0.014	-42503.74	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.699	1.480	-5196.273	26407.61	0.00
180.0	-0.300	0.075	3.946	-5176.108	-40224.45	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 46
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.0000    -2.9430
    000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 1.2000    -2.5430
 2.4000    -2.2430
 2.4000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.4000     1.3170
-2.4000    -2.2430
-1.2000    -2.5430
7   1
1  3  4  5  6  7  9
3  -1
1   3   2
3   1
9   8   7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.    0.00  -5184.
-560.0   1.987
-1364.0  -2.957
0   3    0.0    0
0.0    1.697    32604.0      65.00
0.0    0.000    13728.0      65.00
0.0   -2.786    55913.0      65.00
9   7   -0.035  2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   8   0.035   2
10  11  12  13  14  15  16  17
10  11  1   4   1.12  0.  0.
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
16  17  1   4   1.12  0.  0.
17  10  2   10  1.12  0.  0.
```

```
Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 46
--------


Tension de calculo del hormigon ..... :     2333.00t/m2
Tension de calculo del acero activo ..... :   154545.50t/m2
Tension de calculo del acero pasivo ..... :    46363.60t/m2
Tension de calculo del acero estructural .. :        0.00t/m2

Modulo de elasticidad del hormigon ..... :  3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2



Numero total de vertices ..... :  17
Numero total de circuitos ..... :   4
Numero total de inclusiones circulares .... :   0

Definicion de armaduras activas
-------------------------------

Numero total de tramos de armadura ..... :   1

Definicion de armaduras pasivas
-------------------------------

Numero total de tramos de armadura ..... :   2

Definicion de armadura estructural
----------------------------------

Numero total de chapas continuas ..... :   0
Numero total de chapas aisladas ..... :   0
```

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ... 0.01 (m)
Angulo inicial ..... 0.00 (sex)
Angulo final ..... 180.00 (sex)
Variacion cada ..... 180.00 (sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil 1 de 5184.00 (t)
Axil 2 de 0.00 (t)
Axil 3 de -5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup. -560.000 (t/m2) a 1.99 (m) del c.d.g
Tension fibra Inf. -1364.000 (t/m2) a -2.96 (m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	32604.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	55913.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12

115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12
247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.166	1.008	0.698	5176.693	36203.59	0.00
180.0	-0.268	1.009	1.034	5171.986	-18339.36	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.292	1.009	1.105	-0.031	44227.87	0.00
180.0	-0.300	0.269	2.597	-0.066	-23998.77	0.00

Paso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.258	2.649	-5185.739	43756.72	0.00
180.0	-0.300	0.053	4.185	-5169.148	-22023.18	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 50
2333.  154545.5  46363.6  0.0  3550000.  21000000.
17  4  0  1  2  0  0  2
 3.0000    -2.9430
 3.0000     1.3700
 6.8500     1.6000
 6.8500     1.8500
 0.0000     1.9870
-6.8500     1.8500
-6.8500     1.6000
-3.0000     1.3700
-3.0000    -2.9430
 1.2000    -2.5430
 2.4000    -2.2430
 2.4000     1.3170
 1.4000     1.5570
-1.4000     1.5570
-2.4000     1.3170
-2.4000    -2.2430
-1.2000    -2.5430
7   1
1  3  4  5  6  7  9
3  -1
1   3   2
3  -1
9   8   7
8  -1
10  11  12  13  14  15  16  17
9
1  2  3  4  5  6  7  8  9
8
10  11  12  13  14  15  16  17
0.01
0.00  180.00  180.00
3
5184.   0.00  -5184.
-1611.   1.987
43.0  -2.957
0   3    0.0    0
0.0    1.697    73359.0       65.00
0.0    0.000    13728.0       65.00
0.0   -2.786    20592.0       65.00
9   7   -0.035  2
1   2   3   4   5   6   7   8   9
1   2   2   21  1.12  0.  0.
2   3   1   19  1.12  0.  0.
4   5   1   34  2.02  0.  0.
5   6   1   34  2.02  0.  0.
7   8   1   19  1.12  0.  0.
8   9   2   21  1.12  0.  0.
9   1   1   30  2.02  0.  0.
8   8   0.035   2
10  11  12  13  14  15  16  17
10  11  1   4   1.12  0.  0.
11  12  2   17  1.12  0.  0.
12  13  1   4   1.12  0.  0.
13  14  2   14  1.12  0.  0.
14  15  1   4   1.12  0.  0.
15  16  2   17  1.12  0.  0.
16  17  1   4   1.12  0.  0.
17  10  2   10  1.12  0.  0.
```

Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA. ROTURA. SECCION 50

Tension de calculo del hormigon ..... : 2333.00t/m2
Tension de calculo del acero activo ..... : 154545.50t/m2
Tension de calculo del acero pasivo ..... : 46363.60t/m2
Tension de calculo del acero estructural .. : 0.00t/m2

Modulo de elasticidad del hormigon ..... : 3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2

Numero total de vertices ..... : 17
Numero total de circuitos ..... : 4
Numero total de inclusiones circulares .... : 0

Definicion de armaduras activas

Numero total de tramos de armadura ..... : 1

Definicion de armaduras pasivas

Numero total de tramos de armadura ..... : 2

Definicion de armadura estructural

Numero total de chapas continuas ..... : 0
Numero total de chapas aisladas ..... : 0

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	3.0000	-2.9430	2	3.0000	1.3700
3	6.8500	1.6000	4	6.8500	1.8500
5	0.0000	1.9870	6	-6.8500	1.8500
7	-6.8500	1.6000	8	-3.0000	1.3700
9	-3.0000	-2.9430	10	1.2000	-2.5430
11	2.4000	-2.2430	12	2.4000	1.3170
13	1.4000	1.5570	14	-1.4000	1.5570
15	-2.4000	1.3170	16	-2.4000	-2.2430
17	-1.2000	-2.5430			

Definicion de circuitos

Circuito 1 : Numero de vertices 7 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	4	4	5
5	6	6	7	7	9		

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	3	3	2		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	9	2	8	3	7		

Circuito 4 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	11	3	12	4	13
5	14	6	15	7	16	8	17

Definicion de variacion de angulos

Incremento de corte de franjas ...	0.01	(m)
Angulo inicial	0.00	(sex)
Angulo final	180.00	(sex)
Variacion cada	180.00	(sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil	1	de	5184.00 (t)
Axil	2	de	0.00 (t)
Axil	3	de	-5184.00 (t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup.	-1611.000	(t/m2) a	1.99	(m) del c.d.g
Tension fibra Inf.	43.000	(t/m2) a	-2.96	(m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	73359.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	20592.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	2.9650	-2.6925	1.12	2	2.9650	-2.4985	1.12
3	2.9650	-2.3045	1.12	4	2.9650	-2.1105	1.12
5	2.9650	-1.9165	1.12	6	2.9650	-1.7225	1.12
7	2.9650	-1.5285	1.12	8	2.9650	-1.3345	1.12
9	2.9650	-1.1405	1.12	10	2.9650	-0.9465	1.12
11	2.9650	-0.7525	1.12	12	2.9650	-0.5585	1.12
13	2.9650	-0.3645	1.12	14	2.9650	-0.1705	1.12
15	2.9650	0.0235	1.12	16	2.9650	0.2175	1.12
17	2.9650	0.4114	1.12	18	2.9650	0.6054	1.12
19	2.9650	0.7994	1.12	20	2.9650	0.9934	1.12
21	2.9650	1.1874	1.12	22	2.9650	1.4030	1.12
23	3.1789	1.4157	1.12	24	3.3928	1.4285	1.12
25	3.6067	1.4413	1.12	26	3.8206	1.4541	1.12
27	4.0344	1.4669	1.12	28	4.2483	1.4796	1.12
29	4.4622	1.4924	1.12	30	4.6761	1.5052	1.12
31	4.8900	1.5180	1.12	32	5.1039	1.5307	1.12
33	5.3178	1.5435	1.12	34	5.5317	1.5563	1.12
35	5.7456	1.5691	1.12	36	5.9594	1.5819	1.12
37	6.1733	1.5946	1.12	38	6.3872	1.6074	1.12
39	6.6011	1.6202	1.12	40	6.8150	1.6330	1.12
41	6.8150	1.8157	2.02	42	6.6085	1.8198	2.02
43	6.4020	1.8240	2.02	44	6.1955	1.8281	2.02
45	5.9889	1.8322	2.02	46	5.7824	1.8363	2.02
47	5.5759	1.8405	2.02	48	5.3694	1.8446	2.02
49	5.1629	1.8487	2.02	50	4.9564	1.8529	2.02
51	4.7498	1.8570	2.02	52	4.5433	1.8611	2.02
53	4.3368	1.8653	2.02	54	4.1303	1.8694	2.02
55	3.9238	1.8735	2.02	56	3.7173	1.8776	2.02
57	3.5108	1.8818	2.02	58	3.3042	1.8859	2.02
59	3.0977	1.8900	2.02	60	2.8912	1.8942	2.02
61	2.6847	1.8983	2.02	62	2.4782	1.9024	2.02
63	2.2717	1.9066	2.02	64	2.0652	1.9107	2.02
65	1.8586	1.9148	2.02	66	1.6521	1.9190	2.02
67	1.4456	1.9231	2.02	68	1.2391	1.9272	2.02
69	1.0326	1.9313	2.02	70	0.8261	1.9355	2.02
71	0.6195	1.9396	2.02	72	0.4130	1.9437	2.02
73	0.2065	1.9479	2.02	74	0.0000	1.9520	2.02
75	0.0000	1.9520	2.02	76	-0.2065	1.9479	2.02
77	-0.4130	1.9437	2.02	78	-0.6195	1.9396	2.02
79	-0.8261	1.9355	2.02	80	-1.0326	1.9313	2.02
81	-1.2391	1.9272	2.02	82	-1.4456	1.9231	2.02
83	-1.6521	1.9190	2.02	84	-1.8586	1.9148	2.02
85	-2.0652	1.9107	2.02	86	-2.2717	1.9066	2.02
87	-2.4782	1.9024	2.02	88	-2.6847	1.8983	2.02
89	-2.8912	1.8942	2.02	90	-3.0977	1.8900	2.02
91	-3.3042	1.8859	2.02	92	-3.5108	1.8818	2.02
93	-3.7173	1.8776	2.02	94	-3.9238	1.8735	2.02
95	-4.1303	1.8694	2.02	96	-4.3368	1.8653	2.02
97	-4.5433	1.8611	2.02	98	-4.7498	1.8570	2.02
99	-4.9564	1.8529	2.02	100	-5.1629	1.8487	2.02
101	-5.3694	1.8446	2.02	102	-5.5759	1.8405	2.02
103	-5.7824	1.8363	2.02	104	-5.9889	1.8322	2.02
105	-6.1955	1.8281	2.02	106	-6.4020	1.8240	2.02
107	-6.6085	1.8198	2.02	108	-6.8150	1.8157	2.02
109	-6.8150	1.6330	1.12	110	-6.6011	1.6202	1.12
111	-6.3872	1.6074	1.12	112	-6.1733	1.5946	1.12
113	-5.9594	1.5819	1.12	114	-5.7456	1.5691	1.12
115	-5.5317	1.5563	1.12	116	-5.3178	1.5435	1.12
117	-5.1039	1.5307	1.12	118	-4.8900	1.5180	1.12
119	-4.6761	1.5052	1.12	120	-4.4622	1.4924	1.12
121	-4.2483	1.4796	1.12	122	-4.0344	1.4669	1.12
123	-3.8206	1.4541	1.12	124	-3.6067	1.4413	1.12
125	-3.3928	1.4285	1.12	126	-3.1789	1.4157	1.12
127	-2.9650	1.4030	1.12	128	-2.9650	1.1874	1.12
129	-2.9650	0.9934	1.12	130	-2.9650	0.7994	1.12
131	-2.9650	0.6054	1.12	132	-2.9650	0.4114	1.12
133	-2.9650	0.2175	1.12	134	-2.9650	0.0235	1.12
135	-2.9650	-0.1705	1.12	136	-2.9650	-0.3645	1.12
137	-2.9650	-0.5585	1.12	138	-2.9650	-0.7525	1.12
139	-2.9650	-0.9465	1.12	140	-2.9650	-1.1405	1.12
141	-2.9650	-1.3345	1.12	142	-2.9650	-1.5285	1.12
143	-2.9650	-1.7225	1.12	144	-2.9650	-1.9165	1.12
145	-2.9650	-2.1105	1.12	146	-2.9650	-2.3045	1.12
147	-2.9650	-2.4985	1.12	148	-2.9650	-2.6925	1.12
149	-2.9650	-2.9080	2.02	150	-2.7605	-2.9080	2.02
151	-2.5560	-2.9080	2.02	152	-2.3516	-2.9080	2.02
153	-2.1471	-2.9080	2.02	154	-1.9426	-2.9080	2.02
155	-1.7381	-2.9080	2.02	156	-1.5336	-2.9080	2.02
157	-1.3291	-2.9080	2.02	158	-1.1247	-2.9080	2.02
159	-0.9202	-2.9080	2.02	160	-0.7157	-2.9080	2.02
161	-0.5112	-2.9080	2.02	162	-0.3067	-2.9080	2.02
163	-0.1022	-2.9080	2.02	164	0.1022	-2.9080	2.02
165	0.3067	-2.9080	2.02	166	0.5112	-2.9080	2.02
167	0.7157	-2.9080	2.02	168	0.9202	-2.9080	2.02
169	1.1247	-2.9080	2.02	170	1.3291	-2.9080	2.02
171	1.5336	-2.9080	2.02	172	1.7381	-2.9080	2.02
173	1.9426	-2.9080	2.02	174	2.1471	-2.9080	2.02
175	2.3516	-2.9080	2.02	176	2.5560	-2.9080	2.02
177	2.7605	-2.9080	2.02	178	2.9650	-2.9080	2.02
179	1.2043	-2.5780	1.12	180	1.6145	-2.4754	1.12
181	2.0248	-2.3729	1.12	182	2.4350	-2.2703	1.12
183	2.4350	-2.0444	1.12	184	2.4350	-1.8467	1.12
185	2.4350	-1.6490	1.12	186	2.4350	-1.4513	1.12
187	2.4350	-1.2536	1.12	188	2.4350	-1.0559	1.12
189	2.4350	-0.8582	1.12	190	2.4350	-0.6606	1.12
191	2.4350	-0.4629	1.12	192	2.4350	-0.2652	1.12
193	2.4350	-0.0675	1.12	194	2.4350	0.1302	1.12
195	2.4350	0.3279	1.12	196	2.4350	0.5256	1.12
197	2.4350	0.7233	1.12	198	2.4350	0.9210	1.12
199	2.4350	1.1187	1.12	200	2.4350	1.3446	1.12
201	2.0914	1.4271	1.12	202	1.7478	1.5095	1.12
203	1.4041	1.5920	1.12	204	1.1881	1.5920	1.12
205	1.0053	1.5920	1.12	206	0.8225	1.5920	1.12
207	0.6398	1.5920	1.12	208	0.4570	1.5920	1.12
209	0.2742	1.5920	1.12	210	0.0914	1.5920	1.12
211	-0.0914	1.5920	1.12	212	-0.2742	1.5920	1.12
213	-0.4570	1.5920	1.12	214	-0.6398	1.5920	1.12
215	-0.8225	1.5920	1.12	216	-1.0053	1.5920	1.12
217	-1.1881	1.5920	1.12	218	-1.4041	1.5920	1.12
219	-1.7478	1.5095	1.12	220	-2.0914	1.4271	1.12
221	-2.4350	1.3446	1.12	222	-2.4350	1.1187	1.12
223	-2.4350	0.9210	1.12	224	-2.4350	0.7233	1.12
225	-2.4350	0.5256	1.12	226	-2.4350	0.3279	1.12
227	-2.4350	0.1302	1.12	228	-2.4350	-0.0675	1.12
229	-2.4350	-0.2652	1.12	230	-2.4350	-0.4629	1.12
231	-2.4350	-0.6606	1.12	232	-2.4350	-0.8582	1.12
233	-2.4350	-1.0559	1.12	234	-2.4350	-1.2536	1.12
235	-2.4350	-1.4513	1.12	236	-2.4350	-1.6490	1.12
237	-2.4350	-1.8467	1.12	238	-2.4350	-2.0444	1.12
239	-2.4350	-2.2703	1.12	240	-2.0248	-2.3729	1.12
241	-1.6145	-2.4754	1.12	242	-1.2043	-2.5780	1.12
243	-0.9367	-2.5780	1.12	244	-0.7285	-2.5780	1.12
245	-0.5204	-2.5780	1.12	246	-0.3122	-2.5780	1.12

247	-0.1041	-2.5780	1.12	248	0.1041	-2.5780	1.12
249	0.3122	-2.5780	1.12	250	0.5204	-2.5780	1.12
251	0.7285	-2.5780	1.12	252	0.9367	-2.5780	1.12

Caso 1 : Axil de 5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.147	1.008	0.626	5163.605	11835.15	0.00
180.0	-0.300	0.353	2.264	5182.784	-39245.04	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.221	1.009	0.884	-0.044	20241.77	0.00
180.0	-0.300	0.110	3.611	0.032	-37237.91	0.00

Caso 3 : Axil de -5184.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.300	0.508	1.831	-5196.149	26529.65	0.00
180.0	-0.300	0.008	4.796	-5183.210	-31701.12	0.00

```
PUENTE SOBRE EL RIO CINCA. LOSA SECCION 51. ROTURA. PASO HOMBRE
2333.  154545.5  46363.6  0.0  3550000.  21000000.
19  5  0  1  1  0  0  1
 0.4000     -2.9430
 0.0000     -2.9430
 3.0000      1.3700
 6.8500      1.6000
 6.8500      1.8500
 0.0000      1.9870
-6.8500      1.8500
-6.8500      1.6000
-3.0000      1.3700
-3.0000     -2.9430
-0.4000     -2.9430
-0.4000     -2.3430
-2.2000     -2.3430
-2.2000      1.3170
-1.4000      1.5570
 1.4000      1.5570
 2.2000      1.3170
 2.2000     -2.3430
 0.4000     -2.3430
9   1
1   2   4   5   6   7   8   10   11
3   -1
2   4   3
3   -1
10   9   8
4   -1
1   19   12   11
8   -1
19   18   17   16   15   14   13   12
19
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
0.01
0.00   180.00   180.00
3
2250.    0.00   -2250.
-1615.0    1.987
53.0   -2.957
0    3      0.0      0
0.0      1.697      73359.0        65.00
0.0      0.000      13728.0        65.00
0.0     -2.786      20592.0        65.00
19   17   -0.035   2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
1    2    1    12   2.02   0.   0.
2    3    2    21   1.12   0.   0.
3    4    1    19   1.12   0.   0.
5    6    1    34   2.02   0.   0.
6    7    1    34   2.02   0.   0.
8    9    1    19   1.12   0.   0.
9    10   2    21   1.12   0.   0.
10   11   1    12   2.02   0.   0.
11   12   2    3    1.12   0.   0.
12   13   2    8    1.12   0.   0.
13   14   1    16   1.12   0.   0.
14   15   1    5    1.12   0.   0.
15   16   2    17   1.12   0.   0.
16   17   1    5    1.12   0.   0.
17   18   1    16   1.12   0.   0.
18   19   2    8    1.12   0.   0.
1    1    2    3    1.12   0.   0.
```

```
Proyecto : PUENTE SOBRE EL RIO CINCA. LOSA SECCION 51. ROTURA. PASO HOM
--------


Tension de calculo del hormigon ..... :     2333.00t/m2
Tension de calculo del acero activo ..... :   154545.50t/m2
Tension de calculo del acero pasivo ..... :    46363.60t/m2
Tension de calculo del acero estructural .. :        0.00t/m2

Modulo de elasticidad del hormigon ..... :  3550000.00t/m2
Modulo de elasticidad del acero activo .... : 21000000.00t/m2
Modulo de elasticidad del acero pasivo .... : 21000000.00t/m2
Modulo de elasticidad del acero estructural : 21000000.00t/m2



Numero total de vertices ..... :  19
Numero total de circuitos ..... :   5
Numero total de inclusiones circulares .... :   0

Definicion de armaduras activas
-------------------------------

Numero total de tramos de armadura ..... :   1

Definicion de armaduras pasivas
-------------------------------

Numero total de tramos de armadura ..... :   1

Definicion de armadura estructural
----------------------------------

Numero total de chapas continuas ..... :   0
Numero total de chapas aisladas ..... :   0
```

Definicion de puntos (respecto c.d.g.)

Punto	X	Y	Punto	X	Y
1	0.4000	-2.9430	2	3.0000	-2.9430
3	3.0000	1.3700	4	6.8500	1.6000
5	6.8500	1.8500	6	0.0000	1.9870
7	-6.8500	1.8500	8	-6.8500	1.6000
9	-3.0000	1.3700	10	-3.0000	-2.9430
11	-0.4000	-2.9430	12	-0.4000	-2.3430
13	-2.2000	-2.3430	14	-2.2000	1.3170
15	-1.4000	1.5570	16	1.4000	1.5570
17	2.2000	1.3170	18	2.2000	-2.3430
19	0.4000	-2.3430			

Definicion de circuitos

Circuito 1 : Numero de vertices 9 (Clave 1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	2	3	4	4	5
5	6	6	7	7	8	8	10
9	11						

Circuito 2 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	2	2	4	3	3		

Circuito 3 : Numero de vertices 3 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	10	2	9	3	8		

Circuito 4 : Numero de vertices 4 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	1	2	19	3	12	4	11

Circuito 5 : Numero de vertices 8 (Clave -1)

Vertice	Punto	Vertice	Punto	Vertice	Punto	Vertice	Punto
1	19	2	18	3	17	4	16
5	15	6	14	7	13	8	12

Definicion de variacion de angulos

Incremento de corte de franjas ...	0.01	(m)
Angulo inicial	0.00	(sex)
Angulo final	180.00	(sex)
Variacion cada	180.00	(sex)

Definicion de Axiles (Comp. (-) Trac. (+))

Axil	1	de	2250.00	(t)
Axil	2	de	0.00	(t)
Axil	3	de	-2250.00	(t)

Definicion de Ley de tensiones en fibras extremas (Comp. (-) Trac. (+))

Tension Fibra Sup.	-1615.000	(t/m2)	a	1.99	(m) del c.d.g
Tension fibra Inf.	53.000	(t/m2)	a	-2.96	(m) del c.d.g

Definicion de armaduras activas (respecto c.d.g.)

Armad	X	Y	A(mm2)	% Ten
1	0.0000	1.6970	73359.0	65.0
2	0.0000	0.0000	13728.0	65.0
3	0.0000	-2.7860	20592.0	65.0

Definicion de armaduras pasivas (respecto c.d.g.)

Armad	X	Y	A(cm2)	Armad	X	Y	A(cm2)
1	0.4350	-2.9080	2.02	2	0.6650	-2.9080	2.02
3	0.8950	-2.9080	2.02	4	1.1250	-2.9080	2.02
5	1.3550	-2.9080	2.02	6	1.5850	-2.9080	2.02
7	1.8150	-2.9080	2.02	8	2.0450	-2.9080	2.02
9	2.2750	-2.9080	2.02	10	2.5050	-2.9080	2.02
11	2.7350	-2.9080	2.02	12	2.9650	-2.9080	2.02
13	2.9650	-2.6925	1.12	14	2.9650	-2.4985	1.12
15	2.9650	-2.3045	1.12	16	2.9650	-2.1105	1.12
17	2.9650	-1.9165	1.12	18	2.9650	-1.7225	1.12
19	2.9650	-1.5285	1.12	20	2.9650	-1.3345	1.12
21	2.9650	-1.1405	1.12	22	2.9650	-0.9465	1.12
23	2.9650	-0.7525	1.12	24	2.9650	-0.5585	1.12
25	2.9650	-0.3645	1.12	26	2.9650	-0.1705	1.12
27	2.9650	0.0235	1.12	28	2.9650	0.2175	1.12
29	2.9650	0.4114	1.12	30	2.9650	0.6054	1.12
31	2.9650	0.7994	1.12	32	2.9650	0.9934	1.12
33	2.9650	1.1874	1.12	34	2.9650	1.4030	1.12
35	3.1789	1.4157	1.12	36	3.3928	1.4285	1.12
37	3.6067	1.4413	1.12	38	3.8206	1.4541	1.12
39	4.0344	1.4669	1.12	40	4.2483	1.4796	1.12
41	4.4622	1.4924	1.12	42	4.6761	1.5052	1.12
43	4.8900	1.5180	1.12	44	5.1039	1.5307	1.12
45	5.3178	1.5435	1.12	46	5.5317	1.5563	1.12
47	5.7456	1.5691	1.12	48	5.9594	1.5819	1.12
49	6.1733	1.5946	1.12	50	6.3872	1.6074	1.12
51	6.6011	1.6202	1.12	52	6.8150	1.6330	1.12
53	6.8150	1.8157	2.02	54	6.6085	1.8198	2.02
55	6.4020	1.8240	2.02	56	6.1955	1.8281	2.02
57	5.9889	1.8322	2.02	58	5.7824	1.8363	2.02
59	5.5759	1.8405	2.02	60	5.3694	1.8446	2.02
61	5.1629	1.8487	2.02	62	4.9564	1.8529	2.02
63	4.7498	1.8570	2.02	64	4.5433	1.8611	2.02
65	4.3368	1.8653	2.02	66	4.1303	1.8694	2.02
67	3.9238	1.8735	2.02	68	3.7173	1.8776	2.02
69	3.5108	1.8818	2.02	70	3.3042	1.8859	2.02
71	3.0977	1.8900	2.02	72	2.8912	1.8942	2.02
73	2.6847	1.8983	2.02	74	2.4782	1.9024	2.02
75	2.2717	1.9066	2.02	76	2.0652	1.9107	2.02
77	1.8586	1.9148	2.02	78	1.6521	1.9190	2.02
79	1.4456	1.9231	2.02	80	1.2391	1.9272	2.02
81	1.0326	1.9313	2.02	82	0.8261	1.9355	2.02
83	0.6195	1.9396	2.02	84	0.4130	1.9437	2.02
85	0.2065	1.9479	2.02	86	0.0000	1.9520	2.02
87	0.0000	1.9520	2.02	88	-0.2065	1.9479	2.02
89	-0.4130	1.9437	2.02	90	-0.6195	1.9396	2.02
91	-0.8261	1.9355	2.02	92	-1.0326	1.9313	2.02
93	-1.2391	1.9272	2.02	94	-1.4456	1.9231	2.02
95	-1.6521	1.9190	2.02	96	-1.8586	1.9148	2.02
97	-2.0652	1.9107	2.02	98	-2.2717	1.9066	2.02
99	-2.4782	1.9024	2.02	100	-2.6847	1.8983	2.02
101	-2.8912	1.8942	2.02	102	-3.0977	1.8900	2.02
103	-3.3042	1.8859	2.02	104	-3.5108	1.8818	2.02
105	-3.7173	1.8776	2.02	106	-3.9238	1.8735	2.02
107	-4.1303	1.8694	2.02	108	-4.3368	1.8653	2.02
109	-4.5433	1.8611	2.02	110	-4.7498	1.8570	2.02
111	-4.9564	1.8529	2.02	112	-5.1629	1.8487	2.02
113	-5.3694	1.8446	2.02	114	-5.5759	1.8405	2.02
115	-5.7824	1.8363	2.02	116	-5.9889	1.8322	2.02
117	-6.1955	1.8281	2.02	118	-6.4020	1.8240	2.02
119	-6.6085	1.8198	2.02	120	-6.8150	1.8157	2.02
121	-6.8150	1.6330	1.12	122	-6.6011	1.6202	1.12
123	-6.3872	1.6074	1.12	124	-6.1733	1.5946	1.12
125	-5.9594	1.5819	1.12	126	-5.7456	1.5691	1.12
127	-5.5317	1.5563	1.12	128	-5.3178	1.5435	1.12
129	-5.1039	1.5307	1.12	130	-4.8900	1.5180	1.12
131	-4.6761	1.5052	1.12	132	-4.4622	1.4924	1.12
133	-4.2483	1.4796	1.12	134	-4.0344	1.4669	1.12
135	-3.8206	1.4541	1.12	136	-3.6067	1.4413	1.12
137	-3.3928	1.4285	1.12	138	-3.1789	1.4157	1.12
139	-2.9650	1.4030	1.12	140	-2.9650	1.1874	1.12
141	-2.9650	0.9934	1.12	142	-2.9650	0.7994	1.12
143	-2.9650	0.6054	1.12	144	-2.9650	0.4114	1.12
145	-2.9650	0.2175	1.12	146	-2.9650	0.0235	1.12
147	-2.9650	-0.1705	1.12	148	-2.9650	-0.3645	1.12
149	-2.9650	-0.5585	1.12	150	-2.9650	-0.7525	1.12
151	-2.9650	-0.9465	1.12	152	-2.9650	-1.1405	1.12
153	-2.9650	-1.3345	1.12	154	-2.9650	-1.5285	1.12
155	-2.9650	-1.7225	1.12	156	-2.9650	-1.9165	1.12
157	-2.9650	-2.1105	1.12	158	-2.9650	-2.3045	1.12
159	-2.9650	-2.4985	1.12	160	-2.9650	-2.6925	1.12
161	-2.9650	-2.9080	2.02	162	-2.7350	-2.9080	2.02
163	-2.5050	-2.9080	2.02	164	-2.2750	-2.9080	2.02
165	-2.0450	-2.9080	2.02	166	-1.8150	-2.9080	2.02
167	-1.5850	-2.9080	2.02	168	-1.3550	-2.9080	2.02
169	-1.1250	-2.9080	2.02	170	-0.8950	-2.9080	2.02
171	-0.6650	-2.9080	2.02	172	-0.4350	-2.9080	2.02
173	-0.4350	-2.6430	1.12	174	-0.4350	-2.6430	1.12
175	-0.4350	-2.6430	1.12	176	-0.6921	-2.3780	1.12
177	-0.8758	-2.3780	1.12	178	-1.0595	-2.3780	1.12
179	-1.2432	-2.3780	1.12	180	-1.4268	-2.3780	1.12
181	-1.6105	-2.3780	1.12	182	-1.7942	-2.3780	1.12
183	-1.9779	-2.3780	1.12	184	-2.2350	-2.3780	1.12
185	-2.2350	-2.1299	1.12	186	-2.2350	-1.8819	1.12
187	-2.2350	-1.6338	1.12	188	-2.2350	-1.3857	1.12
189	-2.2350	-1.1377	1.12	190	-2.2350	-0.8896	1.12
191	-2.2350	-0.6415	1.12	192	-2.2350	-0.3934	1.12
193	-2.2350	-0.1454	1.12	194	-2.2350	0.1027	1.12
195	-2.2350	0.3508	1.12	196	-2.2350	0.5988	1.12
197	-2.2350	0.8469	1.12	198	-2.2350	1.0950	1.12
199	-2.2350	1.3430	1.12	200	-2.2350	1.3430	1.12
201	-2.0275	1.4053	1.12	202	-1.8201	1.4675	1.12
203	-1.6126	1.5298	1.12	204	-1.4051	1.5920	1.12
205	-1.2295	1.5920	1.12	206	-1.0758	1.5920	1.12
207	-0.9221	1.5920	1.12	208	-0.7684	1.5920	1.12
209	-0.6147	1.5920	1.12	210	-0.4611	1.5920	1.12
211	-0.3074	1.5920	1.12	212	-0.1537	1.5920	1.12
213	0.0000	1.5920	1.12	214	0.1537	1.5920	1.12
215	0.3074	1.5920	1.12	216	0.4611	1.5920	1.12
217	0.6147	1.5920	1.12	218	0.7684	1.5920	1.12
219	0.9221	1.5920	1.12	220	1.0758	1.5920	1.12
221	1.2295	1.5920	1.12	222	1.4051	1.5920	1.12
223	1.6126	1.5298	1.12	224	1.8201	1.4675	1.12
225	2.0275	1.4053	1.12	226	2.2350	1.3430	1.12
227	2.2350	1.3430	1.12	228	2.2350	1.0950	1.12
229	2.2350	0.8469	1.12	230	2.2350	0.5988	1.12
231	2.2350	0.3508	1.12	232	2.2350	0.1027	1.12
233	2.2350	-0.1454	1.12	234	2.2350	-0.3934	1.12
235	2.2350	-0.6415	1.12	236	2.2350	-0.8896	1.12
237	2.2350	-1.1377	1.12	238	2.2350	-1.3857	1.12
239	2.2350	-1.6338	1.12	240	2.2350	-1.8819	1.12
241	2.2350	-2.1299	1.12	242	2.2350	-2.3780	1.12
243	1.9779	-2.3780	1.12	244	1.7942	-2.3780	1.12
245	1.6105	-2.3780	1.12	246	1.4268	-2.3780	1.12

247	1.2432	-2.3780	1.12	248	1.0595	-2.3780	1.12
249	0.8758	-2.3780	1.12	250	0.6921	-2.3780	1.12
251	0.4350	-2.6430	1.12	252	0.4350	-2.6430	1.12
253	0.4350	-2.6430	1.12				

Caso 1 : Axil de 2250.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.182	1.008	0.754	2248.938	16428.69	0.00
180.0	-0.300	0.257	2.656	2251.428	-41096.58	0.00

Caso 2 : Axil de 0.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.218	1.009	0.875	-0.087	20034.33	0.00
180.0	-0.300	0.171	3.143	-0.029	-40432.43	0.00

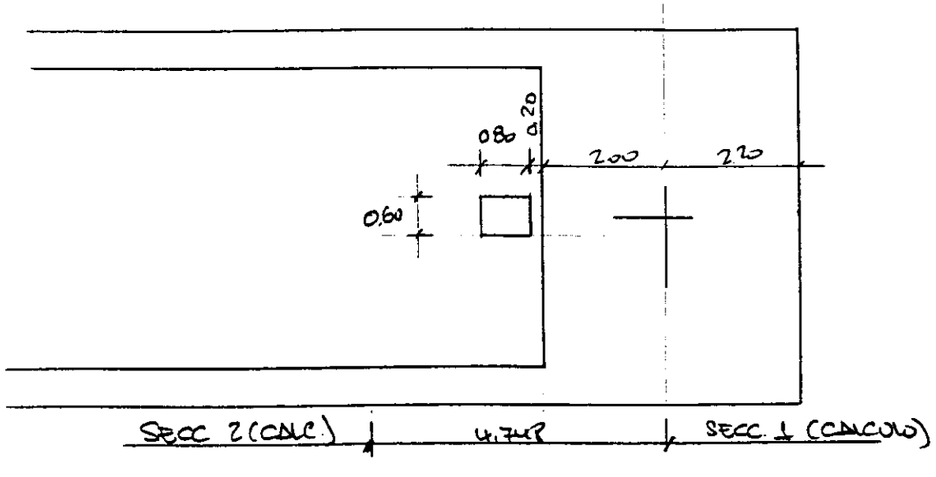
Caso 3 : Axil de -2250.00 (t)

Ang	Dsup	Dinf	Prof.(m)	N(t)	M2 (mxt)	M1 (mxt)
0.0	-0.270	1.009	1.039	-2258.802	23468.17	0.00
180.0	-0.300	0.101	3.690	-2256.469	-39444.63	0.00

DISPOSICIÓN DE SISTEMA DE ACCESO AL INTERIOR DEL CAJÓN ENTRE PILA-13 Y E-2

DISPOSICIÓN DE SISTEMA DE ACCESO AL INTERIOR DEL CAJÓN ENTRE PILA-13 Y E-2.

DIMENSIONES Y SITUACIÓN DEL PASO



La solución es mover los cables 7A-8A-9A-10A y 7, 8 y 9 según croquis adjunto y acortar el cable 6A

Cable que se acorta.

N = 19 x 20 = 380 t

μ = 380 x (2,943 - 0,20) = 1042 mt

VARIACIÓN DE TENSIONES

$$\Delta\sigma_s = -\frac{380}{13{,}481} + \frac{1042\ x\ 1{,}987}{45{,}3025} = -28 + 46 = 18\ t/m^2 = 1{,}8\ kg/cm^2\ (aumentan\ \ las\ compr.)$$

$$\Delta\sigma_i = -\frac{380}{13{,}481} - \frac{1042\ x\ 2{,}943}{45{,}3025} = -28 - 68 = 96\ t/m^2 = -9{,}6\ kg/cm^2\ (disminuyen\ \ las\ \ compr.)$$

En fibra superior se produce un incremento de tensiones de compresión de 2 kg/cm^2 y en fibra inferior se produce una disminución de tensiones de compresión de 10 kg/cm^2 .

Esta variación es puntual entre las secciones 1 y 2 de cálculo.

En el cuadro nº 2 (1/3 2/3 y 3/3) del documento emitido en fecha 11 de Noviembre de 1998 sobre "Los efectos producidos en las tensiones de trabajo ....." se aprecia que esta variación de tensiones es perfectamente asumible por el cajón.

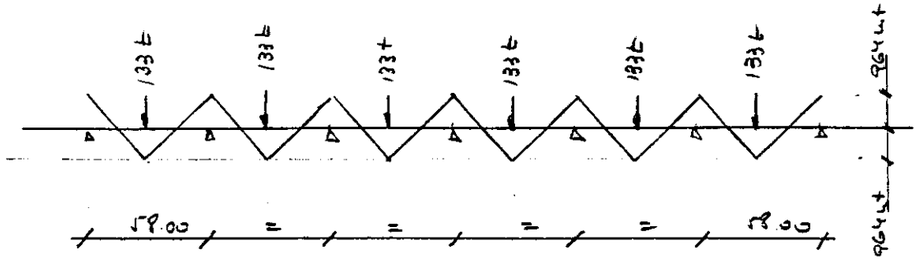
POSIBILIDAD DE HORMIGONADO DE LOS MAMPAROS CORRESPONDIENTES A LOS VANOS DE 58,00 m ANTES DE LLEGAR EL TABLERO A SU POSICIÓN DEFINITIVA.

PESO DE UN MAMPARO

p = 3,20 x 2,50 ((4,937 - 0,427 -0,40) (6,00 - 0,60 - 0,60) - 1,50 x 2,50) = 8,00 (4,10 x 4,80 - 3,00) = 133 t.

Posición 1

Suponiendo el tablero formado por una sucesión de tramos de 58,00 m



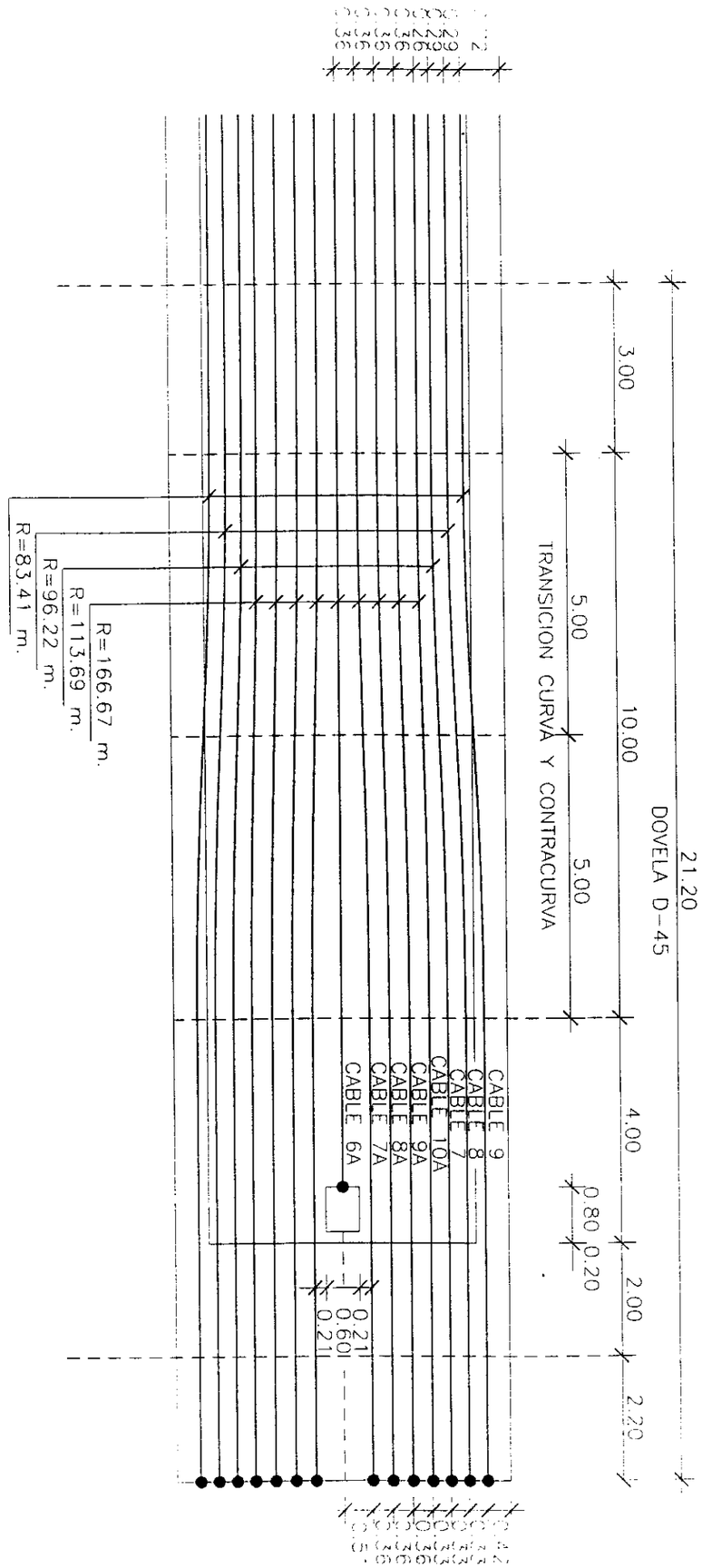
$$M = \frac{PL}{8} = \frac{133x58}{8} = 964\,mt$$

Variación de tensiones

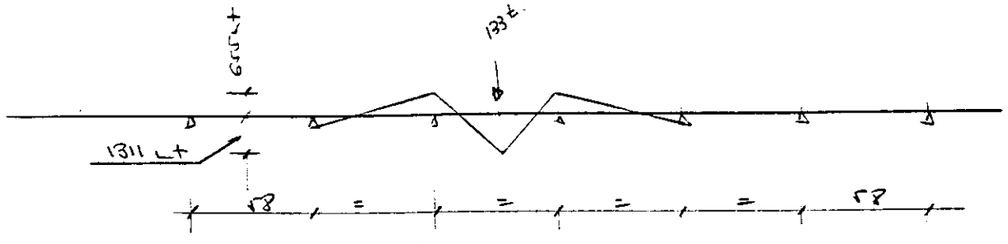
$$\Delta\sigma_s = \frac{964\,x\,1{,}987}{45{,}3025} = 42{,}28\,t/m^2 = 4\,kg/cm^2\ (compresiones\ \ y\ \ tracciones)$$

$$\Delta\sigma_i = \frac{964\,x\,2{,}943}{45{,}3025} = 62{,}62\,t/m^2 = 6\,kg/cm^2\ (compresiones\ \ y\ \ tracciones)$$

MODIFICACIÓN PASO DE HOMBRE EN DOVELA 45
ESCALA 1/100



Posición 2



En apoyos M = -0,085 x 58 x 133 = 655 mt < 964 mt

En vano M = 0,17 x 58 x 133 = 1311 mt

Variación de tensiones

$$\Delta\sigma_s = - \frac{1311\,x\,1{,}987}{45{,}3025} = - 57\ t/m^2 = 6\ kg/cm^2\ (compresiones)$$

$$\Delta\sigma_i = - \frac{1311\,x\,2{,}943}{45{,}3025} = - 85\ t/m^2 = 8{,}5\ kg/cm^2\ (tracciones)$$

Comparando estas dos posiciones y atendiendo exclusivamente a las tracciones, se tiene:

a) En fibra superior se puede producir un incremento de tracciones de 4 kg/cm².

b) En fibra inferior, se puede producir un incremento de tracciones de 8,5 kg/cm².

Examinando el cuadro de tensiones que se producen en el proceso de avance en el cajón, se observa:

a) La zona a considerar (vanos de 58,00 m) corresponde a las secciones.

X = 42 +50 + 70 + 70 + 70 + 58 = 360 m

Secciones 180 y siguientes.

b) Las posiciones de avance a considerar corresponden a la posición 35 y siguientes.

c) En las condiciones citadas en a) y b) en fibra superior no se presentan tracciones en el proceso de avance previsto en proyecto, y por lo tanto, el cajón puede asumir perfectamente el incremento de tracciones de 4 kg/cm² producido por el hormigonado de los mamparos de vanos de 58,00 m.

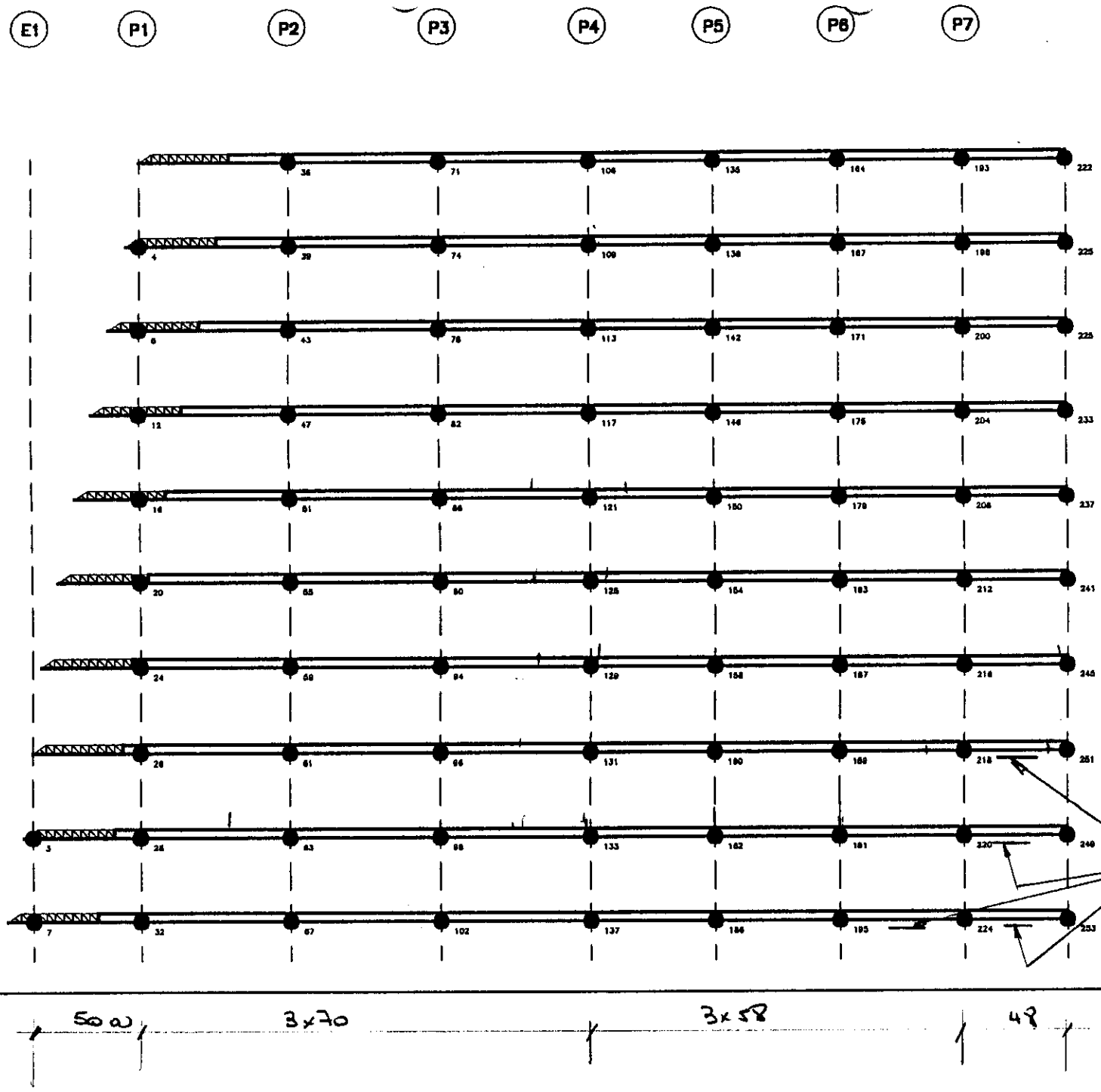
En fibra inferior, en el proceso de avance se detectan tracciones de hasta 10,5 kg/cm² en el entorno de las secciones 206 a 214, que se sitúan en el croquis adjunto (X ≅ 420 m). No obstante, debe tenerse en cuenta, que en el modelo matemático solo se ha considerado una sucesión de 3 vanos de 58 m en vez de los 9 que tiene la estructura.

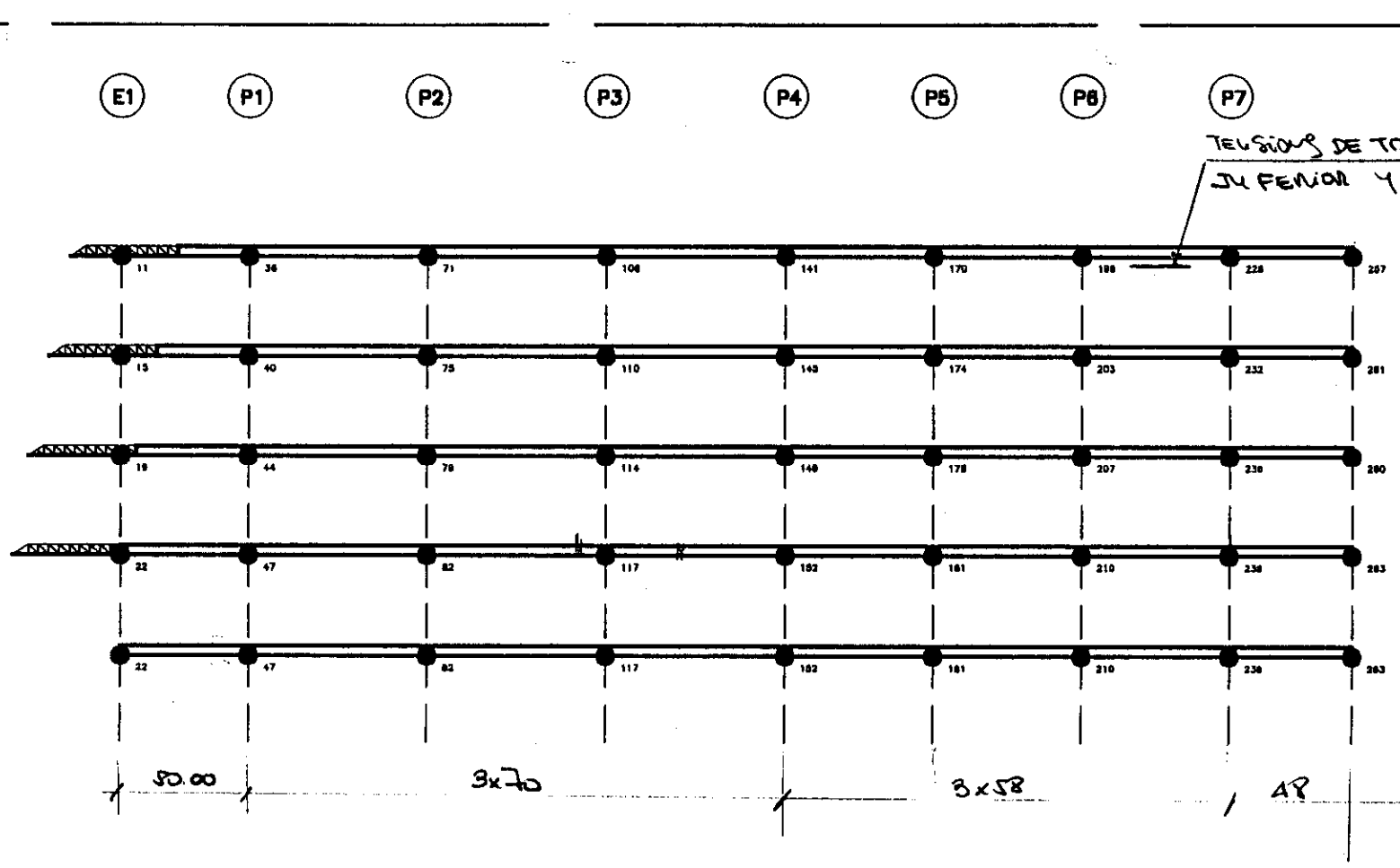
De todas formas si a esos 10,5 kg/cm² de tracciones se añaden los 8,5 kg/cm² se tendría:

σ = 10,5 + 8,5 = 19 kg/cm²

inferior a los 24 kg/cm² previstos en el cálculo.

En consecuencia, se podría hormigonar en estas condiciones desde el mamparo correspondiente a la pila 5 hasta el correspondiente a la pila 11 ambos incluidos.


