



## **Annex 11. Estructures i murs**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **ÍNDEX**

1	INTRODUCCIÓ .....	1	4.1	COEFICIENTS PARCIALS.....	6
2	DESCRIPCIÓ DEL PONT .....	1	4.2	MATERIALS .....	7
2.1	OBRA DE FÀBRICA OF 0.1 .....	1	4.3	NIVELLS DE CONTROL .....	8
3	ACCIONS.....	2	4.4	NORMATIVES.....	8
3.1	ACCIONS PERMANENTS .....	2	5	AMBIENTS, RECOBRIMENTS, FISSURACIÓ I COMBINACIONS .....	8
3.1.1.	PES PROPI.....	2	5.1	AMBIENTS I RECOBRIMENTS.....	8
3.1.2.	CÀRREGUES MORTES.....	2	5.2	FISSURACIÓ.....	8
3.2	ACCIONS PERMANENTS DE VALOR NO CONSTANT .....	2	5.3	HIPÓTESIS DE COMBINACIÓ D'ESFORÇOS .....	8
3.2.1.	PRESOL·LICITACIONS .....	2	5.3.1	ESTATS LÍMITS ÚLTIMS .....	8
3.2.2.	ACCIONS REOLÒGIQUES.....	3	5.3.2	ESTATS LÍMITS DE SERVEI.....	9
2.2.3.	EMPENTES DEL TERRENY .....	4	6	CÀLCUL ESTRUCTURAL.....	9
3.3	ACCIONS VARIABLES .....	4	6.1	OBRA DE FÀBRICA0.1 .....	9
3.3.1.	SOBRECÀRREGA D'ÚS.....	4	6.1.1	CÀLCUL DEL TAULER.....	9
3.3.2.	VENT .....	5	6.1.2	CÀLCUL DELS ESTREPS I DE LA FONAMENTACIÓ.....	10
3.3.3.	ACCIÓ TÈRMICA.....	5	6.1.3	CÀLCUL DE LES PILES DE RECOLZAMENT .....	11
3.4	ACCIONS ACCIDENTALS .....	5	6.1.4	CÀLCUL DELS NEOPRENS DE RECOLZAMENT .....	12
3.4.1.	ACCIÓ SÍSMICA .....	5	6.1.5	CÀLCULS LOCALS .....	12
4	COEFICIENTS DE SEGURETAT, COMBINACIÓ, MATERIALS, NIVELLS DE CONTROL I NORMATIVES .....	6	6.1.6	PROVA DE CÀRREGA.....	12
				APÈNDIX 1. CÀLCUL DEL PONT. OF 0.1	

## 1 INTRODUCCIÓ

El present Annex té per objecte descriure i documentar les característiques i càlculs justificatius del nou pont sobre el riu Manol, inclòs al projecte constructiu "Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol".

L'estructura principal del projecte correspon al pont, format per un tauler a base de bigues artesa prefabricades, situat sobre el riu Manol, entre el PK 0+600 i PK 0+720, recolzat sobre dues piles intermèdies i estreps tancats en els extrems que transmeten les càrregues al terreny mitjançant enceps i pilons.

A continuació es mostra una taula resum amb les característiques més significatives de l'estructura projectada.

Estructura	Tipologia	Secció (m)	Amplada (m)	PK inici	PK final	L (m)
OF 0.1	Pont	Pont de bigues artesa prefabricades de tres trams de 45-45-30 m de llum amb piles i estreps tancats	9.3	0+600	0+720	120

Taula 1: Relació d'estructures i murs del present projecte constructiu.

## 2 DESCRIPCIÓ DEL PONT

### 2.1 OBRA DE FÀBRICA OF 0.1

L'estructura neix de la necessitat de superar, amb el nou traçat, el seu creuament amb el riu Manol. Es tracta de salvar una longitud total de 120m amb llums de 45 m a la zona de llera. La justificació d'aquestes dimensions pot trobar-se a l'annex d'hidrologia i drenatge.

La tipologia escollida per resoldre l'estructura correspon a un pont a base de dues bigues artesa prefabricades, simplement recolzades en dues piles intermèdies i en els seus extrems en estreps tancats. Totes les fonamentacions son profundes amb pilons formigonats "in situ".

Es proposa una plataforma de 9,3 m d'ample, apta per a dos carrils de 3,0 m d'amplada, vorals de 1.0 m i espais a banda i banda de 0,65 m per a les barreres de contenció de vehicles.

El tauler té 120