E1
P1
P2
P3
P4
P5
P6
P7
POSICION 31
POSICION 32
POSICION 33
POSICION 34
POSICION 35
POSICION 36
POSICION 37
POSICION 38
POSICION 39
POSICION 40
TENSIONES DE TRACCION EN FIBRA SUPERIOR Y DE VALOR < 19 kg/cm2
50.00
3x70
3x58
49


E1
P1
P2
P3
P4
P5
P6
P7
TENSIONES DE TRACCION EN FIBRA SUPERIOR Y DE VALOR < 19 kg/cm2
POSICION 41
POSICION 42
POSICION 43
POSICION 44
POSICION 45
50.00
3x70
3x58
48

			41				42				43				44				45				MAXIMOS			
B	N	D	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	FS+	FS-	FI+	FI-
	199	398	-8621	-11614	-129	-1394	-8621	-5007	-419	-965	-8621	-709	-808	-868	-8621	1404	-701	-548	-8621	1404	-701	-548	0	-730	0	-1394
199	199	398	8621	11614	-129	-1394	8621	5007	-419	-965	8621	709	-808	-868	8621	-1405	-701	-548	8621	-1404	-701	-548	0	-730	0	-1394
	200	398	-8621	-9704	-213	-1270	-8621	-6424	-357	-1067	-8621	-1807	-569	-744	-8621	907	-679	-581	-8621	906	-679	-581	0	-733	0	-1375
200	200	398	8621	9704	-213	-1270	8621	6424	-357	-1067	8621	1807	-569	-744	8621	-907	-679	-581	8621	-906	-679	-581	0	-733	0	-1375
	201	400	-8621	-7933	-290	-1155	-8621	-7978	-288	-1158	-8621	-2643	-623	-811	-8621	271	-651	-622	-8621	271	-651	-622	0	-735	0	-1376
201	201	400	8621	7933	-290	-1155	8621	7978	-288	-1158	8621	2643	-623	-811	8621	-271	-651	-622	8621	-271	-651	-622	0	-735	0	-1376
	202	402	-8621	-6298	-362	-1049	-8621	-9870	-214	-1268	-8621	-3818	-472	-888	-8621	502	-617	-672	-8621	-502	-617	-672	0	-739	0	-1374
202	202	402	8621	6298	-362	-1049	8621	9870	-214	-1268	8621	3818	-472	-888	8621	502	-617	-672	8621	502	-617	-672	0	-739	0	-1374
	203	404	-7814	-4965	-361	-902	-7814	-11662	-67	-1338	-7814	-5290	-347	-924	-7814	-1576	-510	-682	-7814	-1576	-510	-682	0	-673	0	-1338
203	203	404	7814	4965	-361	-902	7814	11662	-67	-1338	7814	5290	-347	-924	7814	1576	-510	-682	7814	1576	-510	-682	0	-673	0	-1338
	204	406	-7814	-3606	-421	-814	-7814	-9756	-150	-1214	-7814	-6738	-283	-1018	-7814	-2624	-464	-750	-7814	-2624	-464	-750	0	-675	0	-1324
204	204	406	7814	3606	-421	-814	7814	9756	-150	-1214	7814	6738	-283	-1018	7814	2624	-464	-750	7814	2624	-464	-750	0	-675	0	-1324
	205	408	-7814	-2384	-478	-735	-7814	-7987	-226	-1099	-7814	-8323	-213	-1121	-7814	-3809	-412	-827	-7814	-3809	-412	-827	0	-677	0	-1343
205	205	408	7814	2384	-478	-735	7814	7987	-226	-1099	7814	8323	-213	-1121	7814	3809	-412	-827	7814	3809	-412	-827	0	-677	0	-1343
	206	410	-7450	6256	-826	-146	-7450	1201	-606	-476	-7450	-2489	-443	-714	-7450	2425	-659	-395	-7450	2425	-659	-395	0	-986	87	-823
206	206	410	7450	-6257	-826	-146	7450	-1201	-606	-475	7450	2489	-443	-714	7450	-2425	-659	-395	7450	-2425	-659	-395	0	-986	87	-823
	207	412	-7450	7204	-870	-84	-7450	2695	-671	-377	-7450	-4350	-361	-835	-7450	964	-595	-490	-7450	965	-595	-490	0	-988	90	-835
207	207	412	7450	-7204	-870	-84	7450	-2695	-671	-377	7450	4350	-361	-835	7450	-964	-595	-490	7450	-965	-595	-490	0	-988	90	-835
	208	414	-7450	8013	-905	-32	-7450	4051	-731	-289	-7450	-2405	-447	-709	-7450	634	-525	-594	-7450	633	-525	-594	0	-988	91	-824
208	208	414	7450	-8013	-905	-32	7450	-4051	-731	-289	7450	2406	-447	-709	7450	-634	-525	-594	7450	633	-525	-594	0	-988	91	-824
	209	416	-7450	8685	-935	12	-7450	5270	-785	-210	-7450	-596	-626	-592	-7450	-2369	-448	-707	-7450	2369	-448	-707	0	-990	94	-826
209	209	416	7450	-8685	-935	12	7450	-5270	-785	-210	7450	596	-626	-592	7450	2369	-448	-707	7450	2369	-448	-707	0	-990	94	-826
	210	418	-7450	9219	-958	47	-7450	6351	-832	-140	-7450	1071	-600	-483	-7450	4242	-366	-828	-7450	4241	-366	-828	0	-993	98	-828
210	210	418	7450	-9219	-958	47	7450	-6351	-832	-140	7450	-1071	-600	-483	7450	-4242	-366	-828	7450	4241	-366	-828	0	-993	98	-828
	211	420	-7450	9618	-976	72	-7450	7295	-874	-78	-7450	2603	-667	-383	-7450	-2318	-451	-703	-7450	-2317	-451	-703	0	-993	98	-829
211	211	420	7450	-9618	-976	72	7450	-7295	-874	-78	7450	-2603	-667	-383	7450	2318	-451	-703	7450	2317	-451	-703	0	-993	98	-829
	212	422	-7450	9875	-987	89	-7450	8101	-909	-26	-7450	-3998	-729	-293	-7450	531	-529	-587	-7450	530	-529	-587	0	-995	100	-831
212	212	422	7450	-9875	-987	89	7450	-8101	-909	-26	7450	3998	-729	-293	7450	-531	-529	-587	7450	530	-529	-587	0	-995	100	-831
	213	424	-7450	9997	-993	97	-7450	8770	-936	17	-7450	5255	-784	-211	-7450	1119	-602	-480	-7450	1120	-602	-480	0	-998	102	-836
213	213	424	7450	-9997	-993	97	7450	-8768	-936	17	7450	-5255	-784	-211	7450	-1119	-602	-480	7450	-1120	-602	-480	0	-998	102	-836
	214	426	-7450	9981	-992	96	-7450	9301	-982	52	-7450	6375	-833	-138	-7450	2631	-668	-382	-7450	2632	-668	-382	0	-998	105	-839
214	214	426	7450	-9981	-992	96	7450	-9301	-982	52	7450	-6375	-833	-138	7450	-2631	-668	-382	7450	-2632	-668	-382	0	-998	105	-839
	215	428	-8736	1810	-728	-530	-8736	1878	-722	-538	-8736	881	-619	-891	-8736	4012	-472	-909	-8736	4012	-472	-909	0	-740	0	-1459
215	215	428	8736	-1810	-728	-530	8736	-1878	-722	-538	8736	881	-619	-891	8736	4012	-472	-909	8736	4012	-472	-909	0	-740	0	-1459
	216	430	-8736	1519	-715	-549	-8736	1933	-733	-522	-8736	184	-656	-936	-8736	-2775	-526	-828	-8736	-2775	-526	-828	0	-741	0	-1462
216	216	430	8736	-1519	-715	-549	8736	-1933	-733	-522	8736	-184	-656	-936	8736	2775	-526	-828	8736	2775	-526	-828	0	-741	0	-1462
	217	432	-8736	1091	-696	-577	-8736	2051	-738	-515	-8736	891	-667	-890	-8736	1676	-574	-757	-8736	1675	-574	-757	0	-740	0	-1456
217	217	432	8736	-1091	-696	-577	8736	-2051	-738	-515	8736	-891	-667	-890	8736	-1676	-574	-757	8736	-1675	-574	-757	0	-740	0	-1456
	218	434	-8736	525	-671	-814	-8736	2032	-737	-516	-8736	1460	-712	-653	-8736	-714	-617	-694	-8736	-713	-617	-694	0	-750	0	-1567
218	218	434	8736	-525	-671	-814	8736	-2032	-737	-516	8736	-1460	-712	-653	8736	714	-617	-694	8736	713	-617	-694	0	-750	0	-1567
	219	436	-8736	179	-640	-660	-8736	1876	-731	-528	-8736	1893	-731	-625	-8736	111	-653	-641	-8736	111	-653	-641	0	-757	0	-1469
219	219	436	8736	179	-640	-660	8736	-1876	-731	-528	8736	-1892	-731	-625	8736	-111	-653	-641	8736	-111	-653	-641	0	-757	0	-1469
	220	438	-8736	-1019	-603	-714	-8736	1582	-718	-545	-8736	2187	-744	-606	-8736	798	-683	-596	-8736	798	-683	-596	0	-758	0	-1471
220	220	438	8736	1020	-603	-714	8736	-1582	-718	-545	8736	-2187	-744	-606	8736	-798	-683	-596	8736	-798	-683	-596	0	-758	0	-1471

			41				42				43				44				45				MAXIMOS			
B	N	D	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	FS+	FS-	FI+	FI-
	221	440	-8736	-1998	-560	-778	-8736	1151	-699	-573	-8736	2344	-751	-496	-8736	1347	-707	-561	-8736	1346	-707	-560	0	-758	0	-1473
221	221	440	8736	1998	-560	-778	8736	-1151	-699	-573	8736	-2344	-751	-496	8736	-1347	-707	-561	8736	-1346	-707	-560	0	-758	0	-1473
	222	442	-8736	-3114	-511	-850	-8736	582	-674	-610	-8736	2364	-752	-494	-8736	1759	-725	-534	-8736	1760	-725	-534	0	-755	0	-1475
222	222	442	8736	3114	-511	-850	8736	-582	-674	-610	8736	-2364	-752	-494	8736	-1758	-725	-534	8736	-1760	-725	-534	0	-756	0	-1476
	223	444	-8736	-4367	-456	-932	-8736	-125	-643	-656	-8736	2246	-747	-502	-8736	2034	-736	-516	-8736	2034	-736	-516	0	-754	0	-1475
223	223	444	8736	4367	-456	-932	8736	125	-643	-656	8736	-2246	-747	-502	8736	-2034	-736	-516	8736	-2034	-736	-516	0	-754	0	-1475
	224	446	-8736	-5758	-395	-1022	-8736	-969	-805	-711	-8736	1990	-736	-519	-8736	2171	-744	-507	-8736	2171	-744	-507	0	-753	0	-1475
224	224	446	8736	5758	-395	-1022	8736	969	-805	-711	8736	-1990	-736	-519	8736	-2171	-744	-507	8736	-2171	-744	-507	0	-753	0	-1475
	225	448	-8736	-7286	-327	-1122	-8736	-1950	-582	-775	-8736	1887	-718	-544	-8736	2170	-744	-507	-8736	2170	-744	-507	0	-751	0	-1477
225	225	448	8736	7286	-327	-1122	8736	1950	-582	-775	8736	-1887	-718	-544	8736	-2170	-744	-507	8736	-2170	-744	-507	0	-751	0	-1477
	226	450	-8736	8952	-264	-1230	-8736	3066	-513	-848	-8736	1067	-696	-578	-8736	2032	-737	-516	-8736	2032	-737	-516	0	-766	0	-1477
226	226	450	8736	8952	-264	-1230	8736	3066	-513	-848	8736	-1067	-696	-578	8736	-2032	-737	-516	8736	-2032	-737	-516	0	-766	0	-1477
	227	452	-8736	10756	-176	-1347	8736	4326	-468	-929	-8736	399	-666	-622	8736	1767	-726	-534	8736	1767	-726	-534	0	-769	0	-1477
227	227	452	8736	10756	-176	-1347	8736	4326	-468	-929	8736	-399	-666	-622	8736	-1767	-726	-534	8736	-1767	-726	-534	0	-769	0	-1477
	228	454	-8736	12697	-89	-1473	8736	5719	-306	-1020	-8736	407	-630	-676	8736	1344	-707	-561	8736	1344	-707	-561	0	-782	0	-1477
228	228	454	8736	12697	-89	-1473	8736	5719	-306	-1020	8736	407	-630	-676	8736	-1344	-707	-561	8736	-1344	-707	-561	0	-782	0	-1477
	229	456	-8736	10707	-177	-1344	8736	7251	-329	-1119	-8736	1350	-589	-736	8736	-793	-683	-597	8736	-793	-683	-597	0	-768	0	-1478
229	229	456	8736	10707	-177	-1344	8736	7251	-329	-1119	8736	1350	-589	-736	8736	793	-683	-597	8736	793	-683	-597	0	-768	0	-1478
	230	458	-8736	8854	-258	-1224	-8736	8920	-256	-1228	-8736	2430	-541	-606	8736	106	-653	-641	8736	106	-653	-641	0	-800	0	-1476
230	230	458	8736	8854	-258	-1224	8736	8920	-256	-1228	8736	2430	-541	-606	8736	-106	-653	-641	8736	-105	-653	-641	0	-800	0	-1476
	231	460	-8736	7140	-334	-1112	-8736	10728	-176	-1345	-8736	3848	-488	-885	-8736	721	-816	-695	-8736	-721	-816	-695	0	-828	0	-1476
231	231	460	8736	7140	-334	-1112	8736	10728	-176	-1345	8736	3848	-488	-885	8736	721	-816	-695	8736	720	-816	-695	0	-828	0	-1476
	232	462	-8736	5562	-403	-1010	-8736	12870	-91	-1472	-8736	5004	-428	-973	-8736	1684	-574	-758	-8736	1684	-574	-758	0	-847	0	-1475
232	232	462	8736	5562	-403	-1010	8736	12870	-91	-1472	8736	5004	-428	-973	8736	1684	-574	-758	8736	1684	-574	-758	0	-847	0	-1475
	233	464	-8736	4122	-467	-918	-8736	10707	-177	-1344	-8736	6497	-362	-1070	-8736	2784	-526	-829	-8736	2784	-526	-829	0	-881	0	-1476
233	233	464	8736	4122	-467	-918	8736	10707	-177	-1344	8736	6497	-362	-1070	8736	2784	-526	-829	8736	2784	-526	-829	0	-881	0	-1476
	234	466	-8736	2820	-524	-831	-8736	8861	-257	-1225	-8736	8127	-290	-1176	-8736	4022	-471	-910	-8736	4022	-471	-910	0	-889	0	-1409
234	234	466	8736	2820	-524	-831	8736	8861	-257	-1225	8736	8127	-290	-1176	8736	4022	-471	-910	8736	4022	-471	-910	0	-889	0	-1409
	235	468	-8006	5263	-628	-251	-8006	-254	-583	-810	-8006	-2957	-464	-788	-8006	1840	-662	-494	-8006	1840	-662	-494	0	-1122	186	-910
235	235	468	8006	-5263	-628	-251	8006	254	-583	-810	8006	2957	-464	-788	8006	-1840	-662	-494	8006	-1840	-662	-494	0	-1122	186	-910
	236	470	-8006	6310	-672	-184	8006	1299	-651	-510	-8006	-4863	-380	-910	-8006	27	-595	-592	-8006	27	-595	-592	0	-1118	181	-914
236	236	470	8006	-6310	-672	-184	8006	-1299	-651	-510	8006	4863	-380	-910	8006	-27	-595	-592	8006	-27	-595	-592	0	-1118	181	-914
	237	472	-8006	7200	-911	-128	8006	2710	-713	-418	-8006	-3082	-458	-784	-8006	1624	-523	-699	-8006	1624	-522	-699	0	-1108	186	-992
237	237	472	8006	-7200	-911	-128	8006	-2710	-713	-418	8006	3082	-458	-784	8006	-1624	-523	-699	8006	-1624	-522	-699	0	-1108	186	-992
	238	474	-8006	7953	-944	-77	-8006	3988	-769	-335	-8006	-1438	-631	-687	-8006	3412	-444	-816	-8006	-3412	-444	-816	0	-1092	142	-917
238	238	474	8006	-7952	-944	-77	8006	-3988	-769	-336	8006	1438	-631	-687	8006	-3412	-444	-816	8006	3412	-444	-816	0	-1092	142	-917
	239	476	-8006	8567	-971	-37	-8006	5124	-819	-261	-8006	68	-567	-560	-8006	5337	-359	-941	-8006	5336	-359	-941	0	-1070	110	-943
239	239	476	8006	-8567	-971	-37	8006	-5124	-819	-261	8006	-68	-567	-560	8006	-5337	-359	-941	8006	-5336	-359	-941	0	-1070	110	-943
	240	478	-8006	9045	-992	-8	-8006	6125	-863	-196	-8006	1437	-667	-501	-8006	-3479	-441	-820	-8006	-3479	-441	-820	0	-1042	68	-823
240	240	478	8006	-9044	-992	-8	8006	-6125	-863	-196	8006	-1437	-667	-501	8006	3479	-441	-820	8006	3479	-441	-820	0	-1042	68	-823
	241	480	-8006	9385	-1007	16	-8006	6968	-901	-140	-8006	2866	-711	-421	-8006	-1758	-517	-706	-8006	-1758	-517	-706	0	-1024	41	-905
241	241	480	8006	-9385	-1007	16	8006	-6968	-901	-140	8006	-2866	-711	-421	8006	1758	-517	-706	8006	1758	-517	-706	0	-1024	41	-905
	242	482	-8006	9587	-1016	29	-8006	7714	-933	-93	-8006	3761	-789	-349	-8006	-176	-586	-605	-8006	-175	-586	-605	0	-1021	37	-887
242	242	482	8006	-9587	-1016	29	8006	-7714	-933	-93	8006	-3761	-789	-349	8006	176	-586	-605	8006	175	-586	-605	0	-1021	37	-887

			41				42				43				44				45				MAXIMOS			
B	N	D	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	N	M	FS	FI	FS+	FS-	FI+	FI-
	243	484	-8008	9651	-1019	33	-8008	8302	-958	-54	-8008	4717	-802	-287	-8008	1271	-650	-511	-8008	1271	-650	-511	0	-1019	33	-872
243	243	484	8008	-9652	-1019	33	8008	-8302	-958	-54	8008	-4717	-802	-287	8008	-1271	-650	-511	8008	-1271	-650	-511	0	-1019	33	-872
	244	486	-8008	4673	-800	-290	-8008	3847	-783	-344	-8008	630	-622	-553	-8008	-2328	-492	-745	-8008	-2328	-492	-745	0	-800	0	-1177
244	244	486	8008	-4673	-800	-290	8008	-3848	-783	-344	8008	-630	-622	-553	8008	2328	-492	-745	8008	2328	-492	-745	0	-800	0	-1177
	245	488	-8008	4463	-790	-304	-8008	4181	-777	-324	-8008	1311	-662	-609	-8008	-1155	-543	-669	-8008	-1155	-543	-669	0	-795	0	-1186
245	245	488	8008	-4463	-790	-304	8008	-4181	-777	-324	8008	-1311	-662	-609	8008	1155	-543	-669	8008	1155	-543	-669	0	-795	0	-1186
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247	247	492	8008	-3630	-754	-358	8008	-4376	-786	-310	8008	-2261	-693	-447	8008	-778	-628	-544	8008	-775	-628	-544	0	-786	0	-1148
	248	494	-8008	3007	-726	-388	-8008	4276	-782	-316	-8008	2830	-706	-430	-8008	1533	-661	-494	-8008	1533	-661	-494	0	-782	0	-1141
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251	251	500	8008	-314	-608	-574	8008	-3153	-733	-389	8008	-2510	-704	-431	8008	-2983	-725	-400	8008	-2983	-725	-400	0	-793	0	-1298
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252	252	502	8008	859	-556	-650	8008	-2504	-704	-431	8008	-2229	-692	-449	8008	-3192	-734	-386	8008	-3192	-734	-386	0	-797	0	-1209
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254	254	506	8008	3617	-435	-829	8008	-793	-629	-542	8008	-1253	-649	-512	8008	-3196	-735	-386	8008	-3196	-735	-386	0	-785	0	-1141
	255	508	-8008	-5202	-365	-932	-8008	-269	-582	-611	-8008	659	-619	-558	-8008	2992	-726	-399	-8008	2992	-726	-399	0	-771	0	-1147
255	255	508	8008	5202	-365	-932	8008	269	-582	-611	8008	-659	-619	-558	8008	-2992	-726	-399	8008	-2992	-726	-399	0	-771	0	-1147
	256	510	-8008	-6925	-289	-1044	-8008	-1468	-529	-669	-8008	-272	-582	-612	-8008	-2650	-711	-422	-8008	-2650	-711	-422	0	-750	0	-1155
256	256	510	8008	6925	-289	-1044	8008	1468	-529	-669	8008	272	-582	-612	8008	-2650	-711	-422	8008	-2650	-711	-422	0	-750	0	-1155
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257	257	512	8008	6785	-207	-1166	8008	2805	-471	-778	8008	1241	-639	-678	8008	-2171	-689	-453	8008	-2171	-689	-453	0	-723	0	-1165
	258	514	-8008	-7578	-261	-1068	-8008	-4260	-406	-872	-8008	-2348	-491	-747	-8008	1554	-662	-493	-8008	1554	-662	-493	0	-691	0	-1173
258	258	514	8008	7578	-261	-1068	8008	4260	-406	-872	8008	2348	-491	-747	8008	-1555	-662	-493	8008	-1554	-662	-493	0	-691	0	-1173
	259	516	-8008	-6504	-308	-1017	-8008	-5891	-335	-977	-8008	-3562	-436	-627	-8008	800	-629	-542	-8008	800	-629	-542	0	-652	0	-1185
259	259	516	8008	6504	-308	-1017	8008	5891	-335	-977	8008	3562	-436	-627	8008	-800	-629	-542	8008	-800	-629	-542	0	-652	0	-1185
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260	260	518	8008	5569	-349	-956	8008	7641	-258	-1091	8008	4973	-376	-817	8008	91	-590	-600	8008	91	-590	-600	0	-607	0	-1198
	261	520	-8008	-4773	-384	-904	-8008	-9527	-175	-1213	-8008	-4378	-401	-878	-8008	-1121	-545	-667	-8008	-1121	-545	-667	0	-556	0	-1213
261	261	520	8008	4773	-384	-904	8008	9527	-175	-1213	8008	4378	-401	-878	8008	1121	-545	-667	8008	1121	-545	-667	0	-556	0	-1213
	262	522	-8008	-4113	-413	-861	-8008	-8491	-308	-1016	-8008	-3914	-422	-848	-8008	-2287	-493	-743	-8008	-2287	-493	-743	0	-499	0	-1228
262	262	522	8008	4113	-413	-861	8008	8491	-308	-1016	8008	3914	-422	-848	8008	2287	-493	-743	8008	2287	-493	-743	0	-499	0	-1228
	263	524	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

COMPROBACIÓN DEL EFECTO DE LA COLOCACIÓN DE LOS APARATOS DE APOYO DEFINITIVOS SOBRE PILAS, CON UNA EXCENTRICIDAD ADICIONAL DE 0,20 M. EN EL SENTIDO LONGITUDINAL DEL TABLERO

PUENTE SOBRE EL RIO CINCA

(8 - marzo - 1999)

COMPROBACION DEL EFECTO DE LA COLOCACION DE LOS APARATOS DE APOYO DEFINITIVOS SOBRE PILAS, CON UNA EXCENTRICIDAD ADICIONAL DE 0.20 m. EN EL SENTIDO LONGITUDINAL DEL TABLERO.

Partiendo de los datos del anejo de cálculo, se ha repetido la comprobación de los fustes de pilas, incrementando los momentos longitudinales en el valor 0.20 * N, siendo N el axil en cabeza de pilas.

Los resultados se han trasladado a los ábacos representativos de la capacidad resistente de los fustes. Son los puntos denominados 1', 2', 3' y 4'.

En los esquemas que se adjuntan puede verse tanto la relación de estos valores con los calculados en su día en el proyecto (puntos 1 2 3 y 4), así como el campo de validez de la sección de los fustes para estos nuevos valores.

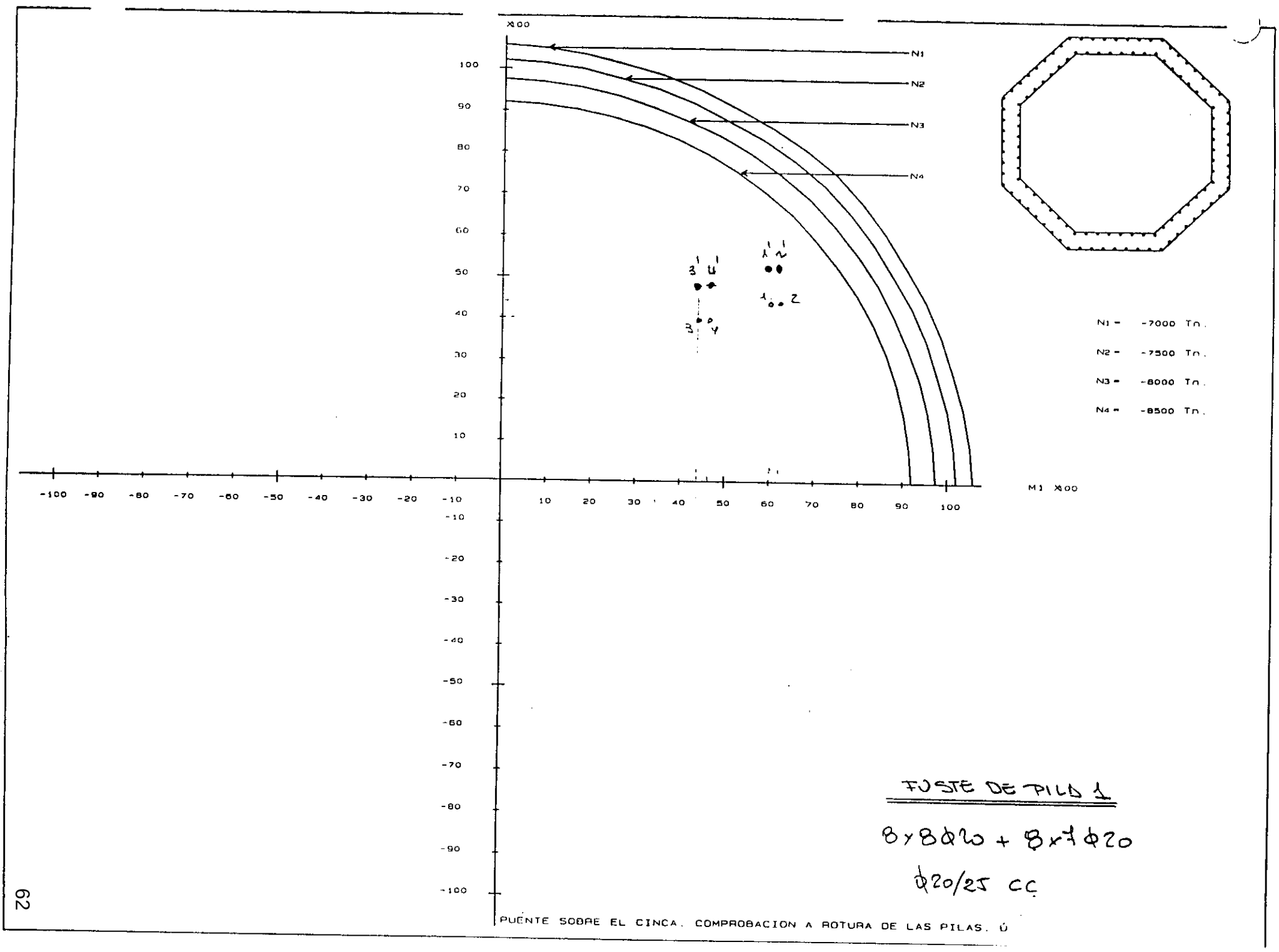
También se han recalculado las nuevas tensiones en cimentación observandose una tensión punta máxima de 8.3 kg/cm2., para hipótesis sin sismo, frente a 8.1 kg/cm2 que figura en dicho anejo.

ESFUERZOS MAYORADOS EN BASE DE PILAS

	ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS			ESFUERZOS MAYORADOS		
	AXILES	MAXIMOS	2 TRENES	TORSORES	MAXIMOS	1 TREN	SISMO CON	AXILES	MAXIMOS	SISMO CON	M. TRANS.	MAXIMOS
PILA	N_D	MT_D	ML_D	N_D	MT_D	ML_D	ND	MTD	MLD	ND	MTD	MLD
1	6931	5953	5334	5981	6057	5334	4631	4470	4741	4378	4581	4741
2	7345	8916	5645	6322	9406	5645	4928	6676	5018	4655	6903	5018
3	7405	8544	5971	6378	8987	5971	4973	6398	5308	4700	6610	5308
4	6822	8032	5221	5860	8556	5221	4573	5983	4641	4317	6206	4641
5	6063	7070	4364	5186	7632	4364	4043	5226	3879	3809	5444	3879
6	6194	6503	4222	5317	7079.0	4222	4209	4770	3753	3975	4985	3753
7	6072	6126	3724	5206	6800	3724	4175	4436	3310	3944	4668	3310
8	6042	6070	3442	5176	6852	3442	4194	4356	3060	3964	4610	3060
9	6072	5412	3724	5206	5999	3724	4214	3899	3310	3983	4104	3310
10	6031	5714	3342	5165	6471	3342	4233	4080	2970	4002	4325	2970
11	6007	5299	3120	5142	6081	3120	4252	3728	2774	4021	3992	2774
12	5994	4926	3000	5129	5675	3000	4271	3464	2666	4040	3697	2666
13	6014	4041	2899	5173	4550	2899	4354	2838	2577	4130	3011	2577

TENSIONES EN CIMENTACION SIN SISMO

	ZAPATA			CARGAS CON	EN AXILES	CIMENTACIÓN MAXIMOS	TENSIONES EN CIMENTACION				CARGAS CON	EN M. TRANS.	CIMENTACIÓN MAXIMO	TENSIONES EN CIMENTACION			
PILA	LONG.	ANCHO	CANTO	N	MT	ML	S1	S2	S3	S4	N	MT	ML	S1	S2	S3	S4
1	10.0	12.5	2.7	5657	4616	4137	82.8	43.1	47.4	7.7	4154	4259	4137	69.4	29.7	36.7	-3.0
2	10.2	14.0	3.2	6243	6877	4463	82.7	46.0	41.5	4.7	4391	6603	4463	68.9	32.2	29.3	-7.5
3	10.2	14.0	3.2	6285	6678	4693	83.4	44.7	43.3	4.6	4430	6302	4693	69.3	30.6	31.4	-7.2
4	10.2	14.0	3.2	5880	6334	4123	77.2	43.2	39.2	5.2	4070	6005	4123	63.5	29.5	27.5	-6.5
5	10.0	12.0	2.5	4961	5413	3370	80.7	47.0	35.6	1.9	3602	5369	3370	69.2	35.5	24.5	-9.2
6	10.0	12.0	2.5	5052	5005	3286	79.4	46.5	37.7	4.8	3693	4982	3286	68.0	35.1	26.4	-6.4
7	10.0	12.0	2.5	4967	4753	2936	75.9	46.5	36.3	6.9	3616	4789	2936	64.8	35.4	24.9	-4.5
8	10.0	12.0	2.5	4946	4750	2740	74.7	47.3	35.1	7.7	3595	4832	2740	63.8	36.4	23.5	-3.9
9	10.0	11.0	2.5	4904	4201	2936	81.4	49.4	39.8	7.7	3616	4223	2936	69.8	37.8	27.9	-4.1
10	10.0	11.0	2.5	4876	4492	2670	81.2	52.0	36.6	7.5	3587	4565	2670	69.8	40.7	24.5	-4.6
11	10.0	11.0	2.5	4859	4185	2516	78.7	51.2	37.1	9.7	3571	4291	2516	67.5	40.0	24.9	-2.5
12	10.0	11.0	2.5	4850	3919	2433	76.8	50.3	37.9	11.4	3562	4009	2433	65.5	39.0	25.8	-0.8
13	10.0	11.0	2.5	4864	3217	2370	73.1	47.2	41.2	15.3	3593	3217	2370	61.5	35.7	29.6	3.8

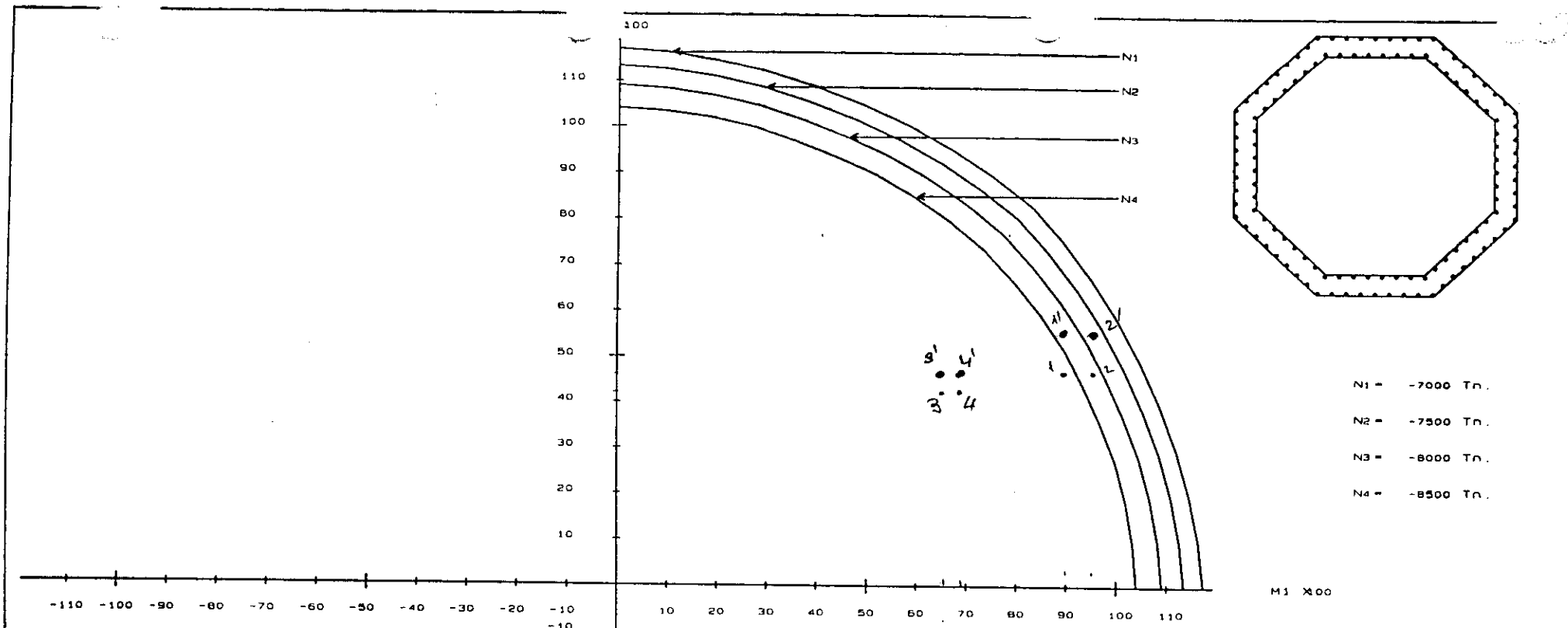


FUSTE DE PILA 1

8×8ϕ20 + 8×1ϕ20

ϕ20/25 cc

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú



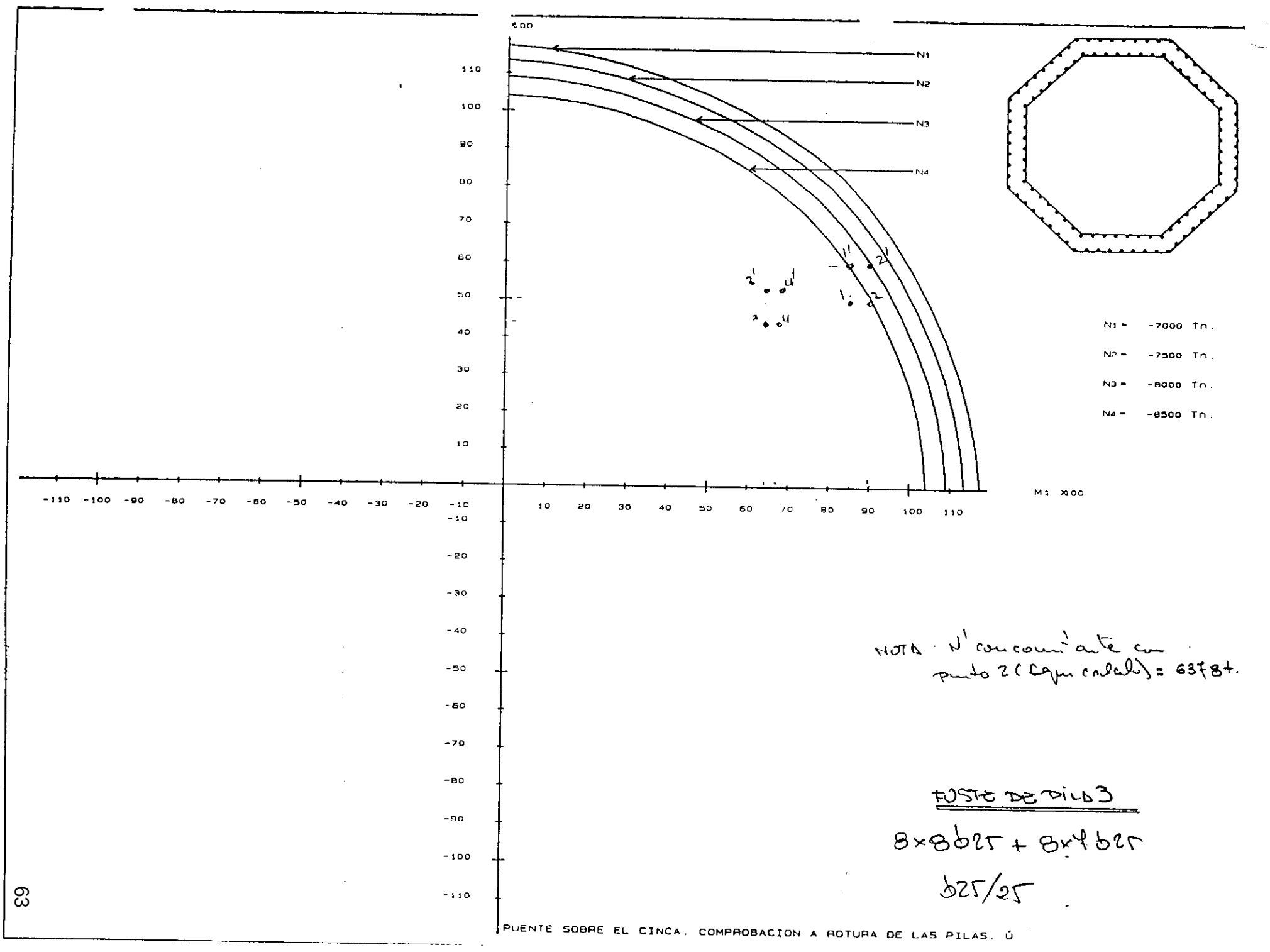
NOTA: N' concomitante en el punto 2 (Cqm calculo) = 6322 tn

FUSTE DE PILA 2

8x8 ø25 + 8x4 ø25

ø25/25 c/c

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú



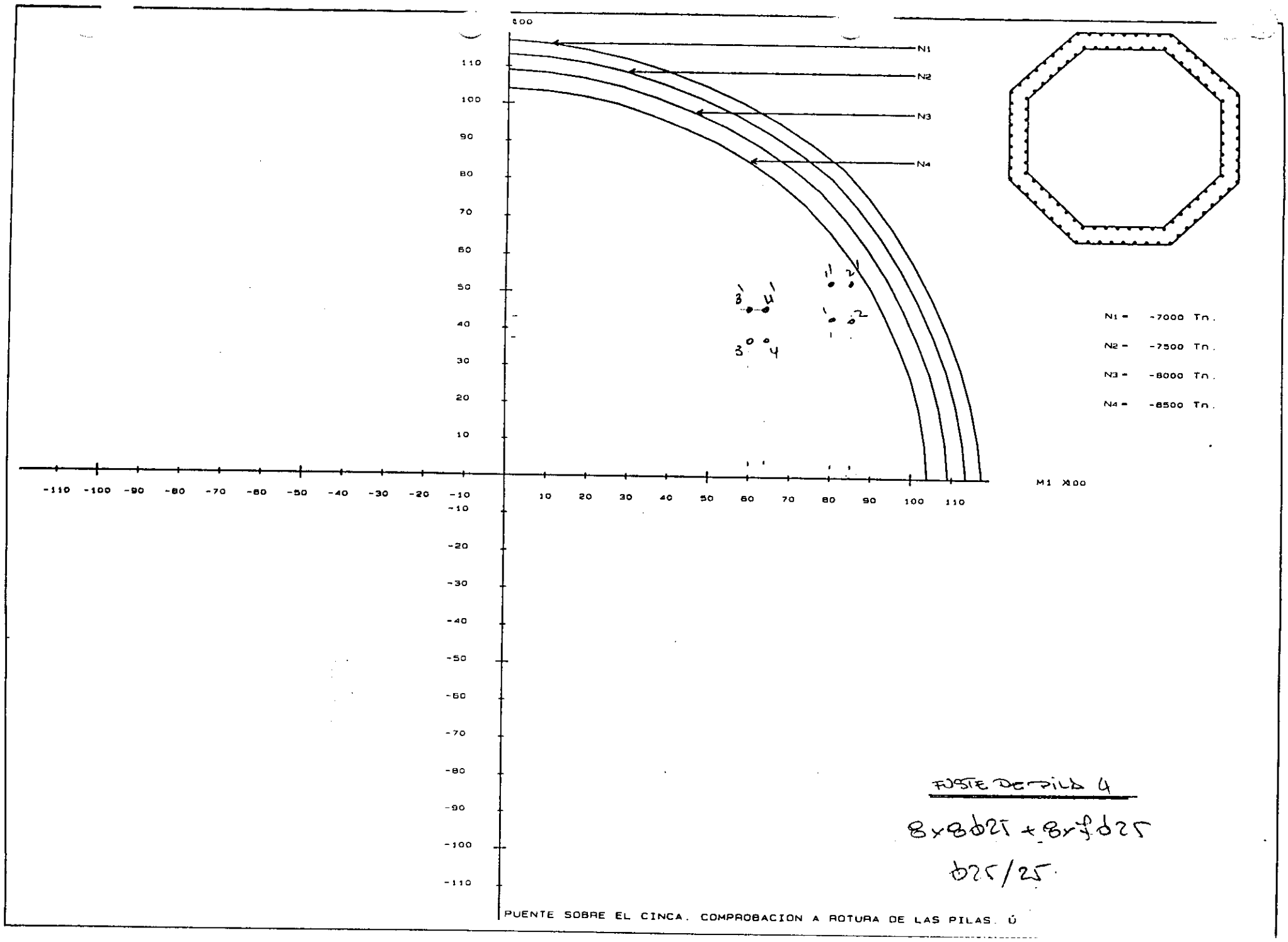
NOTA: N' concomitante en punto 2 (Cqm calculo) = 6378 t.

FUSTE DE PILA 3

8x8 ø25 + 8x4 ø25

ø25/25

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

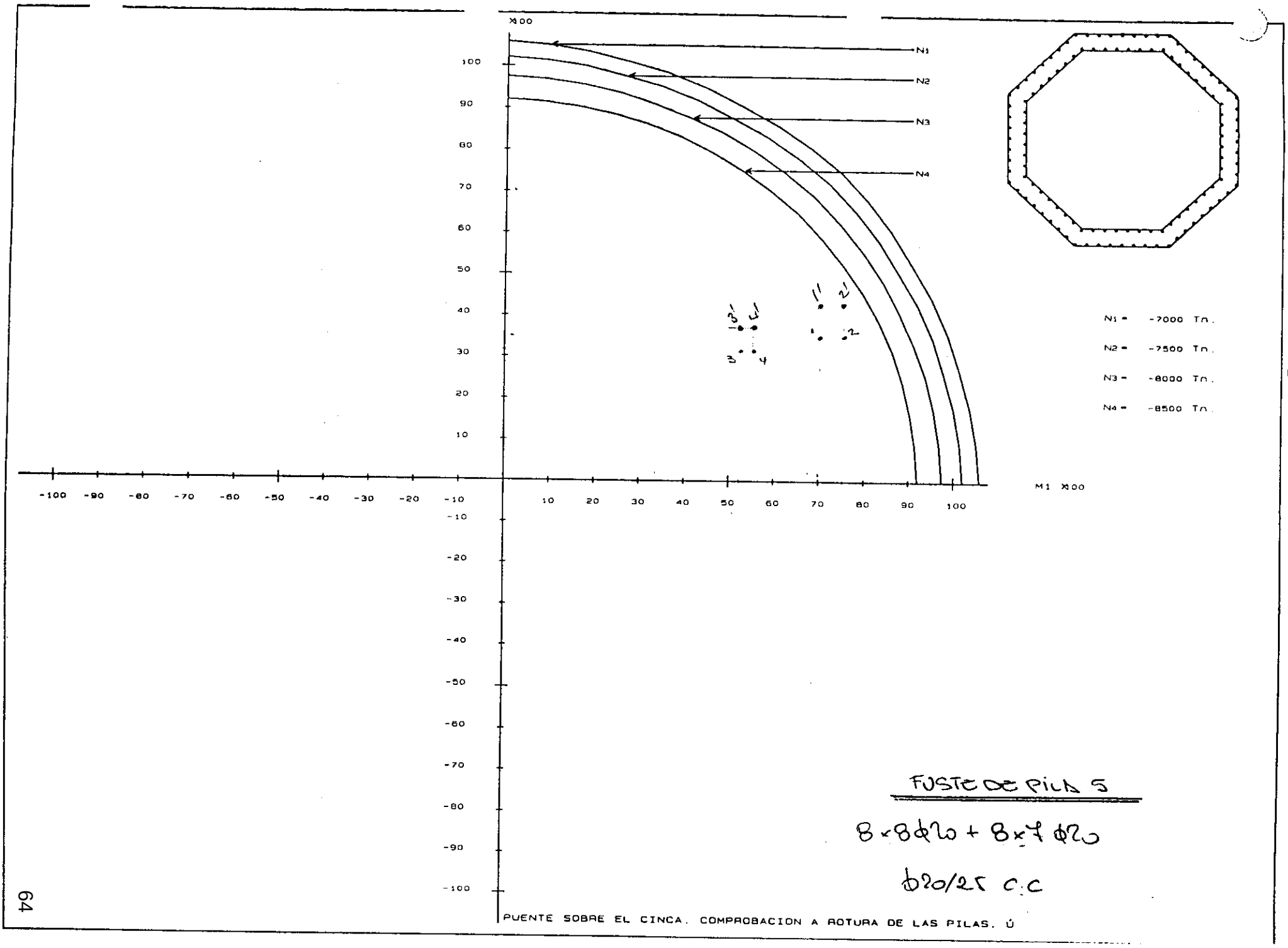


FUSTE DE PILA 4

8×8ϕ25 + 8×fϕ25

ϕ25/25

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

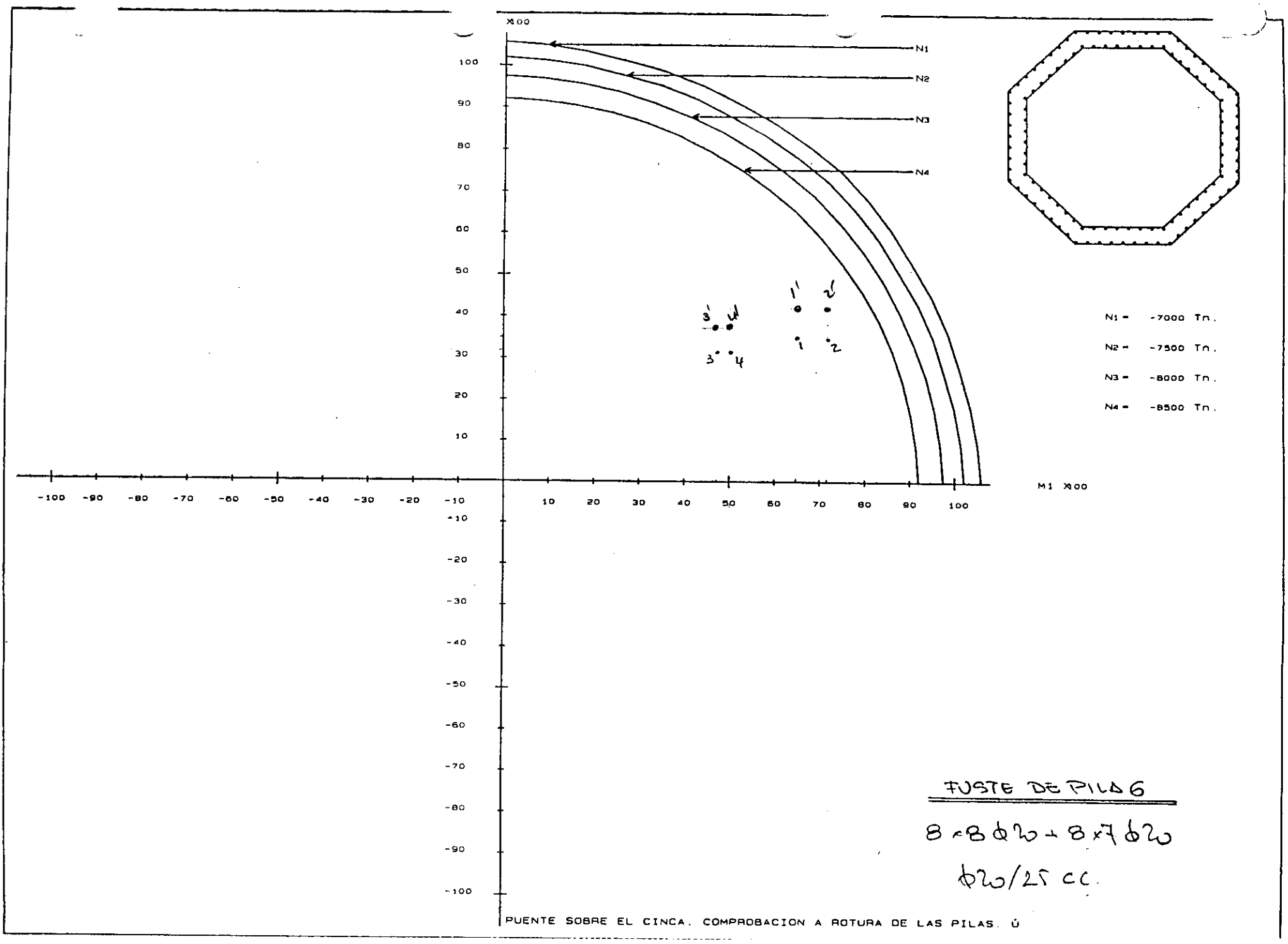


FUSTE DE PILA 5

8×8ϕ20 + 8×fϕ20

ϕ20/25 c.c

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú



N1 = -7000 Tn.

N2 = -7500 Tn.

N3 = -8000 Tn.

N4 = -8500 Tn.

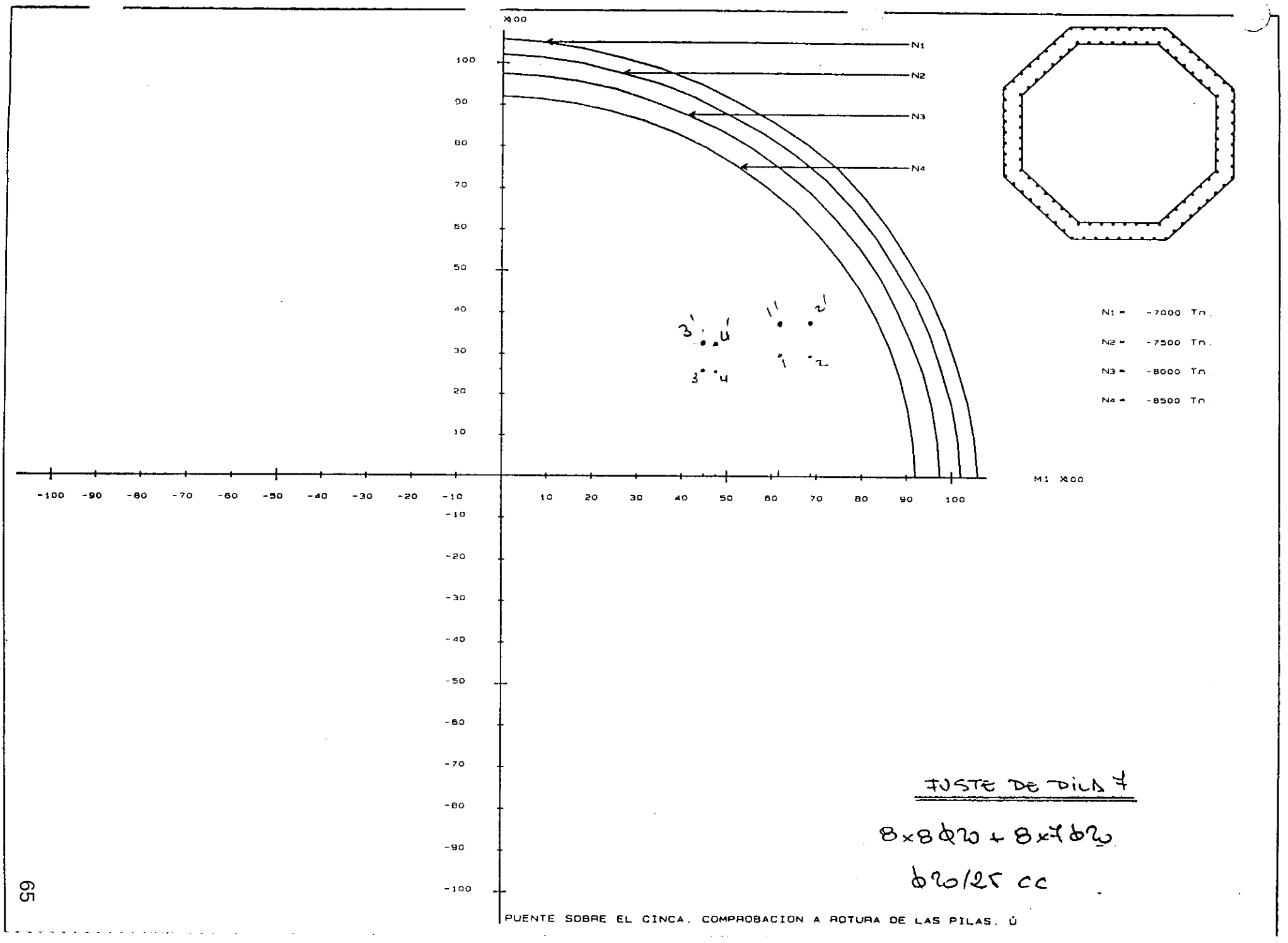
M1 X00

FUSTE DE PILA 6

8 x 8 ϕ20 + 8 x 7 ϕ20

ϕ20/25 cc.

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú



N1 = -7000 Tn.

N2 = -7500 Tn.

N3 = -8000 Tn.

N4 = -8500 Tn.

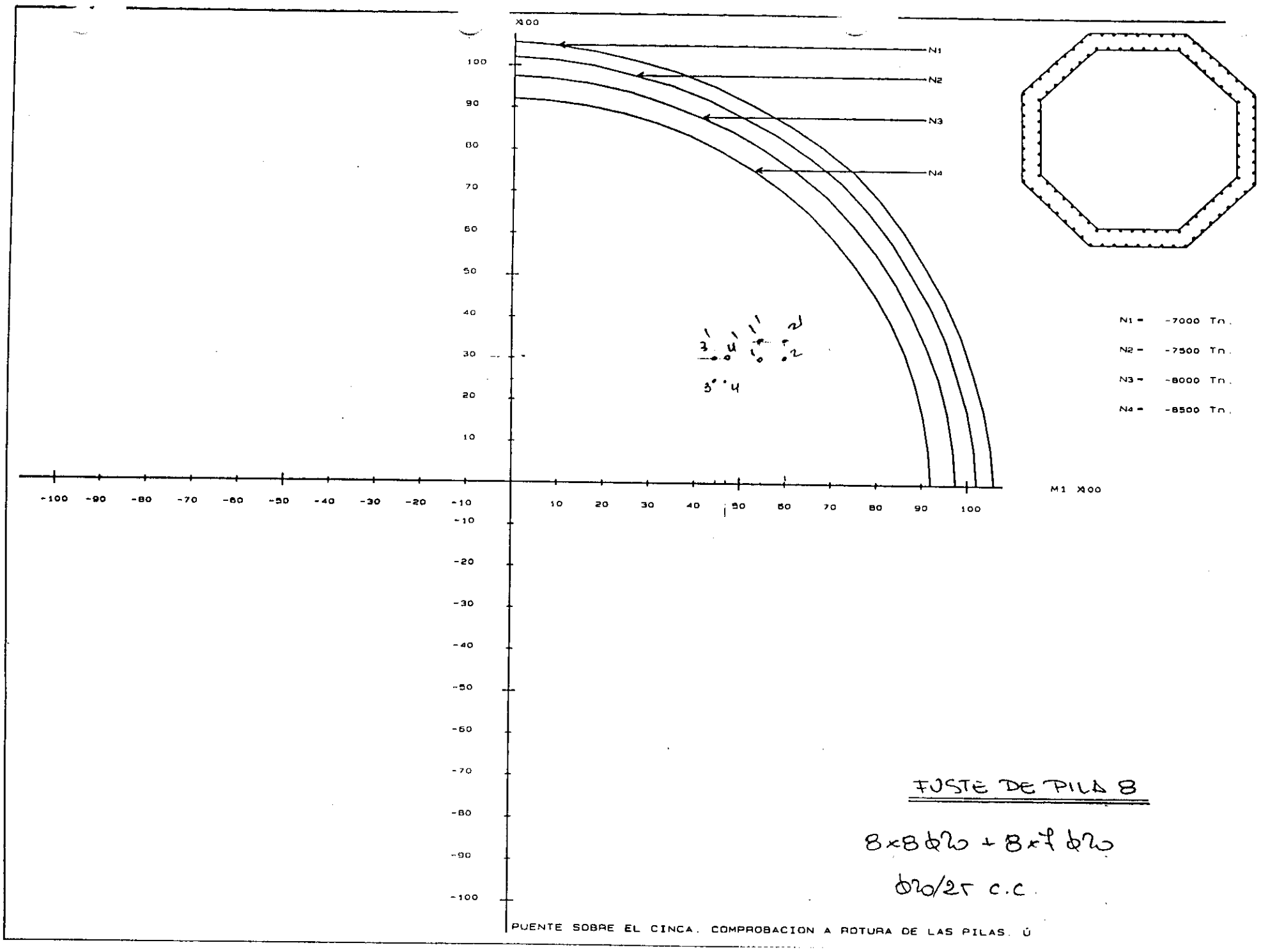
M1 X00

FUSTE DE PILA 7

8 x 8 ϕ20 + 8 x 7 ϕ20

ϕ20/25 cc

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

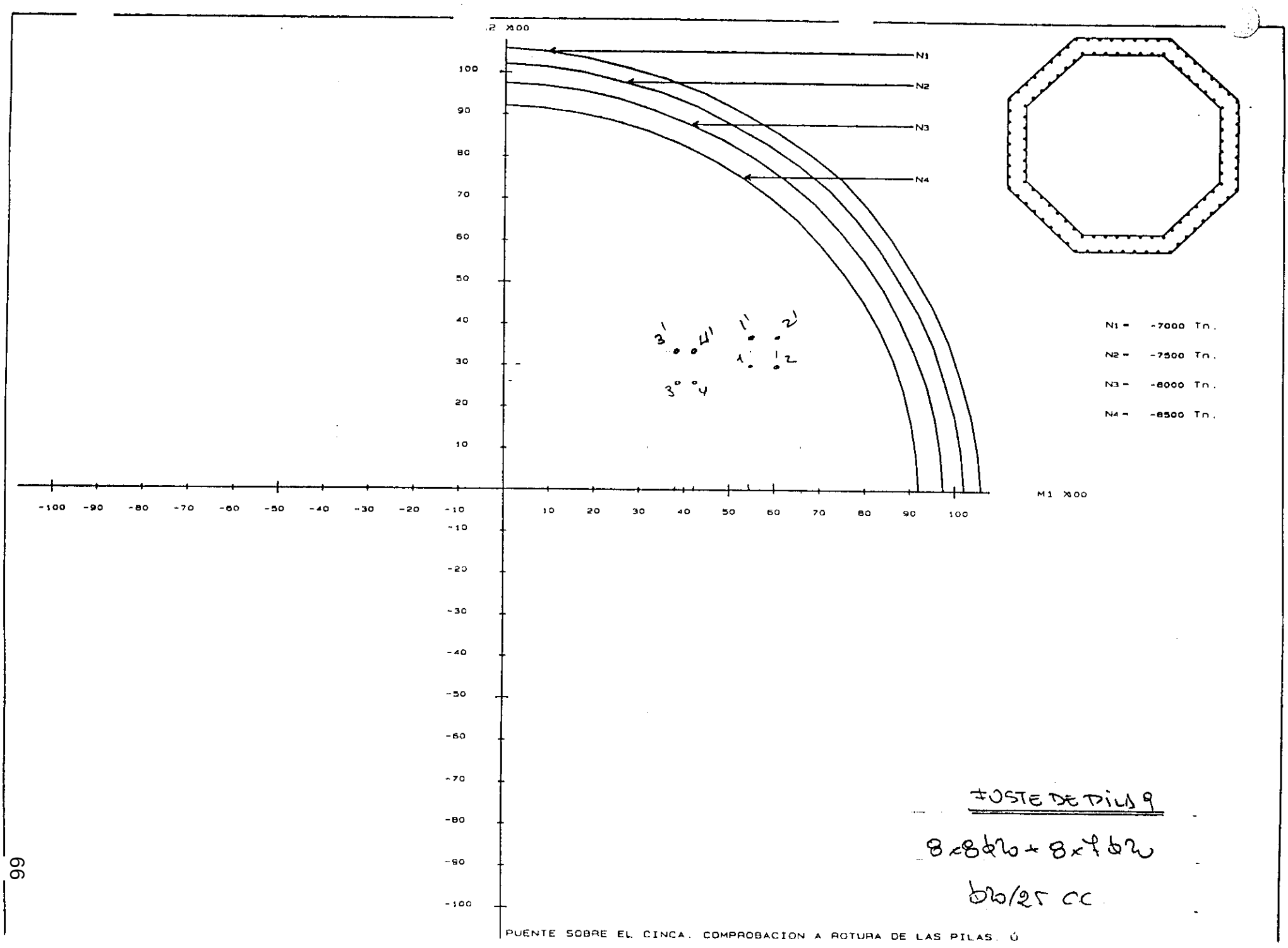


FUSTE DE PILA 8

8×8 ⌀20 + 8×1 ⌀20

⌀20/25 c.c.

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

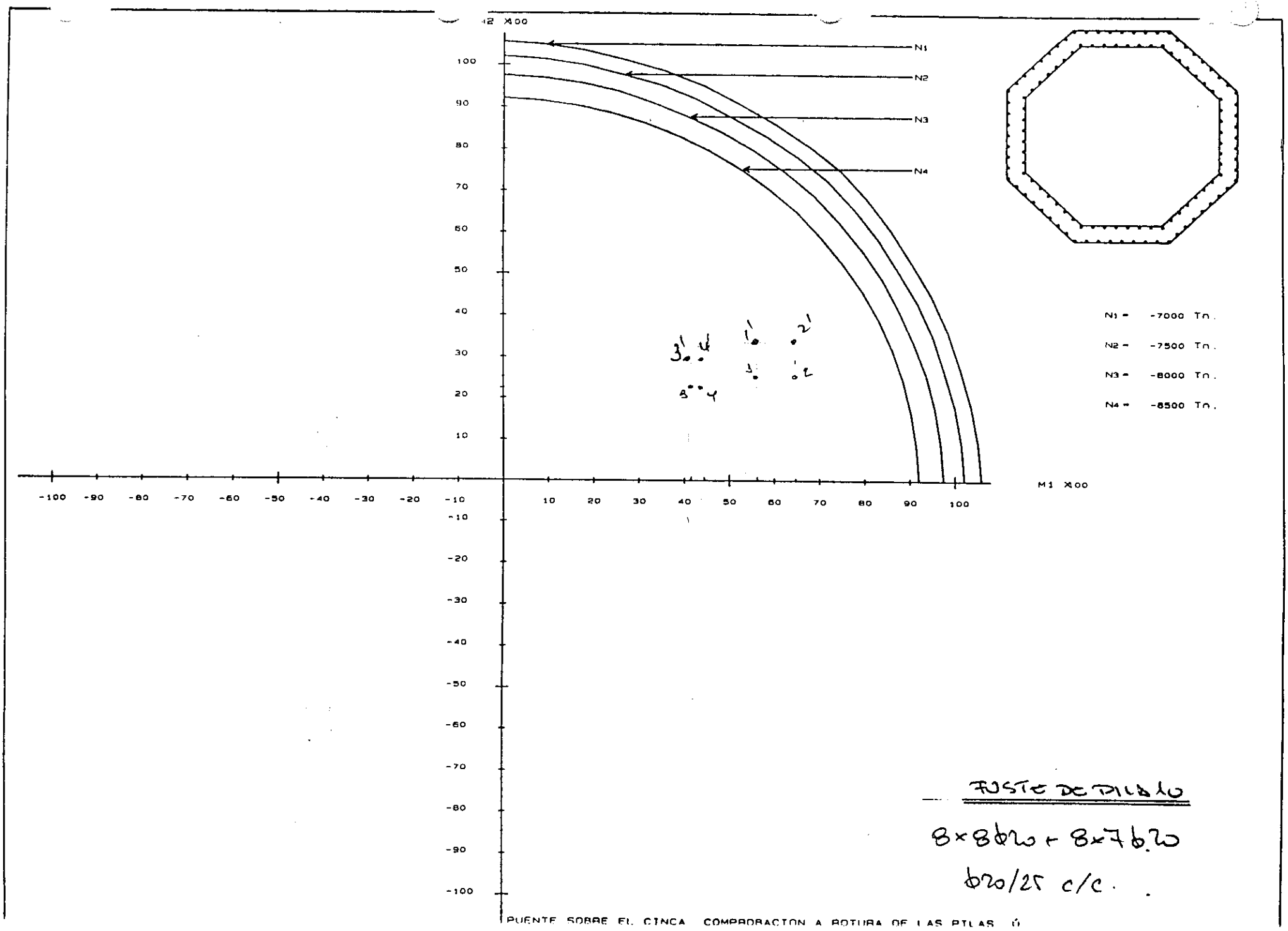


FUSTE DE PILA 9

8×8 ⌀20 + 8×1 ⌀20

⌀20/25 cc

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

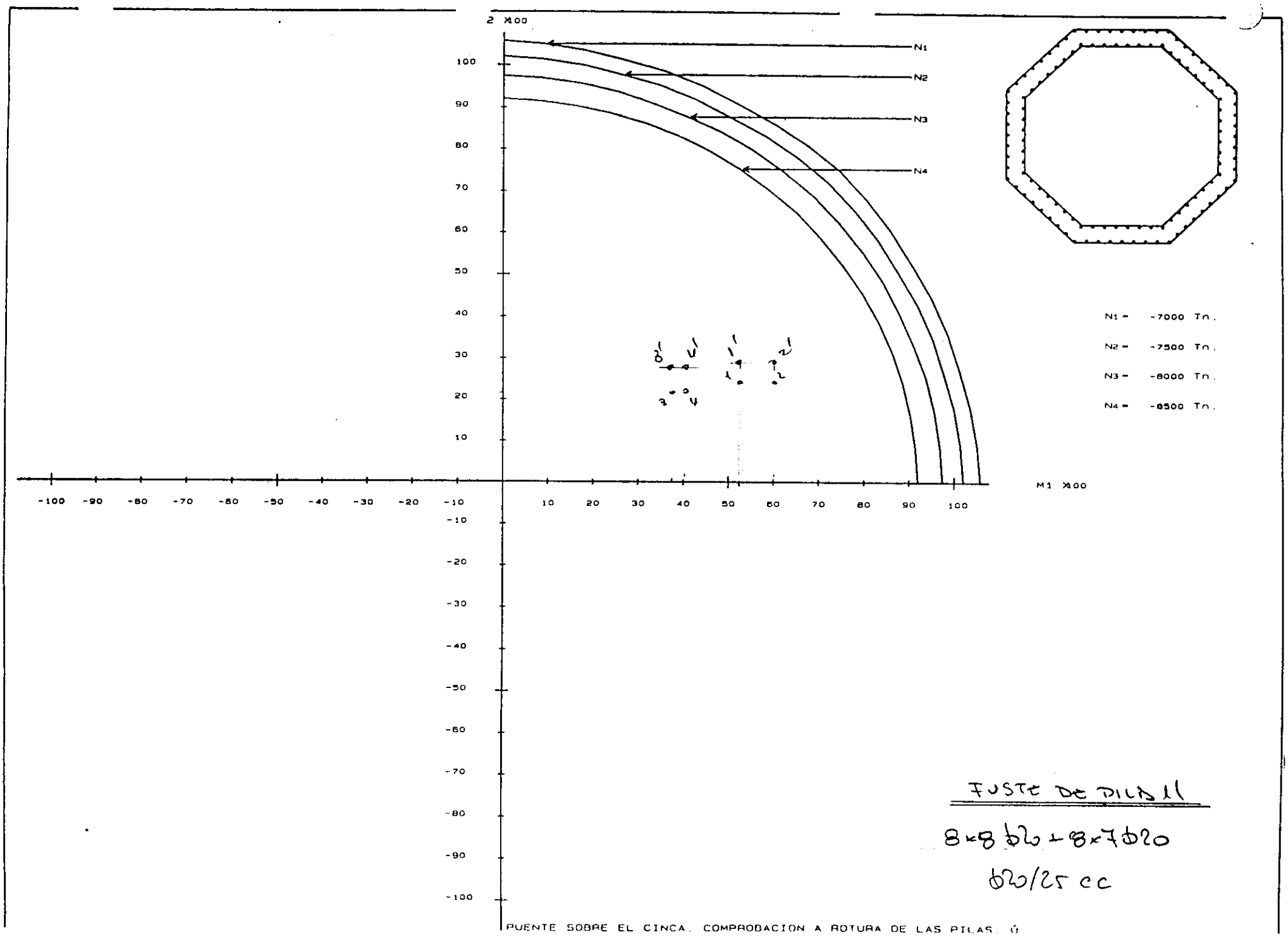


FUSTE DE PILA 10

8×8ϕ20 + 8×7ϕ20

ϕ20/25 c/c.

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ó

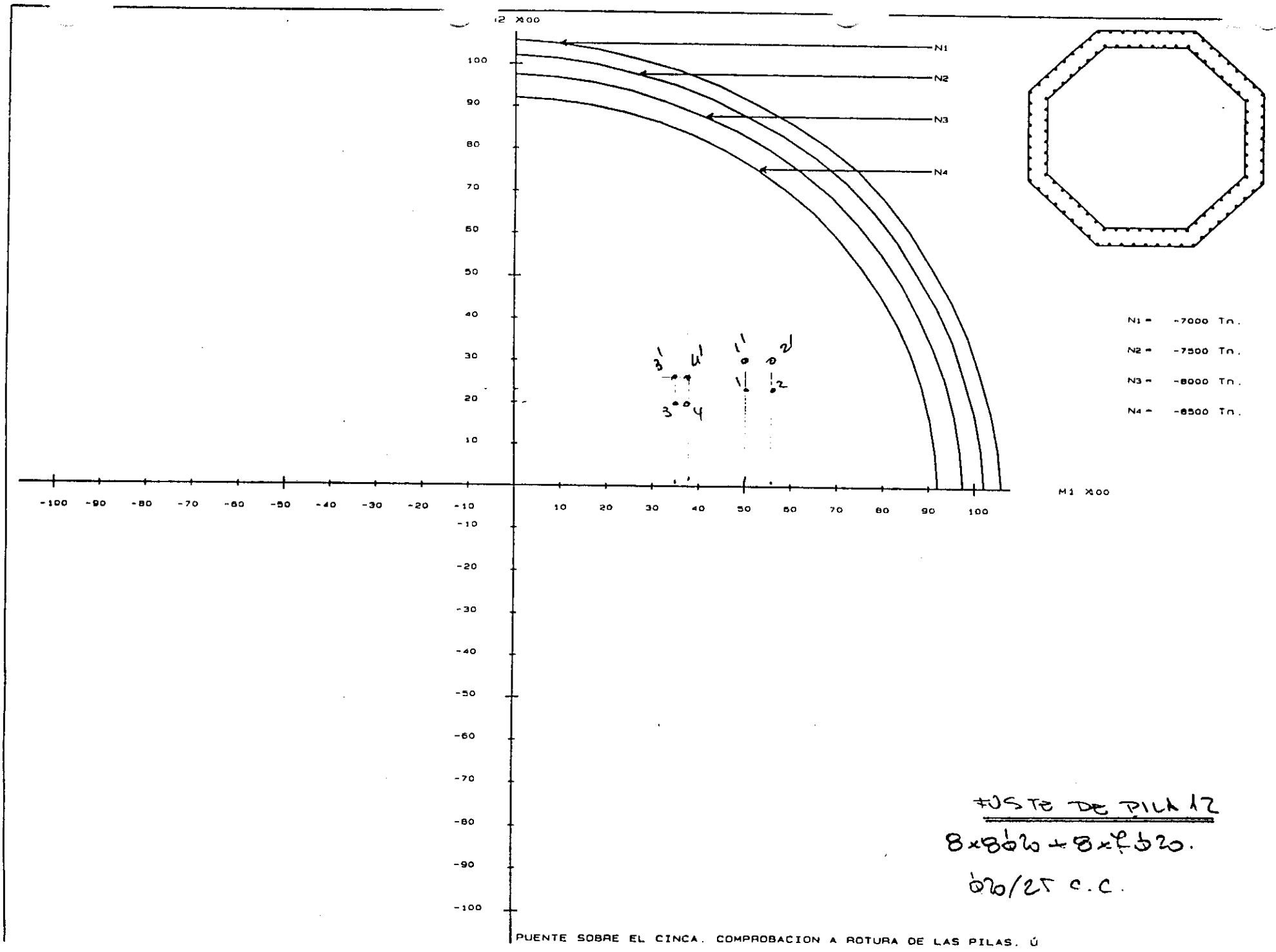


FUSTE DE PILA 11

8×8ϕ20 + 8×7ϕ20

ϕ20/25 cc

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ó

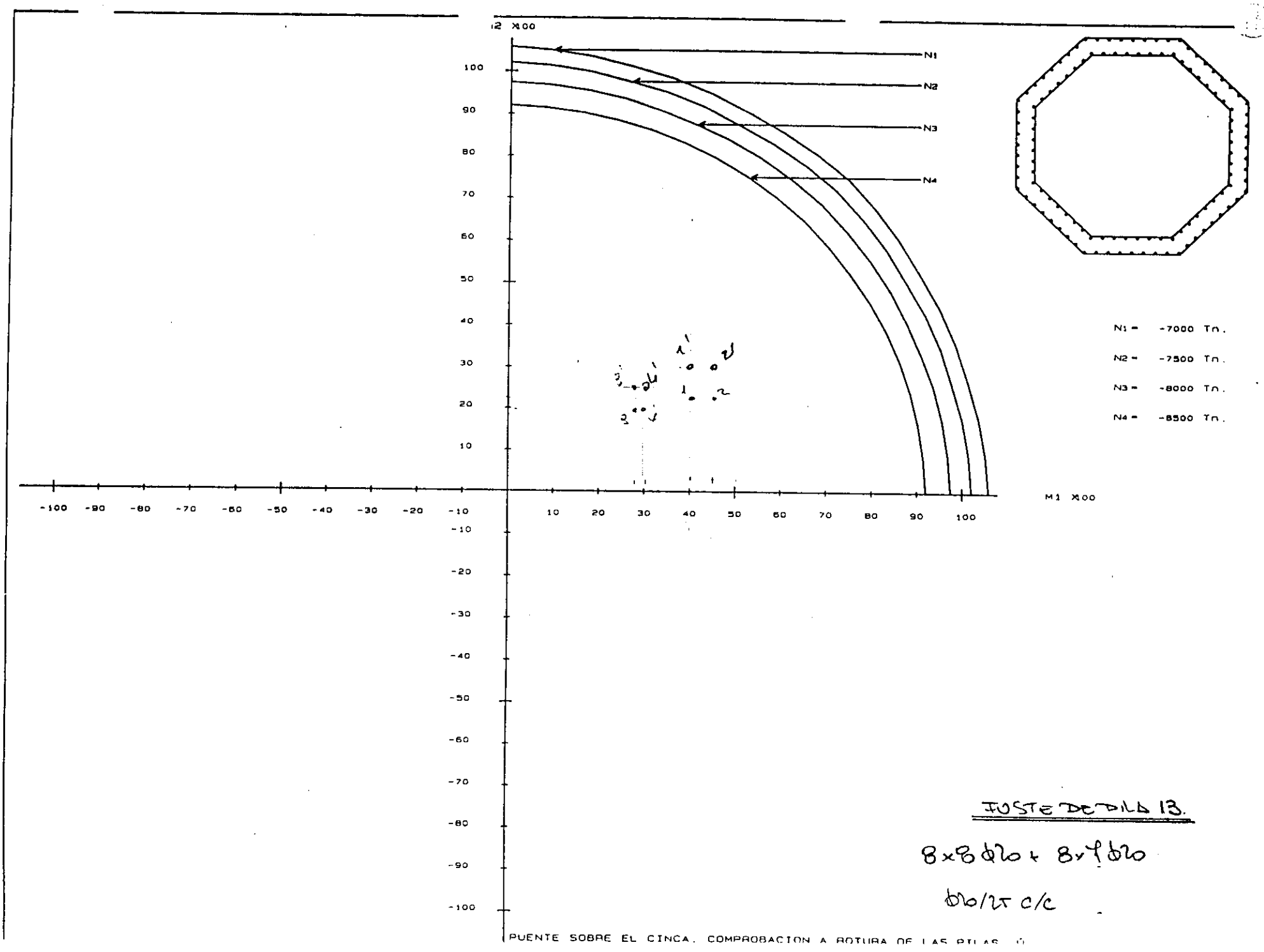


FUSTE DE PILA 12

8xØ20 + 8xØ20.

Ø20/25 c.c.

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú



FUSTE DE PILA 13.

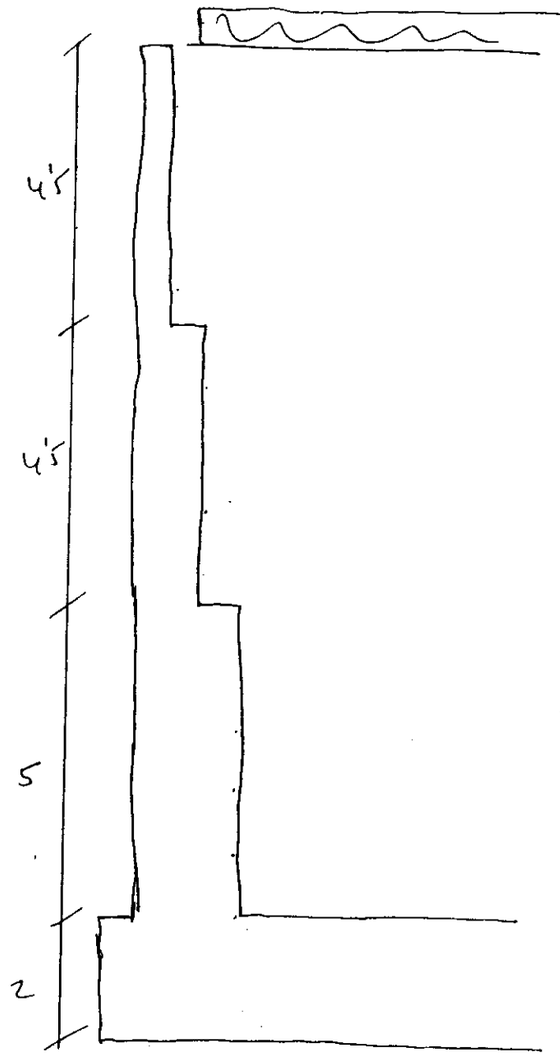
8xØ20 + 8xØ20

Ø20/25 c/c

PUENTE SOBRE EL CINCA. COMPROBACION A ROTURA DE LAS PILAS. Ú

7.3. MARCO ENCAUZAMIENTO ARROYO VALDRAGAS

MUROS DE ESTRIBO 1



Se toma una sobrecarga de funcamil de $SC = 3\ t/m^2$

Coficiente de empuje activo

$K = 0'33$

$\gamma = 1'8\ t/m^3$

Esfuerzos:

TRAMO I: $\Pi = \frac{1}{6} K\gamma H^3 + \frac{KpH^2}{2} = 19'23\ m\,t/m$.

TRAMO II: $\Pi = 113'4\ m\,t/m$.

TRAMO III: $\Pi = 372'4\ m\,t/m$

Momentos reducidos: $\mu_1 = 0'061$ $\omega_I = 0'065$ $A_{s1d} = 59\ t/m^2$.

$\mu_{II} = 0'082$ $\omega_{II} = 0'089$ $A_{s1d} = 129\ t/m^2$.

$\mu_{III} = 0'116$ $\omega_{III} = 0'130$ $A_{s1d} = 380\ t/m^2$.

$A_I = 13'43\ cm^2/m \rightarrow 7\phi 16/m$.

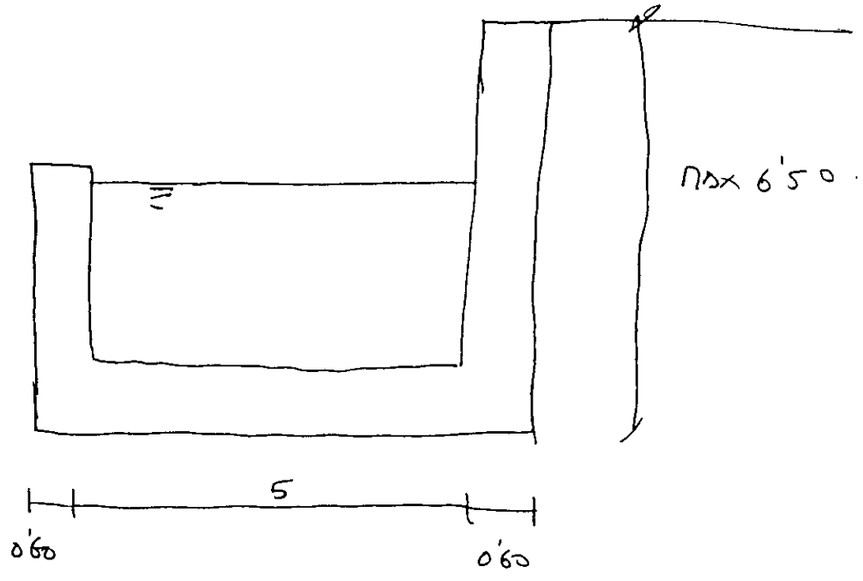
$A_{II} = 29'09\ cm^2/m \rightarrow 7\phi 25/m$.

$A_{III} = 85'7\ cm^2/m \rightarrow 7\phi 32 + 7\phi 25/m$.

En zapata con $h = 2\ m \rightarrow \omega = 0'102$ $A_{s1d} = 334\ t/m^2$

EN FLEXO compresión: $A_{s1d} = 292\ t/m^2 \rightarrow 8\phi 32/m$.

CALCULO DE CAJEROS DE CANAL HIDROGAS



- ENPUJE DE TIERRAS - SE ADOPTA UN COEFICIENTE DE EMPUJE DE $K=0'33$ y $\gamma=1'8\ t/m^3$

EN VACIO -

SE DIMENSIONA PARA EL CAJERO DERECHO.

$P = K\gamma H$

$M = \frac{1}{6} K\gamma H^3 = 20'54\ mt/m.$

$\mu = 0'065 \qquad \omega = 0'06943$

Flexión Simple $\qquad \Delta f_{cd} = 63'64\ t/m \qquad \delta = 14\ cm^2/m.$

Se disponen 5 ϕ20

EN CARGA

SE SUPONE QUE NO HAY ENPUJE DE TIERRAS EN TRASDÓS

$M = \frac{1}{6} H^3$

Lo toma UN RESGUARDO DE $H=1\ m.$

$M = 27'73\ mt/m. \qquad$ para $H_{MAX} = 5'50\ m.$

$\mu = 0'088 \qquad \omega = 0'09575$

$\Delta f_{cd} = 87'76\ t.$

$\Delta = 19'79\ cm^2/m. \qquad$ Se dispone 7ϕ20

SOLERA

Armadura Superior -

SUPONEMOS UNA SUBPRESIÓN DE 5'50 m. de AGUA

$P = 5'5\ t/m.$

$M = \frac{5'5 \times 6^2}{8} = 24'75\ mt/m.$

$\mu = 0'078$

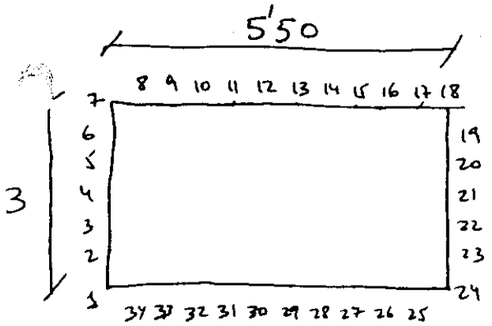
$\omega = 0'085$

$\Delta f_{cd} = 77'62\ t \quad$ — $\quad 17'5\ cm^2/m.$

Se DISPONEN 7ϕ20/m.

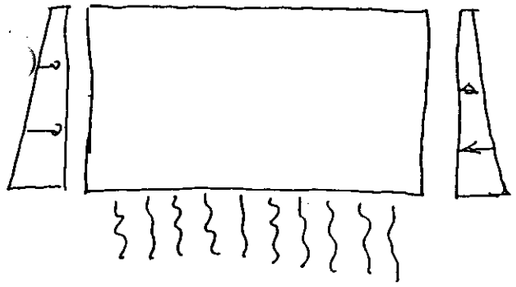
COMO ARMADURA INFERIOR SE DISPONEN 5 ϕ20/m.

MARCO CONTRL ESTRIBO 1



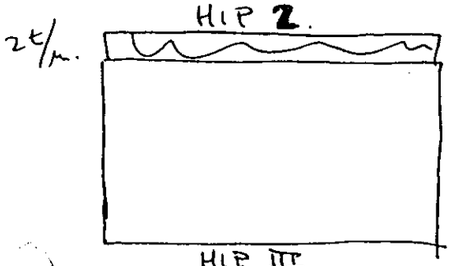
Se discretiza como una estructura de barras

Se supone que el terreno se sobre el apoya sobre un medio elástico con un coeficiente de balasto de $K = 2000\ t/m^3$



Cargas Consideradas:

- Sobrecarga de tierras de 1m sobre dintel
- Carro a dintel
- Empuje de tierras sobre HASTIAL



dintel. En hipótesis favorable no se considera.

HIPOTESIS I: PESO PROPIO

HIPOTESIS II: E. TIERRAS SOBRE HASTIAL

HIPOTESIS III: SC. DINTEL TIERRAS

HIPOTESIS IV: SC $0'4\ t/m^2$ SOBRE DINTEL

HIPOTESIS V: CARRO EN DINTEL

LOS RESULTADOS DE ESTAS HIPOTESIS SE DAN EN LOS CASOS QUE SE ADJUNTAN

- COMBINACION DE HIPOTESIS

Esfuerzos Máximos en arranques de dintel

P.ro Propio	$M^- = -2'341$	m.t.
EMPUJE TIERRAS	$M^- = -$	
C.P. TIERRAS	$M^- = -3'060$	m.t.
SC $0'4\ t/m^2$	$M^- = -0'680$	m.t.
Carro	$M^- = -5'631$	m.t.

$M^-_{TOTAL} = -11'711$ m.t.

$\mu^- = 0'0371$ $\omega^- = 0'0385$ $\Delta f_{yd}^- = 35\ t$

$A^- = 8\ cm^2$. Se dispone $5\ \phi 20$

Esfuerzos En centro de dintel

P.P	$M^+ = 3'33$	
E.T	$M^+ = -$	
C.P. TIERRAS	$M^+ = 3'74$	
SC $0'4\ t/m^2$	$M^+ = 0'833$	
CARRO	$M^+ = 6'40$	

$M^+_{TOTAL} = 14'3$ m.t.

$\mu^+ =$ $\omega^+ = 0'0454$ $\Delta f_{yd}^+ = 41\ t.$

Se dispone $7\ \phi 20/m$

Cortante

Arranques	I	$V =$	$4'125$ t.
	II	$V =$	—
	III	$V =$	$4'95$ t.
	IV	$V =$	$1'10$ t.
	V	$V =$	$7'341$ t.

$V_{TOTAL} = 17'52t$

Cortante absorbe el Hormigón: $V_{cu} = b_w \cdot f_{cd} \cdot d$

$V_{cu} = 0'55 \cdot f_{cd}$

$f_{cd} = 0'5\sqrt{f_{cd}} = 64'55$ t/m²

$V_{cu} = 0'55 \times 64'55 = 35'5$ t.

$V_d = 28'03$ t. $< V_{cu}$ No hace falta cercos. No obstante se dispone el mínimo 3 cercos Ø12/m.

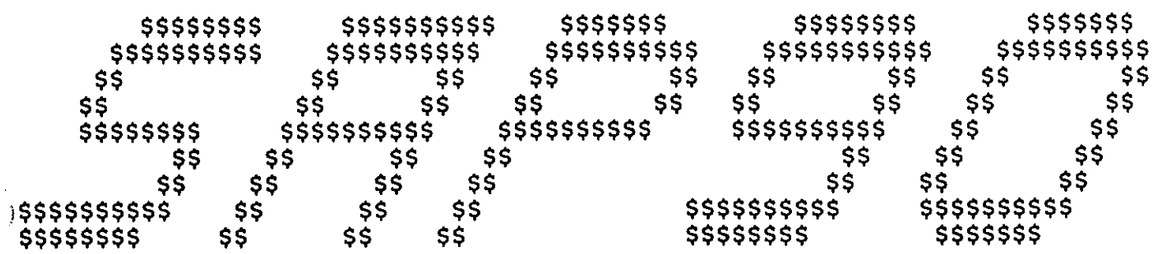
En Hastiales se dispone la misma armadura a flexión del dintel aunque se precisa mucha menos

SOLERA

$M^- = -3'301 - 0'521 - 1'93 - 0'429 - 2'624 = -8'805$ mt

$M^+ = 3'827 + 0 + 2'749 + 0'611 + 4'744 = 11'931$ mt.

se dispone la misma armadura de dintel y hastiales



STRUCTURAL ANALYSIS PROGRAMS

VERSION 5.40

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MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

S Y S T E M D A T A

EXECUTION CODE	0
MAXIMUM JOINT OR ELEMENT NUMBER	34
NUMBER OF LOAD CONDITIONS	5
STEADY STATE LOAD FREQUENCY	.0000E+00
NUMBER OF EIGENVALUES	0
EIGEN CONVERGENCE TOLERANCE	.1000E-03
EIGEN CUTOFF TIME PERIOD	.0000E+00

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

G E N E R A T E D J O I N T C O O R D I N A T E S

JOINT	X	Y	Z
1	.000	.000	.000
2	.000	.500	.000
3	.000	1.000	.000
4	.000	1.500	.000
5	.000	2.000	.000
6	.000	2.500	.000
7	.000	3.000	.000
8	.500	3.000	.000
9	1.000	3.000	.000
10	1.500	3.000	.000
11	2.000	3.000	.000
12	2.500	3.000	.000
13	3.000	3.000	.000
14	3.500	3.000	.000
15	4.000	3.000	.000
16	4.500	3.000	.000
17	5.000	3.000	.000
18	5.500	3.000	.000
19	5.500	2.500	.000
20	5.500	2.000	.000
21	5.500	1.500	.000
22	5.500	1.000	.000
23	5.500	.500	.000
24	5.500	.000	.000
25	5.000	.000	.000
26	4.500	.000	.000
27	4.000	.000	.000
28	3.500	.000	.000
29	3.000	.000	.000
30	2.500	.000	.000
31	2.000	.000	.000
32	1.500	.000	.000
33	1.000	.000	.000
34	.500	.000	.000

S A P 9 0 FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE 3
PROGRAM:SAP90/FILE:MARES1.SAP

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E S T R A I N T D A T A

JOINT	RX	RY	RZ	RXX	RYY	RZZ
29	1	0	1	1	1	1
30	1	0	1	1	1	1

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

S P R I N G D A T A

JT	KX	KY	KZ	KRX	KRY	KRZ
1	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
24	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
25	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
26	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
27	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
28	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
31	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
32	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
33	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00
34	.000E+00	.100E+04	.000E+00	.000E+00	.000E+00	.000E+00

S A P 9 0 ... PROGRAM:SAP90/FILE:MARES1.SAP

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E C O N T R O L D A T A

NUMBER OF MEMBER SECTION PROPERTIES 1
NUMBER OF SPAN LOADING PATTERNS 16

LOAD COND	GRAVITATIONAL MULTIPLIERS X	Y	Z	TEMPERATURE MULTIPLIERS	PRESTRESS MULTIPLIERS
1	.000	-1.000	.000	.000	.000
2	.000	.000	.000	.000	.000
3	.000	.000	.000	.000	.000
4	.000	.000	.000	.000	.000
5	.000	.000	.000	.000	.000

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

S E C T I O N P R O P E R T Y D A T A

PROP ID	AREA	TORSIONAL INERTIA	MOMENTS OF INERTIA I33	MOMENTS OF INERTIA I22	SHEAR AREAS A2	SHEAR AREAS A3
1	.500E+00	.28610E-01	.10417E-01	.41667E-01	.417E+00	.417E+00

C S I / S A P 9 0 - - FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE
PROGRAM:SAP90/FILE:MARES1.SAP

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

M A T E R I A L P R O P E R T Y D A T A

PROP ID	MODULUS OF ELASTICITY	SHEAR MODULUS	WEIGHT PER UNIT LEN	MASS PER UNIT LEN	THERMAL EXPANSION
1	.3000E+07	.1154E+07	.1500E+01	.0000E+00	.0000E+00

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

S P A N L O A D I N G D A T A

F FORM LOAD DATA

PATTERN ID	1-DIR	2-DIR	3-DIR	X-DIR	Y-DIR	Z-DIR
1	.0000	.0000	.0000	.6330	.0000	.0000
2	.0000	.0000	.0000	.9330	.0000	.0000
3	.0000	.0000	.0000	1.2300	.0000	.0000
4	.0000	.0000	.0000	1.5360	.0000	.0000
5	.0000	.0000	.0000	1.8330	.0000	.0000
6	.0000	.0000	.0000	2.1300	.0000	.0000
7	.0000	.0000	.0000	2.4300	.0000	.0000
8	.0000	.0000	.0000	-.6330	.0000	.0000
9	.0000	.0000	.0000	-.9330	.0000	.0000
10	.0000	.0000	.0000	-1.2300	.0000	.0000
11	.0000	.0000	.0000	-1.5360	.0000	.0000
12	.0000	.0000	.0000	-1.8330	.0000	.0000
13	.0000	.0000	.0000	-2.1300	.0000	.0000
14	.0000	.0000	.0000	-2.4300	.0000	.0000
15	.0000	.0000	.0000	.0000	-1.8000	.0000
16	.0000	.0000	.0000	.0000	-.4000	.0000

PROGRAM:SAP90/FILE:MARES1.SAP

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T D A T A

ELT ID	JOINT END-I	JOINT END-J	LOCAL-AXIS N1	LOCAL-AXIS N2	PROPERTY-ID END-I	PROPERTY-ID END-J	VAR	REL CODES	REF TEMP	ELEMENT LENGTH
1	1	2	1	0	1	1	0	000000	.00	.50
2	2	3	1	0	1	1	0	000000	.00	.50
3	3	4	1	0	1	1	0	000000	.00	.50
4	4	5	1	0	1	1	0	000000	.00	.50
5	5	6	1	0	1	1	0	000000	.00	.50
6	6	7	1	0	1	1	0	000000	.00	.50
7	7	8	1	0	1	1	0	000000	.00	.50
8	8	9	1	0	1	1	0	000000	.00	.50
9	9	10	1	0	1	1	0	000000	.00	.50
10	10	11	1	0	1	1	0	000000	.00	.50
11	11	12	1	0	1	1	0	000000	.00	.50
12	12	13	1	0	1	1	0	000000	.00	.50
13	13	14	1	0	1	1	0	000000	.00	.50
14	14	15	1	0	1	1	0	000000	.00	.50
15	15	16	1	0	1	1	0	000000	.00	.50
16	16	17	1	0	1	1	0	000000	.00	.50
17	17	18	1	0	1	1	0	000000	.00	.50
18	18	19	1	0	1	1	0	000000	.00	.50
19	19	20	1	0	1	1	0	000000	.00	.50
20	20	21	1	0	1	1	0	000000	.00	.50
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27	27	28	1	0	1	1	0	000000	.00	.50
28	28	29	1	0	1	1	0	000000	.00	.50
29	29	30	1	0	1	1	0	000000	.00	.50
30	30	31	1	0	1	1	0	000000	.00	.50
31	31	32	1	0	1	1	0	000000	.00	.50
32	32	33	1	0	1	1	0	000000	.00	.50
33	33	34	1	0	1	1	0	000000	.00	.50
34	34	1	1	0	1	1	0	000000	.00	.50

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

B E A M S P A N L O A D I N G P A T T E R N S

ELT ID	LOAD 1	LOAD 2	LOAD 3	LOAD 4	LOAD 5
1	0	7	0	0	0
2	0	6	0	0	0
3	0	5	0	0	0
4	0	4	0	0	0
5	0	3	0	0	0
6	0	2	0	0	0
7	0	0	15	16	0
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11	0	0	15	16	0
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16	0	0	15	16	0
17	0	0	15	16	0
18	0	9	0	0	0
19	0	10	0	0	0
20	0	11	0	0	0
21	0	12	0	0	0
22	0	13	0	0	0
23	0	14	0	0	0

PROGRAM:SAP90/FILE:MARES1.SAP

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

T O T A L W E I G H T S A N D M A S S E S

PROP	WEIGHT	MASS
1	25.5000	.0000
TOTAL	25.5000	.0000

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

J O I N T L O A D S

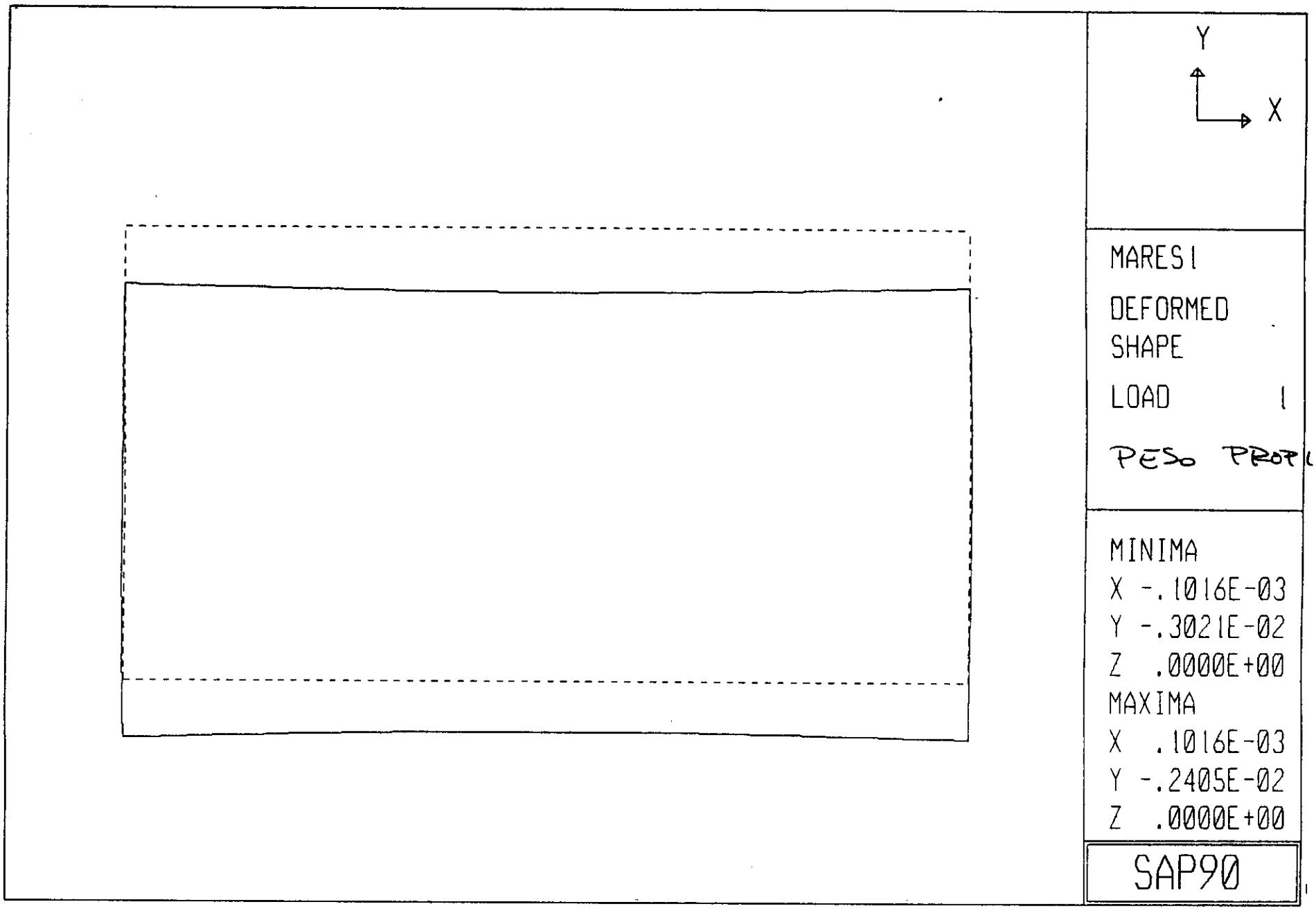
INT	LOAD	FX	FY	FZ	MX	MY	MZ
10	5	.000E+00	-.666E+01	.000E+00	.000E+00	.000E+00	.000E+00
14	5	.000E+00	-.666E+01	.000E+00	.000E+00	.000E+00	.000E+00

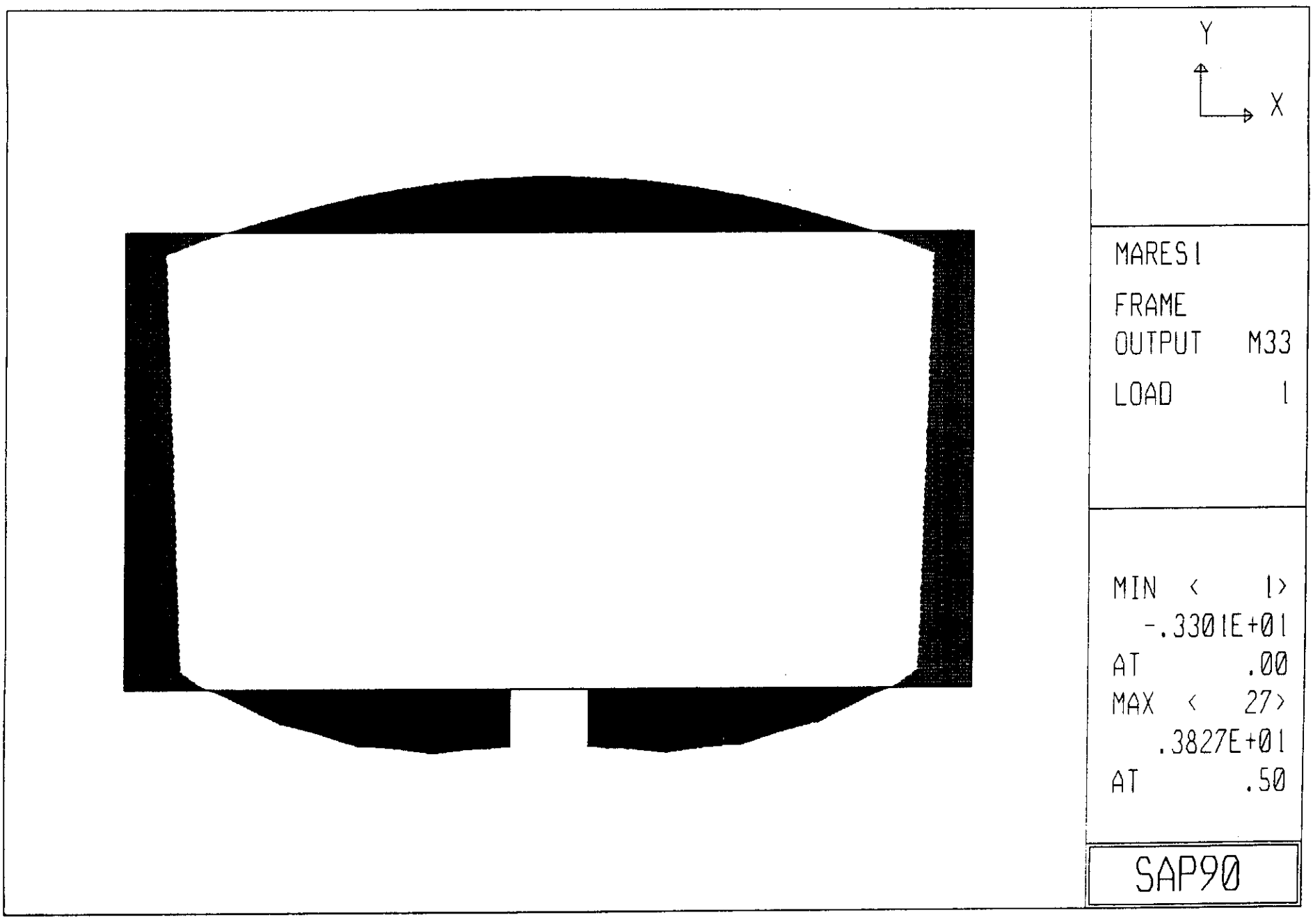
C S I / S A P 9 0 FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE 11
PROGRAM:SAP90/FILE:MARES1.SAP

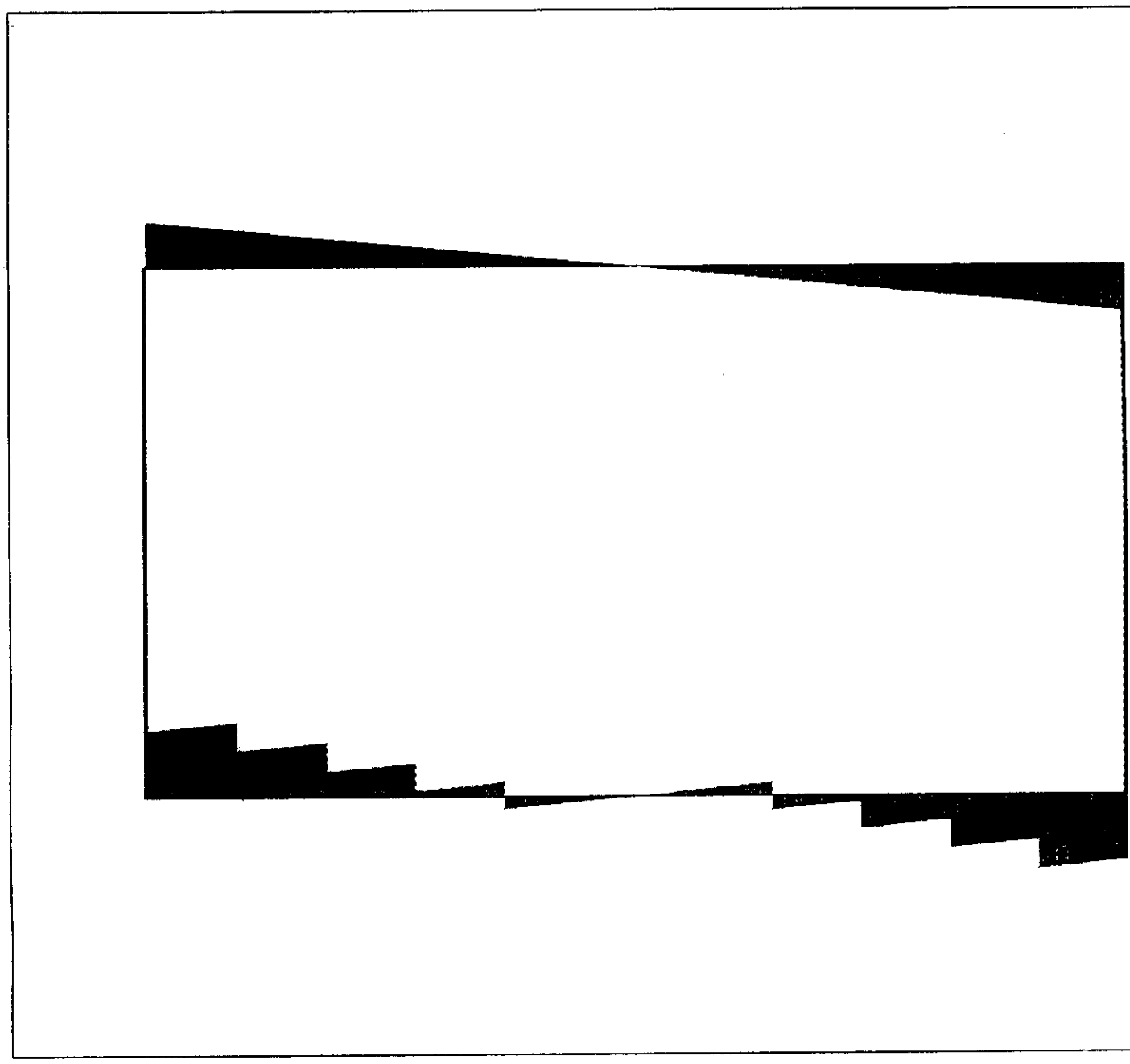
MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

O U T P U T F I L E S C R E A T E D B Y P R O G R A M

INPUT DATA ECHO	MARES1.SAP
SOLUTION ERRORS AND WARNINGS	MARES1.ERR
EQUATION NUMBERING	MARES1.EQN
DISPLACEMENTS AND REACTIONS	MARES1.SOL
FRAME ELEMENT FORCES	MARES1.F3F


Y
X
MARES1
DEFORMED
SHAPE
LOAD 1
PESO PROPIO
MINIMA
X -.1016E-03
Y -.3021E-02
Z .0000E+00
MAXIMA
X .1016E-03
Y -.2405E-02
Z .0000E+00
SAP90


Y
X
MARES1
FRAME
OUTPUT M33
LOAD 1
MIN < 1>
-.3301E+01
AT .00
MAX < 27>
.3827E+01
AT .50
SAP90

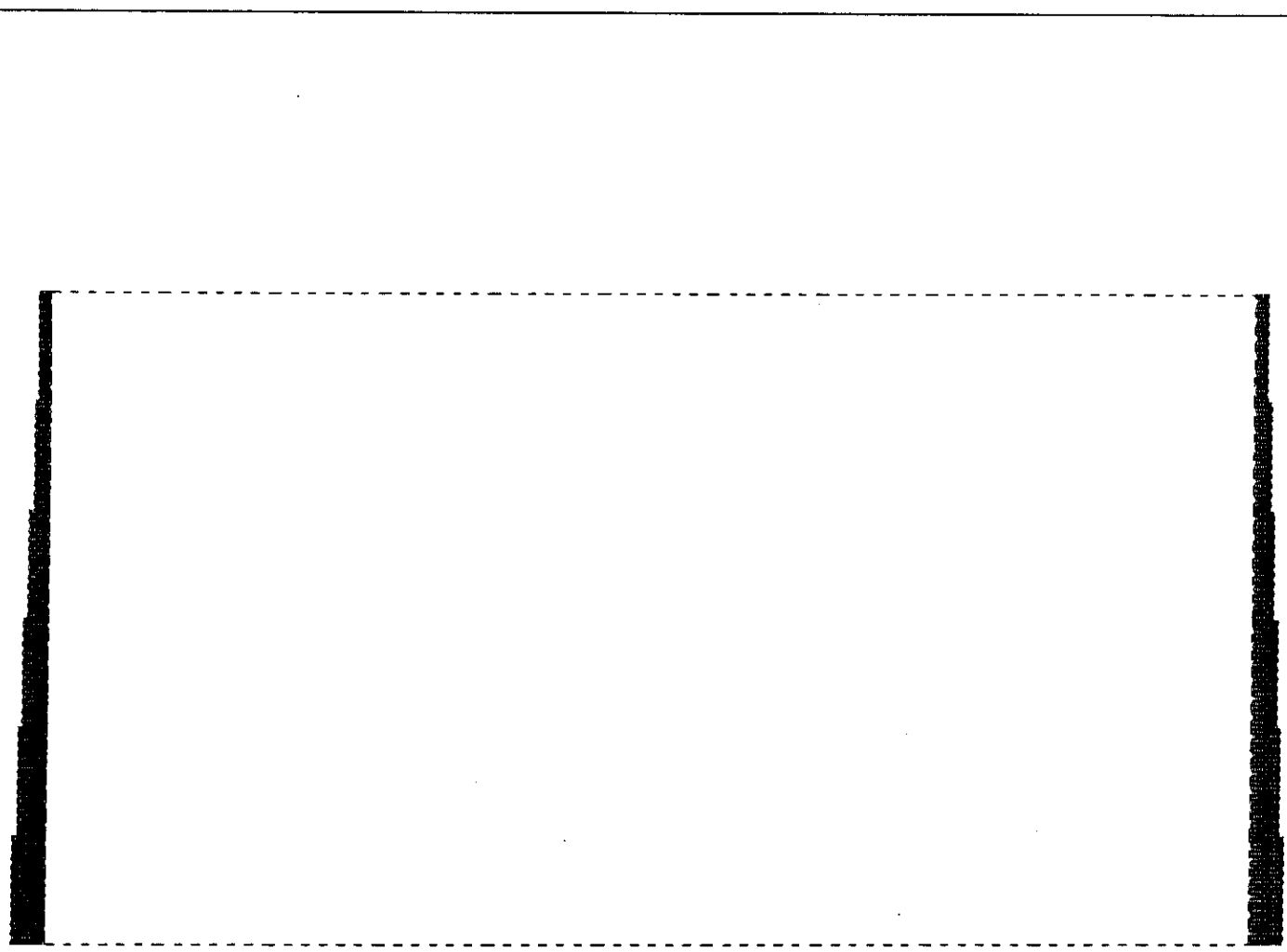


Y
X

MARES1
FRAME
OUTPUT V22
LOAD 1

MIN < 34>
-.6664E+01
AT .00
MAX < 24>
.6664E+01
AT .50

SAP90

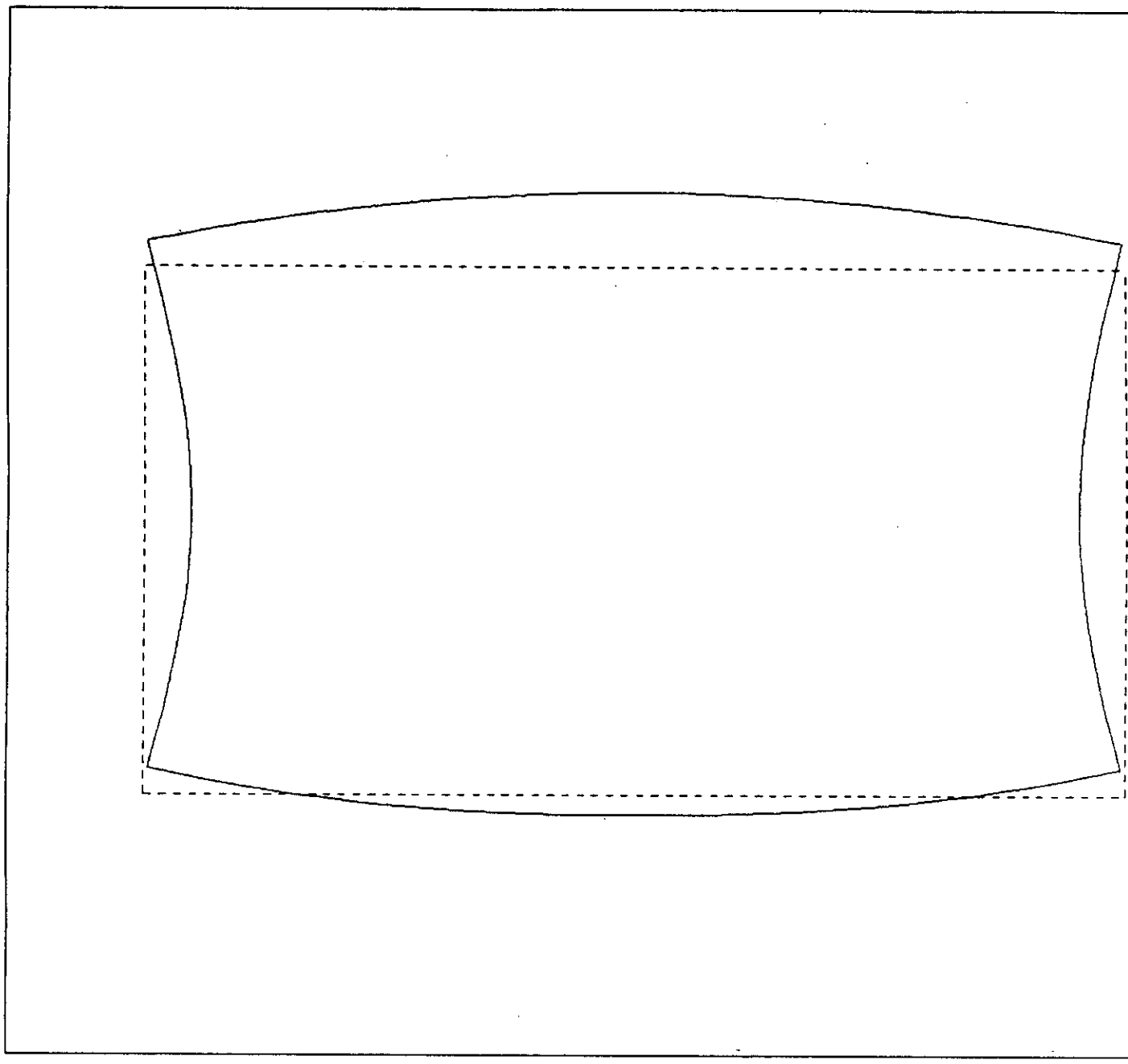


Y
X

MARES1
FRAME
LOADS
LOAD 2

MINIMA
w -.2430E+01
P .0000E+00
MAXIMA
w .2430E+01
P .0000E+00

SAP90

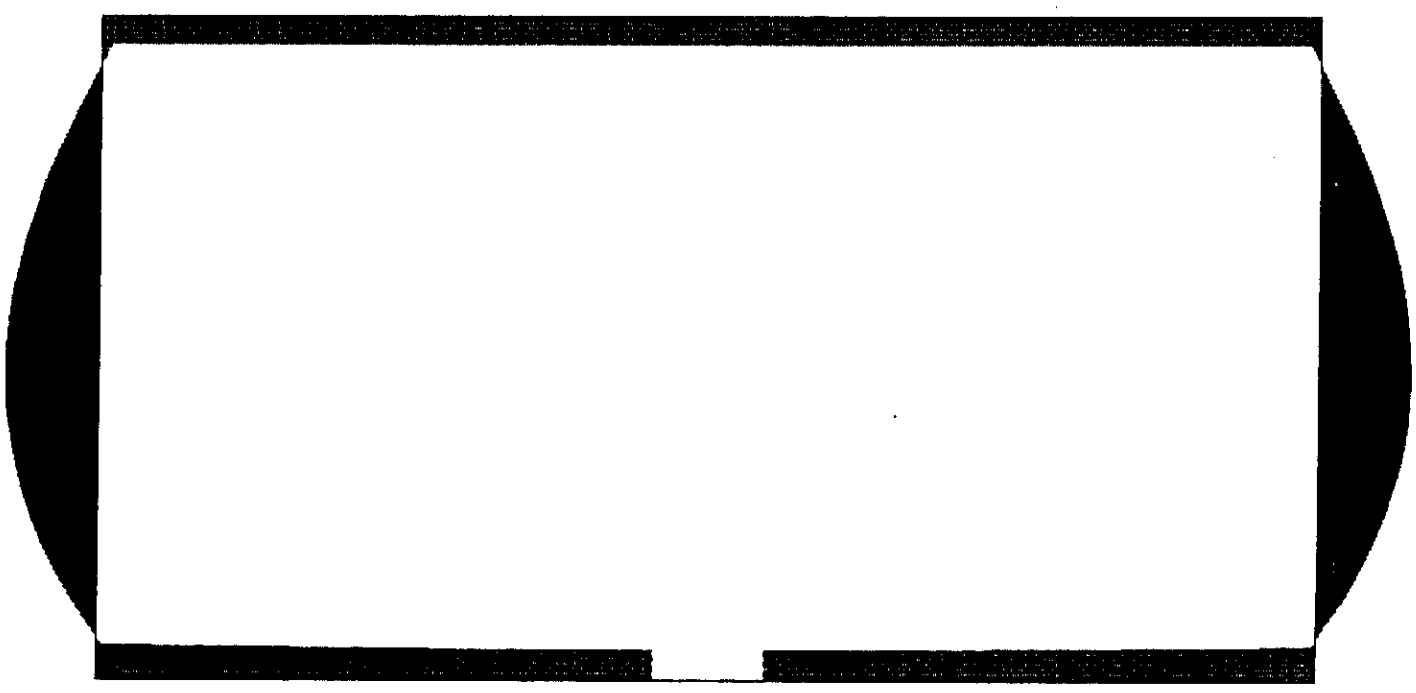


Y
X

MARES I
DEFORMED
SHAPE
LOAD 2

MINIMA
X -.4814E-04
Y -.2068E-04
Z .0000E+00
MAXIMA
X .4814E-04
Y .7722E-04
Z .0000E+00

SAP90

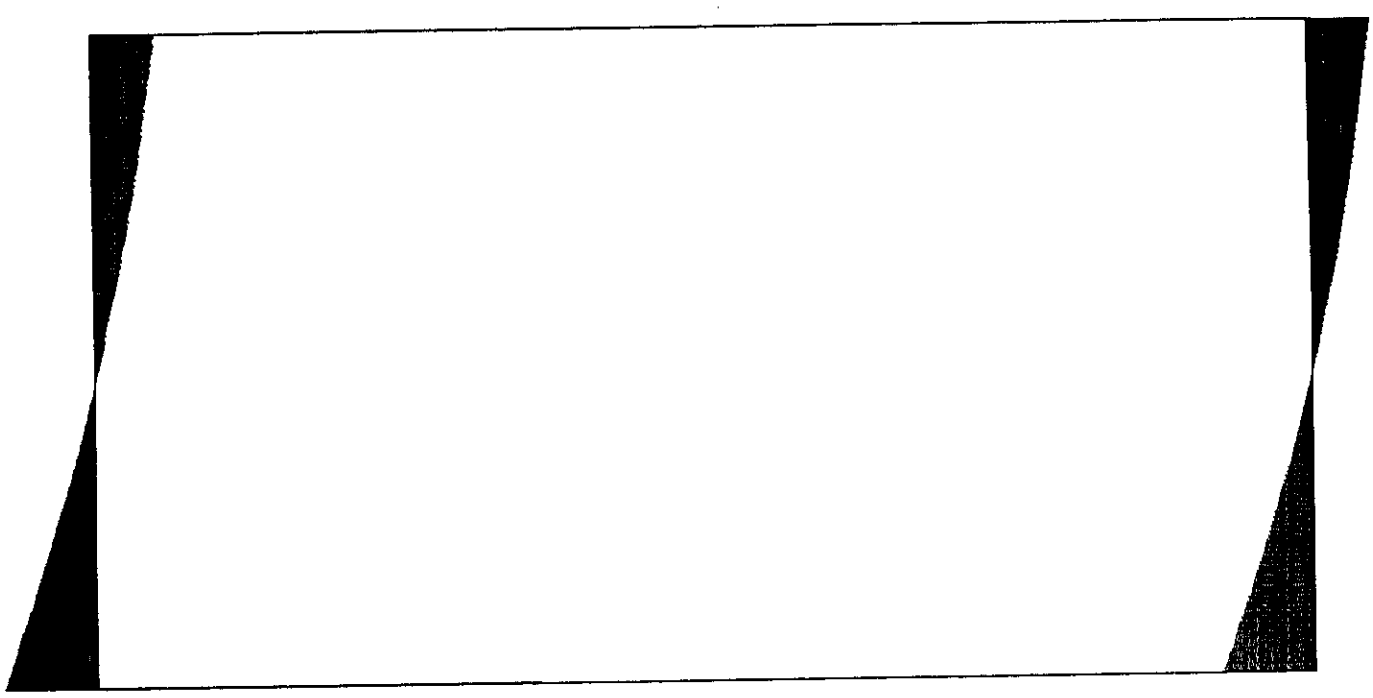


Y
X

MARES I
FRAME
OUTPUT M33
LOAD 2

MIN < 1>
-.5209E+00
AT .00
MAX < 3>
.1433E+01
AT .38

SAP90

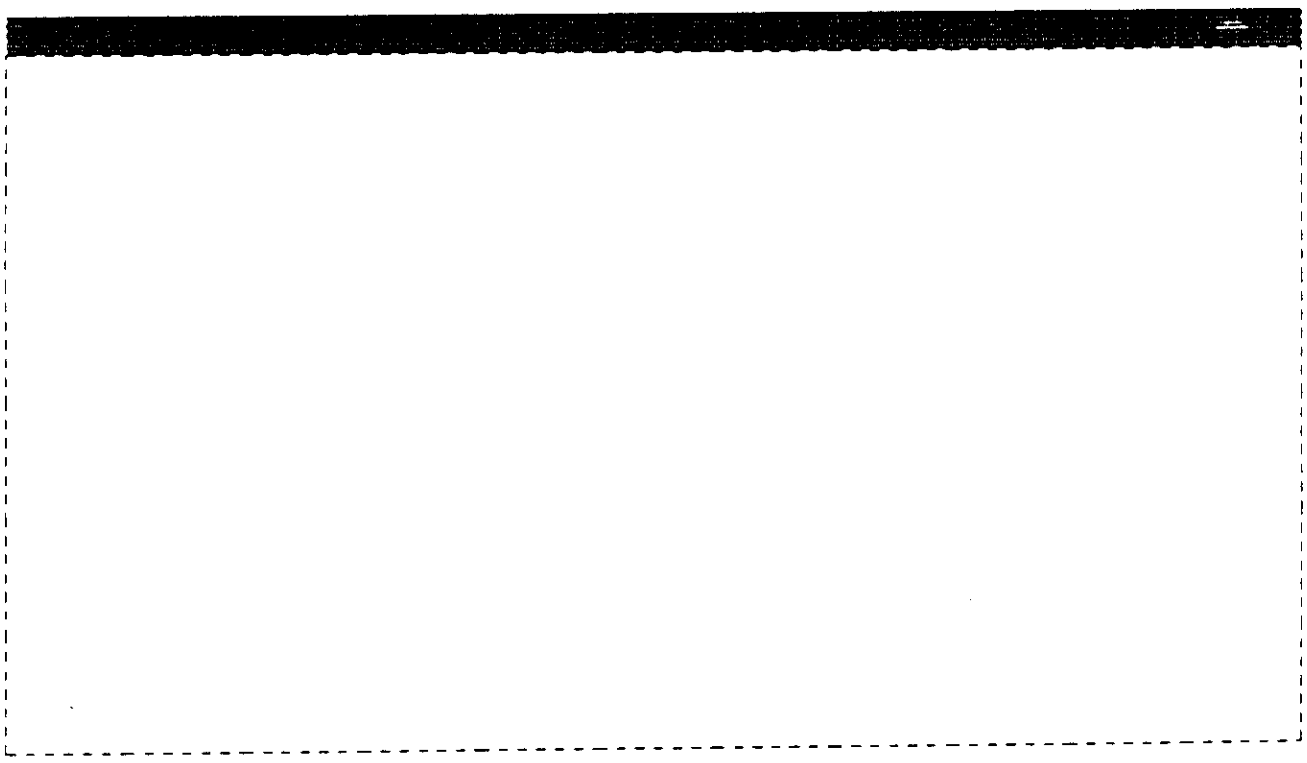


Y
X

MARES1
FRAME
OUTPUT V22
LOAD 2

MIN < 23>
-.2993E+01
AT .50
MAX < 1>
.2993E+01
AT .00

SAP90

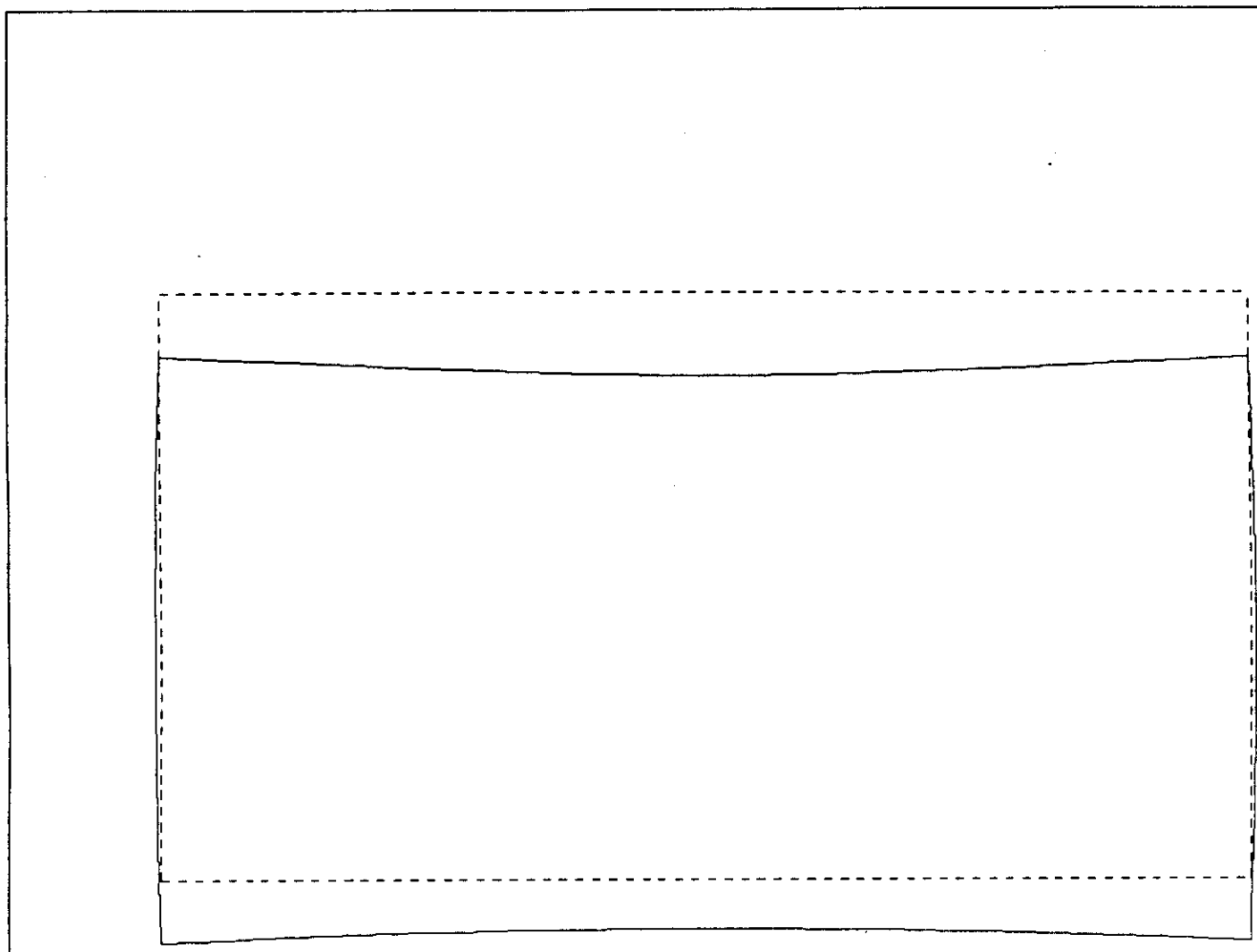


Y
X

MARES1
FRAME
LOADS
LOAD 3

MINIMA
w -.1800E+01
P .0000E+00
MAXIMA
w -.1800E+01
P .0000E+00

SAP90

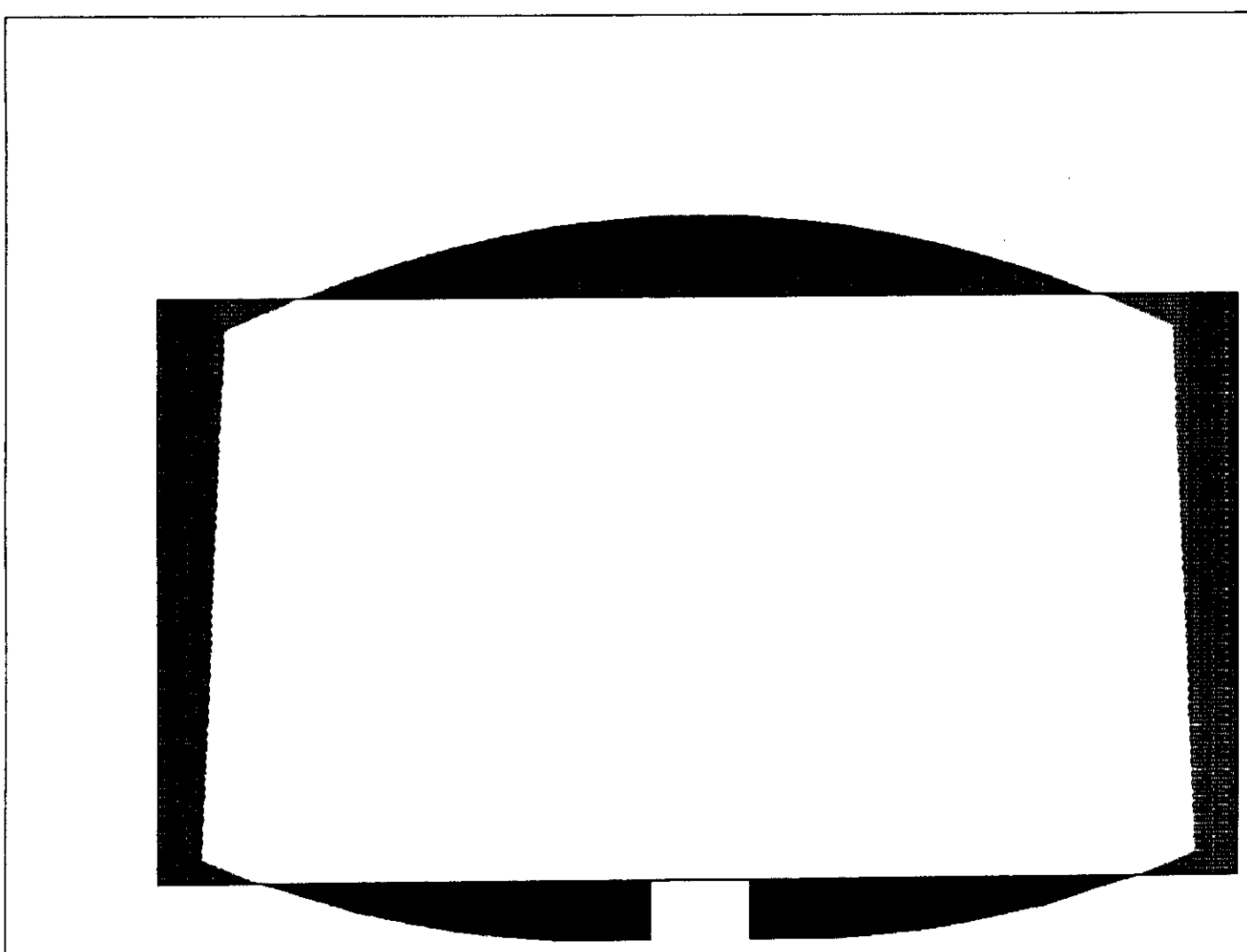


Y
X

MARES1
DEFORMED
SHAPE
LOAD 3

MINIMA
X -.8979E-04
Y -.1443E-02
Z .0000E+00
MAXIMA
X .8979E-04
Y -.8829E-03
Z .0000E+00

SAP90

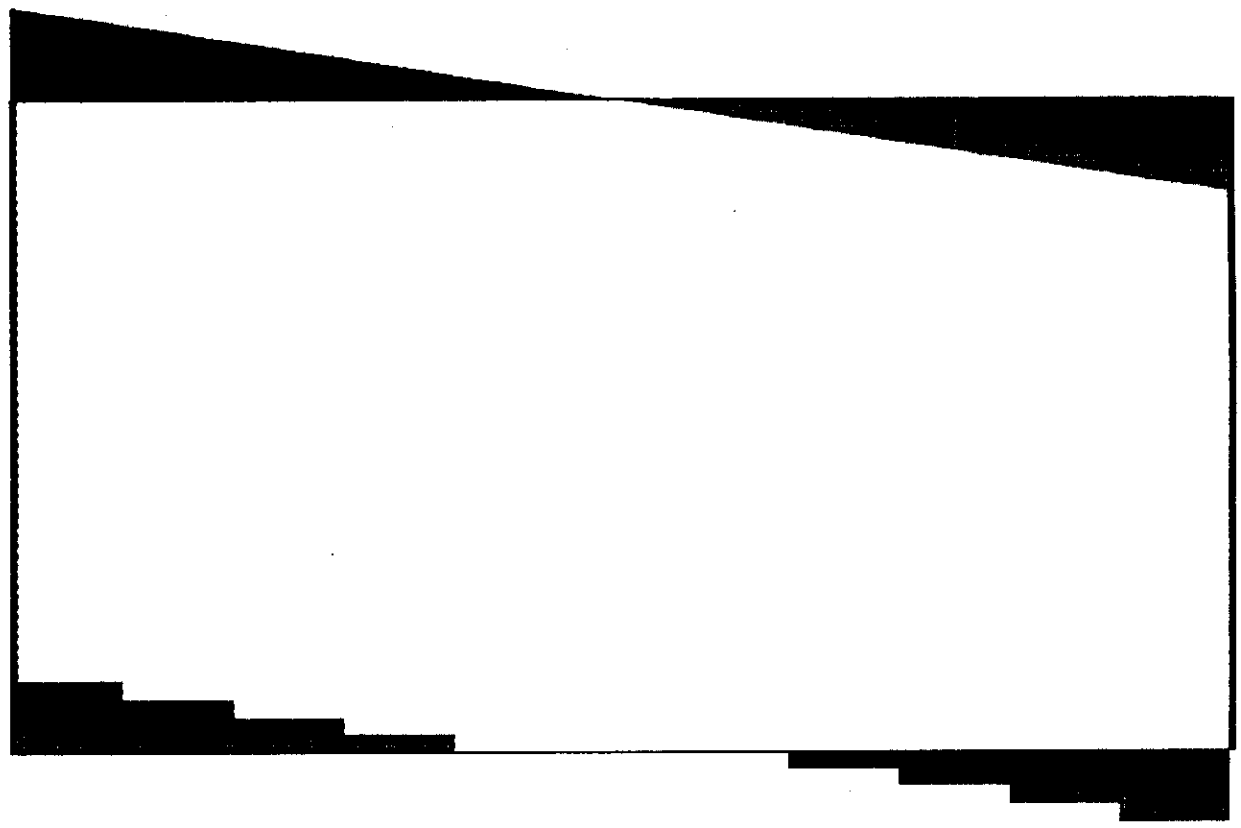


Y
X

MARES1
FRAME
OUTPUT M33
LOAD 3

MIN < 6>
-.3060E+01
AT .50
MAX < 12>
.3746E+01
AT .25

SAP90

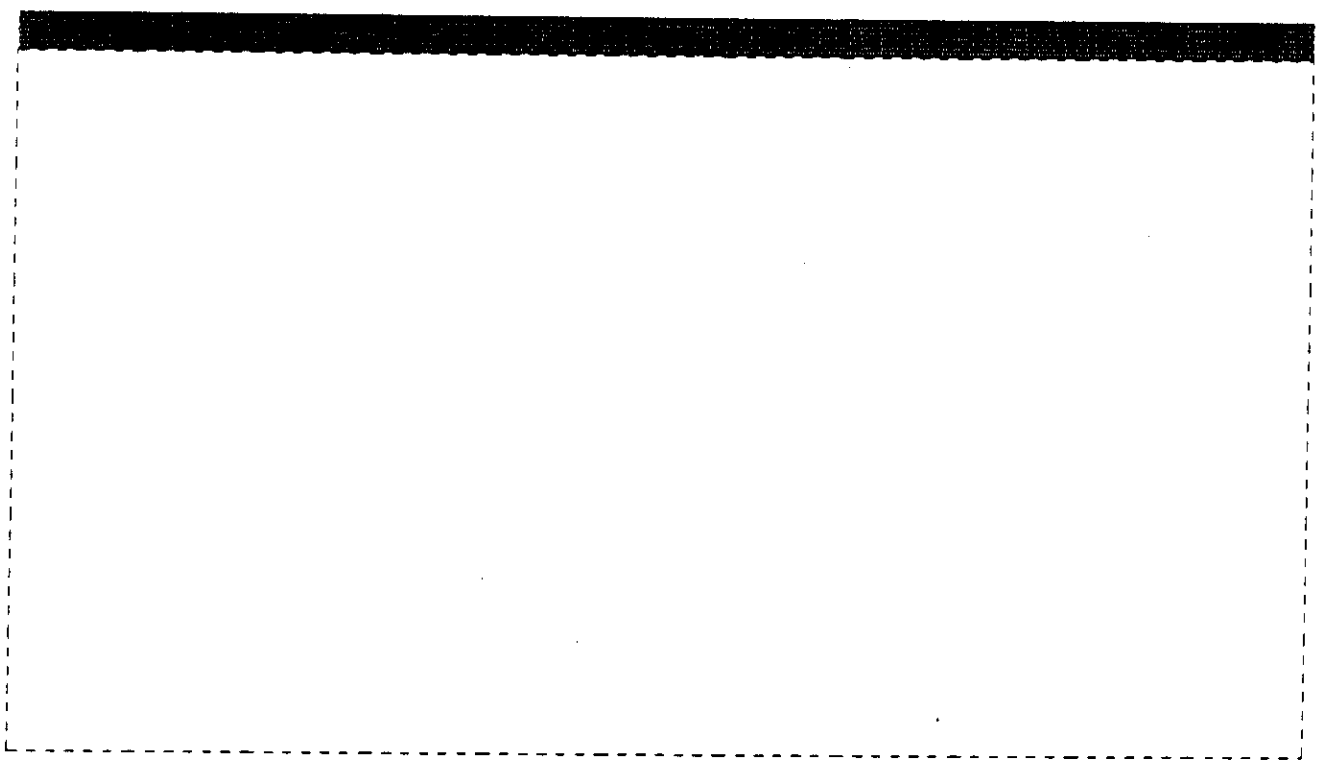


Y
X

MARES1
FRAME
OUTPUT V22
LOAD 3

MIN < 17>
-.4950E+01
AT .50
MAX < 7>
.4950E+01
AT .00

SAP90

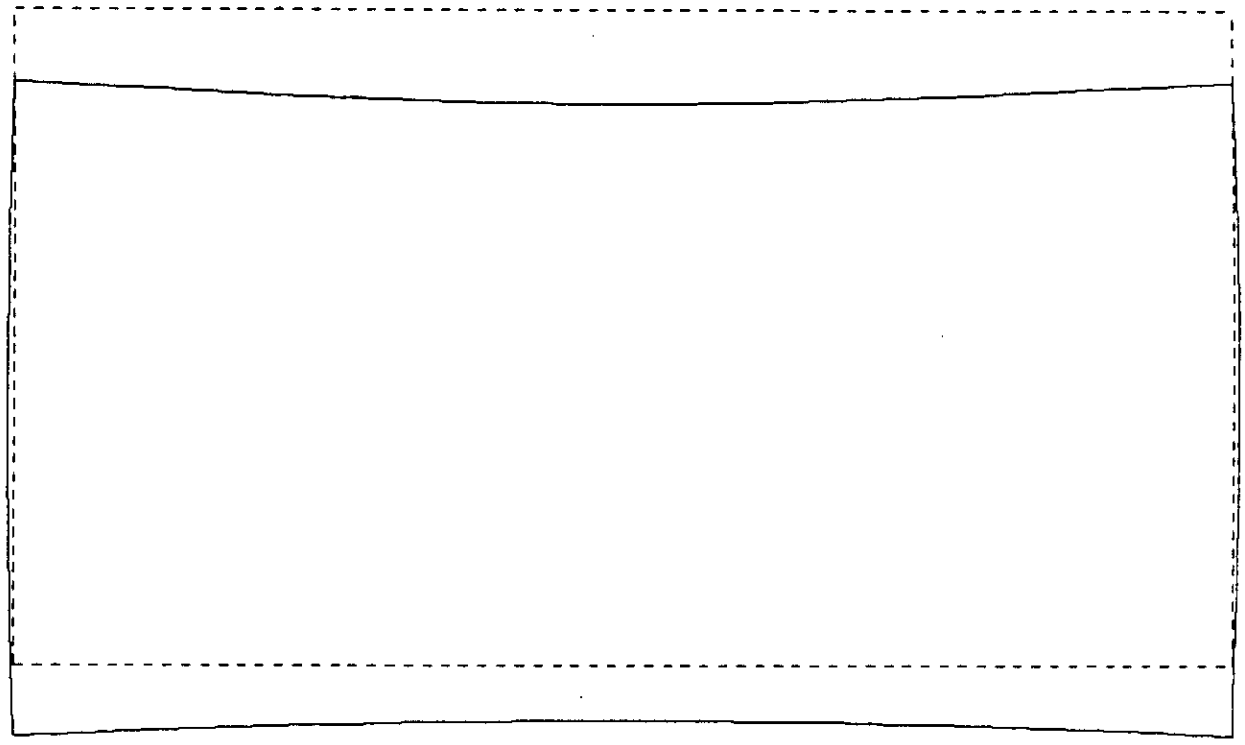


Y
X

MARES1
FRAME
LOADS
LOAD 4

MINIMA
w -.4000E+00
P .0000E+00
MAXIMA
w -.4000E+00
P .0000E+00

SAP90

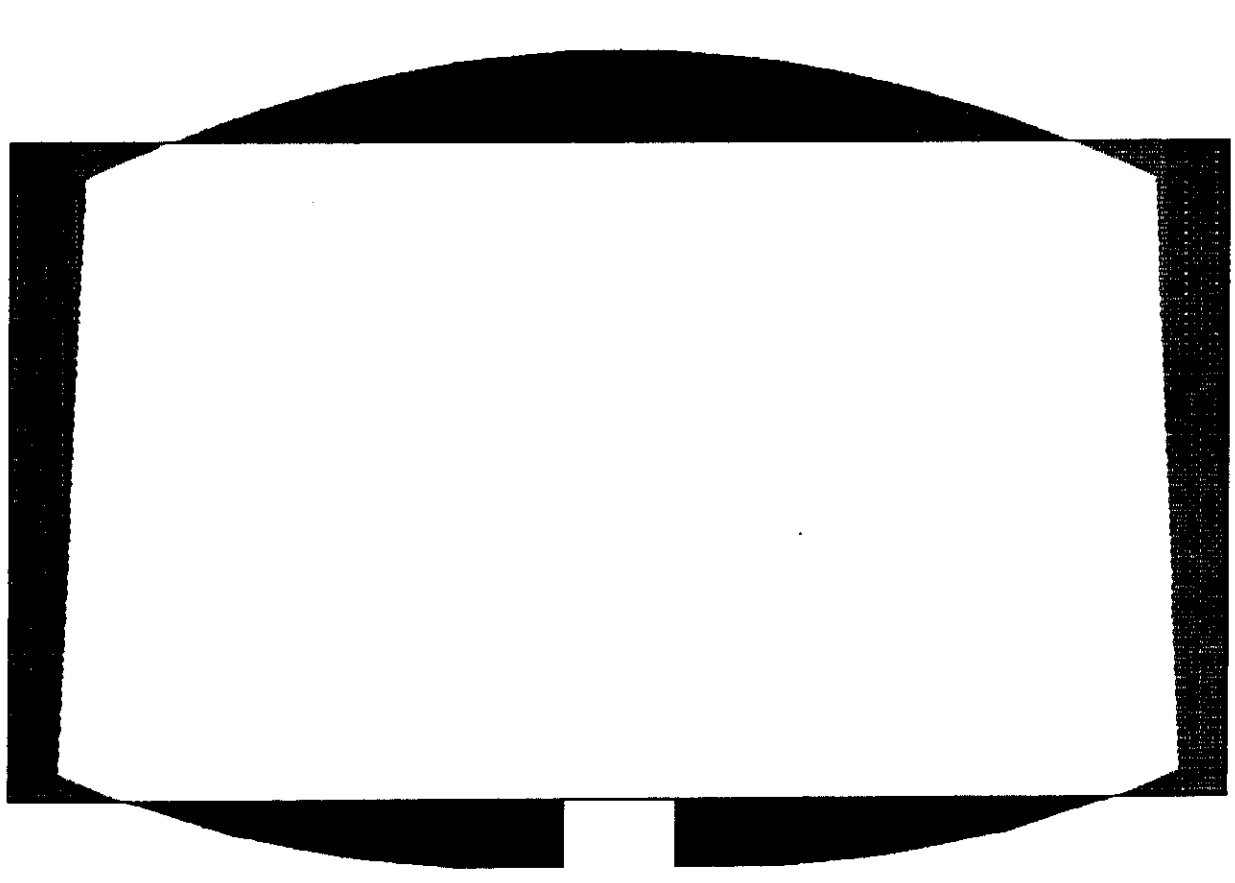


Y
X

MARES I
DEFORMED
SHAPE
LOAD 4

MINIMA
X -.1995E-04
Y -.3207E-03
Z .0000E+00
MAXIMA
X .1995E-04
Y -.1962E-03
Z .0000E+00

SAP90

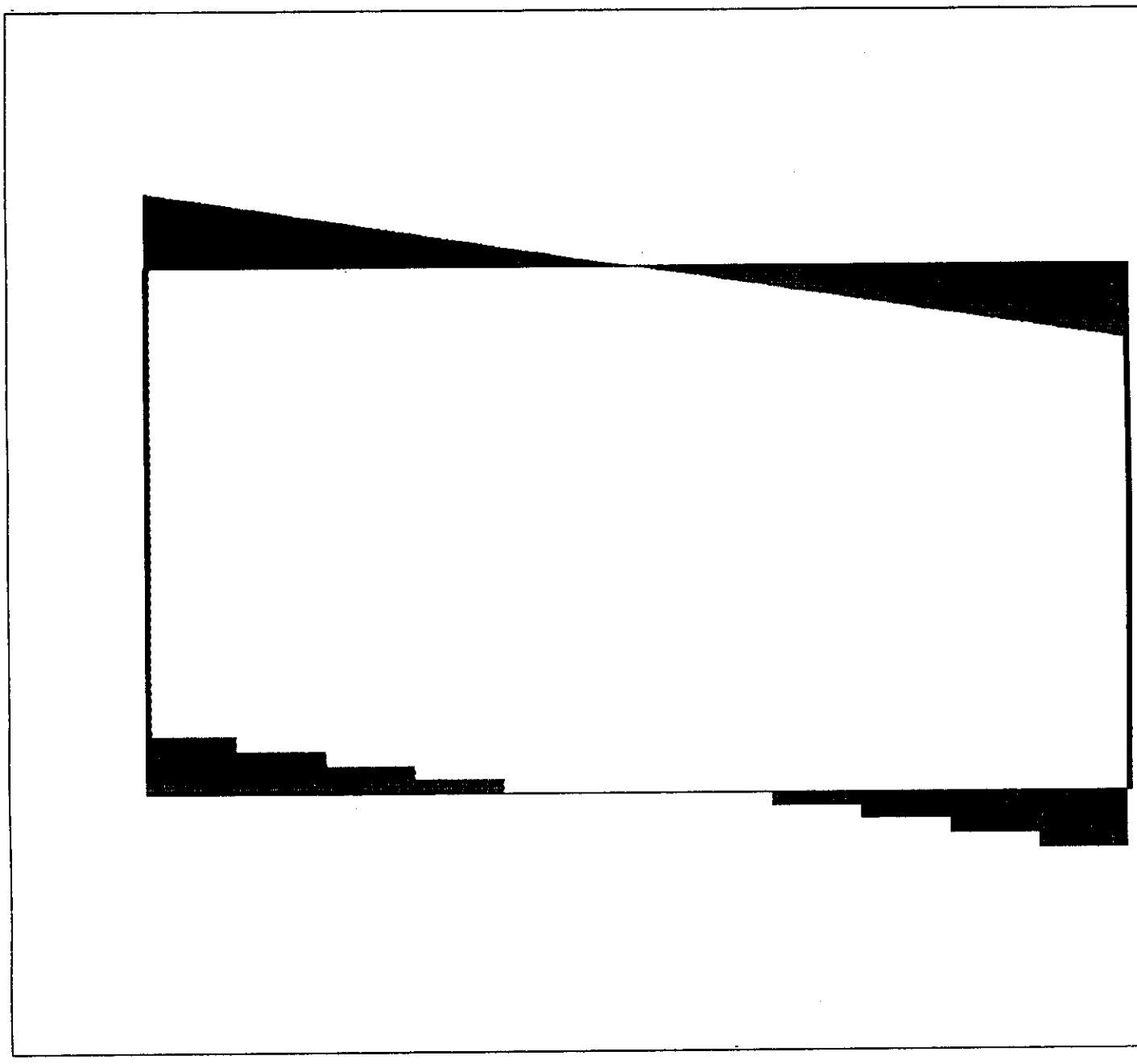


Y
X

MARES I
FRAME
OUTPUT M33
LOAD 4

MIN < 6>
-.6800E+00
AT .50
MAX < 12>
.8325E+00
AT .25

SAP90

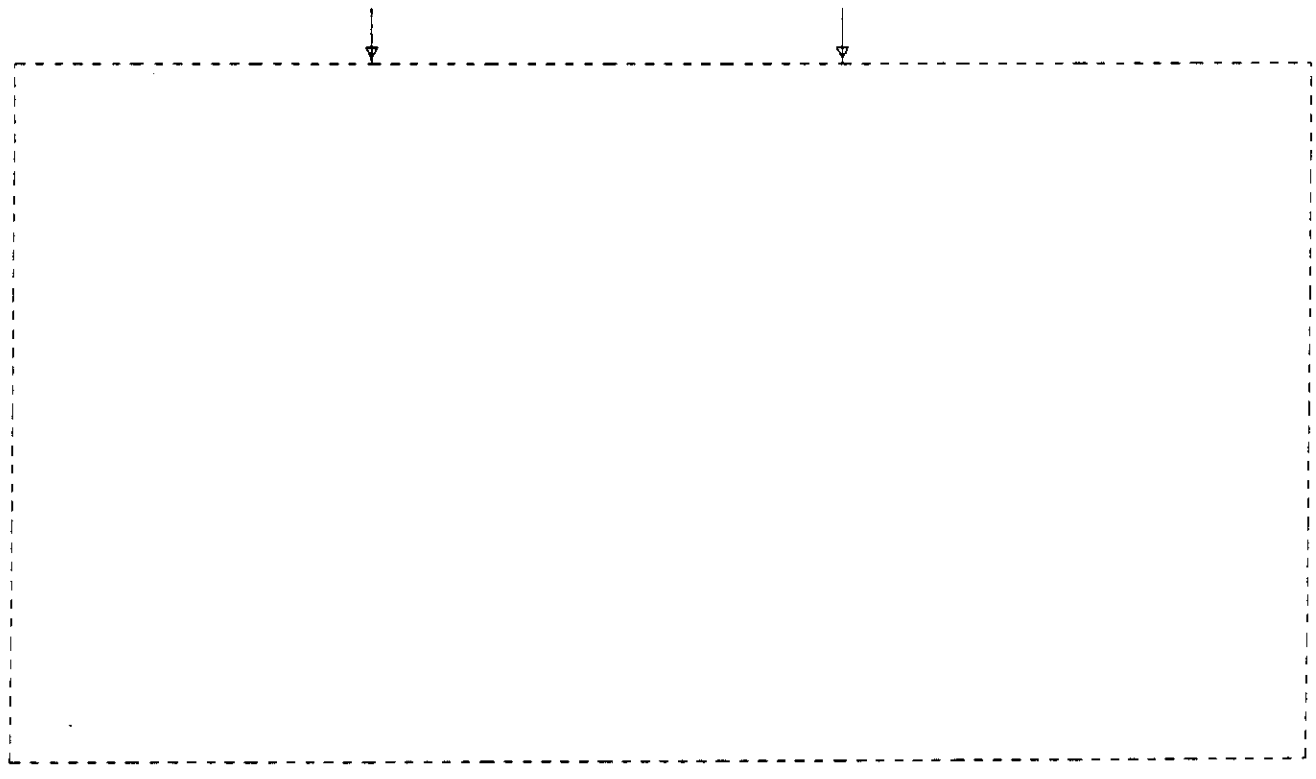


Y
X

MARES1
FRAME
OUTPUT V22
LOAD 4

MIN < 17>
-.1100E+01
AT .50
MAX < 7>
.1100E+01
AT .00

SAP90

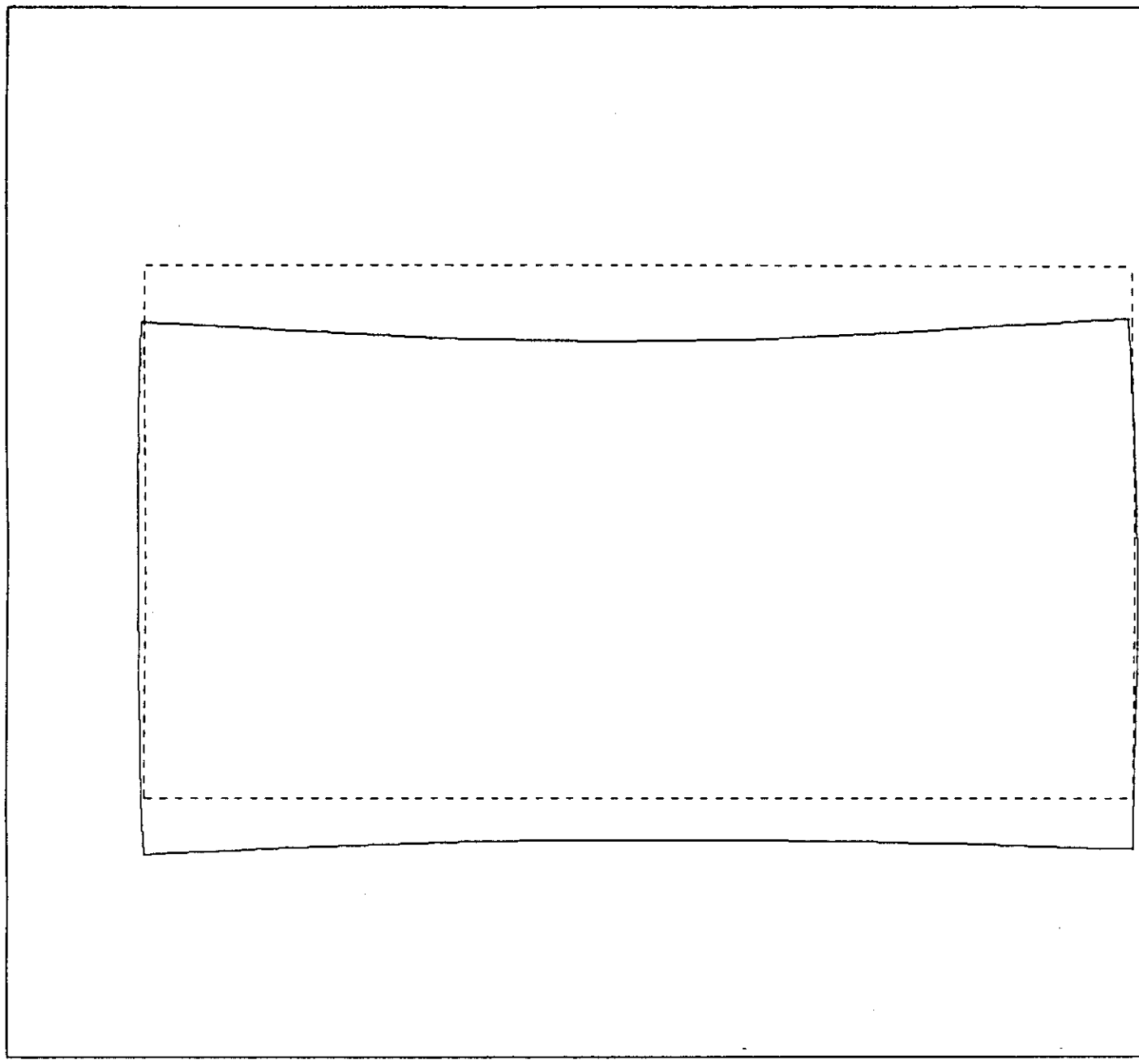


Y
X

MARES1
JOINT
LOADS
LOAD 5

MINIMA
P -.6660E+01
MAXIMA
P -.6660E+01

SAP90



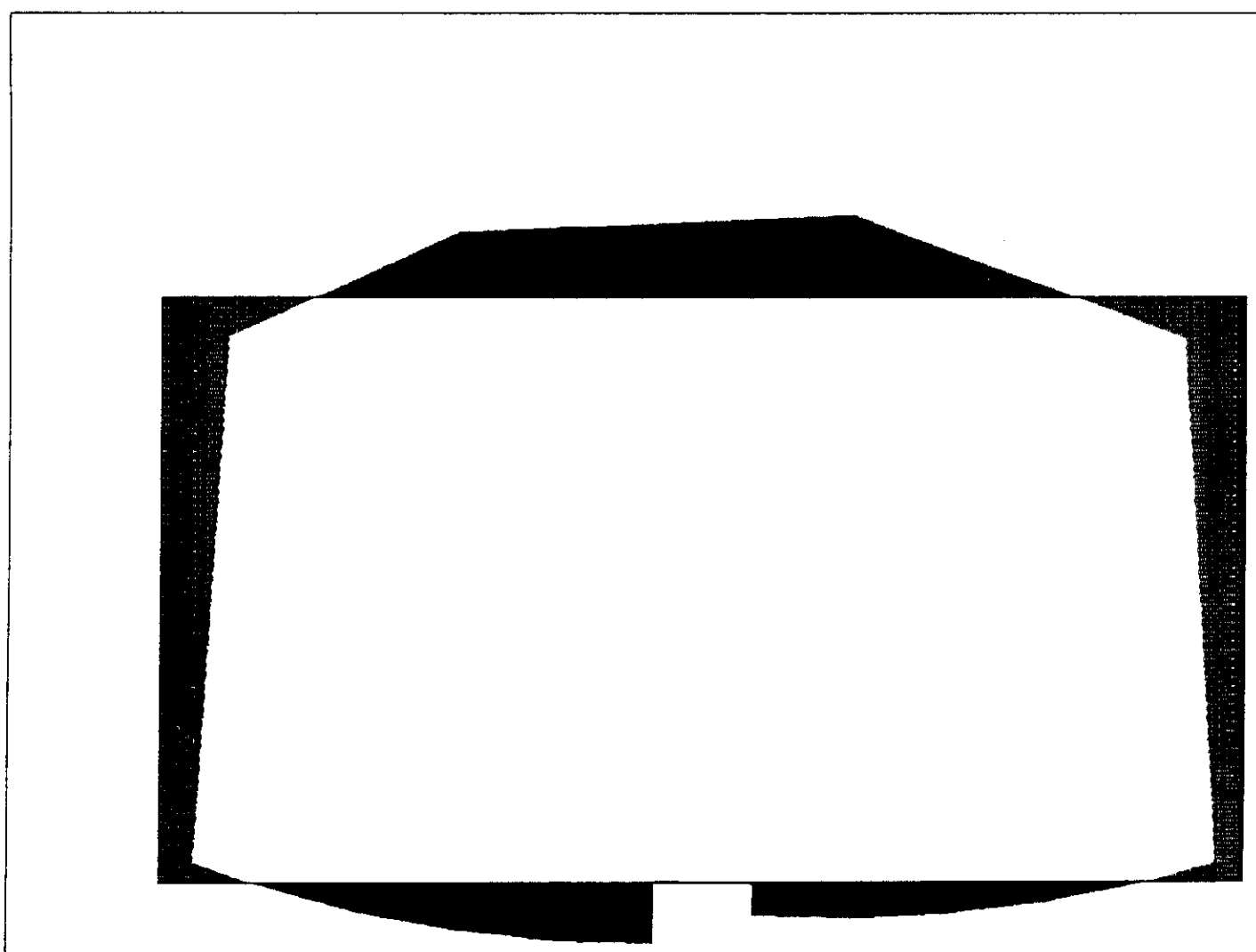
MARES I

DEFORMED SHAPE

LOAD 5

MINIMA
X -.1951E-03
Y -.2089E-02
Z .0000E+00
MAXIMA
X .8980E-04
Y -.1180E-02
Z .0000E+00

SAP90



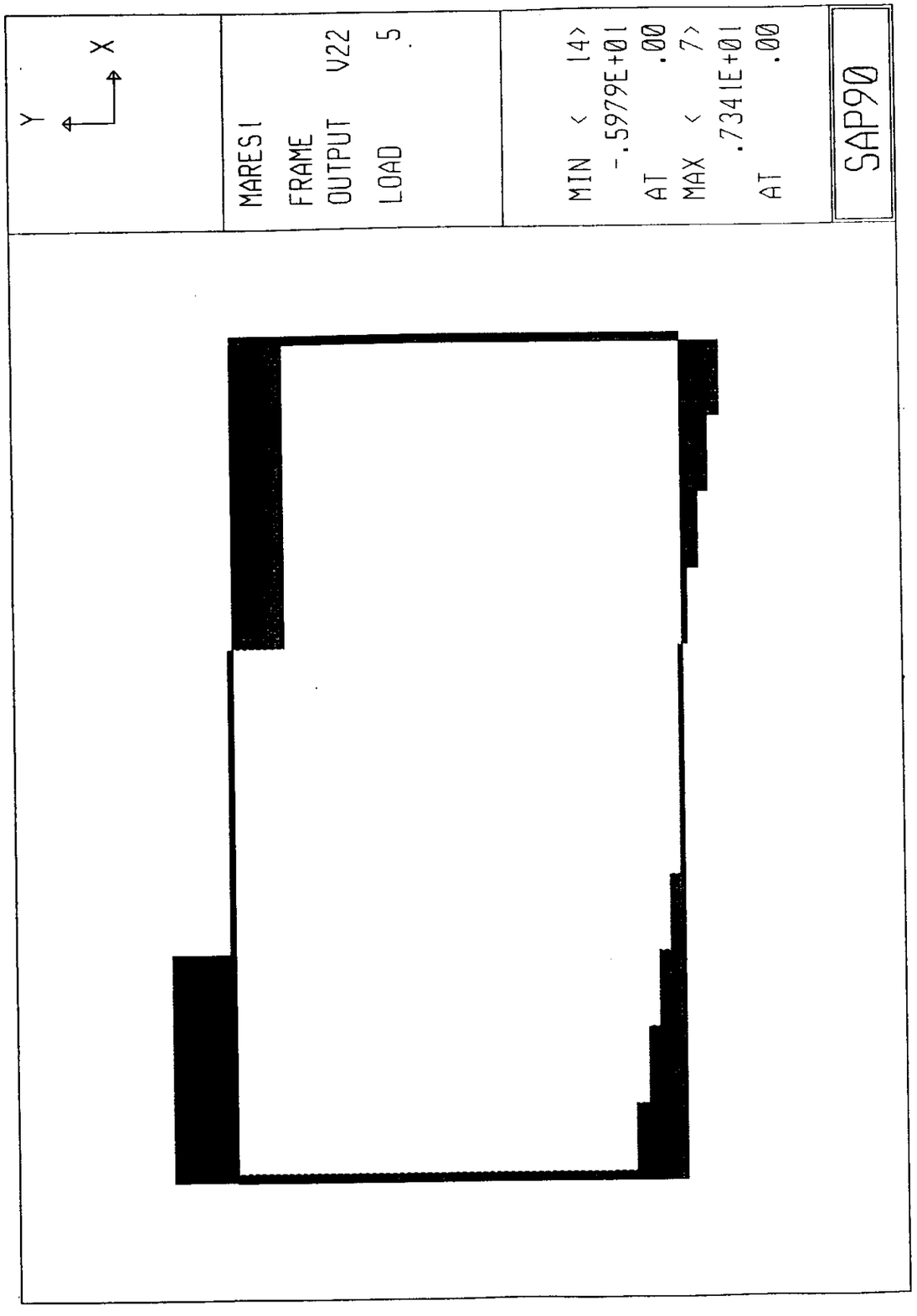
MARES I

FRAME OUTPUT M33

LOAD 5

MIN < 6>
-.5631E+01
AT .50
MAX < 13>
.6743E+01
AT .50

SAP90



MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(X)	U(Y)	U(Z)	R(X)	R(Y)	R(Z)
1	.000001	-.002711	.000000	.000000	.000000	.000144
2	-.000058	-.002714	.000000	.000000	.000000	.000093
3	-.000092	-.002716	.000000	.000000	.000000	.000044
4	-.000102	-.002718	.000000	.000000	.000000	-.000003
5	-.000089	-.002720	.000000	.000000	.000000	-.000047
6	-.000055	-.002722	.000000	.000000	.000000	-.000088
7	-.000001	-.002724	.000000	.000000	.000000	-.000127
8	-.000000	-.002798	.000000	.000000	.000000	-.000149
9	-.000000	-.002875	.000000	.000000	.000000	-.000144
10	-.000000	-.002943	.000000	.000000	.000000	-.000118
11	-.000000	-.002994	.000000	.000000	.000000	-.000077
12	.000000	-.003021	.000000	.000000	.000000	-.000027
13	.000000	-.003021	.000000	.000000	.000000	.000027
14	.000000	-.002994	.000000	.000000	.000000	.000077
15	.000000	-.002943	.000000	.000000	.000000	.000118
16	.000000	-.002875	.000000	.000000	.000000	.000144
17	.000000	-.002798	.000000	.000000	.000000	.000149
18	.000001	-.002724	.000000	.000000	.000000	.000127
19	.000055	-.002722	.000000	.000000	.000000	.000088
20	.000089	-.002720	.000000	.000000	.000000	.000047
21	.000102	-.002718	.000000	.000000	.000000	.000003
22	.000092	-.002716	.000000	.000000	.000000	-.000044
23	.000058	-.002714	.000000	.000000	.000000	-.000093
24	-.000001	-.002711	.000000	.000000	.000000	-.000144
25	-.000000	-.002623	.000000	.000000	.000000	-.000172
26	-.000000	-.002535	.000000	.000000	.000000	-.000158
27	-.000000	-.002463	.000000	.000000	.000000	-.000115
28	-.000000	-.002418	.000000	.000000	.000000	-.000058
29	.000000	-.002405	.000000	.000000	.000000	.000000
30	.000000	-.002405	.000000	.000000	.000000	.000000
31	.000000	-.002418	.000000	.000000	.000000	.000058
32	.000000	-.002463	.000000	.000000	.000000	.000115
33	.000000	-.002535	.000000	.000000	.000000	.000158
34	.000000	-.002623	.000000	.000000	.000000	.000172

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

J O I N T D I S P L A C E M E N T S

OAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(X)	U(Y)	U(Z)	R(X)	R(Y)	R(Z)
1	.4988E-05	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.3883E-04
2	.2718E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.3682E-04
3	.4319E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.2038E-04
4	.4814E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.1967E-05
5	.4112E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.2288E-04
6	.2459E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.3622E-04
7	.3764E-05	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.3707E-04
8	.3080E-05	.4352E-04	.0000E+00	.0000E+00	.0000E+00	.3033E-04
9	.2395E-05	.5700E-04	.0000E+00	.0000E+00	.0000E+00	.2359E-04
10	.1711E-05	.6711E-04	.0000E+00	.0000E+00	.0000E+00	.1685E-04
11	.1027E-05	.7385E-04	.0000E+00	.0000E+00	.0000E+00	.1011E-04
12	.3422E-06	.7722E-04	.0000E+00	.0000E+00	.0000E+00	.3370E-05
13	-.3422E-06	.7722E-04	.0000E+00	.0000E+00	.0000E+00	-.3370E-05
14	-.1027E-05	.7385E-04	.0000E+00	.0000E+00	.0000E+00	-.1011E-04
15	-.1711E-05	.6711E-04	.0000E+00	.0000E+00	.0000E+00	-.1685E-04
16	-.2395E-05	.5700E-04	.0000E+00	.0000E+00	.0000E+00	-.2359E-04
17	-.3080E-05	.4352E-04	.0000E+00	.0000E+00	.0000E+00	-.3033E-04
18	-.3764E-05	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.3707E-04
19	-.2459E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.3622E-04
20	-.4112E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.2288E-04
21	-.4814E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	-.1967E-05
22	-.4319E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.2038E-04
23	-.2718E-04	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.3682E-04
24	-.4988E-05	.2667E-04	.0000E+00	.0000E+00	.0000E+00	.3883E-04
25	-.3991E-05	.9342E-05	.0000E+00	.0000E+00	.0000E+00	.3061E-04
26	-.2993E-05	-.3918E-05	.0000E+00	.0000E+00	.0000E+00	.2263E-04
27	-.1995E-05	-.1326E-04	.0000E+00	.0000E+00	.0000E+00	.1493E-04
28	-.9976E-06	-.1883E-04	.0000E+00	.0000E+00	.0000E+00	.7425E-05
29	.0000E+00	-.2068E-04	.0000E+00	.0000E+00	.0000E+00	.0000E+00
30	.0000E+00	-.2068E-04	.0000E+00	.0000E+00	.0000E+00	.0000E+00
31	.9976E-06	-.1883E-04	.0000E+00	.0000E+00	.0000E+00	-.7425E-05
32	.1995E-05	-.1326E-04	.0000E+00	.0000E+00	.0000E+00	-.1493E-04
33	.2993E-05	-.3918E-05	.0000E+00	.0000E+00	.0000E+00	-.2263E-04
34	.3991E-05	.9342E-05	.0000E+00	.0000E+00	.0000E+00	-.3061E-04

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(X)	U(Y)	U(Z)	R(X)	R(Y)	R(Z)
1	-.000001	-.001107	.000000	.000000	.000000	.000110
2	-.000048	-.001108	.000000	.000000	.000000	.000077
3	-.000078	-.001110	.000000	.000000	.000000	.000042
4	-.000090	-.001112	.000000	.000000	.000000	.000003
5	-.000082	-.001113	.000000	.000000	.000000	-.000038
6	-.000052	-.001115	.000000	.000000	.000000	-.000083
7	.000001	-.001117	.000000	.000000	.000000	-.000130
8	.000001	-.001195	.000000	.000000	.000000	-.000160
9	.000000	-.001280	.000000	.000000	.000000	-.000158
10	.000000	-.001356	.000000	.000000	.000000	-.000131
11	.000000	-.001413	.000000	.000000	.000000	-.000086
12	.000000	-.001443	.000000	.000000	.000000	-.000030
13	.000000	-.001443	.000000	.000000	.000000	.000030
14	-.000000	-.001413	.000000	.000000	.000000	.000086
15	-.000000	-.001356	.000000	.000000	.000000	.000131
16	-.000000	-.001280	.000000	.000000	.000000	.000158
17	-.000001	-.001195	.000000	.000000	.000000	.000160
18	-.000001	-.001117	.000000	.000000	.000000	.000130
19	.000052	-.001115	.000000	.000000	.000000	.000083
20	.000082	-.001113	.000000	.000000	.000000	.000038
21	.000090	-.001112	.000000	.000000	.000000	-.000003
22	.000078	-.001110	.000000	.000000	.000000	-.000042
23	.000048	-.001108	.000000	.000000	.000000	-.000077
24	.000001	-.001107	.000000	.000000	.000000	-.000110
25	.000001	-.001043	.000000	.000000	.000000	-.000125
26	.3766E-06	-.9793E-03	.0000E+00	.0000E+00	.0000E+00	-.1139E-03
27	.2511E-06	-.9272E-03	.0000E+00	.0000E+00	.0000E+00	-.8440E-04
28	.1255E-06	-.8939E-03	.0000E+00	.0000E+00	.0000E+00	-.4399E-04
29	.0000E+00	-.8829E-03	.0000E+00	.0000E+00	.0000E+00	.0000E+00
30	.0000E+00	-.8829E-03	.0000E+00	.0000E+00	.0000E+00	.0000E+00
31	-.1255E-06	-.8939E-03	.0000E+00	.0000E+00	.0000E+00	.4399E-04
32	-.2511E-06	-.9272E-03	.0000E+00	.0000E+00	.0000E+00	.8440E-04
33	-.3766E-06	-.9793E-03	.0000E+00	.0000E+00	.0000E+00	.1139E-03
34	-.000001	-.001043	.000000	.000000	.000000	.000125

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 4 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(X)	U(Y)	U(Z)	R(X)	R(Y)	R(Z)
1	-.1395E-06	-.2460E-03	.0000E+00	.0000E+00	.0000E+00	.2433E-04
2	-.1062E-04	-.2463E-03	.0000E+00	.0000E+00	.0000E+00	.1714E-04
3	-.1734E-04	-.2467E-03	.0000E+00	.0000E+00	.0000E+00	.9269E-05
4	-.1995E-04	-.2471E-03	.0000E+00	.0000E+00	.0000E+00	.7326E-06
5	-.1813E-04	-.2474E-03	.0000E+00	.0000E+00	.0000E+00	-.8474E-05
6	-.1154E-04	-.2478E-03	.0000E+00	.0000E+00	.0000E+00	-.1835E-04
7	.1534E-06	-.2482E-03	.0000E+00	.0000E+00	.0000E+00	-.2889E-04
8	.1255E-06	-.2657E-03	.0000E+00	.0000E+00	.0000E+00	-.3564E-04
9	.9764E-07	-.2845E-03	.0000E+00	.0000E+00	.0000E+00	-.3519E-04
10	.6974E-07	-.3014E-03	.0000E+00	.0000E+00	.0000E+00	-.2913E-04
11	.4184E-07	-.3140E-03	.0000E+00	.0000E+00	.0000E+00	-.1908E-04
12	.1395E-07	-.3207E-03	.0000E+00	.0000E+00	.0000E+00	-.6627E-05
13	-.1395E-07	-.3207E-03	.0000E+00	.0000E+00	.0000E+00	.6627E-05
14	-.4184E-07	-.3140E-03	.0000E+00	.0000E+00	.0000E+00	.1908E-04
15	-.6974E-07	-.3014E-03	.0000E+00	.0000E+00	.0000E+00	.2913E-04
16	-.9764E-07	-.2845E-03	.0000E+00	.0000E+00	.0000E+00	.3519E-04
17	-.1255E-06	-.2657E-03	.0000E+00	.0000E+00	.0000E+00	.3564E-04
18	-.1534E-06	-.2482E-03	.0000E+00	.0000E+00	.0000E+00	.2889E-04
19	.1154E-04	-.2478E-03	.0000E+00	.0000E+00	.0000E+00	.1835E-04
20	.1813E-04	-.2474E-03	.0000E+00	.0000E+00	.0000E+00	.8474E-05
21	.1995E-04	-.2471E-03	.0000E+00	.0000E+00	.0000E+00	-.7326E-06
22	.1734E-04	-.2467E-03	.0000E+00	.0000E+00	.0000E+00	-.9269E-05
23	.1062E-04	-.2463E-03	.0000E+00	.0000E+00	.0000E+00	-.1714E-04
24	.1395E-06	-.2460E-03	.0000E+00	.0000E+00	.0000E+00	-.2433E-04
25	.1116E-06	-.2317E-03	.0000E+00	.0000E+00	.0000E+00	-.2778E-04
26	.8369E-07	-.2176E-03	.0000E+00	.0000E+00	.0000E+00	-.2532E-04
27	.5579E-07	-.2060E-03	.0000E+00	.0000E+00	.0000E+00	-.1875E-04
28	.2790E-07	-.1986E-03	.0000E+00	.0000E+00	.0000E+00	-.9775E-05
29	.0000E+00	-.1962E-03	.0000E+00	.0000E+00	.0000E+00	.0000E+00
30	.0000E+00	-.1962E-03	.0000E+00	.0000E+00	.0000E+00	.0000E+00
31	-.2790E-07	-.1986E-03	.0000E+00	.0000E+00	.0000E+00	.9775E-05
32	-.5579E-07	-.2060E-03	.0000E+00	.0000E+00	.0000E+00	.1875E-04
33	-.8369E-07	-.2176E-03	.0000E+00	.0000E+00	.0000E+00	.2532E-04
34	-.1116E-06	-.2317E-03	.0000E+00	.0000E+00	.0000E+00	.2778E-04

PROGRAM:SAP90/FILE:MARES1.SOL
MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.
J O I N T D I S P L A C E M E N T S

LOAD CONDITION 5 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(X)	U(Y)	U(Z)	R(X)	R(Y)	R(Z)
1	-.000002	-.001573	.000000	.000000	.000000	.000200
2	-.000092	-.001575	.000000	.000000	.000000	.000154
3	-.000156	-.001577	.000000	.000000	.000000	.000100
4	-.000192	-.001580	.000000	.000000	.000000	.000038
5	-.000195	-.001582	.000000	.000000	.000000	-.000032
6	-.000161	-.001585	.000000	.000000	.000000	-.000110
7	-.000086	-.001587	.000000	.000000	.000000	-.000196
8	-.000086	-.001711	.000000	.000000	.000000	-.000257
9	-.000086	-.001850	.000000	.000000	.000000	-.000259
10	-.000087	-.001975	.000000	.000000	.000000	-.000202
11	-.000087	-.002055	.000000	.000000	.000000	-.000113
12	-.000087	-.002089	.000000	.000000	.000000	-.000019
13	-.000088	-.002075	.000000	.000000	.000000	.000081
14	-.000088	-.002009	.000000	.000000	.000000	.000186
15	-.000088	-.001887	.000000	.000000	.000000	.000270
16	-.000089	-.001735	.000000	.000000	.000000	.000306
17	-.000089	-.001577	.000000	.000000	.000000	.000294
18	-.000089	-.001436	.000000	.000000	.000000	.000235
19	.000007	-.001434	.000000	.000000	.000000	.000155
20	.000065	-.001432	.000000	.000000	.000000	.000084
21	.000090	-.001430	.000000	.000000	.000000	.000020
22	.000085	-.001428	.000000	.000000	.000000	-.000035
23	.000054	-.001426	.000000	.000000	.000000	-.000082
24	.000002	-.001424	.000000	.000000	.000000	-.000122
25	.000001	-.001353	.000000	.000000	.000000	-.000139
26	.000001	-.001283	.000000	.000000	.000000	-.000125
27	.000001	-.001226	.000000	.000000	.000000	-.000090
28	.000000	-.001191	.000000	.000000	.000000	-.000046
29	.000000	-.001180	.000000	.000000	.000000	.000000
30	.000000	-.001181	.000000	.000000	.000000	.000000
31	-.000000	-.001201	.000000	.000000	.000000	.000078
32	-.000001	-.001260	.000000	.000000	.000000	.000147
33	-.000001	-.001350	.000000	.000000	.000000	.000197
34	-.000001	-.001460	.000000	.000000	.000000	.000219

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(X)	F(Y)	M(Z)
1	.0000	2.7109	.0000
2	.0000E+00	.2296E-11	.0000E+00
3	.0000E+00	-.1181E-11	.0000E+00
4	.0000E+00	-.1023E-11	.0000E+00
5	.0000	.0000	.0000
6	.0000	.0000	.0000
7	.0000	.0000	.0000
8	.0000	.0000	.0000
9	.0000	.0000	.0000
10	.0000	.0000	.0000
11	.0000	.0000	.0000
12	.0000	.0000	.0000
13	.0000	.0000	.0000
14	.0000	.0000	.0000
15	.0000	.0000	.0000
16	.0000	.0000	.0000
17	.0000	.0000	.0000
18	.0000	.0000	.0000
19	.0000E+00	.1255E-11	.0000E+00
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000E+00	.2247E-11	.0000E+00
24	.0000	2.7109	.0000
25	.0000	2.6231	.0000
26	.0000	2.5346	.0000
27	.0000	2.4629	.0000
28	.0000	2.4185	.0000
29	.3198	.0000	3.4203
30	-.3198	.0000	-3.4203
31	.0000	2.4185	.0000
32	.0000	2.4629	.0000
33	.0000	2.5346	.0000
34	.0000	2.6231	.0000
OTAL	.0000E+00	.2550E+02	-.1528E-10

PROGRAM:SAP90/FILE:MARES1.SOL

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 2 - FORCES "F" AND MOMENTS "M"

JOINT	F(X)	F(Y)	M(Z)
1	.0000	-.0267	.0000
2	.0000	.0000	.0000
3	.0000	.0000	.0000
4	.0000	.0000	.0000
5	.0000	.0000	.0000
6	.0000	.0000	.0000
7	.0000	.0000	.0000
8	.0000	.0000	.0000
9	.0000	.0000	.0000
10	.0000	.0000	.0000
11	.0000	.0000	.0000
12	.0000	.0000	.0000
13	.0000	.0000	.0000
14	.0000	.0000	.0000
15	.0000	.0000	.0000
16	.0000	.0000	.0000
17	.0000	.0000	.0000
18	.0000	.0000	.0000
19	.0000	.0000	.0000
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	-.0267	.0000
25	.0000E+00	-.9342E-02	.0000E+00
26	.0000E+00	.3918E-02	.0000E+00
27	.0000	.0133	.0000
28	.0000	.0188	.0000
29	2.9929	.0000	-.4641
30	-2.9929	.0000	.4641
31	.0000	.0188	.0000
32	.0000	.0133	.0000
33	.0000E+00	.3918E-02	.0000E+00
34	.0000E+00	-.9342E-02	.0000E+00
TOTAL	.0000E+00	-.1041E-16	.1504E-12

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 3 - FORCES "F" AND MOMENTS "M"

JOINT	F(X)	F(Y)	M(Z)
1	.0000	1.1068	.0000
2	.0000	.0000	.0000
3	.0000	.0000	.0000
4	.0000	.0000	.0000
5	.0000	.0000	.0000
6	.0000	.0000	.0000
7	.0000	.0000	.0000
8	.0000	.0000	.0000
9	.0000	.0000	.0000
10	.0000	.0000	.0000
11	.0000	.0000	.0000
12	.0000	.0000	.0000
13	.0000	.0000	.0000
14	.0000	.0000	.0000
15	.0000	.0000	.0000
16	.0000	.0000	.0000
17	.0000	.0000	.0000
18	.0000	.0000	.0000
19	.0000	.0000	.0000
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	1.1068	.0000
25	.0000	1.0429	.0000
26	.0000	.9793	.0000
27	.0000	.9272	.0000
28	.0000	.8939	.0000
29	-.3766	.0000	2.7491
30	.3766	.0000	-2.7491
31	.0000	.8939	.0000
32	.0000	.9272	.0000
33	.0000	.9793	.0000
34	.0000	1.0429	.0000
OTAL	.0000E+00	.9900E+01	-.5789E-11

PROGRAM:SAP90/FILE:MARES1.SOL

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 4 - FORCES "F" AND MOMENTS "M"

JOINT	F(X)	F(Y)	M(Z)
1	.0000	.2460	.0000
2	.0000	.0000	.0000
3	.0000	.0000	.0000
4	.0000	.0000	.0000
5	.0000	.0000	.0000
6	.0000	.0000	.0000
7	.0000	.0000	.0000
8	.0000	.0000	.0000
9	.0000	.0000	.0000
10	.0000	.0000	.0000
11	.0000	.0000	.0000
12	.0000	.0000	.0000
13	.0000	.0000	.0000
14	.0000	.0000	.0000
15	.0000	.0000	.0000
16	.0000	.0000	.0000
17	.0000	.0000	.0000
18	.0000	.0000	.0000
19	.0000	.0000	.0000
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	.2460	.0000
25	.0000	.2317	.0000
26	.0000	.2176	.0000
27	.0000	.2060	.0000
28	.0000	.1986	.0000
29	-.0837	.0000	.6109
30	.0837	.0000	-.6109
31	.0000	.1986	.0000
32	.0000	.2060	.0000
33	.0000	.2176	.0000
34	.0000	.2317	.0000
TOTAL	.0000E+00	.2200E+01	-.1349E-11

PROGRAM:SAP90/FILE:MARES1.SOL

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 5 - FORCES "F" AND MOMENTS "M"

JOINT	F(X)	F(Y)	M(Z)
1	.0000	1.5725	.0000
2	.0000	.0000	.0000
3	.0000	.0000	.0000
4	.0000	.0000	.0000
5	.0000	.0000	.0000
6	.0000	.0000	.0000
7	.0000	.0000	.0000
8	.0000	.0000	.0000
9	.0000	.0000	.0000
10	.0000	-6.6600	.0000
11	.0000	.0000	.0000
12	.0000	.0000	.0000
13	.0000	.0000	.0000
14	.0000	-6.6600	.0000
15	.0000	.0000	.0000
16	.0000	.0000	.0000
17	.0000	.0000	.0000
18	.0000	.0000	.0000
19	.0000	.0000	.0000
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	1.4242	.0000
25	.0000	1.3528	.0000
26	.0000	1.2825	.0000
27	.0000	1.2261	.0000
28	.0000	1.1911	.0000
29	-1.0023	.0000	2.6032
30	1.0023	.0000	-5.1169
31	.0000	1.2012	.0000
32	.0000	1.2597	.0000
33	.0000	1.3499	.0000
34	.0000	1.4599	.0000
TOTAL	.0000E+00	.4441E-15	-.2514E+01

PROGRAM:SAP90/FILE:MARES1.F3F

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
1								
	1	.000			-8.625			
		.000	.320	-3.301				
		.500	.320	-3.141				
		.500			-7.875			
	2	.000			.000			
		.000	2.993	-.521				
		.500	1.778	.672				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-1.930				
		.500	-.377	-2.118				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.429				
		.500	-.084	-.471				
		.500			-1.100			
	5	.000			-7.341			
		.000	-1.002	-2.624				
		.500	-1.002	-3.125				
		.500			-7.341			
2								
	1	.000			-7.875			
		.000	.320	-3.141				
		.500	.320	-2.981				
		.500			-7.125			
	2	.000			.000			
		.000	1.778	.672				
		.500	.713	1.295				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-2.118				
		.500	-.377	-2.307				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.471				
		.500	-.084	-.513				
		.500			-1.100			
	5	.000			-7.341			
		.000	-1.002	-3.125				
		.500	-1.002	-3.626				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500			-7.341			
3								
	1	.000			-7.125			
		.000	.320	-2.981				
		.500	.320	-2.821				
		.500			-6.375			
	2	.000			.000			
		.000	.713	1.295				
		.389	.000	1.433				
		.500	-.204	1.422				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-2.307				
		.500	-.377	-2.495				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.513				
		.500	-.084	-.554				
		.500			-1.100			
	5	.000			-7.341			
		.000	-1.002	-3.626				
		.500	-1.002	-4.127				
		.500			-7.341			
4								
	1	.000			-6.375			
		.000	.320	-2.821				
		.500	.320	-2.661				
		.500			-5.625			
	2	.000			.000			
		.000	-.204	1.422				
		.500	-.972	1.128				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-2.495				
		.500	-.377	-2.683				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.554				
		.500	-.084	-.596				
		.500			-1.100			
	5	.000			-7.341			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.000	-1.002	-4.127				
		.500	-1.002	-4.628				
		.500			-7.341			
5								
	1	.000			-5.625			
		.000	.320	-2.661				
		.500	.320	-2.501				
		.500			-4.875			
	2	.000			.000			
		.000	-.972	1.128				
		.500	-1.587	.489				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-2.683				
		.500	-.377	-2.872				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.596				
		.500	-.084	-.638				
		.500			-1.100			
	5	.000			-7.341			
		.000	-1.002	-4.628				
		.500	-1.002	-5.129				
		.500			-7.341			
6								
	1	.000			-4.875			
		.000	.320	-2.501				
		.500	.320	-2.341				
		.500			-4.125			
	2	.000			.000			
		.000	-1.587	.489				
		.500	-2.053	-.421				
		.500			.000			
	3	.000			-4.950			
		.000	-.377	-2.872				
		.500	-.377	-3.060				
		.500			-4.950			
	4	.000			-1.100			
		.000	-.084	-.638				
		.500	-.084	-.680				
		.500			-1.100			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
	5	.000			-7.341			
		.000	-1.002	-5.129				
		.500	-1.002	-5.631				
		.500			-7.341			
7								
	1	.000			.320			
		.000	4.125	-2.341				
		.500	3.375	-.466				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	4.950	-3.060				
		.500	4.050	-.810				
		.500			-.377			
	4	.000			-.084			
		.000	1.100	-.680				
		.500	.900	-.180				
		.500			-.084			
	5	.000			-1.002			
		.000	7.341	-5.631				
		.500	7.341	-1.960				
		.500			-1.002			
8								
	1	.000			.320			
		.000	3.375	-.466				
		.500	2.625	1.034				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	4.050	-.810				
		.500	3.150	.990				
		.500			-.377			
	4	.000			-.084			
		.000	.900	-.180				
		.500	.700	.220				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500			-.084			
	5	.000			-1.002			
		.000	7.341	-1.960				
		.500	7.341	1.710				
		.500			-1.002			
9								
	1	.000			.320			
		.000	2.625	1.034				
		.500	1.875	2.159				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	3.150	.990				
		.500	2.250	2.340				
		.500			-.377			
	4	.000			-.084			
		.000	.700	.220				
		.500	.500	.520				
		.500			-.084			
	5	.000			-1.002			
		.000	7.341	1.710				
		.500	7.341	5.381				
		.500			-1.002			
10								
	1	.000			.320			
		.000	1.875	2.159				
		.500	1.125	2.909				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	2.250	2.340				
		.500	1.350	3.240				
		.500			-.377			
	4	.000			-.084			
		.000	.500	.520				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500	.300	.720				
		.500			-.084			
	5	.000			-1.002			
		.000	.681	5.381				
		.500	.681	5.721				
		.500			-1.002			
11		---	---	---	---	---	---	---
	1	.000			.320			
		.000	1.125	2.909				
		.500	.375	3.284				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	1.350	3.240				
		.500	.450	3.690				
		.500			-.377			
	4	.000			-.084			
		.000	.300	.720				
		.500	.100	.820				
		.500			-.084			
	5	.000			-1.002			
		.000	.681	5.721				
		.500	.681	6.062				
		.500			-1.002			
12		---	---	---	---	---	---	---
	1	.000			.320			
		.000	.375	3.284				
		.250	.000	3.330				
		.500	-.375	3.284				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	.450	3.690				
		.250	.000	3.746				
		.500	-.450	3.690				
		.500			-.377			

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MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
	4	.000			-.084			
		.000	.100	.820				
		.250	.000	.833				
		.500	-.100	.820				
		.500			-.084			
	5	.000			-1.002			
		.000	.681	6.062				
		.500	.681	6.403				
		.500			-1.002			
13		---	---	---	---	---	---	---
	1	.000			.320			
		.000	-.375	3.284				
		.500	-1.125	2.909				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	-.450	3.690				
		.500	-1.350	3.240				
		.500			-.377			
	4	.000			-.084			
		.000	-.100	.820				
		.500	-.300	.720				
		.500			-.084			
	5	.000			-1.002			
		.000	.681	6.403				
		.500	.681	6.743				
		.500			-1.002			
14		---	---	---	---	---	---	---
	1	.000			.320			
		.000	-1.125	2.909				
		.500	-1.875	2.159				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	-1.350	3.240				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500	-2.250	2.340				
		.500			-.377			
	4	.000			-.084			
		.000	-.300	.720				
		.500	-.500	.520				
		.500			-.084			
	5	.000			-1.002			
		.000	-5.979	6.743				
		.500	-5.979	3.754				
		.500			-1.002			
15		----------						
	1	.000			.320			
		.000	-1.875	2.159				
		.500	-2.625	1.034				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	-2.250	2.340				
		.500	-3.150	.990				
		.500			-.377			
	4	.000			-.084			
		.000	-.500	.520				
		.500	-.700	.220				
		.500			-.084			
	5	.000			-1.002			
		.000	-5.979	3.754				
		.500	-5.979	.764				
		.500			-1.002			
16		----------						
	1	.000			.320			
		.000	-2.625	1.034				
		.500	-3.375	-.466				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.000	-3.150	.990				
		.500	-4.050	-.810				
		.500			-.377			
	4	.000			-.084			
		.000	-.700	.220				
		.500	-.900	-.180				
		.500			-.084			
	5	.000			-1.002			
		.000	-5.979	.764				
		.500	-5.979	-2.225				
		.500			-1.002			
17		----------						
	1	.000			.320			
		.000	-3.375	-.466				
		.500	-4.125	-2.341				
		.500			.320			
	2	.000			-2.053			
		.000	.000	-.421				
		.500	.000	-.421				
		.500			-2.053			
	3	.000			-.377			
		.000	-4.050	-.810				
		.500	-4.950	-3.060				
		.500			-.377			
	4	.000			-.084			
		.000	-.900	-.180				
		.500	-1.100	-.680				
		.500			-.084			
	5	.000			-1.002			
		.000	-5.979	-2.225				
		.500	-5.979	-5.215				
		.500			-1.002			
18		----------						
	1	.000			-4.125			
		.000	-.320	-2.341				
		.500	-.320	-2.501				
		.500			-4.875			
	2	.000			.000			
		.000	2.053	-.421				
		.500	1.587	.489				
		.500			.000			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
	3	.000			-4.950			
		.000	.377	-3.060				
		.500	.377	-2.872				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.680				
		.500	.084	-.638				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-5.215				
		.500	1.002	-4.714				
		.500			-5.979			
19	----------							
	1	.000			-4.875			
		.000	-.320	-2.501				
		.500	-.320	-2.661				
		.500			-5.625			
	2	.000			.000			
		.000	1.587	.489				
		.500	.972	1.128				
		.500			.000			
	3	.000			-4.950			
		.000	.377	-2.872				
		.500	.377	-2.683				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.638				
		.500	.084	-.596				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-4.714				
		.500	1.002	-4.213				
		.500			-5.979			
20	----------							
	1	.000			-5.625			
		.000	-.320	-2.661				
		.500	-.320	-2.821				
		.500			-6.375			
	2	.000			.000			
		.000	.972	1.128				
		.500	.204	1.422				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500			.000			
	3	.000			-4.950			
		.000	.377	-2.683				
		.500	.377	-2.495				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.596				
		.500	.084	-.554				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-4.213				
		.500	1.002	-3.712				
		.500			-5.979			
21	----------							
	1	.000			-6.375			
		.000	-.320	-2.821				
		.500	-.320	-2.981				
		.500			-7.125			
	2	.000			.000			
		.000	.204	1.422				
		.111	.000	1.433				
		.500	-.713	1.295				
		.500			.000			
	3	.000			-4.950			
		.000	.377	-2.495				
		.500	.377	-2.307				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.554				
		.500	.084	-.513				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-3.712				
		.500	1.002	-3.210				
		.500			-5.979			
22	----------							
	1	.000			-7.125			
		.000	-.320	-2.981				
		.500	-.320	-3.141				
		.500			-7.875			
	2	.000			.000			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.000	-.713	1.295				
		.500	-1.778	.672				
		.500			.000			
	3	.000			-4.950			
		.000	.377	-2.307				
		.500	.377	-2.118				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.513				
		.500	.084	-.471				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-3.210				
		.500	1.002	-2.709				
		.500			-5.979			
23								
	1	.000			-7.875			
		.000	-.320	-3.141				
		.500	-.320	-3.301				
		.500			-8.625			
	2	.000			.000			
		.000	-1.778	.672				
		.500	-2.993	-.521				
		.500			.000			
	3	.000			-4.950			
		.000	.377	-2.118				
		.500	.377	-1.930				
		.500			-4.950			
	4	.000			-1.100			
		.000	.084	-.471				
		.500	.084	-.429				
		.500			-1.100			
	5	.000			-5.979			
		.000	1.002	-2.709				
		.500	1.002	-2.208				
		.500			-5.979			
24								
	1	.000			-.320			
		.000	5.914	-3.301				
		.500	6.664	-.156				
		.500			-.320			

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MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
	2	.000			-2.993			
		.000	.027	-.521				
		.500	.027	-.508				
		.500			-2.993			
	3	.000			.377			
		.000	3.843	-1.930				
		.500	3.843	-.009				
		.500			.377			
	4	.000			.084			
		.000	.854	-.429				
		.500	.854	-.002				
		.500			.084			
	5	.000			1.002			
		.000	4.555	-2.208				
		.500	4.555	.069				
		.500			1.002			
25								
	1	.000			-.320			
		.000	4.041	-.156				
		.500	4.791	2.052				
		.500			-.320			
	2	.000			-2.993			
		.000	.036	-.508				
		.500	.036	-.490				
		.500			-2.993			
	3	.000			.377			
		.000	2.800	-.009				
		.500	2.800	1.392				
		.500			.377			
	4	.000			.084			
		.000	.622	-.002				
		.500	.622	.309				
		.500			.084			
	5	.000			1.002			
		.000	3.202	.069				
		.500	3.202	1.670				
		.500			1.002			
26								
	1	.000			-.320			
		.000	2.256	2.052				
		.500	3.006	3.367				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500			-.320			
	2	.000			-2.993			
		.000	.032	-.490				
		.500	.032	-.474				
		.500			-2.993			
	3	.000			.377			
		.000	1.821	1.392				
		.500	1.821	2.302				
		.500			.377			
	4	.000			.084			
		.000	.405	.309				
		.500	.405	.512				
		.500			.084			
	5	.000			1.002			
		.000	1.919	1.670				
		.500	1.919	2.630				
		.500			1.002			
27	----------							
	1	.000			-.320			
		.000	.543	3.367				
		.500	1.293	3.827				
		.500			-.320			
	2	.000			-2.993			
		.000	.019	-.474				
		.500	.019	-.464				
		.500			-2.993			
	3	.000			.377			
		.000	.894	2.302				
		.500	.894	2.749				
		.500			.377			
	4	.000			.084			
		.000	.199	.512				
		.500	.199	.611				
		.500			.084			
	5	.000			1.002			
		.000	.693	2.630				
		.500	.693	2.977				
		.500			1.002			
28	----------							
	1	.000			-.320			
		.000	-1.125	3.827				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500	-.375	3.452				
		.500			-.320			
	2	.000			-2.993			
		.000	.000	-.464				
		.500	.000	-.464				
		.500			-2.993			
	3	.000			.377			
		.000	.000	2.749				
		.500	.000	2.749				
		.500			.377			
	4	.000			.084			
		.000	.000	.611				
		.500	.000	.611				
		.500			.084			
	5	.000			1.002			
		.000	-.498	2.977				
		.500	-.498	2.728				
		.500			1.002			
29	----------							
	1	.000			.000			
		.000	-.375	.031				
		.250	.000	-.016				
		.500	.375	.031				
		.500			.000			
	2	.000			.000			
		.000	.000	.000				
		.500	.000	.000				
		.500			.000			
	3	.000			.000			
		.000	.000	.000				
		.500	.000	.000				
		.500			.000			
	4	.000			.000			
		.000	.000	.000				
		.500	.000	.000				
		.500			.000			
	5	.000			.000			
		.000	-.498	.124				
		.500	-.498	-.124				
		.500			.000			

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
30								
	1	.000			-.320			
		.000	.375	3.452				
		.500	1.125	3.827				
		.500			-.320			
	2	.000			-2.993			
		.000	.000	-.464				
		.500	.000	-.464				
		.500			-2.993			
	3	.000			.377			
		.000	.000	2.749				
		.500	.000	2.749				
		.500			.377			
	4	.000			.084			
		.000	.000	.611				
		.500	.000	.611				
		.500			.084			
	5	.000			1.002			
		.000	-.498	4.992				
		.500	-.498	4.744				
		.500			1.002			
31								
	1	.000			-.320			
		.000	-1.293	3.827				
		.500	-.543	3.367				
		.500			-.320			
	2	.000			-2.993			
		.000	-.019	-.464				
		.500	-.019	-.474				
		.500			-2.993			
	3	.000			.377			
		.000	-.894	2.749				
		.500	-.894	2.302				
		.500			.377			
	4	.000			.084			
		.000	-.199	.611				
		.500	-.199	.512				
		.500			.084			
	5	.000			1.002			
		.000	-1.699	4.744				
		.500	-1.699	3.894				

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MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500			1.002			
32								
	1	.000			-.320			
		.000	-3.006	3.367				
		.500	-2.256	2.052				
		.500			-.320			
	2	.000			-2.993			
		.000	-.032	-.474				
		.500	-.032	-.490				
		.500			-2.993			
	3	.000			.377			
		.000	-1.821	2.302				
		.500	-1.821	1.392				
		.500			.377			
	4	.000			.084			
		.000	-.405	.512				
		.500	-.405	.309				
		.500			.084			
	5	.000			1.002			
		.000	-2.959	3.894				
		.500	-2.959	2.415				
		.500			1.002			
33								
	1	.000			-.320			
		.000	-4.791	2.052				
		.500	-4.041	-.156				
		.500			-.320			
	2	.000			-2.993			
		.000	-.036	-.490				
		.500	-.036	-.508				
		.500			-2.993			
	3	.000			.377			
		.000	-2.800	1.392				
		.500	-2.800	-.009				
		.500			.377			
	4	.000			.084			
		.000	-.622	.309				
		.500	-.622	-.002				
		.500			.084			
	5	.000			1.002			
		.000	-4.309	2.415				

MARCO DE 2.5*5 CANAL ESTRIBO 1.CON EMP LATL.MUEL EN SOLERA.

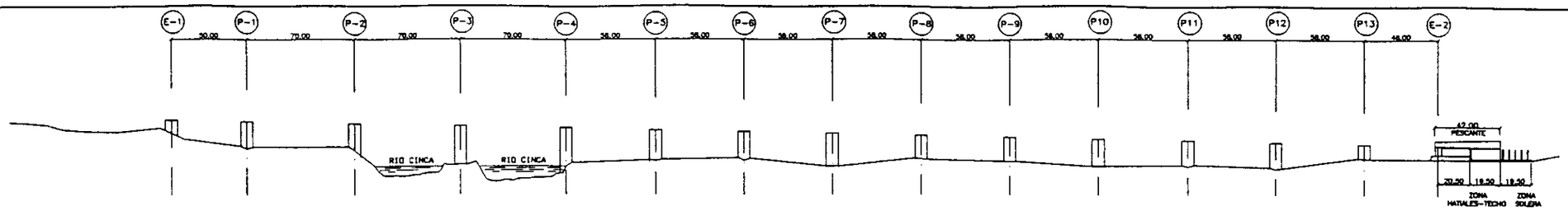
F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
		.500	-4.309	.260				
		.500			1.002			
34								
	1	.000			-.320			
		.000	-6.664	-.156				
		.500	-5.914	-3.301				
		.500			-.320			
	2	.000			-2.993			
		.000	-.027	-.508				
		.500	-.027	-.521				
		.500			-2.993			
	3	.000			.377			
		.000	-3.843	-.009				
		.500	-3.843	-1.930				
		.500			.377			
	4	.000			.084			
		.000	-.854	-.002				
		.500	-.854	-.429				
		.500			.084			
	5	.000			1.002			
		.000	-5.768	.260				
		.500	-5.768	-2.624				
		.500			1.002			

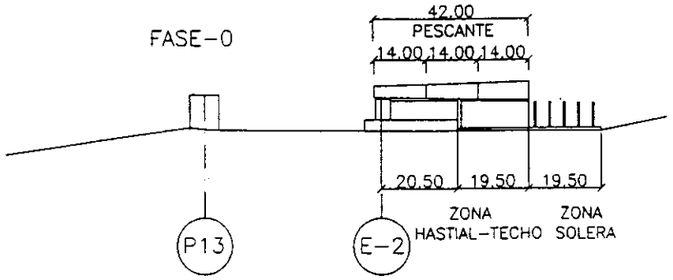
5. Proceso constructivo

5. PROCESO CONSTRUCTIVO

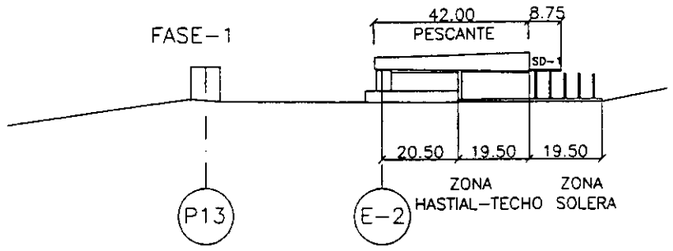
El “Proceso Constructivo” del Viaducto está recogido en los planos que se acompañan a continuación.



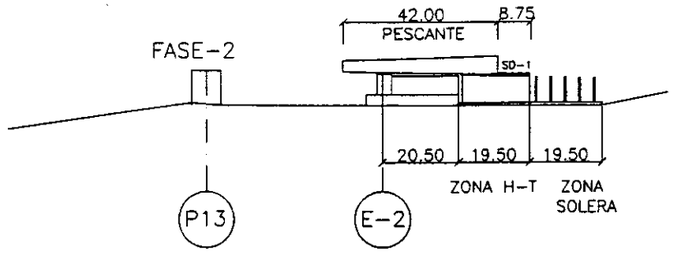
FASE-0



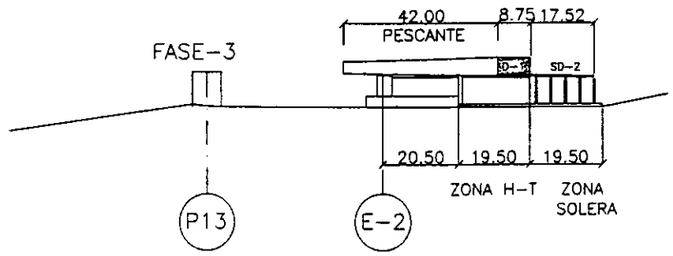
FASE-1



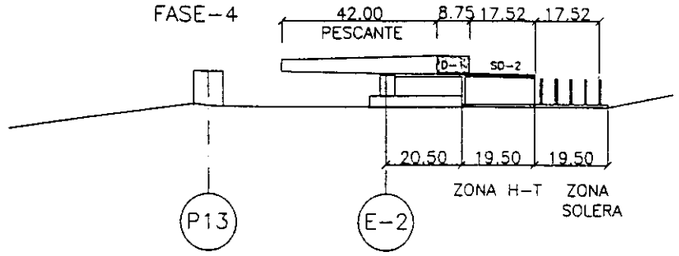
FASE-2



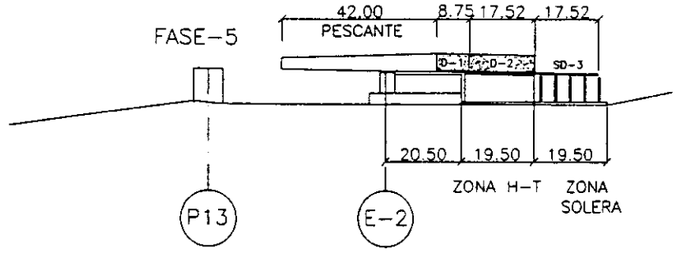
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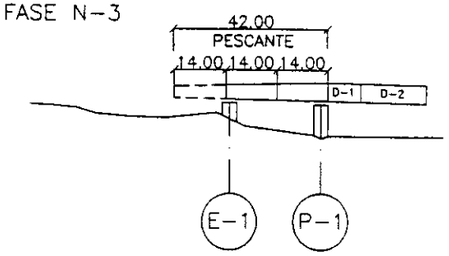
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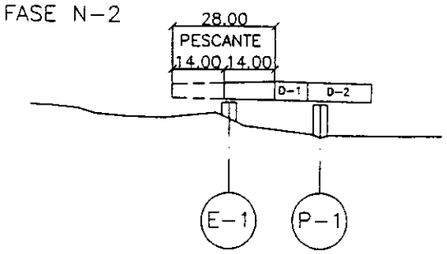
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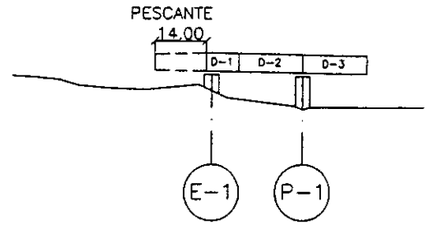
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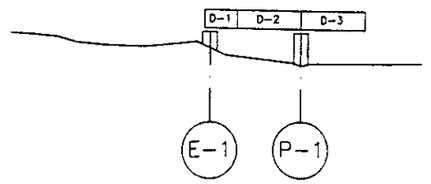
FASE N-2



FASE N-1



FASE N



FASE-0
PREPARACION Y NIVELACION DE LA ZONA DE LANZAMIENTO
SEGUN LA PROLONGACION DE PLANTA Y RASANTE DE EMPUJE.
MONTAJE DEL PESCANTE.

FASE-1
EJECUCION DE LA SOLERA DE LA DOVELA-1.

FASE-2
TESADO DE LOS CABLES UNION SOLERA D-1 Y PESCANTE.
EMPUJE DEL CONJUNTO (8.75 m).

FASE-3
EJECUCION DE LA SOLERA DE LA DOVELA-2
Y HASTIALES-TECHO DOVELA-1.

FASE-4
TESADO DE LOS CABLES UNION TECHO D-1 Y PESCANTE.
TESADO DE LOS CABLES SOLERA D-2.
EMPUJE DEL CONJUNTO (17.52 m).

FASE-5
EJECUCION DE LA SOLERA DE LA DOVELA-3
Y HASTIALES-TECHO DOVELA-2.
EL CICLO SE REPITE SUCESIVAMENTE.

FASE N-3
PASO DEL 1° TRAMO DEL PESCANTE (14 m) POR LOS APOYOS
PROV. DEL E-1 Y DESMONTAJE DEL MISMO.

FASE N-2
PASO DEL 2° TRAMO DEL PESCANTE (14 m) POR LOS APOYOS
PROV. DEL E-1 Y DESMONTAJE DEL MISMO.

FASE N-1
ULTIMO EMPUJE.
PASO DEL 3° TRAMO DEL PESCANTE (14 m) POR LOS APOYOS
PROV. DEL E-1 Y DESMONTAJE DEL MISMO.

FASE N
SUSTITUCION APOYOS PROVISIONALES POR DEFINITIVOS.
ENFILADO Y TESADO DE PRETENSADO DE 2° FASE.
TERMINO DE ESTRIBOS Y PRETENSADO UNION PUENTE-ESTRIBO-2.
ACABADOS.

GIF
Gestor de Infraestructuras Ferroviarias

TITULO:
PROYECTO CONSTRUIDO
MODIFICADO N° 1. LINEA DE ALTA VELOCIDAD
MADRID - BARCELONA - FRONTERA FRANCESA
TRAMO: ZARAGOZA - LLEIDA
PUENTE SOBRE EL RIO CINCA

CINCA U.T.E.
EL GERENTE:
IGNACIO BUSTURIA

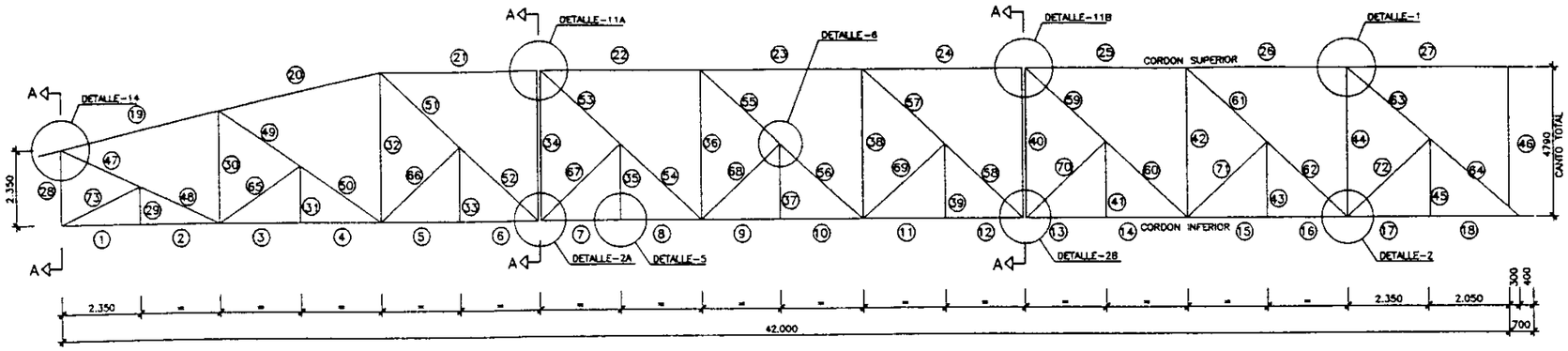
EL ING. AUTOR DEL PROYECTO CONSTRUIDO:

ESCALAS:
SIN ESCALA
NUMERICA
GRAFICA

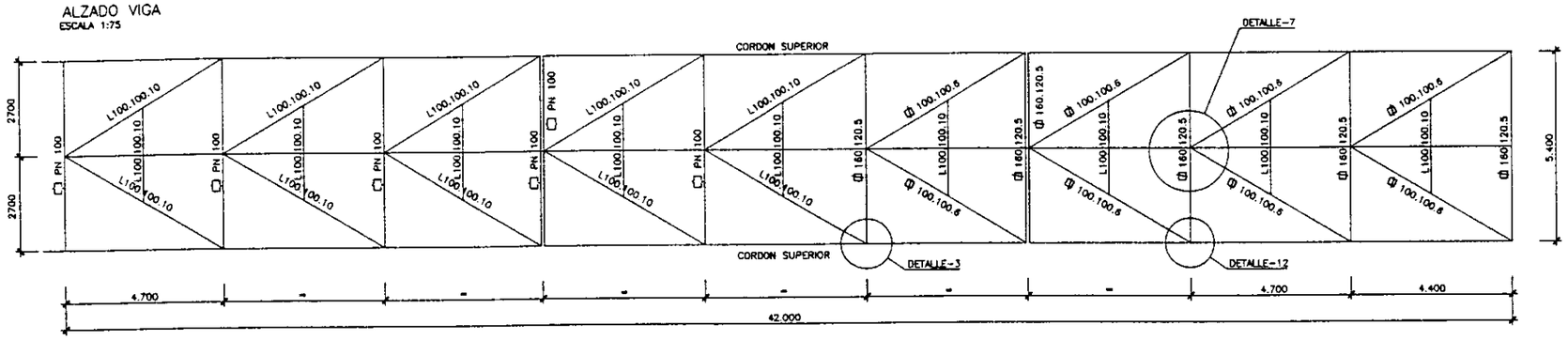
FECHA:
JULIO 1.999

N° DEL PLANO:
C-7
N° DE HOJA:
1 de 2

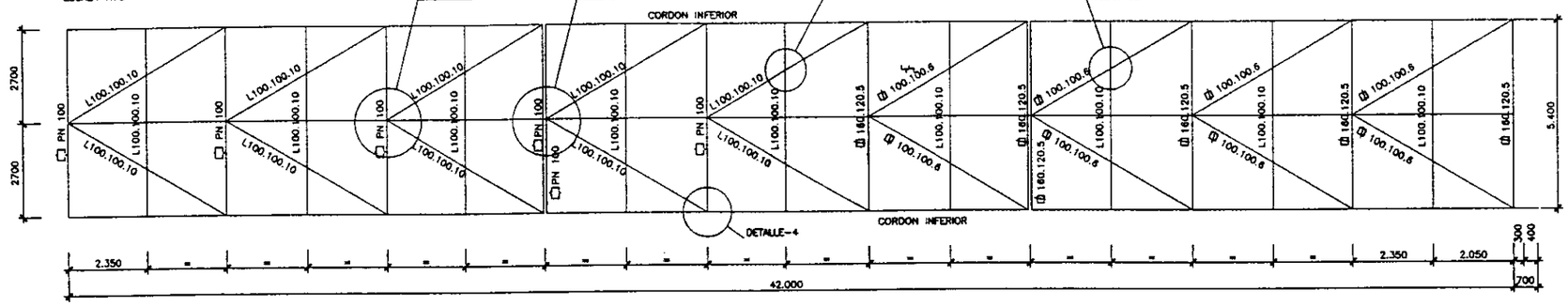
TITULO DEL PLANO:
PROCESO CONSTRUCTIVO TABLERO



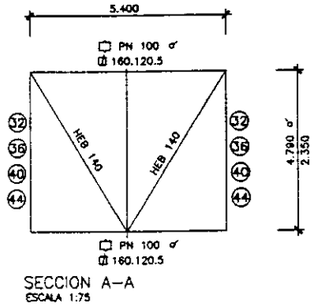
ALZADO VIGA
ESCALA 1:75



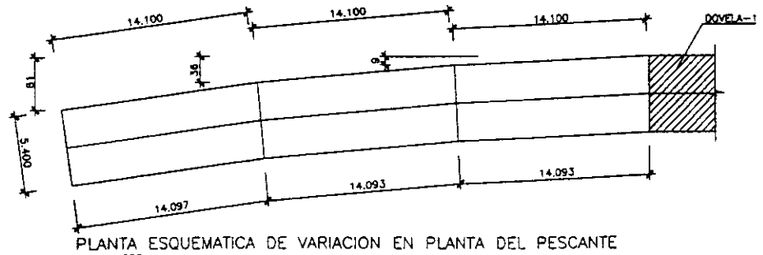
PLANTA SUPERIOR
ESCALA 1:75



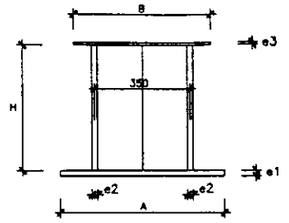
PLANTA INFERIOR
ESCALA 1:75



SECCION A-A
ESCALA 1:75



PLANTA ESQUEMATICA DE VARIACION EN PLANTA DEL PESCANTE
ESCALA 1:200



CUADRO DE BARRAS (CORDONES SUP. E INF.)

BARRA	DIMENSIONES					
	A	e1	e2	H	B	e3
1	600	20	10	400	500	10
2	600	20	10	400	500	10
3	600	20	12	400	500	10
4	600	20	12	400	500	10
5	600	25	15	450	500	10
6	600	25	15	450	500	10
7	600	30	15	450	500	12
8	600	30	15	450	500	12
9	600	35	18	500	500	12
10	600	35	18	500	500	12
11	600	40	22	500	500	15
12	600	40	22	500	500	15
13	600	40	25	550	500	15
14	600	40	25	550	500	15
15	600	45	30	600	500	15
16	600	45	30	600	500	15
17 *	600	50	30	600	500	20
18 *	600	50	30	600	500	20
19	400	10	10	300	400	10
20	400	10	10	300	400	10
21	400	10	10	300	400	10
22	450	10	10	350	450	10
23	450	10	10	350	450	10
24	500	12	12	450	500	12
25	500	15	15	500	500	15
26	500	18	18	500	500	18
27 *	550	20	20	500	550	20

* VER TRANSICION DE BARRAS 17,18 y 27, EN ZONA DE ANCLAJES

CUADRO DE BARRAS (MONTANTES Y DIAGONALES)

BARRA	PERFIL METALICO + PLATABANDAS
28	2[]PN-120
29	2[]PN-120
30	2[]PN-140
31	2[]PN-120
32	2[]PN-220
33	2[]PN-120
34	2x2[]PN-300
35	2[]PN-160
36	HEB-300
37	2[]PN-180
38	HEB-300
39	2[]PN-200
40	2x2[]PN-300
41	2[]PN-240
42	HEB-300 + 2x250x20
43	2[]PN-260
44	HEB-300 + 2x350x20
45	HEB-300
46	HEB-180
47-48	2[]PN-120
49-50	2[]PN-160
51-52	2[]PN-200
53-54	2[]PN-280
55-56	HEB-300
57-58	HEB-300 + 2x250x10
59-60	HEB-300 + 2x250x20
61-62	HEB-300 + 2x350x20
63-64	HEB-300 + 2x300x30
65	2[]PN-120
66	2[]PN-120
67	2[]PN-120
68	2[]PN-180
69	2[]PN-180
70	2[]PN-220
71	2[]PN-220
72	2[]PN-260
73	2[]PN-120

GIF Gestor de Infraestructuras Ferroviarias

TITULO: PROYECTO CONSTRUIDO MODIFICADO Nº 1. LINEA DE ALTA VELOCIDAD MADRID - BARCELONA - FRONTERA FRANCESA TRAMO: ZARAGOZA - LLEIDA PUENTE SOBRE EL RIO CINCA

CINCA U.T.E. EL GERENTE: IGNACIO BUSTURIA

EL ING. AUTOR DEL PROYECTO CONSTRUIDO:

ESCALAS: SIN ESCALA NUMERICA GRAFICA

FECHA: JULIO 1.999

Nº DEL PLANO: C-7

Nº DE HOJA: 2 de 2

TITULO DEL PLANO: NARIZ DE EMPUJE

6. Resumen del control de calidad

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/01/98 Nº Hoja de Control: 1

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
1-2-3	15	2	2	15/01/98
2 3-4	4	4	2	27/01/98

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
1-3	2%	15/01/98
3-5	2%	27/01/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm.

Punto/Fecha	7/01/98	14/01/98	29/01/98
1 Dcha/Izda.	0-1	1-1	1-1
2 Dcha/Izda.	1-2	1-0	1-0
3 Dcha/Izda.	1-0	1-1	0-0
4 Dcha/Izda.	1-1	0-2	1-1
5 Dcha/Izda.	1-1	1-0	1 0

PARQUE DE DOVELAS — Diferencia a origen en mm.

Punto/Fecha	7/01/98	14/01/98	29/01/98
1 Dcha/Izda.	1-1	1-0	1 0
2 Dcha/Izda.	- -	- -	
3 Dcha/Izda.	0-1	1	1 0
4 Dcha/Izda.	0-1	0-1	1 0
5 Dcha/Izda.	1-1	1-0	1-1
6 Dcha/Izda.	1-1	1-0	- 1
7 Dcha/Izda.	1-1	0-0	- 1
8 Dcha/Izda.	- -	1-0	1

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dif en mm.	Pila nº	Cabe./Patin I / D
13	1-2/2 1		6	
12			5	
11			4	
10			3	
9			2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.		Nº de Pila	Ver / Asent.
13	O.K. / 0		6	
12			5	
11			4	
10			3	
9			2	
8			1	
7				

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 27/02/98 Nº Hoja de Control: 2

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
1-2-3	15	2	2	15/01/98
2-3-4	4	4	2	27/01/98
4-5 6	4	1	4	10/02/98
5-6-7	1	4	0	24/02/98

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
1-3	2%	15/01/98
3-5	2%	27/01/98
2-4 6	2%	17/02/98
3-5-7	2%	24/02/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm.

Punto/Fecha	4/02/98	17/02/98	24/02/98
1 Dcha/Izda.	1/1	1/0	1/1
2 Dcha/Izda.	1/1	1/1	1/1
3 Dcha/Izda.	1/1	1/1	0/1
4 Dcha/Izda.	1/1	0/1	1/0
5 Dcha/Izda.	1/1	1/1	1/1

PARQUE DE DOVELAS — Diferencia a origen en mm.

Punto/Fecha	4/02/98	17/02/98	24/02/98
1 Dcha/Izda.	1/1	1/1	- -
2 Dcha/Izda.	- -	- -	/0
3 Dcha/Izda.	1/-	0/-	0/0
4 Dcha/Izda.	0/0	2/1	1/1
5 Dcha/Izda.	1/1	1/0	2/-
6 Dcha/Izda	1/1	1/1	1/1
7 Dcha/Izda.	0/1	1/1	1/1
8 Dcha/Izda.	1/-	-/1	0/

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dif en mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	
12			5	
11			4	
10			3	
9			2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K. / 1	27/02/98	6	
12			5	
11			4	
10			3	
9			2	
8			1	
7				

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/03/98 Nº Hoja de Control: 3

Comprobación de la Geometria del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
2-3-4	4	4	2	27/01/98
4-5-6	4	1	4	10/02/98
5-6-7	1	4	0	24/02/98
6-7-8	6	4	8	4/03/98
7-8-9	4	2	4	11/03/98
8-9-10	1	4	2	24/03/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
1-3	2%	15/01/98
3-5	2%	27/01/98
2-4-6	2%	17/02/98
3-5-7	2%	24/02/98
2-5-7	2%	4/03/98
2-5-8	2%	16/03/98
3-6-9	2%	24/03/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS Punto/Fecha	4/03/98	Diferencia a origen en mm 19/03/98	24/03/98
1 Dcha/Izda.	2/1	0/2	0/2
2 Dcha/Izda.	0/2	1/1	1/1
3 Dcha/Izda.	1/0	2/2	2/2
4 Dcha/Izda.	0/1	1/1	1/1
5 Dcha/Izda.	1/0	0/2	0/2

PARQUE DE DOVELAS Punto/Fecha	4/03/98	Diferencia a origen en mm 16/03/98	19/03/98	24/03/98
1 Dcha/Izda.	-/-	-/-	-/-	1/2
2 Dcha/Izda.	-/-	-/-	/	-/-
3 Dcha/Izda.	1/1	2/1	1/1	1/1
4 Dcha/Izda.	0/1	1/0	1/0	2/1
5 Dcha/Izda.	1/1	1/1	0/1	1/2
6 Dcha/Izda.	0/1	2/1	1/1	0/1
7 Dcha/Izda.	1/1	1/1	1/1	1/2
8 Dcha/Izda.	1/-	1/-	1/-	1/-

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dif en mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	
12	4-4/1-5		5	
11			4	
10			3	
9			2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K. / 1	27/02/98	6	
12	O.K. / 1	27/02/98	5	
11			4	
10			3	
9			2	
8			1	
7				

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 30/04/98 Nº Hoja de Control: 4

Comprobación de la Geometria del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
6-7-8	6	4	8	4/03/98
7-8-9	4	2	4	11/03/98
8-9-10	1	4	2	24/03/98
8-9-10	2	1	0	2/04/98
9-10-11	2	3	5	16/04/98
10-11-12	2	1	5	24/04/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
3-5-7	2%	24/02/98
2-5-7	2%	4/03/98
2-5-8	2%	16/03/98
3-6-9	2%	24/03/98
3-6-10	2%	2/04/98
3-7-11	2%	16/04/98
4-8-12	2%	24/04/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS Punto/Fecha	2/04/98	Diferencia a origen en mm 15/04/98	27/04/98
1 Dcha/Izda.	0/1	1/1	1/1
2 Dcha/Izda.	0/0	1/1	2/1
3 Dcha/Izda	2/1	2/1	1/1
4 Dcha/Izda.	2/1	1/1	1/0
5 Dcha/Izda.	2/1	1/1	1/2

PARQUE DE DOVELAS Punto/Fecha	2/04/98	Diferencia a origen en mm. 15/04/98	27/04/98
1 Dcha/Izda.	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-
3 Dcha/Izda	0/0	1/1	1/1
4 Dcha/Izda.	1/0	1/1	1/1
5 Dcha/Izda.	1/1	1/1	1/1
6 Dcha/Izda.	0/2	1/0	0/1
7 Dcha/Izda.	1/1	1/1	1/1
8 Dcha/Izda.	-/-	-/-	2/0

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dif en mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	
12	4-4/1-5		5	
11	4-4/4-5		4	
10			3	
9			2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K. / 1	27/02/98	6	
12	O.K. / 1	24/03/98	5	
11	O.K. / 0	27/04/98	4	
10			3	
9			2	
8			1	
7				

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/05/98 Nº Hoja de Control: 5

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
8-9-10	2	1	0	2/04/98
9-10-11	2	3	5	16/04/98
10-11-12	2	1	5	24/04/98
11-12-13	0	3	5	8/05/98
12-13-14	1	3	7	19/05/98
13-14-15	3	3	2	27/05/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
3-6-9	2%	24/03/98
3-6-10	2%	2/04/98
3-7-11	2%	16/04/98
4-8-12	2%	24/04/98
3-6-13	2%	8/05/98
4-8-14	2%	19/05/98
5-9-15	2%	27/05/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS Punto/Fecha	8/05/98	19/05/98	27/05/98
1 Dcha/Izda.	2/1	2/2	1/1
2 Dcha/Izda.	1/1	1/1	1/1
3 Dcha/Izda	1/0	1/2	1/0
4 Dcha/Izda.	1/1	2/1	0/1
5 Dcha/Izda.	1/2	0/2	1/1

PARQUE DE DOVELAS Punto/Fecha	8/05/98	19/05/98	27/05/98
1 Dcha/Izda.	-/-	-/-	-/-
2 Dcha/Izda	-/-	-/-	-/-
3 Dcha/Izda.	1/1	2/1	1/1
4 Dcha/Izda.	1/1	1/1	1/0
5 Dcha/Izda.	1/1	1/1	1/1
6 Dcha/Izda	1/2	1/0	1/1
7 Dcha/Izda.	1/1	1/1	1/1
8 Dcha/Izda	1/1	2/-	2/-

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dif en mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	
12	4-4/1-5		5	
11	4-4/4-5		4	
10	4-5/4-5		3	
9			2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K. / 2	27/05/98	6	
12	O.K. / 1	27/05/98	5	
11	O.K. / 1	27/05/98	4	
10	O.K. / 0	27/05/98	3	
9			2	
8			1	
7				

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 30/06/98 Nº Hoja de Control: 6

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
10-11-12	1	3	7	19/05/98
11-12-13	3	3	2	27/05/98
12-13-14	0	3	7	3/06/98
13-14-15	5	2	1	15/06/98
14-15-16	4	4	1	23/06/98
15-16-17	4	4	2	30/06/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
3-6-13	2,006%	8/05/98
4-8-14	2,017%	19/05/98
5-9-15	2,021%	27/05/98
2-9-16	2,004%	3/06/98
2-10-17	2,023%	15/06/98
2-10-18	2,021%	23/06/98
2-10-19	2,023%	30/06/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS Punto/Fecha	3/06/98	15/06/98	23/06/98	30/06/98
1 Dcha/Izda.	1/2	1/1	2/1	1/1
2 Dcha/Izda.	1/2	1/2	1/0	1/1
3 Dcha/Izda.	1/1	1/2	1/1	1/0
4 Dcha/Izda.	1/1	1/1	1/1	2/1
5 Dcha/Izda.	1/1	1/1	0/1	2/1

PARQUE DE DOVELAS Punto/Fecha	3/06/98	15/06/98	23/06/98	30/06/98
1 Dcha/Izda.	-/-	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-	
3 Dcha/Izda.	2/0	2/2	2/2	0/1
4 Dcha/Izda.	2/2	0/1	1/1	1/2
5 Dcha/Izda.	1/1	1/1	1/1	0/0
6 Dcha/Izda.	1/0	2/1	2/1	2/1
7 Dcha/Izda.	2/1	1/1	1/3	2/1
8 Dcha/Izda.	1/-	1/0	1/-	1/0

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	
12	4-4/1-5		5	
11	4-4/4-5		4	
10	4-5/4-5		3	
9	1-1/2-2		2	
8			1	

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 2	30/06/98	6	
12	O.K / 2	30/06/98	5	
11	O.K / 5	30/06/98	4	
10	O.K / 2	30/06/98	3	
9	O.K / 0	30/06/98	2	
8			1	
7				

S.G.S. Tecnos S.A.	OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA TRAMO: PUENTE SOBRE EL RIO CINCA FECHA: 31/07/98 Nº Hoja de Control: 7				
Comprobación de la Geometría del Tablero en Planta	DOVELA Numero	PUNTO 1 Dif. en mm	PUNTO 2 Dif. en mm	PUNTO 3 Dif. en mm	Fecha
	13-14-15	5	2	1	15/06/98
	14-15-16	4	4	1	23/06/98
	15-16-17	4	4	2	30/06/98
	16-17-18	1	4	5	14/07/98
	17-18-19	3	4	4	21/07/98
	18-19-20	1	4	1	28/08/98
Comprobacion de la Geometria del tablero en Alzado	DOVELA NUMERO		PENDIENTE		Fecha
	2-9-16		2,004%		3/06/98
	2-10-17		2,023%		15/06/98
	2-10-18		2,021%		23/06/98
	2-10-19		2,023%		30/06/98
	2-12-20		2,013%		14/07/98
	2-12-21		2,016%		21/07/98
	2-8-14-22		2,015%		28/07/98
Asentamiento del Parque de Fabricación	PARQUE DE SOLERAS		Diferencia a origen en mm		
	Punto/Fecha	14/07/98	21/07/98	28/07/98	
	1 Dcha/Izda.	2/2	2/1	1/1	
	2 Dcha/Izda.	2/2	1/2	2/1	
	3 Dcha/Izda.	2/2	1/1	2/2	
	4 Dcha/Izda.	4/2	1/2	1/2	
	5 Dcha/Izda.	2/2	1/2	2/2	
	PARQUE DE DOVELAS		Diferencia a origen en mm		
	Punto/Fecha	14/07/98	21/07/98	28/07/98	
	1 Dcha/Izda.	-/-	-/-	-/-	
	2 Dcha/Izda.	-/-	-/-	-/-	
	3 Dcha/Izda.	2/1	1/1	2/2	
	4 Dcha/Izda.	2/2	2/1	2/2	
	5 Dcha/Izda.	1/1	1/1	1/1	
	6 Dcha/Izda.	1/0	2/1	2/3	
	7 Dcha/Izda.	1/1	0/2	1/1	
	8 Dcha/Izda.	2/2	1/2	1/0	
Nivelacion de la cabeza de Pilas	Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
	13	1-2/2-1		6	
	12	4-4/1-5		5	
	11	4-4/4-5		4	
	10	4-5/4-5		3	
	9	1-1/2-2		2	
	8	6-5/5-5		1	
Verticalidad y Asentamiento de Pilas	Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
	13	O K / 2	31/07/98	6	
	12	O K / 2	31/07/98	5	
	11	O K / 7	31/07/98	4	
	10	O K / 7	31/07/98	3	
	9	O K / 7	31/07/98	2	
	8	O K / 0	31/07/98	1	
	7				

S.G.S. Tecnos S.A.	OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA TRAMO: PUENTE SOBRE EL RIO CINCA FECHA: 31/08/98 Nº Hoja de Control: 8				
Comprobación de la Geometría del Tablero en Planta	DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
	17-18-19	3	4	4	21/07/98
	18-19-20	1	4	1	28/08/98
	19-20-21	0	3	2	4/08/98
	20-21-22	1	4	3	18/08/98
	21-22-23	4	1	8	25/08/98
	22-23-24	3	5	3	31/08/98
Comprobacion de la Geometria del tablero en Alzado	DOVELA NUMERO		PENDIENTE		Fecha
	2-12-20		2,013%		14/07/98
	2-12-21		2,016%		21/07/98
	2-8-14-22		2,015%		28/07/98
	2-10-18-23		2,013%		4/08/98
	2-10-18-24		2,015%		18/08/98
	2-10-18-25		2,009%		25/08/98
	2-10-18-20		2,013%		31/08/98
Asentamiento del Parque de Fabricación	PARQUE DE SOLERAS		Diferencia a origen en mm.		
	Punto/Fecha	4/08/98	18/08/98	25/08/98	31/08/98
	1 Dcha/Izda.	0/1	2/2	2/0	1/2
	2 Dcha/Izda.	2/2	2/1	2/2	1/2
	3 Dcha/Izda.	1/2	1/1	2/1	0/2
	4 Dcha/Izda.	1/2	1/2	1/1	1/2
	5 Dcha/Izda.	2/1	0/1	1/3	2/2
	PARQUE DE DOVELAS		Diferencia a origen en mm.		
	Punto/Fecha	4/08/98	18/08/98	25/08/98	31/08/98
	1 Dcha/Izda.	-/-	-/-	-/-	-/-
	2 Dcha/Izda.	-/-	-/-	-/-	/
	3 Dcha/Izda.	2/2	2/2	1/2	2/0
	4 Dcha/Izda.	1/2	3/2	1/2	2/2
	5 Dcha/Izda.	1/1	2/0	2/1	1/2
	6 Dcha/Izda.	2/2	2/0	2/2	2/2
	7 Dcha/Izda.	2/2	2/1	0/3	2/3
	8 Dcha/Izda.	1/2	2/2	2/2	2/2
Nivelacion de la cabeza de Pilas	Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
	13	1-2/2-1		6	
	12	4-4/1-5		5	
	11	4-4/4-5		4	
	10	4-5/4-5		3	
	9	1-1/2-2		2	
	8	6-5/5-5		1	
	7	5-5/4-5			
Verticalidad y Asentamiento de Pilas	Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
	13	O K / 2	31/08/98	6	
	12	O K / 3	31/08/98	5	
	11	O K / 7	31/08/98	4	
	10	O K / 7	31/08/98	3	
	9	O K / 6	31/08/98	2	
	8	O K / 4	31/08/98	1	
	7	O K / 1	31/08/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 30/09/98 Nº Hoja de Control: 9

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
21-22-23	4	1	8	25/08/98
22-23-24	3	5	3	31/08/98
23-24-25	2	4	5	8/09/98
24-25-26	4	3	4	15/09/98
25-26-27	2	5	5	22/09/98
26-27-28	4	4	6	29/09/98

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-10-18-24	2.015%	18/08/98
2-10-18-25	2.009%	25/08/98
2-10-18-26	2.013%	31/08/98
2-10-18-27	2.018%	8/09/98
2-10-19-28	2.004%	15/09/98
2-10-20-29	2.011%	22/09/98
2-10-20-30	1.997%	29/09/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm.

Punto/Fecha	8/09/98	15/09/98	22/09/98	29/09/98
1 Dcha/Izda.	2/2	2/2	1/2	2/1
2 Dcha/Izda.	1/2	2/3	2/3	2/2
3 Dcha/Izda.	1/2	2/2	1/1	3/2
4 Dcha/Izda.	2/2	1/3	2/1	3/2
5 Dcha/Izda.	2/2	3/1	1/2	3/2

PARQUE DE DOVELAS — Diferencia a origen en mm.

Punto/Fecha	8/09/98	15/09/98	22/09/98	29/09/98
1 Dcha/Izda.	-/-	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-	-/-
3 Dcha/Izda	1/1	1/2	2/1	3/2
4 Dcha/Izda.	1/3	1/1	1/1	2/2
5 Dcha/Izda.	0/1	2/3	2/0	2/2
6 Dcha/Izda.	2/2	2/2	1/2	0/3
7 Dcha/Izda.	2/1	2/2	2/1	2/3
8 Dcha/Izda.	3/2	1/2	1/2	2/2

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Difc. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	
10	4-5/4-5		3	
9	1-1/2-2		2	
8	6-5/5-5		1	
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 2	30/09/98	6	O.K / 3
12	O.K / 3	30/09/98	5	O.K / 0
11	O.K / 7	30/09/98	4	
10	O.K / 7	30/09/98	3	
9	O.K / 6	30/09/98	2	
8	O.K / 4	30/09/98	1	
7	O.K / 1	30/09/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/10/98 Nº Hoja de Control: 10

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
25-26-27	2	5	5	22/09/98
26-27-28	4	4	6	29/09/98
27-28-29	3	4	1	8/10/98
28-29-30	3	3	6	14/10/98
29-30-31	7	2	4	20/10/98
30-31-32	4	3	6	27/10/98

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-10-19-28	2,004%	15/09/98
2-10-20-29	2,011%	22/09/98
2-10-20-30	1,997%	29/09/98
2-11-21-31	2,019%	8/10/98
2-10-20-32	2,007%	14/10/98
3-13-23-33	2,014%	20/10/98
4-14-24-34	2,017%	27/10/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm.

Punto/Fecha	8/10/98	14/10/98	20/10/98	27/10/98
1 Dcha/Izda.	2/2	2/2	2/2	2/2
2 Dcha/Izda.	2/2	2/2	2/1	2/2
3 Dcha/Izda.	3/2	2/1	0/2	2/2
4 Dcha/Izda.	1/2	1/2	2/2	3/2
5 Dcha/Izda.	1/1	1/2	2/1	1/2

PARQUE DE DOVELAS — Diferencia a origen en mm.

Punto/Fecha	8/10/98	14/10/98	20/10/98	28/10/98
1 Dcha/Izda.	-/-	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-	-/-
3 Dcha/Izda.	1/2	2/1	3/2	1/2
4 Dcha/Izda.	1/2	1/2	2/2	2/2
5 Dcha/Izda.	2/3	2/2	2/2	2/1
6 Dcha/Izda.	2/2	2/2	2/2	2/2
7 Dcha/Izda.	2/3	3/2	2/1	2/2
8 Dcha/Izda.	2/2	2/2	2/2	2/2

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Difc. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	5-4/5-5
10	4-5/4-5		3	
9	1-1/2-2		2	
8	6-5/5-5		1	
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 3	31/10/98	6	O.K / 5
12	O.K / 3	31/10/98	5	O.K / 2
11	O.K / 7	31/10/98	4	O.K / 1
10	O.K / 7	31/10/98	3	
9	O.K / 6	31/10/98	2	
7	O.K / 4	31/10/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/11/98 Nº Hoja de Control: 11

Comprobación de la Geometria del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
29-30-31	7	2	4	20/10/98
30-31-32	4	3	6	27/10/98
31-32-33	7	1	1	6/11/98
32-33-34	4	3	5	10/11/98
33-34-35	5	6	3	17/11/98
34-35-36	8	3	1	24/11/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-10-20-32	2.007%	14/10/98
3-13-23-33	2.014%	20/10/98
4-14-24-34	2.017%	27/10/98
5-15-25-35	2.017%	6/11/98
2-6-16-26-36	2.010%	10/11/98
2-7-17-27-37	2.008%	17/11/98
2-8-18-28-38	2.007%	24/11/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm

Punto/Fecha	6/11/98	10/11/98	17/10/98	24/11/98
1 Dcha/Izda.	1/1	2/2	1/2	1/0
2 Dcha/Izda.	1/1	2/2	2/3	0/1
3 Dcha/Izda.	2/2	2/2	1/1	1/2
4 Dcha/Izda.	2/1	1/1	2/1	2/0
5 Dcha/Izda.	2/2	2/2	1/2	1/1

PARQUE DE DOVELAS — Diferencia a origen en mm.

Punto/Fecha	6/11/98	10/11/98	17/11/98	24/11/98
1 Dcha/Izda.	-/-	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-	-/-
3 Dcha/Izda.	1/1	2/2	2/1	1/2
4 Dcha/Izda.	1/2	2/2	1/1	0/1
5 Dcha/Izda.	1/1	2/3	2/0	2/1
6 Dcha/Izda.	1/2	1/0	1/2	1/0
7 Dcha/Izda.	2/1	2/1	2/1	1/0
8 Dcha/Izda.	3/2	3/2	1/2	1/3

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	5-4/5-5
10	4-5/4-5		3	4-5/5-5
9	1-1/2-2		2	
8	6-5/5-5		1	
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 3	31/10/98	6	O.K / 5
12	O.K / 3	31/10/98	5	O.K / 3
11	O.K / 7	31/10/98	4	O.K / 3
10	O.K / 7	31/10/98	3	O.K / 0
9	O.K / 6	31/10/98	2	
8	O.K / 6	31/10/98	1	
7	O.K / 5	31/10/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/12/98 Nº Hoja de Control: 12

Comprobación de la Geometria del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
35-36-37	5	6	3	17/11/98
36-37-38	8	3	1	24/11/98
37-38-39	5	0	3	1/12/98
38-39-40	6	2	3	7/12/98
39-40-41	7	4	1	15/12/98
40-41-42	6	4	6	22/12/98

Comprobacion de la Geometria del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-6-16-26-36	2.010%	10/11/98
2-7-17-27-37	2.008%	17/11/98
2-8-18-28-38	2.007%	24/11/98
2-9-19-29-39	2.012%	1/12/98
2-10-20-30-40	2.010%	7/12/98
2-11-21-31-40	2.011%	15/12/98
2-12-22-32-42	2.008%	22/12/98

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm

Punto/Fecha	1/12/98	7/12/98	15/12/98	22/12/98
1 Dcha/Izda.	2/2	2/1	2/2	2/2
2 Dcha/Izda.	2/2	3/2	2/2	2/2
3 Dcha/Izda.	3/2	1/1	1/3	1/1
4 Dcha/Izda.	1/2	2/1	3/1	2/2
5 Dcha/Izda.	1/1	2/2	1/1	2/2

PARQUE DE DOVELAS — Diferencia a origen en mm

Punto/Fecha	1/12/98	7/12/98	15/12/98	22/12/98
1 Dcha/Izda.	-/-	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-	-/-
3 Dcha/Izda.	1/2	3/0	2/1	2/3
4 Dcha/Izda.	1/2	2/2	2/2	2/2
5 Dcha/Izda.	2/3	2/0	2/3	2/2
6 Dcha/Izda.	2/2	3/0	2/2	3/2
7 Dcha/Izda.	2/3	3/1	3/0	3/3
8 Dcha/Izda.	2/2	2/1	2/2	2/2

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	5-4/5-5
10	4-5/4-5		3	4-5/5-5
9	1-1/2-2		2	5-6/4-5
8	6-5/5-5		1	
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 3	31/12/98	6	O.K / 5
12	O.K / 3	31/12/98	5	O.K / 4
11	O.K / 6	31/12/98	4	O.K / 4
10	O.K / 7	31/12/98	3	O.K / 4
9	O.K / 6	31/12/98	2	O.K / 1
8	O.K / 6	31/12/98	1	
7	O.K / 6	31/12/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 31/01/99 Nº Hoja de Control: 13

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
38-39-40	6	2	3	7/12/98
39-40-41	7	4	1	15/12/98
40-41-42	6	4	6	22/12/98
41-42-43	3	2	2	12/01/99
42-43-44	4	0	5	20/01/99
43-44-45	4	6	1	26/01/99

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-9-19-29-39	2,012%	1/12/98
2-10-20-30-40	2,010%	7/12/98
2-11-21-31-40	2,011%	15/12/98
2-12-22-32-42	2,008%	22/12/98
4-14-24-34-44	2,013%	12/01/99
2-15-25-35-45	2,007%	20/01/99
2-16-26-36-46	2,010%	26/01/99

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm

Punto/Fecha	12/01/99	20/01/99	26/01/99
1 Dcha/Izda.	2/1	2/2	2/2
2 Dcha/Izda.	2/2	1/1	1/2
3 Dcha/Izda.	2/2	1/1	2/2
4 Dcha/Izda.	2/1	2/2	1/2
5 Dcha/Izda.	1/2	1/1	2/2

PARQUE DE DOVELAS — Diferencia a origen en mm

Punto/Fecha	12/01/99	20/01/99	26/01/99
1 Dcha/Izda.	-/-	-/-	-/-
2 Dcha/Izda.	-/-	-/-	-/-
3 Dcha/Izda.	2/2	1/1	1/3
4 Dcha/Izda.	1/3	2/2	2/2
5 Dcha/Izda.	2/2	1/1	2/2
6 Dcha/Izda.	2/2	2/2	1/1
7 Dcha/Izda.	1/1	2/1	2/2
8 Dcha/Izda.	2/1	1/2	1/1

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	5-4/5-5
10	4-5/4-5		3	4-5/5-5
9	1-1/2-2		2	5-6/4-5
8	6-5/5-5		1	3-4/3-3
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 3	31/12/98	6	O.K / 5
12	O.K / 3	31/12/98	5	O.K / 5
11	O.K / 6	31/12/98	4	O.K / 5
10	O.K / 7	31/12/98	3	O.K / 5
9	O.K / 7	31/12/98	2	O.K / 2
8	O.K / 7	31/12/98	1	O.K / 0
7	O.K / 6	31/12/98		

S.G.S. Tecnos S.A.

OBRA: L.A.V. MADRID-BARCELONA-FRONTERA FRANCESA
TRAMO: PUENTE SOBRE EL RIO CINCA
FECHA: 28/02/99 Nº Hoja de Control: 14

Comprobación de la Geometría del Tablero en Planta

DOVELA Numero	PUNTO 1 Dif. en mm.	PUNTO 2 Dif. en mm.	PUNTO 3 Dif. en mm.	Fecha
39-40-41	6	4	6	22/12/98
40-41-42	3	2	2	12/01/99
41-42-43	4	0	5	20/01/99
42-43-44 / 43-44-45a	4 / 2	6 / 2	1 / 7	26/01/99 / 9/02/99
44-45a-45b	2	1	4	16/02/99

Comprobacion de la Geometría del tablero en Alzado

DOVELA NUMERO	PENDIENTE	Fecha
2-11-21-31-40	2.011%	15/12/98
2-12-22-32-41	2.008%	22/12/98
4-14-24-33-42	2.013%	12/01/99
2-15-25-34-43	2.007%	20/01/99
2-16-26-36-44	2.010%	26/01/99
2-17-27-37-45a	2.006%	9/02/99
2-18-28-38-45b	2.007%	16/02/99

Asentamiento del Parque de Fabricación

PARQUE DE SOLERAS — Diferencia a origen en mm

Punto/Fecha	
1 Dcha/Izda.	
2 Dcha/Izda.	
3 Dcha/Izda.	
4 Dcha/Izda.	
5 Dcha/Izda.	

PARQUE DE DOVELAS — Diferencia a origen en mm

Punto/Fecha	5/02/99
1 Dcha/Izda.	-/-
2 Dcha/Izda.	-/-
3 Dcha/Izda.	1/2
4 Dcha/Izda.	0/1
5 Dcha/Izda.	2/1
6 Dcha/Izda.	0/1
7 Dcha/Izda.	1/0
8 Dcha/Izda.	1/3

Nivelacion de la cabeza de Pilas

Pila nº	Cabe./Patin I / D	Dife. mm.	Pila nº	Cabe./Patin I / D
13	1-2/2-1		6	5-4/4-5
12	4-4/1-5		5	5-4/5-5
11	4-4/4-5		4	5-4/5-5
10	4-5/4-5		3	4-5/5-5
9	1-1/2-2		2	5-6/4-5
8	6-5/5-5		1	3-4/3-3
7	5-5/4-5			

Verticalidad y Asentamiento de Pilas

Nº de Pila	Ver / Asent.	Fecha	Nº de Pila	Ver / Asent.
13	O.K / 3	31/12/98	6	O.K / 5
12	O.K / 4	31/12/98	5	O.K / 5
11	O.K / 8	31/12/98	4	O.K / 5
10	O.K / 7	31/12/98	3	O.K / 6
9	O.K / 6	31/12/98	2	O.K / 1
8	O.K / 7	31/12/98	1	O.K / 0
7	O.K / 7	31/12/98		

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UNIDAD DE CONTROL DE CALIDAD
CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
10/05/97	ZAPATA E2	1 2 3 4 5 6 7 8 9 10 11 12 13	7/06/97	
11/05/97	ZAPATA E2	14 15 16 17 18 19 20 21 22 23 24	8/06/97	
22/05/97	ZAPATA FAB	25 26	19/06/97	
29/05/97	MUROS FAB FASE 1	27 28	26/06/97	
7/06/97	ALZADO E2	29 30 31 32 33 34 35 36 37 38 39 40	5/07/97	
12/06/97	ZAPATA P13	41 42 43 44 45 46	10/07/97	
19/06/97	ZAPATA P10	47 48 49 50 51 52	17/07/97	
20/06/97	MURO FAB IZQ	53 54	18/07/97	
25/06/97	ZAPATA P11	55 56 57 58 59 60	23/07/97	
26/06/97	MURO FAB DER	61	24/07/97	
27/06/97	ZAPATA GRUA	62 63 64 65 66 67	25/07/97	ENSAYO CARACTERISTICO
30/06/97	PLANTA NUEVA	1 2 3 4 5 6 7	28/07/97	ENSAYO CARACTERISTICO
4/07/97	ZAPATA P8	68 69 70 71 72 73	1/08/97	
10/07/97	ZAPATA P7	74 75 76 77 78 79	7/08/97	
14/07/97	ZAPATA P6	80 81 82 83 84 85	11/08/97	
16/07/97	ZAPATA P-12	86 87 88 89 90 91	13/08 97	
17/07/97	1 TREPA P 13	92 93 94 95	14/08/97	
21/07/97	ZAPATA P5	96 97 98 99 100 101	18/08/97	
23/07/97	1 TREPA P12	102 103 104 105	20/08/97	
29/07/97	1 TREPA P-11	106 107 108 109	26/08/97	
30/07/97	ZAPATA P-4	110 111 112 113 114 115 116 117 118 119	27/08/97	
1/08/97	1 TREPA P-10	120 121 122 123 124	29/08/97	
5/08/97	1 TREPA P-8	125 126 127 128 129	2/09/97	
8/08/97	2° TREPA P-12	1 2 3 4 5 6.	15/08/97 y 09/97	ENSAYO CARACTERISTICO
12/08/97	2° TREPA P-11	130 131	9/09/97	
13/08/97	LIMPIEZA E-1	132 133	10/09/97	
18/08/97	1 TREPA P-4	134 135 136 137 138 a	15/09/97	
20/08/97	ZAPATA E-1	138b 139 140 141 142 143 144 145	17/09/97	
21/08/97	2 TREPA P-4	146 147 148 149 150	18/09/97	
26/08/97	3 TREPA P-4	151 152 153 154 155	23/09/97	
28/08/97	ZAPATA P-1	156 157 158 159 160 161 162 163	25/09/97	
29/08/97	4 TREPA P-4	164 165	26/09/97	
3/09/97	2 TREPA P-10	166 167 168	1/10/97	
8/09/97	ZAPATA-P-2	169 170 171 172 173 174 175 176 177 178	6/10/97	

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HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
10/09/97	PASO R10	179	8/10/97	
11/09/97	1 TREPA P-1	180 181 182	9/10/97	
15/09/97	2 TREPA P-1	183 184 185 186 187	13/10/97	
18/09/97	3 TREPA P-1	188 189 190 191 192	16/10/97	
23/09/97	4 TREPA P-1	193 194	21/10/97	
26/09/97	1-TREPA-P2	195 196 197 198 199	24/10/97	
30/09/97	ZAPATA P-9	200 201 202 203 204 205	28/10/97	
1/10/97	2-TREPA P2	206 207 208 209 210	29/10/97	
3/10/97	3-TREPA P-2	211 212 213 214 215	31/10/97	
6/10/97	PLANTA CINCA	1 2 3 4 5 6	9/10/97 3/11/97	
7/10/97	4 TREPA P-2	216 217	4/11/97	
10/10/97	1 TREPA P-7	218 219 220 221 222	7/11/97	
15/10/97	2 TREPA P-7	223 224 225 226 227	12/11/97	
15/10/97	ESTRIBO-1	228 229 230 231 232 233	12/11/97	
20/10/97	3 TREPA P-7	234 235	17/11/97	
21/10/97	RELLENO OCTOGONO PILA-9 H-350	236	18/11/97	
23/10/97	1 TREPA P-9	237 238 239 240 241	20/11/97	
27/10/97	2 TREPA P-9	242 243 244 245 246	24/11/97	
29/10/97	ALZADO ESTRIBO-1	247 248 249 250	26/11/97	
30/10/97	2 TREPA P-8	251 252 253 254 255	27/11/97	
4/11/97	1 TREPA P-6	256 257 258 259 260	2/12/97	
5/11/97	RELLENO OCTOGONO P-5	261	3/12/97	
7/11/97	1 TREPA P-5	262 263 264 265 266	5/12/97	
7/11/97	CAJON INDIO	267	5/12/97	
11/11/97	2 TREPA P-6	268 269 270 271 272	9/12/97	
14/11/97	3 TREPA P-6	273 274 275	12/12/97	
17/11/97	SOLERA DOVELA 1	276 277 278 279 280	15/12/97	

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HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
19/11/97	2-TREPA P-5	281-282 283 284 285	17/12/97	
24/11/97	3-TREPA P-5	286 287 288 289 290	22/12/97	
4/12/97	CABEZA LOSA P-13	2 Faltan 291	1/1/98	
9/12/97	TECHO -1 SOLERA-2	292 293 294 295 296 297 298	7/1/98	
		299 300 301 302 303 304 305 (17E)	7/1/98	
		306 307 308 (Faltan 2)	7/1/98	
23/12/97	TECHO - 2 SOLERA-3	309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324	19-1-98	LA 324 ROTA A LOS 15 DIAS PARA TESADO
15/1/98	LOSA - P-11 - P-10	325	12/2/98	
15/1/98	CABEZA P-13 PRELOSAS	326 327 328 329	12/2/98	
21/1/98	SOLERA 4	330 331 332 333	18/2/98	
22/1/98	TECHO 3	334 335 336 337 338	19/2/98	
		339 340 341	19/2/98	
30/1/98	SOLERA 5A	342 343 344	27/2/98	
31/1/98	TECHO 4 1º	345 346	28/2/98	
2-2-98	TECHO 4 2º	347 348 349 350 351	2/3/98	
3-2-98	CABEZA P-12	352 353 354	3-3/98	
3-2-98	CUÑA TECHO-3	355	3/3/98	
11-2-98	SOLERA -5-B	356 357 358 359	11/3/98	
11-2-98	TECHO 5-A	360 361 362 363 364 365	11/3/98	
12-2-98	PRELOSAS P-A-P-8	366	12/3/98	
12-2-98	CABEZA P-11	367 368	12/3/98	
19-2-98	CABEZA P-10	370 371	19/3/98	
19-2-98	PRELOSAS - P-9 - P-8	369	19/3/98	
26-2-98	SOLERA-6	372 373 374 375	26-3-98	
26-2-98	TECHO - 5-B	376 377 378 379 380 381	26-3-98	
26-2-98	CUÑA-T-5A	382		
6-3-98	TECHO-6	383 384 385 386 387 388 389	3-4-98	

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CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO. DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
		390 391 (AMETERLAS EN TECHO		
7-3-98	SOLERA 7	392 393 394 395 396 397 398 399	4-4-98	
13-3-98	CABEZA P-9	400 401 402 403 404 405	11-4-98	
18-3-98	SOLERA 8	406 407 408 409 410 411	15-4-98	
19-3-98	TECHO 7	412 413 414 415 416 417 418 419 420 421 422 423	16-4-98	
27-3-98	SOLERA 9	424 425 426 427 428 429	24-4-98	
28-3-98	TECHO - 8	430 431 432 433 434 435 436 437 438 439 440 441	25-4-98	
30-3-98	CUÑA 7-7	442	27-4-98	
31-3-98	RELLENO CABEZA P-8 PRELOSAS P-4 P-5 P-6	443 444 445 446 447 448	27-4-98	
3-4-98	SOLERA 10	449 450 451 452 453 454	4-5-98	
7-4-98	TECHO 9	455 456 457 458 459 460 461 462 463 464 465 466	5-5-98	
16-4-98	RELLENO CABEZA P-7	469	14-5-98	
20-4-98	SOLERA 11	470 471 472	18-5-98	
20-4-98	TECHO-10	473 474 475 476 477 478	18-5-98	
		479 480 481 [482 483 484 PAM		
30-4-98	SOLERA - 12	485 486 487 488 489 490	28-5-98	
4-5-98	TECHO - 11	491 492 493 494 495 496	1-6-98	
		497 498 499 500 501 502		
8-5-98	CABEZA P-6	503 504 505 506 507	5-6-98	
13-5-98	SOLERA 13	508 509 510 511 512 513	10-6-98	
13-5-98	TECHO-12	514 515 516 517 518 519 520	10-6-98	
		521 522 523		
15-5-98	CABEZA 1-5	524 525 526	12-6-98	
21-5-98	SOLERA 14	527 528 529 530 531 532	18-6-98	
22-5-98	TECHO - 13	533 534 535 536 537 538	19-6-98	
		539 540 541 542 543 544		

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CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
29-5-98	SOLERA - 15	545 546 547 548	26-6-98	
29-5-98	TECHO-14	549 550 551 552 553 554	26-6-98	
		555 556 557 558 559 560		
29-5-98	CUÑA	561	26-6-98	
9-6-98	SOLERA-16	562 563 564 565 566 567	7-7-98	
9-6-98	TECHO-15	568 569 570 571 572 573	7-7-98	
		574 575 576 577 578 579		
15-6-98	CABEZA P-4	580 581 582 583 584	13-7-98	
18-6-98	SOLERA 17	585 586 587 588 589 590	16-7-98	
19-6-98	CANAL E-1 1 FASE	591	17-7-98	
19-6-98	TECHO-16	592 593 594 595	17-7-98	
24-6-98	CANAL E-1 2 FASE	596	22-7-98	
24-6-98	PRELOSA-1	597	22-7-98	
26-6-98	SOLERA-18	598 599 600 601 602 603	24-7-98	
26-6-98	TECHO-17	604 605 606 607 608 609	24-7-98	
		610 611		
1-7-98	CANAL E-1 3 FASE	612 613	29-7-98	
3-7-98	PRELOSA P-2	614	31-7-98	
7-7-98	SOLERA-19	615 616	4-8-98	
7-7-98	TECHO-18	617 618 619	4-8-98	
		620 621 622 623 624 625		
10-7-98	CANAL E-1 4 FASE	626 627	7-8-98	
15-7-98	SOLERA-20	628 629 630 631 632 633 634	12-8-98	
16-7-98	TECHO-19	635 636 637 638 639 640	13-8-98	
		641 642 643 644 645 646		
17-7-98	ZAPATA ACOMP. E-1	647 648 649 650 651	14-8-98	

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UNIDAD DE CONTROL DE CALIDAD

CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
22-7-98	MUROS-1-CANAL E-1	652	19-8-98	
23-7-98	SOLERA-21	653 654 655 656 657 658	20-8-98 (21-9-98)	551 552 553 554 555 556
24-7-98	TECHO 20	659 660 661 662 663 664	21-8-98	557 558 559 560 561 562
		665 666 667 668 669 670	21-8-98	563 564 565 566 567 568
24-7-98	MUROS-2 CANAL E-1	671	21-8-98	
30-7-98	ZAPATA P-3	672 673 674 675 676 677	27-8-98	
		678 679 680	"	
30-7-98	SOLERA-22	681 682 683 684 685 686	27-8-98	
31-7-98	TECHO-21	687 688 689 690 691 692	28-8-98	
		693 694 695		
6-8-98	CABEZA P-2	696 697 698 699 700 701	3-9-98	
6-8-98	SOLERA-23	702 703 704 705 706 707	3-9-98	
7-8-98	TECHO-22	708 709 710 711 712 713	4-9-98	
		714 715 716 717 718 719		
20-8-98	SOLERA-24	720 721 722 723 724 725	17-9-98	
21-8-98	TECHO-23	726 727 728 729 730 731	18-9-98	
		732 733 734 735 736 737		
24-8-98	PRUEBAS	1 2 3 4 5 6	21-9-98	
27-8-98	SOLERA 25	738 739 740 741 742 743	24-9-98	
28-8-98	TECHO 24	744 745 746 747 748 749	25-9-98	3 3 3 días 3 3 7 días 32 14 días 32 28 días (serie 751)
		750 751 752 753 754 755	"	
3-9-98	SOLERA 26	756 757 758 759 760 761	1-10-98	
4-9-98	TECHO-25	762 763 764 765 766 767	2-10-98	
		768 769 770 771 772 773	"	
4-9-98	CABEZA P-1	774 775	2-10-98	Segueda Jesus
8-9-98	1-TREPA-P-3	776 777	6-10-98	Segueda Jesus

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UNIDAD DE CONTROL DE CALIDAD
CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
10-9-98	SOLERA-27	778 779 780 781	8-10-98	
10-9-98	TECHO-26	782 783 784 785 786 787	"	
16-9-98	2 TREPA P-3	788 789 790 791 792	14-10-98	
17-9-98	SOLERA 28	793 794 795 796 797 798	15-10-98	
"	TECHO 27	799 800 801 802 803 804	15-10-98	
"	"	805 806 807 808	15-10-98	
23-9-98	3 TREPA P-3	821 822 823	21-10-98	
24-9-98	SOLERA 29	809 810 811 812 813 814	22-10-98	
	TECHO 28	815 816 817 818 819 820	22-10-98	
30-9-98	4 TREPA P 3	824	28-10-98	
1-10-98	SOLERA 30	825 826 827 828 829 830	29-10-98	
1-10-98	TECHO 29	831 832 833 834 835 836	29-10-98	
		837 838 839 840 841 842		
8-10-98	SOLERA 31	843 844 845 846 847 848	5-11-98	
8-10-98	TECHO 30	849 850 851 852 853 854	5-11-98	
		855 856 857 858 859 860		
14-10-98	CABEZA P-3	861 862 863 864	11-11-98	
16-10-98	SOLERA 32	865 866 867 868 869	13-11-98	
	TECHO 31	870 871 872 873 874	13-11-98	
		875 876 877 878 879		
22-10-98	SOLERA 33	880 881 882 883 884 885	19-11-98	
	TECHO 32	886 887 888 889 890 891		
		892 893 894 895 896 897		
29-10-98	SOLERA 34	898 899 900 901 902 903	26-11-98	
	TECHO 33	904 905 906 907 908 909		
		910		

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UNIDAD DE CONTROL DE CALIDAD

CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
6-11-98	SOLERA 35	911 912 913 914 915 916	4-12-98	
.	TECHO 34	917 918 919 920 921 922		
		923 924		
12-11-98	SOLERA 36	925 926 927 928 929	10-12-98	
	TECHO 35	930 931 932 933 934 935		
19-11-98	SOLERA 37	936 937 938 939 940 941	17-12-98	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
	TECHO 36	942 943 944 945 946 947		
		948 949 950		
26-11-98	SOLERA 38	951 952 953 954 955 956	24-12-98	1 2 3 4 5 6 7 8 9 10 11 12 13 14
	TECHO 37	957 958 959 960 961 962		15 16 17 18 CON FECHA
		963 964 965 966 967 968		
3-12-98	SOLERA 39	969 970 971 972 973 974	31-12-98	
	TECHO 38	975 976 977 978 979 980		
11-12-98	SOLERA 40	981 982 983 984 985 986	8-1-98	
	TECHO 39	987 988 989 990 991 992		
		993 994 995		
17-12-98	SOLERA 41	996 997 998 999 1000 1001	14-1-98	
	TECHO 40	1002 1003 1004 1005 1006		
		1008 1009 1007		
28-12-98	SOLERA 42	1010 1011 1012 1013 1014 1015	25-1-99	
29-12-98	TECHO 41	1016 1017 1018 1019 1020 1021	26-1-99	
		1022 1023 1024 1025 1026 1027		
8-1-99	SOLERA 43	1028 1029 1030 1031 1032 1033	5-11-99	
	TECHO 42	1034 1035		
14-1-99	SOLERA 44	1036 1037 1038 1039 1040 1041	11-11-99	
	TECHO 43	1042 1043 1044 1045 1046		

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UNIDAD DE CONTROL DE CALIDAD

CALENDARIO DE ROTURA DE PROBETAS

HORMIGONADO DIA	ELEMENTO	SERIES	ROTURA DIA	OBSERVACIONES
22-1-99	SOLERA 45-A	1047 1048 1049 1050 1051 1052	19-2-99	
.	TECHO 44	1053 1054 1055 1056 1057 1058		
		1059 1060 1061 1062 1063		
28-1-99	SOLERA 45-B			
	TECHO 45-A	1064 1065 1066 1067 1068 1069	25-2-99	
		1070 1071		
9-2-99	TECHO 45-B	1072 1073 1074 1075 1076 1077	9-3-99	
		1078 1079 1080 1081		
22-2-99	MAMPAROS P-7 P-6	1081 1082 1083 1084 1085	22-3-99	
26-2-99	MAMPAROS P-8 P-5	1086 1087 1088 1089	26-3-99	
9-4-99	MURO ESPALDON E-2	1090 1091 1092 1093	7-5-99	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 14 **FECHA TOMA:** 29/05/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 26/06/98

SERIE	CONO	KG/M2	MEDIA	3 Dias	OBSERVACIONES	ALBARAN	
549		432.00		333.00	HASTIAL		
549	12	432.00	440.00	345.00	HASTIAL		
549		456.00		339.00	HASTIAL		
550		420.00			HASTIAL		
550	10	435.00	426.00		HASTIAL		
550		423.00			HASTIAL		
551		479.00			HASTIAL		
551	10	480.00	482.00		HASTIAL		
551		487.00			HASTIAL		
552		461.00			HASTIAL		
552	12	461.00	461.00		HASTIAL		
552		461.00			HASTIAL		
553		465.00			HASTIAL		
553	8	470.00	471.00		HASTIAL		
553		478.00			HASTIAL		
554		491.00			HASTIAL		
554	14	494.00	491.00		HASTIAL		
554		488.00			HASTIAL		
555		444.00		356.00			
555	11	426.00	435.00	339.00			
555		435.00		367.00			
556		445.00					
556	12	450.00	449.00				
556		452.00					
557		460.00					
557	10	459.00	461.00				
557		464.00					
558		447.00					
558	11	441.00	447.00				
558		453.00					
559		460.00					
559	10	471.00	463.00				
559		458.00					
560		425.00					
560	14	428.00	430.00				
560		437.00					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 13 **FECHA TOMA:** 22/05/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 19/06/98

SERIE	CONO	KG/M2	MEDIA	3 dias	OBSERVACIONES	ALBARAN	
533		413.00		316.00	HASTIAL		
533	11	441.00	424.00	322.00	HASTIAL		
533		418.00		333.00	HASTIAL		
534		396.00			HASTIAL		
534	10	424.00	420.33		HASTIAL		
534		441.00			HASTIAL		
535		447.00			HASTIAL		
535	11	413.00	286.67		HASTIAL		
535					HASTIAL		
536		435.00			HASTIAL		
536	9	430.00	429.67		HASTIAL		
536		424.00			HASTIAL		
537		441.00			HASTIAL		
537	10	418.00	432.33		HASTIAL		
537		438.00			HASTIAL		
538					HASTIAL		
538	12		0.00		HASTIAL		
538					HASTIAL		
539		415.00		322.00			
539	10	447.00	428.67	328.00			
539		424.00		339.00			
540		441.00					
540	10		147.00				
540							
541							
541	9		0.00				
541							
542		430.00					
542	10	447.00	430.00				
542		413.00					
543		452.00			>		
543	11	452.00	452.00		>		
543		452.00			>		
544		435.00					
544	9	441.00	292.00				
544							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA 14 **FECHA TOMA:** 21/05/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 18/06/98

SERIE	CONO	KG/M2	MEDIA	3 dias	OBSERVACIONES	ALBARAN	
527		452.00		379.00	>		
527	8	452.00		384.00	>		
527		452.00		384.00	>		
528							
528	9	452.00			>		
528							
529		452.00			>		
529	10	452.00			>		
529		452.00			>		
530		452.00			>		
530	8	452.00			>		
530		452.00			>		
531		452.00			>		
531	9	452.00			>		
531							
532		452.00			>		
532	8	452.00			>		
532		452.00			>		

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA 13 **FECHA TOMA:** 13/05/98
HORMIGON: H-400 **FECHA ROTURA:** 10/06/98

SERIE	CONO	KG/M2	MEDIA	5Dias	OBSERVACIONES
508		452.00		430.00	>
508	11	447.00		424.00	>
508		452.00		413.00	>
509		458.00			>
509	10	452.00			>
509		452.00			>
510		452.00			>
510	8	447.00			>
510		447.00			>
511		447.00			>
511	8	452.00			>
511					>
512		458.00			>
512	12	452.00			>
512					>
513		447.00			>
513	13	452.00			>
513		447.00			>

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 12 **FECHA TOMA:** 13/05/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 10/06/98

SERIE	CONO	KG/M2	MEDIA	5Dias	OBSERVACIONES	ALBARAN	
514		464.00		401.00	> HASTIAL		
514	9	458.00		407.00	> HASTIAL		
514		458.00		407.00	> HASTIAL		
515		447.00			> HASTIAL		
515	6	458.00			> HASTIAL		
515					> HASTIAL		
516		458.00			> HASTIAL		
516	9	447.00			> HASTIAL		
516		458.00			> HASTIAL		
517		447.00			> HASTIAL		
517	8	452.00			> HASTIAL		
517		447.00			> HASTIAL		
518		452.00		407.00	>		
518	10	456.00		390.00	>		
518		452.00		396.00	>		
519		447.00			>		
519	12	469.00			>		
519		432.00					
520		458.00			>		
520	11	452.00			>		
520		452.00			>		
521		447.00			>		
521	10	441.00			>		
521		424.00			>		
522		435.00					
522	9						
522							
523		452.00			>		
523	10	447.00			>		
523		441.00			>		

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA 9 **FECHA TOMA:** 27/03/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 24/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
424		475.00					
424	10	469.00	471.00			70	
424		469.00					
425		469.00					
425	8	475.00	473.00			70	
425		475.00					
426		464.00					
426	15	458.00	458.00			70	
426		452.00					
427		464.00					
427	7	464.00	467.67			70	
427		475.00					
428		469.00					
428	10	475.00	473.00			70	
428		475.00					
429		458.00					
429	8	452.00	456.00			70	
429		458.00					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 7 FECHA TOMA: 17/03/98 ROTURA A: 28 DIAS
HORMIGON: H-400 FECHA ROTURA: 16/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
412		441.00			> HASTIAL		
412	8	430.00	431.67		> HASTIAL	69	
412		424.00			> HASTIAL		
413		435.00			> HASTIAL		
413	14	430.00	433.33		> HASTIAL	69	
413		435.00			> HASTIAL		
414		430.00			> HASTIAL		
414	11	447.00	437.33		> HASTIAL	69	
414		435.00			> HASTIAL		
415		430.00			> HASTIAL		
415	11	435.00	431.67		> HASTIAL	69	
415		430.00			> HASTIAL		
416		430.00			> HASTIAL		
416	10	441.00	437.33		> HASTIAL	69	
416		441.00			> HASTIAL		
417		447.00			> HASTIAL		
417	11	458.00	450.67		> HASTIAL	69	
417		447.00			> HASTIAL		
418		452.00					
418	11	435.00	442.67			69	
418		441.00					
419		424.00					
419	13	430.00	428.00			69	
419		430.00					
420		435.00					
420	10	430.00	433.33			69	
420		435.00					
421		430.00					
421	8	424.00	428.00			69	
421		430.00					
422		441.00					
422	9	435.00	439.00			69	
422		441.00					
423		424.00					
423	13	430.00	426.00			69	
423		424.00					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA 8 FECHA TOMA: 18/03/98 ROTURA A: 28 DIAS
HORMIGON: H-400 FECHA ROTURA: 15/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
406		447.00			>		
406	5	435.00	439.00		>	68	
406		435.00			>		
407		441.00			>		
407	10	441.00	439.00		>	68	
407		435.00			>		
408		430.00			>		
408	8	441.00	435.33		>	68	
408		435.00			>		
409		430.00			>		
409	10	435.00	433.33		>	68	
409		435.00			>		
410		441.00			>		
410	11	435.00	439.00		>	68	
410		441.00			>		
411		435.00			>		
411	10	441.00	437.00		>	68	
411		435.00			>		

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: CABEZA P-9 **FECHA TOMA:** 13/03/98 **ROTURA A: 28 DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 11/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
400		430.00			>		
400	12	435.00	431.67		>	53	
400		430.00			>		
401		424.00			>		
401	8	430.00	428.00		>	53	
401		430.00			>		
402		441.00			>		
402	12	424.00	431.67		>	53	
402		430.00			>		
403		430.00			>		
403	8	430.00	430.00		>	53	
403		430.00			>		
404		435.00			>		
404	12	424.00	429.67		>	53	
404		430.00			>		
405		430.00			>		
405	10	424.00	426.00		>	53	
405		424.00			>		

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA 7 **FECHA TOMA:** 7/03/98 **ROTURA A: 28 DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 4/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
395		475.00			>		
395	11	458.00	467.33		>	65	
395		469.00			>		
396		458.00			>		
396	10	464.00	462.00		>	65	
396		464.00			>		
397		469.00			>		
397	11	469.00	465.33		>	65	
397		458.00			>		
398		475.00			>		
398	6	469.00	469.33		>	65	
398		464.00			>		
399		464.00			>		
399	7	464.00	462.00		>	65	
399		458.00			>		

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 6 **FECHA TOMA:** 6/03/98 **ROTURA A: 28 DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 3/04/98

SERIE	CONO	KG/M2	MEDIA		OBSERVACIONES	ALBARAN	
383		390.00			> HASTIAL		
383	6	407.00	397.67		> HASTIAL	64	
383		396.00			> HASTIAL		
384		475.00			> HASTIAL		
384	6	469.00	471.00		> HASTIAL	64	
384		469.00			> HASTIAL		
385		464.00			> HASTIAL		
385	12	469.00	467.33		> HASTIAL	64	
385		469.00			> HASTIAL		
386		469.00			> HASTIAL		
386	10	481.00	477.00		> HASTIAL	64	
386		481.00			> HASTIAL		
387		469.00			> HASTIAL		
387	9	469.00	473.00		> HASTIAL	64	
387		481.00			> HASTIAL		
388		469.00			> HASTIAL		
388	10	509.00	484.33		> HASTIAL	64	
388		475.00			> HASTIAL		
389		469.00					
389	9	464.00	465.67			64	
389		464.00					
390		475.00					
390	11	458.00	465.67			64	
390		464.00					
391		464.00					
391	12	475.00	469.33			64	
391		469.00					
392		481.00					
392	8	469.00	469.33			64	
392		458.00					
393		458.00					
393	9	458.00	454.33			64	
393		447.00					
394		464.00					
394	11	464.00	465.67			64	
394		469.00					

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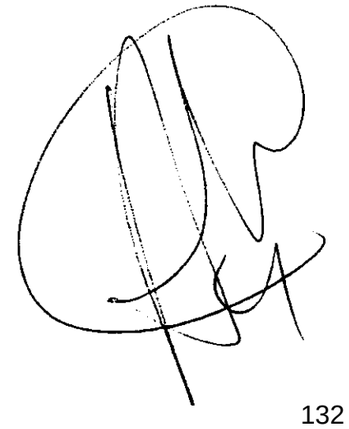
UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: CABEZA P-10 **KN:** **FECHA TOMA:** 19/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350 **FECHA ROTURA:** 19/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
370		424.00							
370	12	418.00	425.67				57		
370		435.00							
371		418.00							
371	9	413.00	416.33				57		
371		418.00							



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PARTE DE PROBETAS A COMPRESION

ELEMENTO: PRELOSAS P **KN:** **FECHA TOMA:** 19/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350 **FECHA ROTURA:** 19/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
369		435,00				>			
369	8	430,00	433,33			>	57		
369		435,00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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PARTE DE PROBETAS A COMPRESION

ELEMENTO: CABEZA P-11 **KN:** **FECHA TOMA:** 12/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350 **FECHA ROTURA:** 12/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
367		430,00							
367	9	430,00	428,00				54		
367		424,00							
368		418,00							
368	11	413,00	414,67				54		
368		413,00							

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PARTE DE PROBETAS A COMPRESION

ELEMENTO: PRELOSAS P-9 P-8 **KN:** **FECHA TOMA:** 12/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350 **FECHA ROTURA:** 12/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
266		430,00				>			
266	7	418,00	426,00			>	54		
266		430,00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 5-A **KN:**0,88 **FECHA TOMA:** 11/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 11/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
360		390,00				> HASTIAL			
360	12	407,00	397,67			> HASTIAL	53		
360		396,00				> HASTIAL			
361		475,00				> HASTIAL			
361	12	469,00	471,00			> HASTIAL	53		
361		469,00				> HASTIAL			
362		464,00				> HASTIAL			
362	10	469,00	467,33			> HASTIAL	53		
362		469,00				> HASTIAL			
363		469,00				> HASTIAL			
363	9	481,00	477,00			> HASTIAL	53		
363		481,00							
364		469,00							
364	11	469,00	473,00				53		
364		481,00							
365		469,00							
365	10	509,00	484,33				53		
365		475,00							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA S-8 **KN:** **FECHA TOMA:** 11/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 11/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
356		475,00							
356	6	475,00	473,00				52		
356		469,00							
357		464,00							
357	6	475,00	469,33				52		
357		469,00							
358		469,00							
358	11	469,00	471,00				52		
358		475,00							
359		469,00							
359	10	469,00	467,33				52		
359		464,00							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: CUÑA T-3 **KN:** **FECHA TOMA:** 3/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350-SR **FECHA ROTURA:** 3/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
355		481,00							
355	10	469,00	475,00			>	49		
355		475,00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: CABEZA P-12 **KN:** **FECHA TOMA:** 3/02/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-350 **FECHA ROTURA:** 3/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
352		447,00				>			
352	9	447,00	450,67			>	44		
352		458,00				>			
353		447,00				>			
353	8	452,00	448,67			>	44		
353		447,00				>			
354		441,00				>			
354	10	452,00	446,67			>	44		
354		447,00				>			



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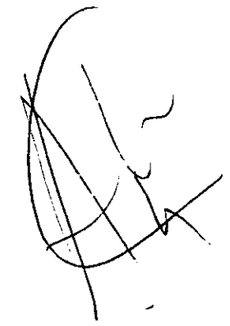
UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECH 4 2ª **KN:** **FECHA TOMA:** 2/02/98 **ROTURA A:** 29 **DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 2/03/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
347		452,00				>			
347	21	469,00	459,67			>	43		
347		458,00				>			
348		458,00				>			
348	9	458,00	461,67			>	43		
348		469,00				>			
349		475,00				>			
349	13	464,00	465,67			>	43		
349		458,00				>			
350		452,00				>			
350	13	469,00	461,67			>	43		
350		464,00				>			
351		475,00				>			
351	9	464,00	463,67			>	43		
351		452,00				>			



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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO 4 1ª **KN:** **FECHA TOMA:** 31/01/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 28/02/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
345		475,00				>			
345	18	475,00	505,00			>	43		
345		565,00							
346		481,00				>			
346	12	486,00	484,33			>	43		
346		486,00				>			



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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA-5A **KN:** **FECHA TOMA:** 30/01/98 **ROTURA A:** 28 **DIAS**

HORMIGON: H-400 **FECHA ROTURA:** 27/02/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
342		492,00				>			
342	20	481,00	484,67			>	42		
342		481,00				>			
343		486,00				>			
343	15	475,00	478,67			>	42		
343		475,00				>			
344		475,00				>			
344	13	469,00	473,00			>	42		
344		475,00				>			



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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: TECHO-3 **FECHA TOMA:** 22/01/98 **ROTURA A:**

HORMIGON: H-400 **FECHA ROTURA:** 19/02/98

SERIE	CONO	KG/M2	MEDIA	OBSERVACIONES	ALBARAN
334		481,00			
334	9	452,00	466,50		41
334		*(367)*		Rotura en cabeza (afectada por la helada)	
335		452,00		>	
335	10	452,00	461,67	>	41
335		481,00			
336		*(396)*		Rotura en cabeza (afectada por la helada)	
336	12	452,00	452,00		41
336		*(396)*		Rotura en cabeza (afectada por la helada)	
337		*(396)*		Rotura en cabeza (afectada por la helada)	
337	11	424,00	438,00		41
337		452,00		>	
338		*(396)*		Rotura en cabeza (afectada por la helada)	
338	12	*(396)*		Rotura en cabeza (afectada por la helada)	41
338		*(396)*		Rotura en cabeza (afectada por la helada)	
339		475,00			
339	9	413,00	437,33	Rotura en cabeza (afectada por la helada)	41
339		424,00		Rotura en cabeza (afectada por la helada)	
340		(339)		Rotura en cabeza (afectada por la helada)	
340	10	(322)		Rotura en cabeza (afectada por la helada)	41
340		(356)		Rotura en cabeza (afectada por la helada)	
341		475,00			
341	10	413,00	446,67		41
341		452,00		>	
NOTA.- LOS VALORES ENTRE PARENTESIS NO SE TIENEN EN CUENTA POR MALA ROTURA DE LA PROBETA					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA-3 TECHO-2 **KM:** **FECHA TOMA:** 23/12/97 **ROTURA A:** 28 DIAS

HORMIGON: H-400 **FECHA ROTURA:** 20/01/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
309		447,00				>			
309	10	441,00	443,00			>	26		
309		441,00				>			
310		435,00				>			
310	8	441,00	437,00			>	26		
310		435,00				>			
311		441,00				>			
311	9	447,00	445,00			>	26		
311		447,00				>			
312		430,00				>			
312	10	441,00	433,67			>	26		
312		430,00				>			
313		447,00				>			
313	9	435,00	444,67			>	26		
313		452,00				>			
314		430,00				>			
314	8	435,00	435,33			>	26		
314		441,00				>			
315		435,00				>			
315	10	430,00	433,33			>	26		
315		435,00				>			
316		435,00				>			
316	10	458,00	446,67			>	26		
316		447,00				>			
317		444,00				>			
317	9	444,00	445,00			>	26		
317		447,00				>			
318		435,00				>			
318	10	447,00	442,00			>	26		
318		444,00				>			
319		447,00				>			
319	9	452,00	444,67			>	26		
319		435,00				>			
320		430,00				>			
320	10	444,00	434,67			>	26		
320		430,00				>			
321		441,00				>			
321	10	452,00	442,67			>	26		
321		435,00				>			
322		447,00				>	26		
322	10	441,00	441,00			>			
322		435,00				>			
323		452,00				>	26		
323	9	452,00	452,00			>			
323		452,00				>			
324		497,00				>	26		
324	6	424,00	461,67			ROTURA A 15 DIAS			
324		464,00				ROTURA A 15 DIAS			
						ROTURA A 15 DIAS			
						ELEMENTO ACEPTADO			

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: SOLERA-2 TECHO-1 **KN:** **FECHA TOMA:** 9/12/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-400 **FECHA ROTURA:** 8/01/98

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
292		452.00				>			
292	10	447.00	454.33			>	26		
292		464.00				>			
293		441.00				>			
293	8	441.00	443.00			>	26		
293		447.00				>			
294		441.00				>			
294	7	435.00	442.67			>	26		
294		452.00				>			
295		447.00				>			
295	10	452.00	448.67			>	26		
295		447.00				>			
296		447.00				>			
296	6	452.00	450.33			>	26		
296		452.00				>			
297		452.00				>			
297	8	464.00	456.00			>	26		
297		452.00				>			
298		447.00				>			
298	10	452.00	446.67			>	26		
298		441.00				>			
299		447.00				>			
299	7	458.00	448.67			>	26		
299		441.00				>			
300		447.00				>			
300	9	458.00	452.33			>	26		
300		452.00				>			
301		447.00				>			
301	10	447.00	450.67			>	26		
301		458.00				>			
302		435.00				>			
302	9	452.00	444.67			>	26		
302		447.00				>			
303		280.00				ROTURA A 3 DIAS			
303	10	283.00	179.00			ROTURA A 3 DIAS			
303		254.00				ROTURA A 3 DIAS			
304		262.00				ROTURA A 3 DIAS			
304	8	298.00	287.00			ROTURA A 3 DIAS			
304		301.00				ROTURA A 3 DIAS			
305		447.00				>			
305	10	441.00	448.67			>			
305		458.00				>			
306		452.00				>			
306	11	452.00	450.33			>			
306		447.00				>			
307		430.00				>			
307	10	441.00	437.33			>			
307		441.00				>			
308		294.00				ROTURA A 3 DIAS			
308	10	294.00				ROTURA A 3 DIAS			
308		294.00				ROTURA A 3 DIAS			
						ELEMENTO ACEPTADO			

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: LOSA P-13 **KN:** **FECHA TOMA:** 24/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 22/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
291		481.00							
291	7	481.00	481.00				16		
291		481.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 3 TREPA P5 **KM:** **FECHA TOMA:** 24/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 22/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
286		413.00							
286	7	424.00	420.33				16		
286		424.00							
287		418.00							
287	8	413.00	416.33				17		
287		418.00							
288		430.00							
288	8	430.00	428.00				18		
288		424.00							
289		430.00							
289	8	424.00	426.00				19		
289		424.00							
290		413.00							
290	7	430.00	420.33				20		
290		418.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA P5 **KM:** **FECHA TOMA:** 19/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 17/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
281		424.00							
281	7	418.00	425.67				5		
281		435.00							
282		418.00							
282	8	413.00	416.33				6		
282		418.00							
283		407.00							
283	9	418.00	416.33				7		
283		424.00							
284		430.00							
284	8	424.00	426.00				8		
284		424.00							
285		418.00							
285	9	430.00	424.00				9		
285		424.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 3 TREPA P6 **KN:** **FECHA TOMA:** 11/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 12/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
273		430.00				SE HORMIGONA CON CUBAS VIDAL			
273	10	424.00	437.33			PRIMER HORMIGONADO CON LA PLANTA	2		
273		458.00							
274		424.00							
274	10	418.00	422.00				2		
274		424.00							
275		430.00							
275	10	435.00	429.67				2		
275		424.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA P6 **KN:** **FECHA TOMA:** 11/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 9/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
268		424.00				>			
268	7	430.00	428.00				2277		
268		430.00				>			
269		424.00				>			
269	8	418.00	420.00			>	2278		
269		418.00				>			
270		433.00				>			
270	9	413.00	422.00			>	2279		
270		418.00				>			
271		413.00				>			
271	8	424.00	418.33			>	2281		
271		418.00				>			
272		435.00				>			
272	8	424.00	425.67			>	2283		
272		418.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: CAJON INDIO **KM:**0,88 **FECHA TOMA:** 7/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-250 **FECHA ROTURA:** 5/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
267		390.00							
267	8	407.00	397.67				789		
267		396.00							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P5 **KM:** **FECHA TOMA:** 7/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 5/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
262		373.00							
262	9	379.00	369.33				2233		
262		356.00							
263		339.00							
263	8	362.00	354.33				2234		
263		362.00							
264		373.00							
264	7	379.00	375.00				2235		
264		373.00							
265		390.00							
265	8	379.00	386.33				2236		
265		390.00							
266		390.00							
266	6	350.00	378.67				2237		
266		396.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: OCTOGONO P-5 **KN:** **FECHA TOMA:** 5/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 3/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
216		430.00				>			
216	9	424.00	424.00			>	2201		
216		418.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P6 **KN:** **FECHA TOMA:** 4/11/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 2/12/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
256		418.00				CONTROL TOTAL			
256	7	424.00	422.00			>	2194		
256		424.00				>			
257		418.00				>			
257	9	424.00	420.00			>	2195		
257		418.00				>			
258		430.00				>			
258	9	418.00	427.67			>	2197		
258		435.00				>			
259		435.00				>			
259	8	430.00	429.67			>	2199		
259		424.00				>			
260		441.00				>			
260	7	424.00	429.67			>	2199		
260		424.00				>			
						>			
						>			

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TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA P8 **KN:** **FECHA TOMA:** 30/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 27/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
251		424.00				CONTROL TOTAL			
251	8	418.00	424.00			>	2154		
251		430.00				>			
252		430.00				>			
252	7	430.00	431.67			>	2155		
252		435.00							
253		441.00							
253	9	435.00	433.33			>	2156		
253		424.00				>			
254		430.00				>			
254	8	435.00	431.67			>	2157		
254		430.00				>			
255		424.00				>			
255	8	424.00	426.00			>	2158		
255		430.00							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: ESTRIBO1 **KN:0,88** **FECHA TOMA:** 29/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-250-SR **FECHA ROTURA:** 26/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
247		424.00				>			
247	6	350.00	390.00				1486		
247		396.00							
248		356.00							
248	6	356.00	350.33	284.09	SI	LOTE ACEPTADO	1490		
248		339.00							
249		396.00							
249	8	316.00	341.00	284.09	SI	LOTE ACEPTADO	1492		
249		311.00				>			
250		322.00				>			
250	9	316.00	346.33			>	1494		
250		401.00							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA P9 **KM:** **FECHA TOMA:** 27/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 20/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
242		407.00							
242	12	401.00	407.00				2072		
242		413.00							
243		401.00							
243	10	390.00	401.33				2073		
243		413.00							
244		424.00							
244	9	424.00	426.00				2074		
244		430.00							
245		401.00							
245	9	396.00	397.67				2075		
245		396.00							
246		430.00							
246	10	418.00	426.00				2076		
246		430.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P9 **KM:** **FECHA TOMA:** 23/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 20/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
237		430.00				>			
237	7	424.00	426.00			>	2011		
237		424.00				>			
238		418.00				>			
238	9	424.00	426.33				2012		
238		407.00							
239		424.00				>			
239	8	407.00	414.67			>	2013		
239		413.00							
240		418.00				>			
240	8	424.00	424.00			>	2014		
240		430.00				>			
241		424.00				>			
241	8	430.00	428.00			>	2016		
241		430.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: OCTOGONO P-9 **KM:** **FECHA TOMA:** 21/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 18/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
236		430.00							
236	9	424.00	428.00				2015		
236		430.00							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 3 TREPA P7 **KM:** **FECHA TOMA:** 20/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 17/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
234		413.00							
234	8	435.00	424.00				1818		
234		424.00							
235		429.00							
235	8	430.00	422.00				1820		
235		418.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: ESTRIBO1 **KM:0,88** **FECHA TOMA:** 15/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-250-SR **FECHA ROTURA:** 12/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
228		424.00							
228	9	311.00	346.67			>	1420		
228		311.00				>			
229		350.00				>			
229	7	329.00	344.67	284.09	SI	>	1424		
229		345.00				>			
230		328.00				>			
230	8	326.00	321.67	284.09	SI	>	1429		
230		328.00				>			
231		345.00				>			
231	9	350.00	348.33			>	1426		
231		350.00				>			
232		333.00				>			
232	9	345.00	341.00	284.09	SI	>	1435		
232		345.00				>			
233		345.00				>			
233	7	339.00	343.00			>	1436		
233		345.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA P7 **KM:** **FECHA TOMA:** 15/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 12/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
223		407.00							
223	8	413.00	403.33				1762		
223		390.00							
224		382.00							
224	9	401.00	381.50				1763		
224		(377)				NO CONSIDERADA			
225		424.00				>			
225	9	424.00	424.00			>	1764		
225		424.00				>			
226		413.00				>			
226	8	407.00	411.00			>	1765		
226		413.00				>			
227		413.00				>			
227	9	418.00	414.67			>	1766		
227		413.00				>			
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P7 **KN:** **FECHA TOMA:** 10/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 7/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
218		424.00				>			
218	8	424.00	422.00			>	1742		
218		418.00				>			
219		424.00				>			
219	9	435.00	431.33			>	1743		
219		435.00				>			
220		418.00							
220	6	413.00	416.67				1744		
220		420.00							
221		412.00							
221	8	416.00	420.33			>	1745		
221		430.00				>			
222		420.00				>			
222	9	441.00	424.00				1746		
222		431.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 4 TREPA P2 **KN:** **FECHA TOMA:** 7/10/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 4/11/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
216		424.00				>			
216	7	424.00	422.00			>	781		
216		418.00				>			
217		424.00							
217	9	430.00	428.00			>	782		
217		430.00							
						CONTROL TOTAL			
						ELEMENTO ACEPTADO			

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: PLANTA RIO CINCA
TIPO HORMIGON: H-400.
KN:
FECHA TOMA: 6-10-97
FECHA ROTURA: 8-10-97, 9-10-97
ROTURA A: 2 Y 3 DIAS.

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN	2 DIAS	3 DIAS
1	10							311	328
1									322
1									
2	10							328	339
2									350
2									
3	4							—	362
3									367
3									
4	6							350	350
4									350
4									
5	7							350	362
5									384
5									
6	8							362	362
6									367
6									

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: PLANTA RIO CINCA.
TIPO HORMIGON: H-400
KN:
FECHA TOMA: 6-10-97
FECHA ROTURA: 4-11-97
ROTURA A: 29DIAS

ENSAYO CARACTERISTICO.

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
1		460	①				
1	10	440	447				
1		442					
2		482	②				
2	10	457	472				
2		477					
3		>486	⑥				
3	4	481	486				
3		492					
4		>486	④				
4	6	481	482				
4		481					
5		475	③				
5	7	>486	480				
5		481					
6		481	⑤				
6	8	497	484				
6		475					

$X_1 + X_2 - X_3 \geq f_{ck}$. $447 + 472 - 480 = 439$ Kg/cm² > 401 Kg/cm²

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 3 TRAPA PILA 2 **FECHA TOMA:** 31/10/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 31/10/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
211		424					
211	7	424					776
211		[illegible]					
212		[illegible]					
212	6	418					777
212		424					
213		>418					
213	9	424					778
213		424					
214		413					
214	7	424					779
214		418					
215		>424					
215	6	>424					780
215		>430					
						ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 3 TRAPA PILA 2 **FECHA TOMA:** 31/10/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 31/10/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
211		424					
211	7	424					776
211		[illegible]					
212		[illegible]					
212	6	418					777
212		424					
213		>418					
213	9	424					778
213		424					
214		413					
214	7	424					779
214		418					
215		>424					
215	6	>424					780
215		>430					
						ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 ZAPATA PILA 2 **FECHA TOMA:** 1/10/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 29/10/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
206		430					
206	7	407					772
206		435					
207		430					
207	12	430					773
207		447					
208		430					
208	9,5	418					771
208		413					
209		441					
209	5	413					774
209		424					
210		418					
210	12	424					775
210		424					
						ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-9 **FECHA TOMA:** 30/09/97
TIPO HORMIGON: H-250 SC **KN:** 0,88 **FECHA ROTURA:** 28/10/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
200		>311					
200	8	>311					1311
200		243					
201		288					
201	13	>322					1315
201		>316					
202		>328					
202	8	>322					1332
202		>322					
203		390					
203	13	384					1338
203		>311					
204		>322					
204	9	>322					1348
204		>316					
205		>311					
205	8	>316					1350
205		>322					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P2 **KN:** **FECHA TOMA:** 26/09/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350-SR **FECHA ROTURA:** 24/10/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
195		424.00				CONTROL TOTAL			
195	11	424.00	429.67			>	1401		
195		441.00				>			
196		435.00				>			
196	5	430.00	421.67			>	1413		
196		450.00				>			
197		424.00							
197	6	417.00	425.33			>	1404		
197		435.00				>			
198		417.00				>			
198	7	439.00	426.00			>	1414		
198		435.00							
199		424.00				>			
199	9	424.00	431.67			>	1415		
199		447.00							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE PROBETAS A COMPRESION

ELEMENTO: 4 TREPA P1 **KN:** **FECHA TOMA:** 23/09/97 **ROTURA A:** 28 **DIAS**
HORMIGON: H-350 **FECHA ROTURA:** 21/10/97

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest>fck	OBSERVACIONES	ALBARAN		
193		424.00				CONTROL TOTAL			
193	10	424.00	422.00				770		
193		418.00							
194		396.00							
194	9	396.00	397.67				769		
194		401.00				ELEMENTO ACEPTADO			

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 3 TREPA PILA 1 — FECHA TOMA: 12/09/97

TIPO HORMIGON: H-350 — KN: — FECHA ROTURA: 16/10/97 — ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
188		376				CONTROL TOTAL	
188	7	367	371				763
188		350					
189		362					
189	8	356	354				765
189		345					
190		413					
190	7	424	414				766
190		407					
191		396					
191	10	396	394				767
191		390					
192		413					
192	7	424	416				768
192		413					
						ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA PILA 1 — FECHA TOMA: 15/09/97

TIPO HORMIGON: H-350 — KN: — FECHA ROTURA: 13/10/97 — ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
183		412				CONTROL TOTAL	
183	7	424	422				311404
183		424					
184		426					
184	7	413	420				311405
184		424					
185		424					
185	8	424	424				311406
185		424					
186		435					
186	9	430	439				311407
186		452					
187		430					
187	9	430	431				311408
187		435					
						ELEMENTO ACEPTADO	

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TREDA PILA 1 — FECHA TOMA: 11/09/97

TIPO HORMIGON: H-350 SR — KN: — FECHA ROTURA: 9/10/97 — ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
180		407				ENSAYO TOTAL	
180	7	396	407				755
180		418					
181		430					
181	6	452	429				756
181		407					
182		381					
182	7	430	405				757
182		404				ELEMENTO ACEPTADO.	

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA 1-2 — FECHA TOMA: 8/09/97

TIPO HORMIGON: H-250 SR — KN: 0,88 — FECHA ROTURA: 6/10/97 — ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
169		333					
169	12	356	331	291			695
169		305					
170		435					
170	6	452	450				700
170		464					
171		429					
171	7	329	339	298			703
171		359					
172		401					
172	10	430	409				709
172		396					
173		415					
173	11	347	352	309			715
173		345					
174		415					
174	10	430	427				725
174		424					
175		411					
175	9	367	374	329			729
175		373					
176		452					
176	9	446	454				734
176		>458					
177		390					
177	10	407	401	352			741
177		407					
178		447					
178	9	452	450				744
178		452					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 TREPA PILA 10 **FECHA TOMA:** 3/09/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 1/10/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
166		430				CONTROL TOTAL			
166	9	447	437						
166		435							
167		452							
167	7	475	463						
167		464							
168		362							
168	7	373	373						
168		384							
						ELEMENTO ACEPTADO.			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 4 TREPA PILA 4 **FECHA TOMA:** 29/08/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 26/09/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
164		435				CONTROL TOTAL			
164	8	452	444				891		
164		444							
165		452							
165	8	464	460				892		
165		464							
						ELEMENTO ACEPTADO			

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA PILA 1 **FECHA TOMA:** 28/08/97
TIPO HORMIGON: H-250 SR **KN:** 0,88 **FECHA ROTURA:** 25/09/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
156		458					
156	7	396	439				656
156		464					
157		435					
157	8	418	420	369	SI		660
157		407					
158		424					
158	7	396	405	356	SI		664
158		396					
159		418					
159	7	418	418				667
159		418					
160		407					
160	7	418	418	367	SI		672
160		430					
161		420					
161	8	452	443				678
161		447					
162		458					
162	7	447	452	397	SI		679
162		452					
163		464					
163	9	464	464				681
163		464					
						ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 3 TECSA PILA 4 **FECHA TOMA:** 26/08/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 23/09/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
151		435				CONTROL TOTAL	
151	5	441	433				812
151		424					
152		424					
152	9	430	429				814
152		435					
153		430					
153	7	430	431				816
153		435					
154		430					
154	8	424	420				818
154		407					
155		430					
155	8	424	429				819
155		435					
						ELEMENTO ACEPTADO.	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 TRE DA VILA 4 **FECHA TOMA:** 21/08/97

TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 18/09/97 **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
146		418				CONTROL TOTAL			
146	7	396	405				520		
146		401							
147		396							
147	8	401	398				521		
147		387							
148		407							
148	7	435	416				527		
148		407							
149		430							
149	6	424	426				531		
149		424							
150		430							
150	6	424	429				535		
150		435				ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA ESTRIBO 1 **FECHA TOMA:** 20/08/97

TIPO HORMIGON: H-250 SR **KN:** 0,88 **FECHA ROTURA:** 17/09/97 **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
132(b)		311							
132(b)	7	339	321	285	SI		608		
138(b)		322							
139		367							
139	10	350	357				612		
139		356							
140		356							
140	8	311	344				619		
140		367							
141		329							
141	8	339	339	298	SI		621		
141		339							
142		326							
142	8	379	380						
142		367					626		
143		311							
143	8	337	326	286	SI				
143		328					628		
144		356							
144	7	356	361						
144		373					638		
145		339							
145	9	316	329	298	SI				
145		362					641		
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 TRESA PILA 11 **FECHA TOMA:** 12/02/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 9/09/97 **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
130	9	>509				CONTROL TOTAL	379		
130	9	>509	509						
130	9	>509							
131	7	>481							
131	7	>509	499				383		
131	7	>509							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 2 TRE PA P-12 **FECHA TOMA:** 8/08/97
TIPO HORMIGON: H-350 **KN:** **FECHA ROTURA:** 5/09/97 **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
5		458				CONTROL TOTAL			
5	8	430	446				329		
5		452							
6		452							
6	7	447	454				334		
6		464							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ENSAYO CAPACT. PLANTA VALMAÑA I-52,5 FECHA TOMA: 8/08/97
TIPO HORMIGON: H-350 I-52,5 KN: FECHA ROTURA: 5/09/97 ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
1	7	420							
1	7	379	414						
1	7	435							
2	8	~~350~~							
2	8	430	430						
2	8	430							
3	7	430							
3	7	443	443						
3	7	452							
4	10	447							
4	10	435	441						
4	10	~~339~~							
5	2	452							
5	2	430	446						
5	8	452							
6	7	452							
6	7	447	454						
6	7	464							

414 ≤ 430 ≤ 441 ≤ 443 ≤ 446 ≤ 454

$X_1 + X_2 - X_3$

$414 + 430 - 441 = 403 \geq f_{ck}$

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TRELA DILA. 4 FECHA TOMA: 18/08/97
TIPO HORMIGON: H-350-I-52,5 KN: FECHA ROTURA: 15/09/97 ROTURA A: 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
134		458				CONTROL TOTAL			
134	8	430	458				470		
134		486							
135		417							
135	7	486	471				471		
135		481							
136		430							
136	12	452	444				472		
136		452							
137		435							
137	12	452	444				473		
137		443							
138(2)		509							
138(2)	8	508	508				474		
138(2)		503							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: LIMPIEZA E 1 **FECHA TOMA:** 13/08/197
TIPO HORMIGON: H-125 SR **KN:** 2,82 **FECHA ROTURA:** 10/09/197 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
132		147,12							
132	9	141,47	146	129,4	SI				
132		152,78							
133		141,47							
133	8	147,12	143,35	126	SI				
133		141,47							

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA PILA 2 **FECHA TOMA:** 5/08/97
TIPO HORMIGON: H-250 SR **KN:** **FECHA ROTURA:** 2/09/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
125		447				CONTROL TOTAL			
125		447	448				257		
125		452							
126		424							
126		469	439				258		
126		424							
127		396							
127		407	405				261		
127		412							
128		452							
128		452	456				263		
128		464							
129		452							
129		452	452				267		
129		452				ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TRCPA PILA 10 **FECHA TOMA:** 1/08/97
TIPO HORMIGON: H-250 SR **KN:** **FECHA ROTURA:** 29/08/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
120		407				CONTROL TOTAL	191
120	10	396	399		SI		
120		396					
121		452					
121	2	452	452		SI		194
121		452					
122		417					
122	10	430	441		SI		195
122		457					
123		435					
125	8	458	450		SI		198
123		488					
124		503					
124	9	464	479		SI		199
124		464				ELEMENTO ACEPTADO	

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA PILA 4 **FECHA TOMA:** 30/07/97
TIPO HORMIGON: H-250 SR **KN:** 0,88 **FECHA ROTURA:** 27/08/97 **ROTURA A:** 28 DIAS

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN
110		452					
110	7	458	459				88
110		469					
111		430					
111	8	424	420	369	SI		90
111		407					
112		430					
112	7	413	420				95
112		418					
113		367					
113	10	384	378	332	SI		101
113		384					
114		452					
114	7	447	446				128
114		441					
115		396					
115	8	407	441	388	SI		131
115		430					
116		424					
116	7	420	424	373	SI		147
116		424					
117		452					
117	7	447	588				149
117		441					
118		435					
118	9	424	431	379	SI		155
118		435					
119		452					
119	10	435	442				159
119		441					

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA PILA 11 **FECHA TOMA:** 29/07/97
TIPO HORMIGON: H-350 SR **KN:** **FECHA ROTURA:** 26/08/97. **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
106		367				CONTROL TOTAL			
106	5	396	381				48		
106		390							
107		396							
107	7	379	382				49		
107		373							
108		367							
108	7	367	369				50		
108		373							
109		379							
109	9	362	375				51		
109		384							
						ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA PILA 12 **FECHA TOMA:** 28/07/97
TIPO HORMIGON: H-350 SR **KN:** **FECHA ROTURA:** 20/08/97 **ROTURA A:** 28 **DIAS**

SERIE	CONO	KG/M2	MEDIA	ESTIMADA fest	fest> fck	OBSERVACIONES	ALBARAN		
102		430							
102	9	475	462				13966		
102		481							
103		452							
103	8	452	454				13967		
103		458							
104		435							
104	7	458	452				13968		
104		464							
105		452							
105	7	458	454				13969		
105		452				ELEMENTO ACEPTADO			

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA PILA 5 — **FECHA TOMA:** 21/07/97 — **FECHA ROTURA:** 19/08/97

0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES		
96	384						
96	407	395		7		13875	
96	396						
97	401						
97	390	395	247	7	LOTE ACEPTADO	13880	
97	396						
98	418						
98	430	409		8		13883	
98	~~399~~						
99	407						
99	396	405	356	8	LOTE ACEPTADO	13889	
99	413						
100	333						
100	362	352	309	12		13905	
100	362						
101	362						
101	367	365		9	LOTE ACEPTADO	13907	
101	367						

ELEMENTO ACEPTADO.

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ENSAYO CARACTERISTICO PLANTA VALMAÑA — **FECHA TOMA:** 8/08/97

CEMENTO CEM I 52,5 — **FECHA ROTURA:** 15/08/97

ROTURA A 7 DIAS

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
			65% de resistencia		
1	339			7	
1	339	339	521		
2	345			8	
2	333	339	521		
3	339			7	
3	362	350	538		
4	339			10	
4	333	336	516		
5	362			8	
5	362	362	556		
6	367			7	
6	379	373	573		

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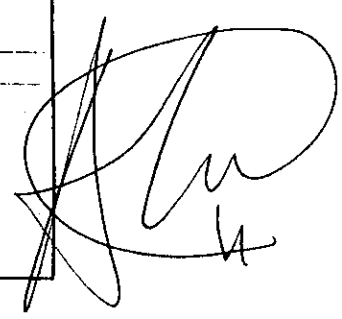
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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: 1 TREPA P-13
H-350 SR

FECHA TOMA: 17/07/97
FECHA ROTURA: 14/08/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
92	464			7	13847
92	452	456			
92	452				
93	452			8	13849
93	458	456			
93	458				
94	447			10	13852
94	447	443			
94	435				
95	430			10	13853
95	430	433			
95	441				



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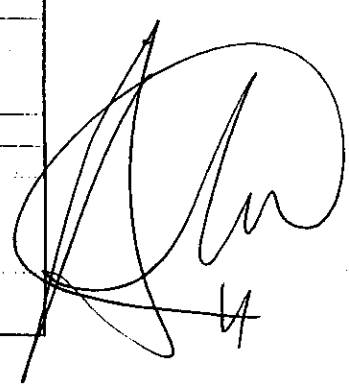
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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-12
4-250 SR. 0,88

FECHA TOMA: 16/07/97
FECHA ROTURA: 13/08/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
86	322			7	ALBARAN 13786
86	350	342	300		
86	356				
87	367			7	13787
87	373	365	321		LOTE ACEPTADO
87	356				
88	471			6	13797
88	401	428	376		
88	413				
89	373			8	13799
89	362	371	326		LOTE ACEPTADO
89	379				
90	384			6	13807
90	401	393	345		
90	396				
91	356			8	13812
91	356	359	315		LOTE ACEPTADO
91	367				



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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-6 H:250 KN:0.88

FECHA TOMA: 14/07/97
FECHA ROTURA: 11/08/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
80	362				
80	333	354	311		
80	367				
81	362				
81	362	358			LOTE ACEPTADO
81	350				
82	435				
82	396	412			
82	407				
83	373				
83	384	378	332		LOTE ACEPTADO
83	379				
84	373				
84	362	367	322		
84	367				
85	413				
85	430	420			LOTE ACEPTADO
85	418				

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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA D-7 H.250 KN: 0,88

FECHA TOMA: 10/07/97
FECHA ROTURA: 7/08/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES	ALBARAN
74	362					
74	379	367		8		13550
74	362					
75	305					
75	294	301	264	11	LOTE ACEPTADO	13549
75	305					
76	413					
76	407	409		9		8928
76	402					
77	407					
77	407	399	351	8	LOTE ACEPTADO	8932
77	384					
78	407					
78	396	403	354	8		8935
78	407					
79	441					
79	452	448		8	LOTE ACEPTADO.	8936
79	452					

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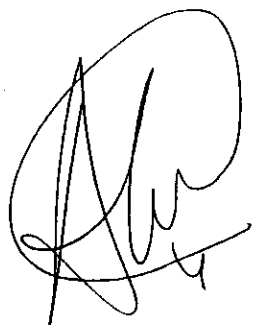
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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P.2 — FECHA TOMA: 4/07/97
4:250 — KN:0,88 — FECHA ROTURA: 1/08/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES	ALBARAN		
68	1441							
68	1447	445		9		8791		
68	1441							
69	424							
69	430	428	376	9	LOTE ACEPTADO	2794		
69	430							
70	452							
70	458	450	394	10		8808		
70	441							
71	452							
71	447	448		10	LOTE ACEPTADO	8812		
71	447							
72	435							
72	424	433		11		8822		
72	441							
73	424							
73	435	429	372	8	LOTE ACEPTADO	8824		
73	430							



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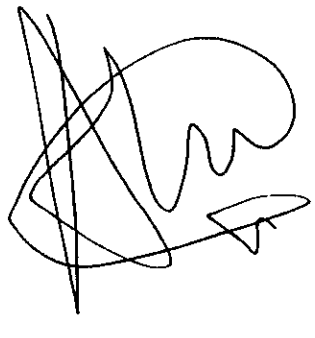
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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: MURO ZONA FABRICACION LADO DERECHO — FECHA TOMA: 26/06/97
H: 250 — KN: 0,88 — FECHA ROTURA: 24/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES			
61	305							
61	328	314	276		LOTE ACEPTADO			
61	311							



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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-11

FECHA TOMA: 25/06/97
FECHA ROTURA: 23/07/97

H: 250 KN: 0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
55	379				
55	407	401	352		
55	418				
56	435				
56	435	433			LOTE ACEPTADO
56	430				
57	430				
57	447	439			
57	441				
58	418				
58	441	433	381		LOTE ACEPTADO
58	441				
59	418				
57	396	414			
59	430				
60	424				
60	418	407	358		LOTE ACEPTADO
60	379				

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ENSAYO CARACTERISTICO (PLANTA NUEVA)

FECHA TOMA: 30/06/97
FECHA ROTURA: 20/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
1	452				
1	447	424			
1	373				
2	486				
2	362	448			
2	497				
3	503				
3	497	493			
3	481				
4	498				
4	514	512			
4	526				
5	441				
5	441	439			
5	435				
7	447				
7	447	458			
7	481				
6	333				
6	350	352			
6	373				

$424 \leq 439 \leq 448 \leq 458 \leq 493 \leq 512$

$x_1 \leq x_2 \leq x_3 \leq x_4 \leq x_5 \leq x_6$

$X_1 + X_2 - X_3 = 424 + 439 - 448 = 415 \geq f_{ck}$

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UNIDAD DE CONTROL DE CALIDAD
RESULTADOS DE ROTURA DE PROBETAS

ELEMENTO: PLANTA CARRETERA VALMAÑA
ROTURA A 7 DIAS 65 % DE RESISTENCIA

FECHA: 30/06/97

SERIE	TONELADAS	KG/CM2	MEDIA	A 28 DIAS 65%	CONO	OBSERVACIONES
1		311		478	7	26,5º C
1		308		474	7	
2		333		512	14	
2		300		462	14	
3		345		531	7	
3		345		531	7	
4		328		505	10	26,5º C
4		339		522	10	
5		289		445	11	
5		277		426	11	
7		272		418	14	25,4º C
7		283		435	14	

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PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA GRUA. (PLANTA GIRAL) FECHA TOMA: 27/06/97
H-350 ENSAYO CARACTERISTICO. FECHA ROTURA: 25/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA	Fck	CONO	OBSERVACIONES
62	509	429				
62	271					
62	509					
63	504	441				
63	305					
63	509					
64	514	518				
64	520					
64	520					
65	532	537				
65	537					
65	537					
66	520	520				
66	520					
66	520					
67	514	506				
67	441					
67	565					

$X_1 X_2 - 43 : 4294441 - 504 = 3864$

$364 \geq f_{ck} = 350$

$429 \geq 441 \geq 505 \geq 518 \geq 537 \geq 506 \geq 364$

$X_1 \; X_2 \; X_3 \; X_4 \; X_5 \; X_6$

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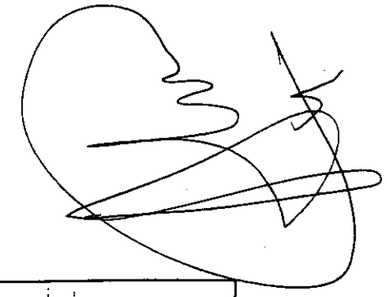
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UNIDAD DE CONTROL DE CALIDAD
RESULTADOS DE ROTURA DE PROBETAS

ELEMENTO: ZAPATA GRUA H-350
ROTURA A 7 DIAS 65 % DE RESISTENCIA

FECHA: 27/06/97

SERIE	TONELADAS	KG/CM2	MEDIA	A 28 DIAS 65%	CONO	OBSERVACIONES
62		350		538	9	TECNOS TOMA 24º C
62		350		538	9	
63		350		538	8	
63		288		443	8	
64		265		408	10	24º C
64		396		609	10	
65		396		609	7	
65		396		609	7	
66		401		617	9	25º C
66		396		609	9	
67		407		626	7	24º C
67		401		617	7	



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UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: MURO PANTALLA FABRICACION LADO 12 QUIEBRE H-250

FECHA TOMA: 20/06/97
FECHA ROTURA: 18/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA	Fck	CONO	OBSERVACIONES
53	350					
53	362	359	375			
53	367					
54	379					
54	340	332				LOTE A (6 PIADAS)
54	309					

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TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-10

FECHA TOMA: 19/06/97

H:250 KN: 0,88

FECHA ROTURA: 17/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
47	350				
47	350	352			
47	356				
48	226				
48	350	308	271	S1	LOTE ACEPTADO
48	350				
49	265				
49	339	333	293		
49	396				
50	333				
50	333	333	293		LOTE ACEPTADO
50	333				
51	339				
51	345	341	300		
51	339				
52	441				
52	424	433			LOTE ACEPTADO
52	435				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA P-13

FECHA TOMA: 12/06/97

H-250 KN: 0,88

FECHA ROTURA: 10/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
41	424				
41	430	429,6	378		
41	435				
42	424				
42	435	431,3			LOTE ACEPTADO
42	435				
43	350				
43	356	359,6	316,4		
43	373				
44	407				
44	401	408,6			LOTE ACEPTADO
44	418				
45	350				
45	379	367,3			
45	373				
46	373				
46	265	318	279,8		LOTE ACEPTADO.
46	316				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ALZADO E-2 — FECHA TOMA: 7/06/97

M:250 — KN:0,88 — FECHA ROTURA: 5/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
38	288				
38	334	337	296,5		LOTE ACEPTADO
38	390				
39	294				
39	401	373			
39	424				
40	362				
40	232	311	273,6		LOTE ACEPTADO
40	339				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ALZADO E-2 — FECHA TOMA: 7/06/97

M:250 — KN:0,88 — FECHA ROTURA: 5/07/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
29	362				
29	362	362			
29	362				
30	328				
30	339	335	294,8		LOTE ACEPTADO
30	339				
31	311				
31	243	307	270,1		
31	367				
32	328				
32	317	328			LOTE ACEPTADO
32	339				
33	345				
33	317	341			
33	362				
34	300				
34	356	309	270,1		LOTE ACEPTADO
34	266				
35	368				
35	362	364	329,3		
35	362				
36	452				
36	475	460			LOTE ACEPTADO
36	452				
37	396				
37	407	403			
37	407				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: MUROS ZONA FABRICACION E-2
H=250

FECHA TOMA: 29/05/97
FECHA ROTURA: 26/06/97

KN: 0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
27	379				
27	328	356	313,2		
27	362				
28	379				
28	390	386			LOTE ACEPTADO
28	390				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA ZONA FABRICACION E-2
H=250

FECHA TOMA: 22/05/97
FECHA ROTURA: 19/06/97

KN 0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
25	345				
25	396	373			
25	379				
26	350				
26	322	346	304,4		LOTE ACEPTADO
26	367				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA E2 — FECHA TOMA: 11/05/97

H.250 — KN= 0,88 — FECHA ROTURA: 9/06/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
23	345,2				
23	356,5	358,4			
23	373,5				
24	356,5				
24	328,2	347,1	305,44		LOTE ACEPTADO
24	356,5				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA E2 — FECHA TOMA: 11/05/97

H.250 — KN= 0,88 — FECHA ROTURA: 9/06/97

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
14	339,5				
14	396,1	369,7			LOTE ACEPTADO
14	373,5				
15	362,2				
15	373,5	365,9			
15	362,2				
16	333,9				
16	362,2	359,8	308,7		LOTE ACEPTADO
16	356,5				
17	305,6				
17	305,6	286,7	252,29		
17	249,0				
18	356,5				
18	362,2	349			LOTE ACEPTADO
18	328,2				
19	345,2				
19	356,5	347,1	305,4		
19	339,5				
20	396,1				
20	379,1	379,1			LOTE ACEPTADO
20	362,2				
21	390,5				
21	384,8	386,7			
21	384,8				
22	384,8				
22	314,9	347,1	305,4		LOTE ACEPTADO
22	339,5				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA E 2
H-250

FECHA TOMA: 10/05/97
FECHA ROTURA: 9/06/97

KN: 0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
10	356,5				
10	390,5	373,5	328,6		LOTE ACEPTADO.
10	373,5				
11	356,5				
11	413,1	390,5			
11	401,8				
12	345,2				
12	316,9	341,4	300,4		LOTE ACEPTADO
12	362,2				
13	384,8				
13	339,5	365,9	321,9		
13	373,5				

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

UNIDAD DE CONTROL DE CALIDAD

PARTE DE ROTURA DE PROBETAS A COMPRESION

ELEMENTO: ZAPATA E2
H: 250

FECHA TOMA: 10/05/97
FECHA ROTURA: 9/06/97

KN: 0,88

SERIE	KG/M2	MEDIA	CARACTERISTICA Fck	CONO	OBSERVACIONES
1	345,2				
1	339,5	341,4	300,4		
1	339,5				
2	339,5				
2	350,8	343,3			LOTE ACEPTADO.
2	339,5				
3	345,2				
3	339,5	341,4	300,4		
3	339,5				
4	367,8				
4	384,8	369,7			LOTE ACEPTADO
4	356,5				
5	350,8				
5	333,9	335,8	295,5		
5	322,6				
6	350,8				
6	356,5	354,6			LOTE ACEPTADO.
6	356,5				
7	396,1				
7	401,8	394,2			
7	384,8				
8	390,5				
8	379,1	382,9	336,9		LOTE ACEPTADO
8	379,1				
9	384,8				
9	379,1	384,8			
9	390,5				

PARTES DE TESADO

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

ESPALDON-TABLERO **TECHO N°** _____

SOLERA N° _____

FECHA	19/20-4-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M7
N° DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT - 11
N° CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

COSIDO CABLES TABLERO - ESTRIBO

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
1	24		21	39	56	74	80					59	
2	24		26	46	62	80	86					60	
3	24		27	45	62	80	85					58	
4	24		26	43	61	77	83					57	
5	24		42	60	77	94	100					58	
6	24		84	103	121	137	143					59	
7	24		61	72	91	111	118					57	
8	24		56	74	90	108	114					58	
9	24		48	66	84	100	106					58	
10	24		81	100	117	135	141					60	

OBSERVACIONES:

RIO CINCA

5 0
8 0
9 0
4 0
1 0

0 6
0 7
0 10
0 3
0 2

CASETAS OBRA →

SE PARACION

LADO IZDO.		LADO DCHO
22,5	SIN TESAR	21,5
22	TESADOS 4 CABLES	21
21,8	TESADOS 6 CABLES	20,8
21,6	TESADOS 8 CABLES	20,6
21,5	TESADOS 10 CABLES	20,5

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-1 **TECHO N°** 345

SOLERA N° _____

FECHA	23-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	225	3	43	80	118/10	47	65				208	-7%
1BD	19	225	3	39	76	114/9	46	64				203	-9%
2BD	19	225	3	42	78	118/12	49	68				209	-7%
2BI	19	225	2	40	79	119/10	47	67				213	-6%
3BI	19	225	2	40	76	119/10	47	67				213	-6%
3BD	19	225	2	40	77	118/10	47	65				209	-7%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

V-2 **TECHO Nº** _____

SOLERA Nº 5-6-7

FECHA	23-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
4BI	19	312	3	56	109	167/13	68	95				301	-3%
4BD	19	312	3	57	111	166/12	67	94				300	-4%
5BD	19	312	2	56	111	166/9	53	80				287	-8%
5BI	19	312	2	56	111	166/9	65	92				302	-3%
6BI	19	312	3	57	112	166/13	69	96				301	-3%
6BD	19	312	3	56	110	164/10	64	92				297	-5%
7BD	19	312	3	58	114	169/12	68	94				303	-3%
7BI	19	312	3	56	112	168/11	66	93				302	-3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-2 **TECHO Nº** 7-8-9

SOLERA Nº _____

FECHA	22-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
1BI	19	215	3	39	75	113/12	49	68				203	-6%
1BD	19	215	3	43	77	115/13	51	68				204	-5%
2BD	19	215	3	39	75	112/11	50	67				202	-6%
2BI	19	215	2	41	76	113/11	47	64				200	-7%
3BI	19	215	3	41	75	112/11	47	63				196	-9%
3BD	19	215	3	38	73	110/12	47	64				194	-10%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° V-3 **SOLERA N°** 9-10-11

FECHA	18-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
4BI	19	290	3	53	102	154/10	60	85				276	-5%
4BD	19	290	3	53	104	156/10	63	87				281	-3%
5BD	19	290	3	54	103	155/10	61	85				277	-4%
5BI	19	290	3	55	105	156/11	63	87				280	-3%
6BI	19	290	3	54	105	157/11	63	87				281	-3%
6BD	19	290	3	54	104	156/11	63	88				281	-3%
7BD	19	290	3	53	103	153/10	60	85				275	-5%
7BI	19	290	3	53	104	154/10	62	86				277	-4%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° P-3 11-12-13 **SOLERA N°**

FECHA	18-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
1BI	19	225	4	43	83	123/11	52	72				220	-2%
1BD	19	225	3	41	82	121/10	50	69				216	-4%
2BD	19	225	3	41	81	121/11	51	71				217	-3%
2BI	19	225	3	40	80	120/11	52	70				216	-4%
3BI	19	225	3	41	81	121/11	50	71				217	-3%
3BD	19	225	3	41	82	122/10	50	70				219	-3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº _____

V-4 **SOLERA Nº** 13-14-15

FECHA	17-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BI	19	290	3	55	106	160/11	64	90				288	0%
4BD	19	290	3	56	108	160/11	63	90				288	0%
5BD	19	290	3	54	106	158/10	63	89				286	-1%
5BI	19	290	3	54	106	159/11	64	90				287	-1%
6BI	19	290	3	53	105	159/11	64	90				287	-1%
)D	19	290	3	54	106	160/10	63	89				288	0%
7BD	19	290	3	53	103	154/12	64	89				279	-4%
7BI	19	290	3	52	103	156/10	60	86				280	-3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-4 **TECHO Nº** 15-16-17

SOLERA Nº _____

FECHA	16-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	231	3	43	83	124/11	50	70				220	-5%
1BD	19	231	3	43	82	121/11	52	71				217	-6%
2BD	19	231	3	44	83	124/11	53	72				222	-4%
2BI	19	231	3	43	81	121/11	50	70				216	-6%
3BI	19	231	3	42	80	120/12	52	71				215	-7%
3BD	19	231	3	43	82	123/14	55	74				220	-5%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

V-5 **TECHO Nº**

SOLERA Nº 17-18

FECHA	15-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BI	19	195	3	38	71	107/11	47	62				189	-3%
4BD	19	195	3	38	72	107/11	45	63				191	-2%
5BD	19	195	2	37	71	106/10	45	62				191	-2%
5BI	19	195	3	38	73	108/13	47	65				192	-2%
6BI	19	195	3	39	73	108/13	47	65				192	-2%
6BD	19	195	3	37	72	108/10	45	62				192	-2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-5 **TECHO Nº** 18-19-20

V-6 **SOLERA Nº** 20-21

FECHA	13-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BI	19	195	2	35	69	103/10	42	59				183	-6%
4BD	19	195	2	34	68	102/10	43	59				182	-6%
5BD	19	195	2	35	69	103/10	44	60				185	-5%
5BI	19	195	2	35	69	103/10	45	61				186	-5%
6BI	19	195	2	35	70	103/10	45	60				184	-6%
6BD	19	195	3	36	70	103/11	46	61				183	-6%
1BI	19	237	2	41	82	124/10	47	70				222	-6%
1BD	19	237	2	43	83	124/11	51	70				221	-6%
2BD	19	237	2	43	83	123/12	53	72				221	-6%
2BI	19	237	2	43	84	124/10	52	71				224	-5%
3BI	19	237	2	43	83	124/11	51	72				224	-5%
3BD	19	237	2	41	81	122/10	50	70				220	-7%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-6 **TECHO Nº** 21-22-23

V-7 **SOLERA Nº** 23-24

FECHA	12-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BI	19	195	3	36	69	103/12	44	60				181	-7%
4BD	19	195	3	36	69	102/13	45	61				180	-7%
5BD	19	195	4	37	71	104/14	47	63				182	-6%
5BI	19	195	3	37	70	103/12	44	61				182	-6%
6BI	19	195	2	36	69	103/11	43	61				184	-5%
6BD	19	195	2	36	69	103/11	43	60				183	-6%
1BI	19	237	3	45	88	129/11	53	74				231	-3%
1BD	19	237	3	44	85	127/12	53	73				226	-5%
2BD	19	237	2	43	85	127/12	53	73				227	-4%
2BI	19	237	3	45	86	129/11	52	72				227	-4%
3BI	19	237	3	45	86	129/11	53	72				228	-4%
3BD	19	237	3	46	86	128/11	53	74				230	-3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-7 **TECHO Nº** 24-25-26

SOLERA Nº

FECHA	9-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	T. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	2	42	81	122/11	51	72				221	-7%
1BD	19	237	3	44	84	125/12	53	73				234	-1%
2BD	19	237	3	41	81	122/12	53	73				220	-7%
2BI	19	237	3	43	83	123/11	51	72				221	-7%
3BI	19	237	3	42	84	124/10	51	72				224	-5%
3BD	19	237	2	42	82	124/10	51	71				224	-5%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-8 **TECHO Nº** 27-28-29

V-8 **SOLERA Nº** 26-27

FECHA	8-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET.

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	4	44	86	128/9	51	73				230	-3%
1BD	19	237	3	42	84	127/9	50	72				228	-4%
2BD	19	237	4	44	86	129/11	53	74				230	-3%
2BI	19	237	3	42	84	126/9	52	72				227	-4%
3BI	19	237	2	42	83	125/10	52	72				226	-5%
3BD	19	237	3	42	85	126/11	53	74				227	-4%
4BI	19	195	2	36	70	105/10	44	60				183	-4%
4BD	19	195	2	36	70	105/11	45	60				186	-5%
5BD	19	195	2	36	70	104/11	45	60				184	-6%
5BI	19	195	2	36	71	108/10	46	64				195	0%
6BI	19	195	2	37	71	105/11	45	62				188	-4%
6BD	19	195	3	37	71	106/10	45	61				188	-4%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-9 **TECHO Nº** 30-31-32

V-9 **SOLERA Nº** 29-30

FECHA	5-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CEMTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	3	43	83	125/11	53	73				225	-5%
1BD	19	237	3	44	84	125/12	53	72				222	-6%
2BD	19	237	4	44	86	127/13	54	74				225	-3%
2BI	19	237	3	44	84	126/12	52	73				225	-3%
3BI	19	237	4	45	86	128/12	54	74				227	-2%
3BD	19	237	3	43	87	129/10	53	74				232	-2%
4BI	19	195	3	40	75	110/11	46	63				194	0%
4BD	19	195	3	40	75	111/11	47	64				197	0%
5BD	19	195	3	39	74	109/10	46	64				195	0%
5BI	19	195	3	39	74	109/12	47	65				194	0%
6BI	19	195	3	38	73	109/11	46	64				194	0%
6BD	19	195	3	40	74	109/12	47	64				193	-1%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-10 **TECHO Nº** 33-34-35

V-10 **SOLERA Nº** 32-33

FECHA	4-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	3	42	83	126/10	49	70				223	-6%
1BD	19	237	3	43	84	127/12	52	73				226	-5%
2BD	19	237	3	44	85	127/12	53	73				226	-5%
2BI	19	237	3	45	87	128/14	56	76				228	-4%
3BI	19	237	2	44	85	128/11	52	73				230	-3%
3BD	19	237	4	45	87	129/11	52	73				228	-4%
4BI	19	195	3	37	71	106/12	47	64				189	-3%
4BD	19	195	3	36	71	106/11	46	64				191	-2%
5BD	19	195	2	37	73	108/12	47	65				194	0%
5BI	19	195	3	37	72	108/11	46	64				193	-1%
6BI	19	195	3	39	74	109/11	46	64				194	0%
6BD		195	2	36	71	106/11	46	63				191	-2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº

V-11 **SOLERA Nº** 35-36

FECHA	1-3-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BI 15:20 15:29	19	195	2	40	75	109/12	46	65				195	0%
4BD 15:34 15:40	19	195	2	38	72	106/11	45	64				192	-1%
5BD 15:49 15:58	19	195	3	38	74	105/12	47	63				187	-4%
5BI 16:04 16:15	19	195	2	37	73	107/12	45	65				193	-1%
6BI 16:20 16:28	19	195	3	40	73	109/12	47	65				194	0%
6BD 16:40 16:48	19	195	4	40	74	109/11	45	64				193	-1%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-11 **TECHO Nº** 36-37-38

SOLERA Nº

FECHA	26-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	5	46	88	129/13	56	75				227	-5%
1BD	19	237	4	44	86	128/11	53	74				228	-4%
2BD	19	237	6	46	87	128/12	52	74				224	-6%
2BI	19	237	6	48	89	130/13	56	77				230	-3%
3BI	19	237	4	44	86	128/11	52	74				228	-4%
3BD	19	237	3	43	86	127/13	54	76				228	-4%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

P-12 **TECHO Nº** 39-40-41

V-12 **SOLERA Nº** 38-39

FECHA	26-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. JORNET

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BI	19	237	5	46	88	133/11	53	74				233	-2%
1BD	19	237	4	44	87	130/11	53	74				231	-3%
2BD	19	237	3	44	86	129/10	51	72				230	-3%
2BI	19	237	3	45	86	129/12	53	75				231	-3%
3BI	19	237	3	42	84	126/11	52	74				227	-4%
3BD	19	237	3	42	84	124/11	53	73				224	-5%
4BI	19	195	2	36	71	105/10	45	61				188	-4%
4BD	19	195	3	37	71	106/10	43	61				188	-4%
5BD	19	195	2	36	71	107/10	44	62				192	-2%
5BI	19	195	2	37	72	106/10	45	62				191	-2%
6BI	19	195	2	37	71	106/11	46	62				189	-3%
6BD	19	195	2	36	70	105/11	45	61				187	-4%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

V13 TECHO N° [redacted]
SOLERA N° [redacted]

FECHA	25-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	S. JORMET

TIPO DE GATO	[redacted]
N° DE GATO	[redacted]
AREA PRESION GATO	618,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
4BD	19	195	5	40	74	110/12	47	65				193	-1%
4BI	19	195	3	39	74	112/11	48	66				200	+2%
5BI	19	195	3	38	73	109/11	46	64				194	0%
5BD	19	195	3	38	72	107/11	45	62				189	-3%
6BD	19	195	2	37	69	105/9	44	61				189	-3%
6BI	19	195	3	37	74	110/11	48	66				198	+1%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO
P-13 **TECHO N°** 42-43-44
SOLERA N° _____

FECHA	24-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COLSELO

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	618,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1BD	19	237	5	46	87	129/12	53	77				231	-3%
1BI	19	237	3	44	85	125/13	53	76				226	-5%
2BI	19	237	3	45	85	128/11	53	74				230	-3%
2BD	19	237	5	45	82	122/13	51	72				215	-9%
3BD	19	237	3	46	82	121/14	52	72				215	-9%
3BI	19	237	3	40	78/8	47	87	107				213	-10%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N°

SOLERA N° 45 B

FECHA	22-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
7AD	19	319	2	57	113/7	63	122	151				312	-2%
7AI	19	319	3	59	114/5	63	118	148				310	-3%
8AI	19	319	2	59	114/7	63	120	149				310	-3%
8AD	19	319	3	58	113/8	63	121	150				308	-3%
9AD	19	319	3	60	115/7	63	118	148				309	-3%
9AI	19	319	3	58	112/8	60	116	145				295	-7%
10AI	19	319	2	55	111/7	63	118	147				304	-5%
10AD	19	319	3	58	113/7	63	118	147				305	-4%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° 45 B

SOLERA N° 45 B

FECHA	19-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M4	M7
N° DE GATO	01	88
AREA PRESION GATO	1099,58	678,56
TIPO CENTRAL	BPT-11	
N° CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
13D	19	812	3	146/11	149/5	154/8		159/10	88			805	0%
14I	19	812	2	145/5	149/9	156/11		161/13	88			816	0%
13I	19	812	2	148/5	150/8	163/9		156/9	42			770	-5%
14D	19	812	3	147/2	140/7	155/9		155/13	87			789	-3%
12D	24	840	22	258/25	218/23	228/27	93					855	+2%
12I	24	840	23	223/23	217/28	229/32	103					814	+2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 45B

SOLERA Nº 45B

FECHA	11-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
7I	12	298	2	55	107/6	58	111	137				289	-3%
7D	12	298	3	54	105/8	57	108	133				278	-6,7%
8I	12	162	2	30	58	87	117	130				156	-3,2%
8D	12	162	2	31	59	88	117	132				159	-2%
2D	12	431	3	82	158/8	87	166/12	52				432	0%
2I	12	431	2	78	155/8	86	164/10	52				430	0%
5D	12	431	3	80	158/5	85	164/9	49				433	0%
5I	12	431	2	79	155/7	87	163/12	50				425	-1%
1I	12	298	3	57	108/9	62	115	142				291	-2%
1D	12	298	4	55	108/8	60	114	141				290	-3%
3D	12	162	4	32	62	91	120	133				158	-2%
3I	12	162	2	30	59	88	117	131				158	-2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 45 B

SOLERA Nº 45 B

FECHA	11-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M 3
Nº DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
4I	12	298	2	55	107/5	70	115	141				295	-1%
4D	12	298	2	54	107/8	73	116	143				294	-1%
6D	12	162	2	31	60	90	119	133				160	-1%
6I	12	162	2	31	59	90	118	133				160	-1%
			100	150	200	250	300	350	400	430			
10I	24	933	38		248/46	140/42	145/41	141/42	137/45	105		862	-7,5%
10D	24	933	26	141/29	123/35	145/33	129/25	145/26	133/35	103		925	-1%
11I	24	933	29	153/22	126/27	145/28	127/32	152/29	134/31	103		967	+4%
11D	24	933	20	137/24	127/27	133/23	128/32	143/30	137/33	97		929	0%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 45A

SOLERA Nº 45B

FECHA	1-2-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COLSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545					
9D	12	431	4	75	146/12	77	145/5	44					- 10%
9I	12	431	2	66	137/9	80	153/14	47				382	- 11%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 44

SOLERA Nº 45A

FECHA	25-I-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. CONSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545	550				
3D	12		2	77	149/17	90	164/17	52				403	
3I	12		10	83	152/16	93	168/22	57				403	
6I	12		14	88	161/15	91	163/17	53				405	
6D	12		12	88	161/17	93	170/20	55				413	
6A	19		3	54	103/7	56	108		134			277	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 43

SOLERA Nº

FECHA	19-1-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COVELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1A	19		28	56	84	113	142	156				156,4	
2AI	19		31	59	88	116	145	160				157,6	
2AD	19		33	64	90	118	147	163				158,8	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 43

SOLERA Nº 44

FECHA	18-1-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	J. TORNET

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
1D	12		80/17	87	155/20	91	162/24	51				376	
1I	12		78/21	95	168/24	98	174/27	55				398	
4I	12		86/20	95	167/23	96	173/25	55				400	
4D	12		86/17	90	165/23	97	174/24	52				400	
8D	12		95/23	94	167/24	97	173/27	57				395,5	
8I	12		82/19	90	160/21	95	168/25	55				389,4	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° 42

SOLERA N° 43

FECHA	11-1-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO.

TIPO DE GATO	M3
N° DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545					
2I	12		7	78	153/10	83	160/13	48				405	
2D	12		5	79	154/14	83	158/16	48				398	
5D	12		8	78	153/14	83	161/15	47				396,8	
5I	12		11	83	156/15	86	166/17	50				402,9	
7I	12		8	74	147/14	78	153/15	47				379,6	
7D	12		12	76	150/15	84	153/15	48				383,3	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° 41

SOLERA N° 42

FECHA	4-1-99
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M3 M7
N° DE GATO	01
AREA PRESION GATO	433,5 678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545	550				
3I	12		4	76	152/9	80	155/12	48				404	
3D	12		11	80	154/11	82	159/12	46				398	
6D	12		7	75	152/12	83	158/13	47				398	
6I	12		5	78	151/14	83	160/18	49				396	
9D	12		5	75	152/13	81	159/17	48				397	
9I	12		6	74	148/12	83	155/16	48				388	
6A	19		2	58	112/6	62	118		147			307	
7AI	19		4	59	112/9	63	118		149			303	
7AD	19		3	58	112/6	60	115		144			302	
8AD	19		2	56	109/6	61	115		142			297	
8AI	19		2	58	114/6	60	116		145			307	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 40

SOLERA Nº 41

FECHA	21-12-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	
Nº DE GATO	
AREA PRESION GATO	
TIPO CENTRAL	
Nº CENTRAL	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
8I	12		3	73	147/9	79	152/13	46				392	
8D	12		2	72	144/8	79	155/13	46				394	
1I	12		11	84	155/11	83	158/14	48				398	
1D	12		2	75	151/8	80	157/12	48				409	
4I	12		4	78	154/12	86	161/13	50				411,5	
4D	12		3	74	151/10	84	162/12	49				412,7	
2AD	19		43	72	99	128	158		173			158,8	
2AI	19		38	66	95	123	153		168			158,8	
3AI	19		2	31	60	88	117		132			158,8	
3AD	19		28	57	86	114	144		159			160	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 39

SOLERA Nº ~~40~~

FECHA	14-12-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
2D	12	418	5	76	155/10	80	160/15	50				410,2	-2%
2I	12	418	2	80	150/10	80	156/15	48				400,4	-4%
5I	12	418	2	75	148/10	80	155/15	47				395,5	-5%
5D	12	418	2	75	150/10	85	160/20	50				401,7	-4%
7I	12	418	2	74	148/8	80	154/12	46				399,2	-5%
7D	12	418	4	76	148/9	79	155/13	47				396,8	-5%
13I	19	800	5	149/7	143/6	150/9	153/13		84			781	-2%
14D	19	800	3	143/2	140/6	150/9	153/13		86			781	-2%
13D	19	800	5	144/10	149/11	152/12	159/14		93			788	-1%
14I	19	800	1	147/3	143/6	153/12	156/16		92			798	0%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 38

SOLERA Nº 39

FECHA	8-12-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
3D	12	418	2	80	135/18	115	155/21	50				336,1	-19%
3I	12	418	5	100	150/15	82	158/15	45				389,4	-7%
6I	12	418	2	68	140/10	78	150/14	45				378,4	-10%
6D	12	418	2	73	146/14	81	157/15	47				390,6	-7%
9I	12	418	10	76	149/14	80	152/15	46				377,2	-10%
9D	12	418	7	78	153/9	79	156/14	47				399,2	-5%
6A	19	305	2	56	113/7	60	119		148			308	0%
7AD	19	305	2	57	112/8	61	120		150			308	0%
7AI	19	305	3	58	120/9	66	126						
8AI	19	305	2	55	119/7	61	117		147			314,1	13%
8AD	19	305	2	54	109/6	60	117		146			301,8	-1%

OBSERVACIONES:

SE ESCAPA 1 CABLE DEL 7AI

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 38

SOLERA Nº 39

FECHA	8-12-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10D	24	792	38	222/30	213/30	219/31	89					800	+1%
10I	24	792	27	203/26	203/27	208/34	86					763,5	-4%
11I	24	792	22	204/29	211/26	214/30	88					794,8	0%
11D	24	792	24	203/30	207/32	218/28	82					776,6	-2%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 37
SOLERA Nº 38

FECHA	30-11-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO: CENTRAL
UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
1I	12	418	4	78	152/15	86	161/18	51				400,4	-4%
1D	12	418	5	78	152/14	84	161/16	49				400,4	-4%
4D	12	418	5	77	152/13	84	163/14	48				405,3	-3%
4I	12	418	5	77	152/14	83	160/16	47				399,7	-5%
8I	12	418	2	74	149/11	80	154/12	46				397	-5%
8D	12	418	5	75	149/15	84	160/13	45				393,1	-6%
2AD	19	158	36	65	94	122	150		166			158,8	0%
2AI	19	158	31	59	88	116	144		160			157,6	0%
3AI	19	158	33	61	89	118	147		163			158,8	0%
3AD	19	158	32	60	89	117	146		161			157,6	0%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 36
SOLERA Nº 37

FECHA	21-11-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.ROUSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL
UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
2D	12	418	92/4	76	152/12	84	161/14	49				407	-3%
2I	12	418	89/6	81	156/12	85	163/15	50				412	-1,5%
5I	12	418	88/4	79	151/10	86	161/14	50				409	-2%
5D	12	418	90/7	81	156/12	86	163/15	52				413	-1,1%
7D	12	418	88/4	76	150/10	82	158/12	48				404	-3,3%
7I	12	418	89/4	76	147/10	80	154/12	48				396	-5,2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 35

SOLERA Nº 36

FECHA	16-11-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
3D	12	418	88/1	72	143/11	84	158/14	48				396	-5,2%
3I	12	418	86/6	81	155/16	88	163/19	52				403	-3,6%
6I	12	418	83/5	76	153/15	85	165/17	49				404	-3,4%
6D	12	418	84/8	77	154/14	89	164/20	52				402	-4%
9I	12	418	85/5	70	143/10	76	146/14	45				373	-10,7%
9D	12	418	88/4	76	150/11	82	159/15	48				400	-4,4%
6A	19	305	53/3	57	112/9	64	119		148			303	-0,6%
7AI	19	305	55/2	58	111/8	62	117		146			302	-1%
7AD	19	305	54/3	58	112/8	61	116		144			299	-2%
8AD	19	305	53/6	59	112/8	62	119		144			296	-3%
8AI	19	305	55/1	54	108/5	60	114		142			298	-2,3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 34

SOLERA Nº 35

FECHA	9-11-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
1D	12	418	86/1	73	149/10	80	162/14	49				410	-2%
1I	12	418	81/6	78	154/11	85	162/13	49				410	-2%
4I	12	418	79/4	73	151/11	85	160/14	49				405	-3%
4D	12	418	88/7	79	159/8	81	159/14	50				415	-0,7%
8D	12	418	90/4	77	153/10	83	162/14	50				413	-1,1%
8I	12	418	88/4	78	153/11	84	163/11	49				415	-0,7%
2AD	19	158	29	58	86	116	145		161			161	+1,9%
2AI	19	158	30	57	86	114	144		160			160	+1,3%
3AI	19	158	29	57	86	116	145		161			161	+1,9%
3AD	19	158	30	59	87	116	146		162			161	+1,9%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 33

SOLERA Nº 34

FECHA	3-11-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
2I	12	418	81/6	78	153/11	86	163/14	51				411,5	-1,6%
2D	12	418	82/5	77	154/9	82	160/12	49				413	-1,1%
5D	12	418	83/6	78	154/11	83	160/14	50				408	-2,3%
5I	12	418	89/4	78	151/10	84	162/14	50				410	-1,4%
7I	12	418	95/4	78	151/8	82	162/13	50				414	-0,9%
7D	12	418	92/6	78	153/8	86	160/8	50				418	0%
13	19	800	152/2	147/7	152/5	153/7	157/12		88			811	+1,3%
14	19	800	160/6	150/7	152/7	158/9	160/11		93			822	+2,7%
13	19	800	153/3	149/7	153/7	157/10	160/13		93			821	+2,6%
14	19	800	159/3	149/6	152/5	155/10	158/12		90			816	+2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 32

SOLERA Nº

FECHA	26-10-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10D	24	800	215/21	207/22	205/26	215/30	85					799	0%
10I	24	800	215/23	203/26	206/29	216/33	93					791	-1,2%
11D	24	800	231/25	210/25	207/28	217/32	88					797	0%
11I	24	800	225/22	216/25	218/27	228							

OBSERVACIONES:

El tendon 11I tiene 23 torones en lugar de 24

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 32

SOLERA Nº 33

FECHA	26-10-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M3	44
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545	550				
3I	12	418	89/4	79	153/10	81	160/14	52				413	-1%
3D	12	418	89/6	76	150/10	82	158/14	50				401	-4%
6D	12	418	86/4	78	154/9	85	164/14	51				418	0%
6I	12	418	90/2	76	151/11	85	164/14	52				416	0%
9I	12	418	90/5	79	152/10	83	162/14	51				411,5	-2%
9D	12	418	94/5	79	154/10	83	163/14	51				415	0%
6A	19	305	59/1	56	110/6	61	116		146			304	0%
7AD	19	305	56/2	56	110/6	63	119		148			305	0%
7AI	19	305	56/5	59	113/6	63	119		146			303	0%
8AI	19	305	56/1	57	108/6	61	117		147			303	0%
8AD	19	305	59/1	56	110/5	63	118		148			308	0%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 31

SOLERA Nº 32

FECHA	19-10-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545	550				
1D	12	418	85/4	79	153/8	83	161/14	52				416	-0,4%
1I	12	418	89/2	76	151/10	85	163/14	49				412	-1,4%
4I	12	418	82/2	77	153/9	84	161/14	50				415	-0,7%
4D	12	418	90/1	78	153/8	83	160/11	49				419	+0,2%
8D	12	418	85/7	79	154/10	86	163/14	50				411	-1,6%
8I	12	418	91/1	74	149/9	80	157/13	48				405	-3,1%
2AD	19	158	34	63	92	121	150		166			161	+1,8%
2AI	19	158	29	57	87	117	146		162			162,5	+2,8%
3AI	19	158	32	59	88	117	148		163			160	+1,2%
3AD	19	158	37	66	94	124	153		169			161	+1,8%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 30

SOLERA Nº 31

FECHA	13-10-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. IOLSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
2I	12	418	87/3	74	151/8	81	159/12	47				409	-2,1 %
2D	12	418	88/2	75	150/10	82	163/11	49				415	-0,07%
5D	12	418	81/3	75	153/8	82	160/11	48				417	-0,02%
5I	12	418	84/2	76	151/7	81	157/12	47				409	-2,1%
7D	12	418	83/9	82	157/10	83	159/13	47				405	-3,1%
DI	12	418	93/4	76	147/9	79	155/11	46				397	-5 %

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 29

SOLERA Nº 30

FECHA	5-10-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	I.JORNET/MIOSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
9D	12	418	81/2	77	152/8	83	159/11	46				411,5	-1,5 %
9I	12	418	93/1	63	137/6	81	156/10	44				392	-6,2%
3D	12	418	86/2	73	144/10	81	155/12	45				392	-6,2%
3I	12	418	83/3	78	152/10	84	161/14	48				409	-2,1%
6I	12	418	86/2	76	151/7	83	161/12	47				414	-1%
6D	12	418	81/2	76	151/10	83	159/12	49				410	-1,9%
6A	19	305	39/1	55	111/1	66	122/21		50			317	+3,9%
7A I	19	305	45/2	57	112/9	64	120/12		43			308	+1%
7A D	19	305	42/1	56	110/6	61	117/12		42			305	0 %
8A D	19	305	44/1	56	109/7	61	115/10		40			300	-1,6%
8A I	19	305	46/1	56	110/7	63	119/10		40			307	+0,6%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 28

SOLERA Nº 29

FECHA	28-9-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,5	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
1D	12	418	92/3	75	149/5	79	155/13	48				405	-3,1%
1I	12	418	97/2	74	148/7	80	157/11	45				404	-3,3%
4I	12	418	81/1	75	149/5	80	157/10	45				410	-1,9%
4D	12	418	82/1	75	151/7	81	158/11	48				414	-0,9%
8D	12	418	81/3	76	152/7	82	157/12	47				409	-2,1%
8I	12	418	83/3	76	150/8	83	160/12	48				410	-1,9%
2AD	19	158	28	56	84	113	142		157			157	-0,6%
2AI	19	158	26	53	82	111	139		154			156	-1,2%
3AI	19	158	26	54	83	111	140		156			159	+0,6%
3AD	19	158	28	56	84	113	142		156			156	-1,6%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 27

SOLERA Nº 28

FECHA	21-9-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		01
AREA PRESION GATO	433,52	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545	550			ALAR. (mm)	% S. TEORIC.
2I	12	418	81/3	76	153/7	83	161/15	50				415	-0,7%
2D	12	418	86/1	76	151/5	81	160/11	48				419	+0,2%
5D	12	418	84/1	75	152/5	81	160/12	46				416	-0,4%
5I	12	418	81/2	75	150/5	80	158/13	49				413	-1,4%
7I	12	418	89/3	75	150/10	85	161/11	49				411	-1,6%
7D	12	418	95/2	76	150/8	85	162/13	49				414	-0,9%
13D	19	675	133/19	143/21	143/25	151/27	153/27		94			690	+2,2%
14I	19	675	134/21	143/24	142/27	150/26	151/27		93			677	+0,2%
13I	19	675	135/1	120/6	125/6	128/9	131/10		73			666	-1,3%
14D	19	675	129/1	121/2	122/5	129/8	131/11		73			671	-0,5%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 26

SOLERA Nº

FECHA	14-9-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10D	24	676	176/25	178/25	179/27	190/27	79					680	+5%
11I	24	676	182/22	172/23	181/20	181/30	79					675	-0,01%
10I	24	676	184/18	173/17	178/19	183/21	77					698	+3,2%
11D	24	676	178/20	178/23	179/26	190/22	79					697	+3,1%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº

SOLERA Nº 27

FECHA	14-9-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
6A	19	297,6	54/4	58	112/11	68	124	153				305 5	+2,6%
7AD	19	297,6	59/4	59	113/8	64	119	149				305,5	+2,6%
7AI	19	297,6	56/8	63	116/8	67	123	153				309	+3,8%
8AI	19	297,6	51/4	59	115/8	65	121	151				310	+4,1%
8AD	19	297,6	60/9	62	117/9	65	122/13	44				308	+3,4%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 26

SOLERA Nº 27

FECHA	14-9-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
3D	12	418	80/1	75	151/5	81	190						
3I	12	418	90/2	76	151/5	79	157/13	46				409	-2,1%
6I	12	418	82/1	74	149/8	83	159/9	50				416	-0,04%
6D	12	418	79/2	78	154/4	84	163/11	50				428	+2,3%
9I	12	418	93/2	73	153/8	83	161/13	49				416	-0,04%
9D	12	418	104/5	79	153/10	85	163/9	50				418	0%

OBSERVACIONES:

SE ESCAPA UN CABLE EN EL TENDON 3D.

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 24

SOLERA Nº 25

FECHA	31-8-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3
Nº DE GATO	
AREA PRESION GATO	433,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	545				ALAR. (mm)	% S. TEORIC.
7I	12	418	83/1	74	148/5	81	157/9	46				411	-1,6%
7D	12	418	80/1	74	147/6	80	157/11	46				407	-2,6%
2D	12	418	81/3	77	153/7	83	160/10	47				416	-0,5%
2I	12	418	84/1	75	150/6	82	160/10	46				415	-0,7%
5I	12	418	82/1	75	151/5	81	190					419	
5D	12	418	87/2	77	150/8	84	162/13	48				413	-1,1%

OBSERVACIONES:

EN EL TENDON 5I SE ESCAPA UN CABLE DEL EMPALME.

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 23

SOLERA Nº 24

FECHA	24-8-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3	M4
Nº DE GATO		
AREA PRESION GATO	433,52	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	545	550				
3D	12	418	81/2	75	151/4	80	158/11	46				414	-1%
3I	12	418	80/3	79	155/5	81	159/11	46				418	0%
6I	12	418	80/2	74	150/5	82	159/5	47				421	+1%
6D	12	418	81/2	75	151/6	84	160/4	48				425	+2%
9D	12	418	84/2	74	150/3	81	157/10	46				414	-1%
9I	12	418	87/2	75	151/4	81	157/10	46				414	-1%
6A	19	305	57/3	58	112/6	64	119		149			308	
7AD	19	305	55/3	58	113/4	61	118		143			304	
7AI	19	305	57/3	58	111/5	64	119		142			299	
8AI	19	305	54/5	61	114/4	63	118		148			309	
8AD	19	305	57/4	58	112/7	64	118		147			303	

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 22

SOLERA Nº

FECHA	18-8-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
2AI	19	158	27	56	86	114	143	157				159	+0,6%
2AD	19	158	28	57	85	114	144	158				159	+0,6%
3AD	19	158	26	55	83	113	142	157				160	+1,2%
3AI	19	158	27	56	84	112	150	157				159	+0,6%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 22

SOLERA Nº 23

FECHA	17-8-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M3 M4
Nº DE GATO	01
AREA PRESION GATO	433,52 / 678,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	530	545	550			ALAR. (mm)	% S. TEORIC.
1D	12	418	86/3	77	152/8	83	160	184	+19mm				421	+0,7%
1I	12	418	82/2	75	151/6	84	159	182	+15mm				416	-0,4%
4I	12	418	86/6	80	155/9	84	161	186	+17mm				420	+0,4%
4D	12	418	87/2	77	151/4	82	159	190	+5mm				416	-0,4%
8D	12	418	89/2	77	151/6	82	160/11	45					415	-0,7%
8I	12	418	90/2	74	147/7	79	155/11	45					403	-3,5%
13D	19	675	137/3	122/2	122/5	123/3	128/3			70			671	-0,5%
14I	19	675	131/2	123/5	125/8	130/3	132/2			71			686	+1,6%
13I	19	675	135/2	122/2	122/2	123/2	129/2			70			678	+0,4%
14D	19	675	140/2	120/2	120/5	127/3	130/12			72			666	-1,3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 21

SOLERA Nº 22

FECHA	3-8-98
HORA INICIO	
HORA FINAL	13:25
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4 M7 M3
Nº DE GATO	01 88
AREA PRESION GATO	678,56 ~~699,5~~ 433,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550					ALAR. (mm)	% S. TEORIC.
2D	19	418	84/1	74	149/5	81	159/10	49					417	-0,2%
2I	19	418	78/2	78	152/6	81	157/4	49					423	+1,1%
5I	19	418	82/2	77	150/8	82	158/10	49					412	-1,4%
5D	19	418	80/1	75	148/3	79	156/4	47					419	+0,2%
			100	200	300	400	500	543						
7D	12	418	92/3	78	153/9	84	159/5	45					416,7	-0,2%
7I	12	418	86/2	69	141/14	85	158/13	43					382	-8,5%
			100	200	300	400	430							
10I	24	670	185/23	174/25	179/26	186/28	78						671	+1,4%
10D	24	670	179/21	173/26	178/30	188/28	78						667	-0,4%
11I	24	670	181/24	179/27	182/29	188/30	79						675	+0,7%
11D	24	670	181/20	175/21	175/25	186/27	75						675	+0,7%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 20
SOLERA Nº 21

FECHA	27-7-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550	ALAR. (mm)	% S. TEORIC.
9D	19	418	84/5	77	151/8	82	158/8	50	413	-1%
9I	19	418	84/1	74	145/8	79	152/10	49	399,6	-4%
3D	19	418	83/1	74	149/2	81	158/6	50	425	+1%
3I	19	418	90/1	72	144/6	76	149/10	46	393	-6%
6I	19	418	79/1	74	148/1	79	155/2	47	422	+0,09%
6D	19	418	82/1	74	147/1	80	155/2	47	421	+0,07%
6A	19	305	54/2	56	108/3	60	115	143	300,6	-1,4%
7AD	19	305	54/2	57	110/6	64	118	147	304	-1%
7AI	19	305	59/2	57	110/4	62	114	143	301	-1%
8AI	19	305	54/2	57	110/6	63	115	143	299,4	-1,9%
8AD	19	305	51/2	57	110/3	63	117	146	306,7	+0,03%

OBSERVACIONES:

CINCA U.T.E.
TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 19
SOLERA Nº 20

ECHA	20-7-98
ORA INICIO	
ORA FINAL	
ECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550	ALAR. (mm)	% S. TEORIC.
1D	19	418	81/2	75	150/2	80	157/4	49	425	+1,6%
1I	19	418	89/2	77	151/3	82	159/4	51	430	+2,8%
4I	19	418	85/3	79	153/3	82	160/4	51	432	+3,3%
4D	19	418	82/2	76	149/4	83	158/5	50	422	+0,09%
8I	19	418	91/2	78	152/4	85	161/3	51	433	+3,5%
8D	19	418	83/2	74	148/2	80	155/4	50	421	+0,07%
2AI	19	158	36	25	93	122	151	166	158	0%
2AD	19	158	38	67	96	125	154	170	161	+1,8%
3AD	19	158	33	62	90	119	148	164	160	+1,2%
3AI	19	158	36	64	93	122	151	167	160	+1,2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° 18

SOLERA N° 19

FECHA	10-7-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
2D	19	405	82/3	77	149/6	79	154/4	49				414	+2%
2I	19	405	82/1	73	144/4	91	168/4	33				414	+2%
5I	19	409	83/1	76	149/8	83	159/4	49				420	+2,6%
5D	19	409	84/2	77	149/3	80	155/3	48				420	+2,6%
7D	19	418	86/1	74	148/4	79	156/3	48				420	+0,4%
17I	19	418	85/1	76	148/4	78	154/9	49				412	-1,4%

OBSERVACIONES:

EL TENDON 2I SE ESCAPA UN CABLE DEL EMPALME SE DEJA EN 530 b

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO N° 17

SOLERA N°

FECHA	1-7-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
N° DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
N° CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
13I	19	747	88/4	127/4	127/6	132/9	135/10	77				691	-7,4%
14D	19	747	153/5	140/7	142/4	146/4	148/5	85				777	+4%
13D	19	747	148/4	139/6	139/8	146/6	145/5	80				758	+1,4%
14I	19	747	178/6	134/4	130/6	138/9	136/11	78				709	-5%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº ____

SOLERA Nº 18

FECHA	30-6-98
HORA INICIO	
HORA FINAL	12:20
TECNICO SR.	M.ROUSELO

TIPO DE GATO	M4	M7
Nº DE GATO	01	88
AREA PRESION GATO	678,56	1099,52
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	180	200	300	400	430	500	550	ALAR. (mm)	% S. TEORIC.
6A	19	305	64/4		59	113/5	63		117	146	305	0%
7AD	19	305	59/7		61	116/10	68		124	152	307	0%
7AI	19	305	57/2		59	114/7	66		120	149	310	+2%
9D	24	531	160/19	111/27	49	167/20	146	184			516	-3%
9I	24	531	153/20	112/30	52	167/21	143	180			506	-5%

OBSERVACIONES:

SE CONTINUA CON LOS TENDONES 9I Y 9D. DESDE 180 b

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PARTE DE TESADO

TECHO Nº 17

SOLERA Nº 18

FECHA	29-6-98
HORA INICIO	8:10
HORA FINAL	17:09
TECNICO SR.	M.ROUSELO

TIPO DE GATO	M4	M7
Nº DE GATO	01	88
AREA PRESION GATO	678,56	1099,52
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
3D	19	399	80/2	71	142/6	78	150/3	45				398	+0,02%
3I	19	399	82/2	73	144/6	80	152/3	46				404	+1,2%
6I	19	399	82/2	72	143/3	78	150/2	47				407	+2%
6D	19	399	81/2	73	141/3	77	149/4	48				402	+0,07%
			100	180									
9I	24	531	153/20	112									
9D	24	531	160/19	111									

OBSERVACIONES:

DEBIDO A LA EXISTENCIA DE UNA COQUERA EN LA TROMPETA DEL TENDON 9D SE TESAN A 180 bares

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PARTE DE TESADO

TECHO Nº 16

SOLERA Nº

FECHA	25-6-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COLSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
1A	19	152	51	79	106	134	162	176				153	+0,06%
2AD	19	152	41	69	96	124	152	166				153	+0,06%
2AI	19	152	48	76	103	131	159	174				154	+ 1,3%
3AD	19	152	31	59	86	114	143	157				154	+ 1,3%
3AI	19	152	26	54	81	109	138	154				156	+ 2,6%
4AD	19	152	30	59	88	117	147	162				161	+ 6%
4AI	19	152	43	71	98	127	157	172				157	+ 3,2%

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº 16

SOLERA Nº

FECHA	23-6-98
HORA INICIO	18:00
HORA FINAL	20:26
TECNICO SR.	M. COLSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,58
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10	24	736	204/23	193/21	197/23	204/25	88					769	+ 4%
11 I	24	736	212/26	195/90	202/30	208/32	91					753	+ 2%
11 D	24	736	207/22	195/24	200/25	207/27	88					771	+ 4,7%
10 I	24	736	210/22	193/32	201/30	210/31	89					753	+ 2%

OBSERVACIONES: EN EL TENDON 11 D A 200 b SE OBSERVA UN CABLE QUE RESBALA EN LA CUNA DEL ACTIVO. SE PROCEDE A IGUALAR SU TENSION CON EL ALEVIN A 230 b. DESPUES SE CONTINUA NORMALMENTE.

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PARTE DE TESADO

TECHO Nº 16

SOLERA Nº 17

FECHA	22-6-98
HORA INICIO	8:15
HORA FINAL	13:00
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
1I	19	386	79/1	68	136/2	73		144/3	46			391	+1,3%
1D	19	386	84/1	69	135/5	75		147/3	46			390	+1%
4D	19	386	76/1	68	137/4	75		145/2	45			391	+1,2%
4I	19	386	79/1	70	138/2	75		146/3	49			399	+3,3%
8D	24	279	93/18	81	144/20	89	110					281	+0,07%
8I	24	279	90/17	82	146/21	90	112					286	+2,5%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 15

SOLERA Nº 16

FECHA	12-6-98
HORA INICIO	11:15
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4 / M7
Nº DE GATO	01 / 88
AREA PRESION GATO	678,56 / 1099,58
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
2I	19	380	75/2	69	135/2	74		143/2	46			388	+2%
2D	19	380	75/2	69	133/3	71		138/14	50			369	-3%
5D	19	380	77/1	70	136/2	75		142/3	45			387	+2%
5I	19	380	84/1	71	138/5	81		149/8	47			391	+3%
7D	24	381	117/23	106	190/25	113	141					368	-3,4%
7I	24	381	114/18	104	183/26	109	136					358	-6%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 14

SOLERA Nº 15

FECHA	1-6-98
HORA INICIO	9:50 17:30
HORA FINAL	12:57 19:20
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
3D	19	380	74/1	68	136/3	75		144/4	46			388	+2%
3I	19	380	72/1	68	136/2	75		145/4	46			391	+3%
6I	19	380	73/1	69	137/1	74		144/2	44			392	+3%
6D	19	380	74/1	66	134/1	73		142/2	44			386	+1%
8I	24	499	146/26	132/23	130/26	137	172					468	-6%
8D 12:57 12:30	24	499	144/22	134/24	132/28	141	176					480	-4%
6A	19	401	73/5	76	144/13	84		157/7	52			401	0%
7AI	19	401	75/6	76	145/6	85		153/15	54			397	-1%
7AD	19	401	83/2	74	143/6	82		153/9	51			403	+0,4%
8AD	19	401	84/5	75	144/11	86		156/14	48			388	-3%
8AI	19	401	86/2	75	145/8	82		154/12	54			404	+0,7%

OBSERVACIONES:

EL TENDON 8AD TIENE UN TORON MENOS AL SOLTARSE UNA CUNA EN EL PASIVO. SE QUEDA A UNA TENSION DE 525 bares.

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PARTE DE TESADO

TECHO Nº 13

SOLERA Nº 14

FECHA	25-5-98
HORA INICIO	8:30
HORA FINAL	12:30
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4 / M7
Nº DE GATO	01 / 88
AREA PRESION GATO	678,56 1099,58
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
9I	24	259	82/19	76	130/24	79	97					240	-7%
9D	24	259	85/17	74	133/24	82	100					250	-3,4%
1I	19	380	73/1	67	132/3	73		141/3	42			376	-1%
1D	19	380	75/1	65	128/2	71		136	168			358	-6%
4D	19	380	76/1	69	135/2	75		144/3	44			387	+2%
4I	19	380	76/2	70	137/3	76		145/3	46			391	+3%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 12

SOLERA Nº

FECHA	20-05-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COVSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,5
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
1A	19	145	30	57	82	111	137	151				148	+0,2%
2AI	19	145	28	55	81	109	135	149				148	+0,2%
2AD	19	145	34	60	86	114	141	154				147	+1,3%
3AD	19	145	29	55	81	109	135	149				147	+1,3%
3AI	19	145	27	55	80	107	134	148				148	+0,2%
4I	19	145	25	50	75	104	131	144				145	0%
4AD	19	145	28	55	80	101	135	149				148	+0,2%
5AD	19	145	38	65	90	117	144	156				144	-1%
5AI	19	145	29	55	81	108	135	150				148	+0,2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 12

SOLERA Nº 13

FECHA	18-5-98
HORA INICIO	9:15
HORA FINAL	12-00
TECNICO SR.	M.COVSELO

TIPO DE GATO	M7 / M4
Nº DE GATO	88 / 01
AREA PRESION GATO	1099,52 / 678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	350	400	430					
7D	24	381	112/18	102	188/20		111	138				375	-1,5%
7I	24	381	113/19	103	188/20	68/21	68	94				378	-0,8%
			100	200	300	400	500	550					
2D	19	380	76/3	69	134/4	72	140	175				369	-3%
2I	19	380	85/4	71	137/6	75	142	177				371	-2,4%
5I	19	380	80/3	72	141/2	76	145	179				385	+1,3%
5D	19	380	76/2	68	136/5	74	144/3	45				381	+0,26%

OBSERVACIONES:

EL TENDON 7I TIENE UN TORON QUE NO SE MUEVE CON LOS OTROS SE EXAMINA LA CUÑA Y SE VE QUE NO HA SIDO TESADO CON LA MISMA TENSION QUE LOS OTROS SE HA LLEGADO A 300 bares CON 23 TORONES HAY QUE TESAR EL QUE FALTA.

$\frac{300}{23} = 13,04$ bares. $13,04 \times 1099,52 \times 1,019 = 14610,5$ kg ; $\frac{14610}{1,019 \times 40,08} = 357,7$; AREA DE PRESION DEL ARRON 2 (Alexion)

SE TESARA CON EL UNIFILAR EL TORON HASTA LOS 360b - PARA DESARROLLOS A LA MISMA TENSION (DESPUES DE RECOLOCAR LA CUÑA) ; RESULTADO 7I - 100 200 300 360

63 126 197/5 = 99

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 11

SOLERA Nº

FECHA	8-5-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROVSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
13 I	19	615	125/3	111/4	114/7	119/10	122/8	63				607	-0,13%
14 D	19	615	120/4	113/6	116/8	121/9	121/6	70				621	+0,09%
13 D	19	615	125/2	110/3	113/4	118/3	119/4	67				624	+1,4%
14 I	19	615	123/2	111/3	114/5	119/5	121/6	68				626	+1,7%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 11

SOLERA Nº

FECHA	7-5-98
HORA INICIO	8:50
HORA FINAL	11:00
TECNICO SR.	M. ROVSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
3 D	19	380	75/2	66	133/5	74	142	177				370	-2,6%
3 I	19	380	78/1	67	134/3	74	140	175				373	-2%
6 I	19	380	81/2	67	135/7	77	146	179				373	-2%
6 D	19	380	77/3	73	139/5	75	145	180				380	0%

OBSERVACIONES:

CINCA U.T.E.

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PARTE DE TESADO

TECHO Nº

SOLERA Nº 12

FECHA	6-5-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
9D	24	381	113/20	103	186/20	109	135					366	-4%
9I	24	381	116/17	101	186/19	110	137					373	-2%

OBSERVACIONES:

CINCA U.T.E.

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PARTE DE TESADO

TECHO Nº 10

SOLERA Nº

FECHA	24-04-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10I	24	611	176/17	160/16	164/19	171	216					636	+4%
11D	24	611	171/19	155/22	156/25	162	205					586	-4%
10D	24	611	179/18	162/16	164/20	170	215					634	+3,7%
11I	24	611	187/18	162/19	166/22	172	217					633	+3,6%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 10

SOLERA Nº 11

FECHA	22-04-98 23-04-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSEL O.

TIPO DE GATO	M7	M4
Nº DE GATO	88	01
AREA PRESION GATO	1099,52	678,56
TIPO CENTRAL	BPT-11	
Nº CENTRAL	26	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430	500	550			ALAR. (mm)	% S. TEORIC.
8I	24	379	116/18	104	190/25	113	141					375	-1%
8D	24	379	119/27	114	199/29	117	146					376,5	-1%
1D	24	399	119/19	105	193/22	117	145					387	-3%
1I	24	399	112/19	111	196/22	118	146					392	-1,7%
4I	24	399	114/18	109	194/21	116	143					388	-2,7%
!D	24	399	121/18	105	196/21	114	143					391	-2%
6A	19	399	69	141/10	81	154/10		86	122			401	0%
7AD	19	399	75	146/6	79	153/7		83	121			406	+1,7%
7AI	19	399	81	151/6	77	150/7		82	119			398	0%
8AI	19	399	72	143/7	79	152/10		86	122			401	0%
8AD	19	399	75	145/5	77	150/9		83	120			398	0%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº

SOLERA Nº 10

FECHA	15-4-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

RETESADO CABLES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	380	400	410	430			ALAR. (mm)	% S. TEORIC.
7I	24	381	115/19	109	195/23		120	132/34	52			394-2mm	+3%
7D	24	381	110/15	98	185/24	98/31	49		76			376-2mm	-2%

OBSERVACIONES: RETESADO

Tendón, 7I se alargo 25 mm medido directamente en el cable

Tendon 7D se alargo 45 mm medido directamente en cable.

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 9

SOLERA Nº

FECHA	14-4-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. IOUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT - 11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
2D	24	377	108/19	104	190/26	114	141					373	-1%
2I	24	377	116/18	104	191/20	110	138					379	+0,5%
5I	24	382	112/21	109	195/22	115	143					384	+0,5%
5D	24	382	112/18	105	191/20	115	143					386	+1%

OBSERVACIONES:

CINCA U.T.E.

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PARTE DE TESADO

TECHO Nº

SOLERA Nº 10

FECHA	7-4-98
HORA INICIO	19:40
HORA FINAL	20:37
TECNICO SR.	M. IOUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT 11
Nº CENTRAL	26

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
7I	24	381	115/19	109	195/23	120	132					371	-2,6%
7D	24	381	110/15	98	185/24	98							

OBSERVACIONES:

EL TENDON 7I SE ELEVA LIGERAMENTE

EL TENDON 7D SE DEJA A 380 PORQUE COMIENZA A DESPEGARSE 3 mm LA PLACA

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PARTE DE TESADO

TECHO Nº 8

SOLERA Nº

FECHA	2-4-98
HORA INICIO	15:00
HORA FINAL	18:00
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT 9.2-C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	400	500	550					
1A	19	156	51	79	107	136	165	179				156,4	0%
2AI	19	156	30	59	86	115	143	158				156,4	0%
2AD	19	156	27	56	84	112	141	156				157,6	+1%
3AD	19	156	30	57	86	115	144	160				158,8	+1,7%
3AI	19	156	28	56	85	115	145	161				162,5	+4,1%
4AI	19	156	31	60	87	117	147	162				160,1	+2,6%
4AD	19	156	27	57	85	114	143	159				161,3	+3,3%
5AD	19	156	29	57	85	114	144	159				158,8	+1,7%
5AI	19	156	30	59	86	114	143	158				156,4	0%

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº 8

SOLERA Nº 9

FECHA	1-4-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COUSELO

TIPO DE GATO	M7 / M4
Nº DE GATO	88 01
AREA PRESION GATO	1099,52 / 678,56
TIPO CENTRAL	BPT 9.2-C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	200	300	360	370	400	430				
9D	24	381	114/19	108	195/21	84/25		67	95			402-12	12%
9I	24	381	115/20	107	195/27		79/22	56	83			375-7	-3%
6I	24	383	115/18	107	194/21	83/22		63	89			397	+4%

OBSERVACIONES:

SE HA REALIZADO EL RETESADO DE DICHOS TENDONES TRAS RELLENAR LOS CAJETINES.

EL 9D ESTABA HASTA 360 b
EL 9I ESTABA HASTA 370 b
EL 6I ESTABA HASTA 360 b

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PARTE DE TESADO

TECHO Nº 8

SOLERA Nº 9

FECHA	30-3-98
HORA INICIO	17:20
HORA FINAL	21:30
TECNICO SR.	M. COUSELO

TIPO DE GATO	M7 / M4
Nº DE GATO	88 / 01
AREA PRESION GATO	1099,52 / 678,56
TIPO CENTRAL	BPT-9.2-C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
9D	24	381	114/19	108	195/21	84							
9I	24	381	115/20	107	195/27	79							
3D	24	378	119/18	105	194/21	118	146					392 −3mm 389	+3%
3I	24	378	113/18	105	192/20	115	146					390 −3mm 387	+2%
6I	24	383	115/18	107	194/21	83							
6D	24	383	118/19	108	196/20	118	151					401-3mm 398	+4%

OBSERVACIONES:

TENDON 9D SE SEPARA LA PLACA 1,2 CM A LA IZQUIERDA PARADA A 360 b
TENDON 9I SE SEPARA LA PLACA 7 mm A LA DERECHA. PARADA A 370 b
TENDON 3D SE SEPARA LA PLACA 3 MM
TENDON 3I SE SEPARA LA PLACA 3 MM
TENDON 6I SE SEPARA LA PLACA HACIA ARRIBA CASI CORTA LA PURGA, PARADA A 360 b
TENDON 6D SE SEPARA LA PLACA 3 mm Y SUBE ALGO.

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PARTE DE TESADO

TECHO Nº

SOLERA Nº

FECHA	27-3-98
HORA INICIO	MAÑANA
HORA FINAL	MAÑANA
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT,56
Nº CENTRAL	

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
14D	19												
14I	19												

OBSERVACIONES:

SE RETESA EL 14 D POR EL DESCANTE 41 mm.
NO SE PUEDE HACER LO MISMO CON EL 14 I PORQUE SE HABIAN CORTADO LOS CABLES

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PARTE DE TESADO

TECHO Nº 7

SOLERA Nº

FECHA	26-3-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
10D	24		185/20	143/24	145/26	152	190						

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº 7

SOLERA Nº

FECHA	25-3-98
HORA INICIO	16:00
HORA FINAL	
TECNICO SR.	M.COUSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT, 9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

700 × 1,019 × 1099,52 = 448, Tn
* 752 nueva Alarga teorica.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	400	430				ALAR. (mm)	% S. TEORIC.
1D	24	778	218/19	188/24	192/21	200/30	68					733	-1,73
4D	24	377	114/21	107	194/20	117/27		61				396	+5%

OBSERVACIONES:
A 420b se rompe un toron del tendon 1D. 16:57
se continua el tesado del cable 4D despues de sellar el rejetin con grout.
(400b, 27) → (430, 61)

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PARTE DE TESADO

TECHO Nº 7

SOLERA Nº 8

FECHA	23-3-98
HORA INICIO	8:15
HORA FINAL	13:00
TECNICO SR.	M. COUSELO

TIPO DE GATO	M 7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT -9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	430					ALAR. (mm)	% S. TEORIC.
1I	24	373	123/21	107	194/25	116	149					387-6	+2%
1D	24	373	123/18	104	190/19								
4D	24	377	114/21	107	194/20	117							
4I	24	377	119/18	104	191/25	115	145					381-3	0%
8D	24	381	115/18	104	189/20	116	146					387-1	+1,3%
18I	24	381	132/19	106	194/24	115*/28	49					374	-1,8%

* Trabajo la armadura.

OBSERVACIONES:

Despeşe placa 6 mm de Tendón 1 I
Despeşe placa 3 mm de tendon 4 I
Despeşe placa 1 mm de tendon 8D y desplazamiento 1 cm hacia arriba
- Rotura de 8 cables tendon 1 D se volverá a enfilar completamente.
. La placa 4 D comienza a desplazarse se para a 300 b.
Retesado cable 4 D: desde frente dovela 1 (prevención frente a despeşe aroplador D4/D5) 12:35
tención despeşe "on manometro" 350 b. Alargamientos (b, mm) (350, 28) → (380,43) → (409,54) → (430,76)
Medida en cable 420 mm

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PARTE DE TESADO

TECHO Nº 6

SOLERA Nº —

FECHA	11-3-98
HORA INICIO	15:30
HORA FINAL	18:00
TECNICO SR.	M. COUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678,56
TIPO CENTRAL	BPT-92C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	400	500	550				ALAR. (mm)	% S. TEORIC.
13 D	19	672	132/2	114/3	117/2	123/9	130/12	69				641	-5%
14 I	19	672	139/2	120/4	123/7	129/8	129/9	72				663	-1,5%
13 I	19	672	139/2	116/3	118/6	125/2	123/4	68				651	-3%
14D	19	672	133/2	112/2	112/5	120/5	119/8	55				606	-10%

OBSERVACIONES:



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PARTE DE TESADO

TECHO Nº _____

SOLERA Nº 7

FECHA	11-3-98
HORA INICIO	9:48
HORA FINAL	10:10
TECNICO SR.	M. ROUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678.56
TIPO CENTRAL	BPT-9.2 C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	500	500	550		
8AI	19	401	136	6	79	151	7	83	157	7	51	414	+3%
8AD	19	401	96	5	77	149	6	84	159	9	50	413	+3%

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº _____

SOLERA Nº 7

FECHA	10-3-98
HORA INICIO	9:40
HORA FINAL	11:32
TECNICO SR.	M ROUSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678.56
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	500	500	550		
6A	19	401	179	4	78	152	11	86	162	12	56	419	+4%
7AI	19	401	179	15	86	160	7	81	156	10	52	410	+2%
7AD	19	401	88	7	76	149	6	83	159	9	53	418	+4%

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº 6

SOLERA Nº 7

FECHA	9-3-98
HORA INICIO	19:00
HORA FINAL	22:15
TECNICO SR.	M. COVSELO.

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	430				
2D	24	362	120	20	105	192	22	115	144			383	+5%
2I	24	362	118	19	105	191	19	113	141			383	+5%
5I	24	381	119	20	109	196	22	122/22	77*			431-8	
5D	24	381	114	18	106	194	20	118	151			398	+4%
7I	24	381	113	18	104	189	23	114	142			378	-0,08%
7D	24	381	111	20	106	190	26	114	142			372,6	-2,2%

SOLERA. TECHO

OBSERVACIONES:

EL TENDON 5I SE DEJA A 400 PORQUE LA PLACA DE EMPALME SE SEPARA. 8 mm.

EL TENDON 7D TIENE SU PLACA DE EMPALME SEPARADA 8 mm

*ESCALON DE 400 A 430 EN EL 5I REALIZADO DIA 11-3-98

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TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 5-B

SOLERA Nº

FECHA	5-3-98
HORA INICIO	17:15
HORA FINAL	18:00.
TECNICO SR.	M. COVSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	200	300	300	400	430			
3D	24	543	165	21	144	20	147	19	150	189		547,3	+0,7%

OBSERVACIONES:

SE HA CAMBIADO Y SE HA COLOCADO TODO ENTERO Y CONTINUO DESDE LA DOVELA-1 HASTA LA 5-B.

SUSTITUYE A TENDON 3D DE PARTE Nº

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PARTE DE TESADO

TECHO Nº 5-B

SOLERA Nº 5-B

FECHA	4-3-98
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COVSELO

TIPO DE GATO	M 7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT - 9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR (mm)		% S. TEORIC.
			100	100	150	200	250	300	300	350	400	430		
10 I	24	558	151	21	80	138	196	249	31	90	152	191	505	-10%
			100	100	200	300	300	400	430					
11 D	24	558	145	20	127	233	24	134	163			458,6		-18%
11 I	24	558	162	16	134/21	141	20	147	185			525		+6%

OBSERVACIONES:

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PARTE DE TESADO

TECHO Nº 5-A

SOLERA Nº 6

FECHA	2-3-98
HORA INICIO	8:30
HORA FINAL	13:08
TECNICO SR.	

TIPO DE GATO	M 7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT - 9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES.

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	430				
3 I	24	381	115	19	104	190	25	113	143			376,6	-1,5%
3 D	24	381	111	18	104	191	20	108					
6 D	24	381	115	20	105	191	20	115	144			384,4	+0,1%
6 I	24	381	115	19	104	190	25	114	142			375,3	-1,5%
9 D	24	371	114	19	103	187	21	113	142			376,6	+1,5%
9 I	24	371	120	20	106	191	19	114	147			389,6	+5%

OBSERVACIONES:

EN EL TENDON 3D A 320 b COMIENZA A SEPARARSE Y SE ROMPEN 3 TORONES.
EN EL TENDON 6D A 380 b COMIENZA A SEPARARSE LA PLACA DE EMPALME
EN EL TENDON 9D A 410 b COMIENZA A SEPARARSE LA PLACA DE EMPALME
EN EL TENDON 9I A 400 b COMIENZA A SEPARARSE LA PLACA DE EMPALME.

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PARTE DE TESADO

TECHO Nº _____

SOLERA Nº 5-B

FECHA	13-2-98
HORA INICIO	19:15
HORA FINAL	19:43
TECNICO SR.	M. COVSELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099.52
TIPO CENTRAL	BPT -9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	430				
8D	24	381	112	17	100	183	22	109	134			362	-5 %
8I	24	381	110	16	99	180	23	109	134			358	-6 %

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 43

SOLERA Nº _____

FECHA	6-02-98
HORA INICIO	19:10
HORA FINAL	19:42
TECNICO SR.	M. COVSELO

TIPO DE GATO	M4
Nº DE GATO	01
AREA PRESION GATO	678.56
TIPO CENTRAL	BPT -9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	400	500	550				
1A	19	157		35	65	93	122	151	166			160	+2%
2AI	19	157		38	67	98	127	157	171			162	+3%
2AD	19	157		36	65	94	123	151	167			160	+2%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 4

SOLERA Nº

FECHA	4-02-98
HORA INICIO	16:15
HORA FINAL	18:57
TECNICO SR.	M. COSUELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	430				
1D	24	440	118	19	105	188	24	109	134		134-24+188-19 = 369 (-27)	239 x 410 / 430	-17%
1I	24	440	129	21	117	214	19	123	152		425		-3,4%
4I	24	440	132	18	115	215	18	125	156		437		-0,6%
4D	24	440	119	20	108	195	25	115	149		390		-11%

OBSERVACIONES:

Finalizado el alargamiento se alarga el cable unos 4 mm extras para rompensar la penetración de cuñas subiendo la presión por término medio 5 bares más.

$\frac{480.000 \text{ Kg}}{1099,52 \text{ cm}^2} / 1,019 = 428 \text{ bares} \simeq 430 \text{ bares}$

* El cable 1D está manchado de óxido

EL TENDON 4D ORIGINA UNA FISURA CERCA DE LA JUNTA CON LA DOVELA ANTERIOR.

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 3

SOLERA Nº 4

FECHA	26-1-98
HORA INICIO	8:15
HORA FINAL	17:00
TECNICO SR.	M. COSUELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,525
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

	TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC
				100	100	200	300	300	400	430				
	2D	24	320	91	16	81	142	25	91	109			274	-14%
	2I	24	320	94	19	87	153	23	91	110			288	-10%
K	5I	24	320	91	17	80	144	22	85	104			374	-8,13
*	5D	24	320	97	17	85	153	23	92	113			294	-8,13%
	7D	24	427	121	18	116	215	25	125	158			430	+0,7
	7I	24	427	118	18	109	200	26	120	147			395	-7,49%

OBSERVACIONES:

*RETESADOS POR EXTREMOS PASIVOS PRESION DE DESPEGUE EN AMBOS CABLES 360 b

EL 5I 400 b 28 mm Y EL 5D 430 b 19 mm

↓

TIENE 1 CABLE MENOS

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 2

SOLERA Nº 3

FECHA	9-1-98
HORA INICIO	14:30
HORA FINAL	18:34
TECNICO SR.	M. COSUELO

TIPO DE GATO	M4 | M7
Nº DE GATO	01 | 88
AREA PRESION GATO	678,56 | 1099,52
TIPO CENTRAL	BPT-9,2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	300	400	430	500	550		
6I	24	198	65	20	65	110		154	168			193	-2,5%
6D	24	198	66	18	64	109		154	168			195	-1,0%
9D	24	313	104	20	88	155	25	94	112			289	-7%
9I	24	313	100	18	82	146	23	88	107			276	-11%
6A	19	315	70		125	179	6	68		125	155	328	+1%
8AI	19	315	68	4	61	117	5	69		121	150	315	0%
8AD	19	315	71	3	59	115	6	66		122	152	315	0%
7AD	19	315	69	3	57	112	5	66		122	149	309	-1,9%
7AI	19	315	71	4	60	114	6	68		124	154	315	-0%

OBSERVACIONES:

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 2

SOLERA Nº

FECHA	8/01/98
HORA INICIO	19:20
HORA FINAL	20:30
TECNICO SR.	M. COSUELO

TIPO DE GATO	M7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-9.2C
Nº CENTRAL	18

MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			100	100	200	300	400	428					
~~3D~~	~~24~~	~~192~~	~~70~~	~~21~~	~~65~~	~~104~~	~~155~~	~~168~~				~~192~~	~~0%~~
3I	24	192	65	18	62	106	150	164				190	-1,04%

OBSERVACIONES:

TENDON 3D SUSTITUIDO POR EL DEL PARTE Nº

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº 1

SOLERA Nº

FECHA	12/12/97
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COSUELO

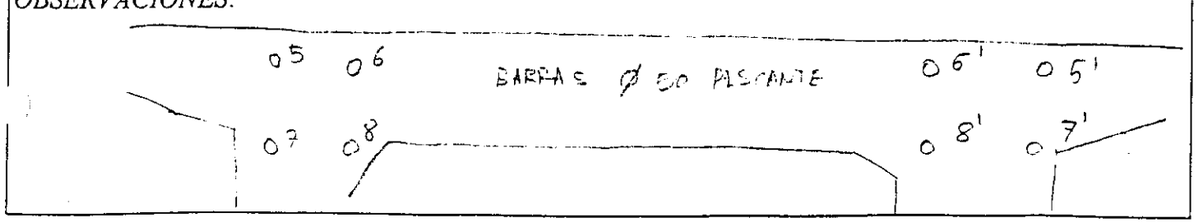
TIPO DE GATO	MH-300
Nº DE GATO	
AREA PRESION GATO	419.980
TIPO CENTRAL	BP T-9
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	245			Lfinal	Linic			ALAR. (mm)	% S. TEORIC.
5	Ø50		10	22	28			750	727				
5'	Ø50		11	21	28			760	725				
7'	Ø50		13	24	30			770	740				
6	Ø50		10	21	28			770	740				
7'	Ø50		11	24	29			760	735				
6'	Ø50		12	25	30			765	740				
8'	Ø50		11	23	29			770	740				
8	Ø50		12	24	30			760	735				

OBSERVACIONES:



CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº

SOLERA Nº 2

FECHA	12/12/97
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COSUELO

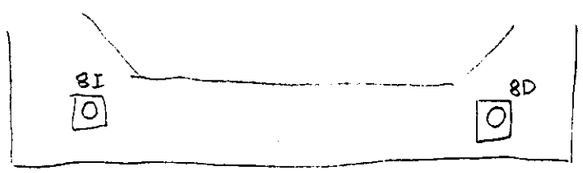
TIPO DE GATO	M-7
Nº DE GATO	88
AREA PRESION GATO	1099,52
TIPO CENTRAL	BPT-9,2C
Nº CENTRAL	18

MANOMETRO UTILIZADO: CENTRAL

UDS. DE PRESION EN MANOMETRO: BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM) 100	200	300	430					ALAR. (mm)	% S. TEORIC.
8I	24	190	76/19	64/22	67	128		$\frac{128-22+64-18}{330}\times 430 =$		197	197	+3,6 %
8D	24	190	74/18	62	106	167					194	+2,1 %
								$\frac{167-18}{330}\times 430 =$				

OBSERVACIONES:



$\mu = 0{,}21$ $K = 0{,}00125$

CORDONES	179,4 mm
GATO	3,9 mm
CUÑAS	5 mm
	183,3

CINCA U.T.E.

TECSA - FERNANDEZ CONSTRUCTOR

PARTE DE TESADO

TECHO Nº _____

SOLERA Nº 1

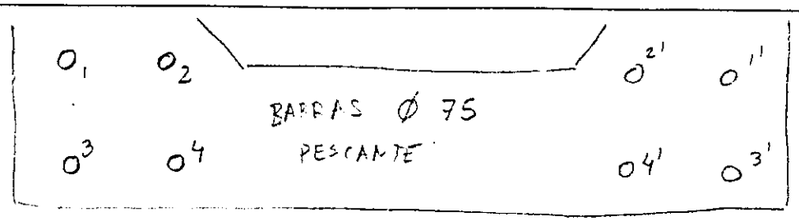
FECHA	24/11/97
HORA INICIO	
HORA FINAL	
TECNICO SR.	M. COSUELO

TIPO DE GATO	MH-300
Nº DE GATO	
AREA PRESION GATO	419,98
TIPO CENTRAL	BP-T-9
Nº CENTRAL	18

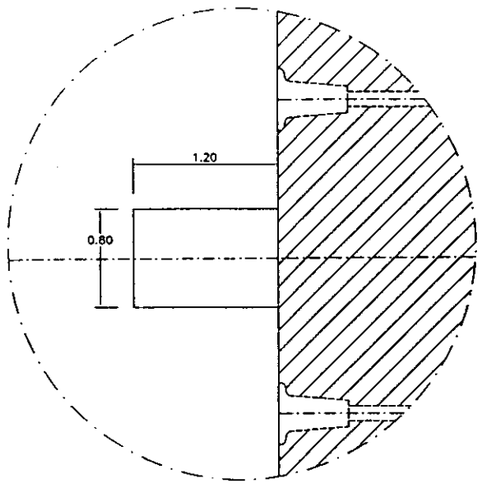
MANOMETRO UTILIZADO	CENTRAL
UDS. DE PRESION EN MANOMETRO	BARES

TENDON	TIPO	ALARG. TEORICO	LECTURAS DE CARRERA DE EMBOLO (MM)									ALAR. (mm)	% S. TEORIC.
			200	400	700		INICIAL	FINAL					
1	Ø75		10	17	27		120	152					
1'	Ø75		11	21	30		117	151					
3'	Ø75		8	19	28		118	151					
2	Ø75		10	18	27		119	151					
3	Ø75		12	20	29		120	152					
2'	Ø75		13	22	31		118	154					
4'	Ø75		11	19	27		120	153					
4	Ø75		10	19	26		120	152					

OBSERVACIONES:

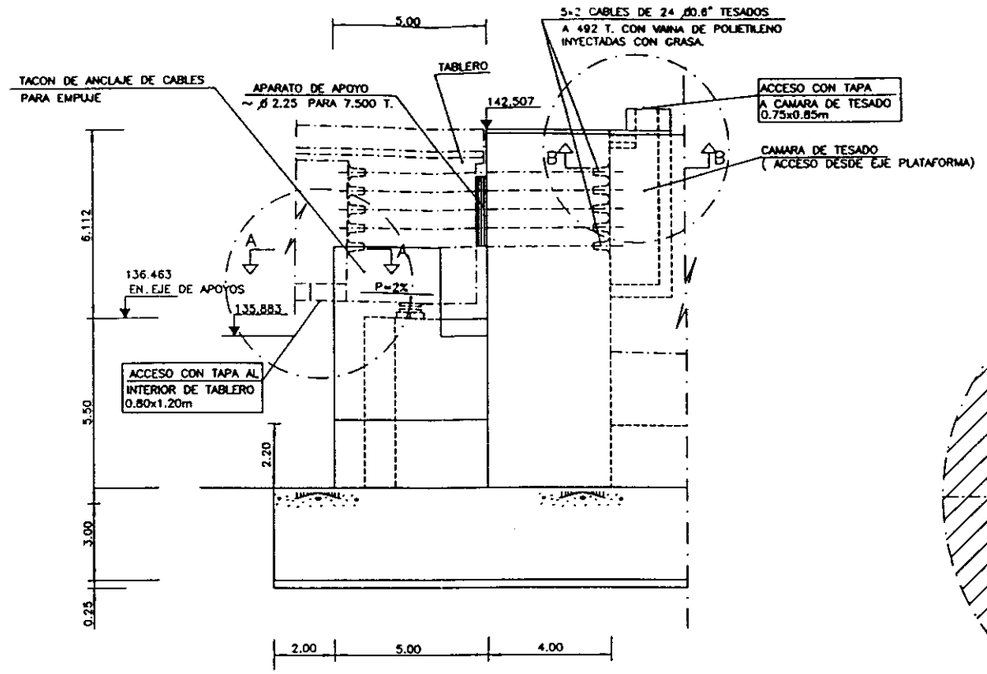


7. Accesos y elementos para mantenimiento

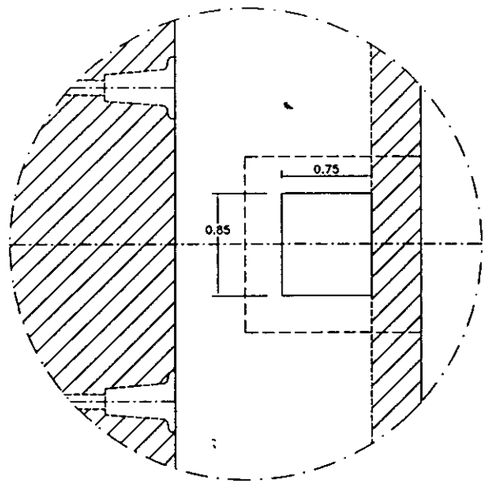


SECCION A–A PLANTA DETALLE
ESCALA 1:25

Detalle de trampilla de acceso al interior del cajon en la tabla inferior junto al estribo E–2

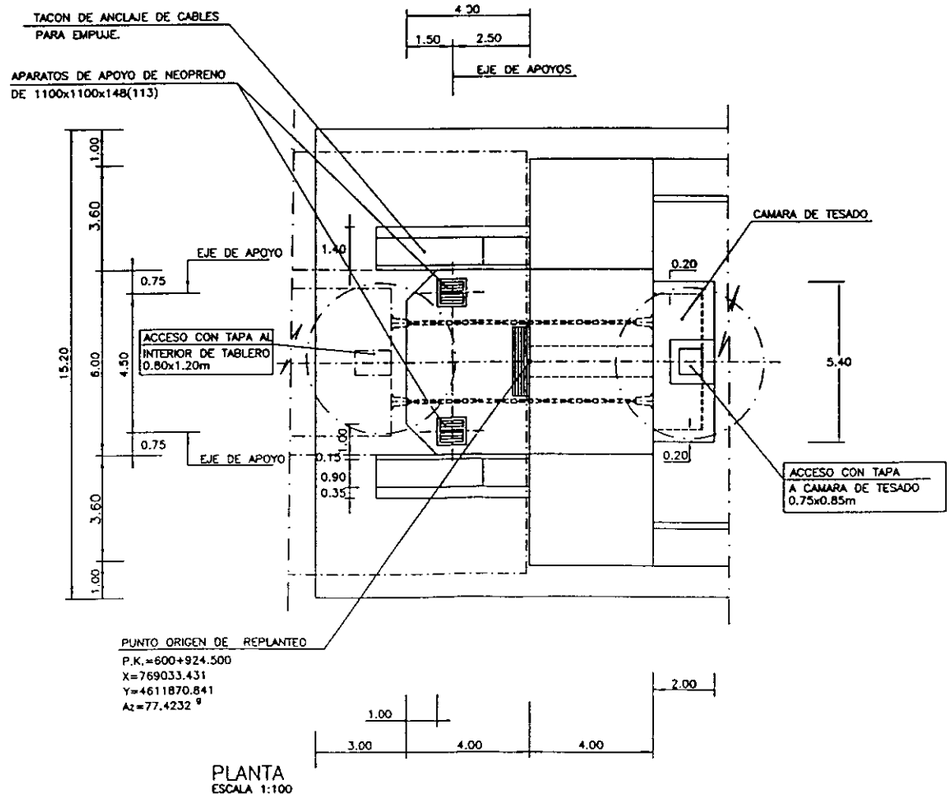


ALZADO
ESCALA 1:100



SECCION B–B PLANTA DETALLE
ESCALA 1:25

Detalle de trampilla de acceso al interior de la camara de tesado desde la plataforma en el estribo E–2



PLANTA
ESCALA 1:100

SECCION B–B PLANTA DETALLE
ESCALA 1:25

Detalle de trampilla de acceso al interior de la camara de tesado desde la plataforma en el estribo E–2

ESTRIBO-2

GIF Centro de Investigaciones Ferroviarias	TITULO: PROYECTO CONSTRUIDO MODIFICADO N° 1. LINEA DE ALTA VELOCIDAD MADRID – BARCELONA – FRONTERA FRANCESA TRAMO: ZARAGOZA – LLEIDA PUENTE SOBRE EL RIO CINCA	CINCA U.T.E. EL GERENTE: IGNACIO BUSTURIA	EL ING. AUTOR DEL PROYECTO CONSTRUIDO:	ESCALAS: 1:100 NUMERICA; GRAFICA	FECHA: JULIO 1.999	N° DEL PLANO: C– N° DE HOJA: 1 de 1	TITULO DEL PLANO: SISTEMA DE ACCESO PARA CONSERVACION EN ESTRIBO-2

8. Recomendaciones para la conservación y mantenimiento

RECOMENDACIONES A TENER EN CUENTA PARA EL MANTENIMIENTO

1. IMPERMEABILIZACIÓN

El tablero del puente se ha impermeabilizado mediante la aplicación de dos imprimaciones de una mezcla de brea-epoxi y protegidas con un riego de arena. Las dotaciones aportadas han sido:

Imprimaciones de 150 gr/m^2 de brea-epoxi fluidificada y riego de arena de 1,3 l/m^2 con grano de tamaño 1 mm.

Dado que el GIF tiene planificado el extendido de una capa de microaglomerado en todos los tableros, esta impermeabilización provisional es una garantía suficiente para la función requerida, por lo que no precisará un mantenimiento salvo que en el plazo de 5 años no se hubiera montado dicha impermeabilización definitiva.

2. FIJACIÓN Y ANCLAJE DEL TABLERO AL ESTRIBO

El sistema de fijación del tablero al estribo ha sido el definido en el Proyecto Modificado. Consiste en la colocación de 10 cables de 24 ∅ 0,6" tesadas al 80% de su limite elástico uniendo el mamparo de apoyo del tablero de la dovela 45B al espaldón del estribo fijo (E-2). Las vainas correspondientes a dichos cables se han rellenado de grasa para la conservación adecuada de los cables.

En la plataforma se ha ejecutado la cámara de tesado prevista adosada al espaldón del estribo. Dicha cámara tiene acceso desde una arqueta situada en el eje de la plataforma.

Por el tablero también se tiene acceso al mantenimiento y conservación del sistema de anclaje. El acceso al interior del tablero se realiza desde una ventana ejecutada en el centro de la tabla inferior junto al estribo.

Este sistema de acceso al interior del tablero supone una modificación respecto al Proyecto Modificado nº 1. Está perfectamente representado en los planos del Proyecto de liquidación y en este "AS BUILT", cuyo detalle se reproduce aquí mismo.

El objeto de esta modificación ha consistido en simplificar el complicado sistema de acceso previsto a través de un agujero de sección reducida que atravesaba todo el espaldón y el mamparo de apoyo de la última dovela.

Si fuera preciso liberar el tablero del estribo o se quisiera proceder a la sustitución de los cables de anclaje, sería necesario soltar ambos extremos de los cables, tanto desde la cámara de tesado como desde el interior del tablero, previo vaciado de la grasa de las vainas.

Como puede observarse en los planos, el acceso de equipos, gatos, pequeña maquinaria etc. al interior del tablero se ha simplificado y facilitado enormemente, por lo que el mantenimiento del sistema de anclaje puede realizarse fácilmente.

3. MANTENIMIENTO DEL PUENTE SOBRE EL RÍO CINCA

Los trabajos de inspección y mantenimiento del puente deben orientarse de acuerdo al sistema que para este tipo de trabajos está imponiéndose en la actualidad en el Ministerio de Fomento. Básicamente, las actuaciones de inspección a realizar se pueden clasificar en tres grupos principales, de acuerdo a su intensidad y profundidad:

- Inspecciones rutinarias
- Inspecciones principales
- Inspecciones especiales

A continuación, describiremos someramente el alcance de cada uno de los grupos anteriores, aplicándolo al puente que nos ocupa.

No obstante, se trata únicamente de un primer avance, toda vez que la descripción detallada de los aspectos a controlar y de la dinámica de actuación más conveniente se incluirá en el futuro Manual de Mantenimiento de todos los puentes de la línea que el GIF debe redactar. Este Manual, así como la presente nota preliminar, contempla sólo aquellos aspectos de índole estructural específicos del puente. La infraestructura de vía deberá ser objeto del mantenimiento e inspección que en su caso se establezca para la misma, y que no se trata en este informe.

a) INSPECCIONES RUTINARIAS

La vigilancia permanente tiene por finalidad el detectar lo más rápidamente posibles fallos o inicios de patologías en los elementos del puente, así como cualquier situación que pueda tener como resultado un rápido deterioro del mismo. Se trata de inspecciones rápidas que no necesitan de personal especializado ni de medios auxiliares.

La vigilancia permanente se realizará por personal sin necesidad de especialización, pudiendo ser, en caso de existir, el personal general de mantenimiento de la línea. Los elementos a controlar serían aquellos de menor especificad y mayor facilidad de acceso, como son los elementos de la superestructura (barandilla, canaleta, etc.), sumideros e impermeabilización, así como un control visual de los paramentos exteriores del cajón del tablero, pilas y estribos, con objeto de detectar fisuraciones visibles a simple vista, pérdidas de alineación o cualquier otro defecto similar.

b) INSPECCIONES PRINCIPALES

Las inspecciones principales tienen por objeto analizar en profundidad el estado de los elementos fundamentales del puente, y suministrar una información fiable para proponer estrategias de mantenimiento, reparación o refuerzo, y en su caso, de renovación. Para determinados elementos, no será posible disponer de toda la información necesaria para adoptar dichas decisiones, por la trascendencia o complejidad del elemento deteriorado. En dichos casos, las inspecciones periódicas deberán constituir una base para preparar una inspección especial de la zona o elemento deteriorado.

Los responsables de la inspección deberán realizar un análisis de evaluación de daños y las oportunas estrategias de conservación necesarias; de esta forma, podrá alcanzarse el objetivo de proponer medidas de reparación y mantenimiento para gran parte de los elementos del puente sin incurrir en la necesidad de inspecciones especiales adicionales, optimizando costes y ganando en eficacia y operatividad.

La empresa o departamento encargado de las inspecciones periódicas deberá disponer de un gabinete de ingeniería con capacidad técnica suficiente para la interpretación de los resultados de cada inspección. El registro de una inspección no garantiza, por sí mismo, el éxito de las labores de mantenimiento, si no incorpora una evaluación del estado de la obra.

Las inspecciones principales se realizarán con la periocidad que figure en el Manual de Mantenimiento del puente, comprendiendo un control detallado de todos los elementos del puente. Debe ser realizada por personal técnico especializado.

Los elementos a controlar en la inspección principal serán los que figuren en el Manual de Mantenimiento del puente, que debe incluir todos los puntos importantes a controlar, en especial aquellos aspectos en los que el puente, en virtud de su tipología y condiciones, pudiera resultar más sensible. En este sentido, el carácter más singular del tablero lo proporcionan sus propias dimensiones, por lo que son los aspectos ligados a éstas los que deben ser objeto de un control más riguroso, como son los movimientos en la junta, el estado de la misma y el estado de los apoyos de teflón. También son importantes las zonas con esfuerzos locales concentrados, como el tope longitudinal en el estribo, los mamparos y las cuñas de anclaje de cables en 21 fase,

así como el control de la posible aparición de fisuración en los paramentos, o progreso de la fisuración preexistente que pudiera existir, y que debe localizarse. Todo ello, como se ha dicho, debe quedar incluido en el Manual de Mantenimiento del puente.

c) INSPECCIONES ESPECIALES

Las inspecciones especiales sólo se harán en el caso de detectarse algún problema de envergadura en el puente. La preparación de la inspección será objeto de un proyecto específico realizado por ingenieros especialistas en puentes que tengan a su disposición el proyecto del puente y los informes de las inspecciones rutinarias y principales antes realizadas.

EVOLUCIÓN DE LOS MOVIMIENTOS ESPERADOS DEL TABLERO POR DEFORMACIONES DIFERIDAS

Según el Anejo de Cálculo los valores empleados de la deformación diferida en el estribo 1 asciende a 435 mm a lo que debe añadirse la deformación debida a la variación de la temperatura media del hormigón. Esta deformación está estimada en ± 124,5 mm.

Teniendo en cuenta que la primera dovela comenzó a construirse en Diciembre de 1.997 y la última se ejecutó en Febrero de 1.999, habiéndose producido una aceleración de la ejecución de dovelas en el segundo semestre de 1.999, y que el pretensado de 2ª fase se ejecutó entre Marzo y Abril de 1.999 vamos a suponer como fecha de comienzo de las deformaciones diferidas conjuntas en Octubre de 1.998.

A partir de este momento sacaremos los coeficientes de desarrollo de la fluencia y retracción de acuerdo con la función que proporciona la EHE para la fluencia que es del tipo:

$$\beta_{c(t-t0)} = \left[\frac{t-t_0}{\beta_t + (t-t_0)} \right]^{0,3}$$

En el cuadro siguiente se deducen los valores estimados para el movimiento del tablero proporcionando este valor para cada año desde el 1-10-98 hasta el 1-10-08.

MOVIMIENTOS DIFERIDOS DEL PUENTE DE

COEFICIENTE DE EVOLUCION

BETA SUB H "=1,5*e*(1+(,012HR)^18))+250

BETA h= 986,5

BETA t= (T-t)/(BETA t+(T-t))^,3

FECHA	DIAS	% DEFOR	DEFORMACION MM.	TEMPERATU MM.
1/10/98	0	0	0	"+/- 124,5
1/10/99	365	0,6752165	294	"+/- 124,5
1/10/00	730	0,77375544	337	"+/- 124,5
1/10/01	1095	0,82472909	359	"+/- 124,5
1/10/02	1460	0,85652943	373	"+/- 124,5
1/10/03	1825	0,87841033	382	"+/- 124,5
1/10/04	2190	0,89443457	389	"+/- 124,5
1/10/05	2555	0,90669474	394	"+/- 124,5
1/10/06	2920	0,91638613	399	"+/- 124,5
1/10/07	3285	0,92424368	402	"+/- 124,5
1/10/08	3650	0,93074515	405	"+/- 124,5

DEFORMACION TOTAL PREVISTA 435 MM.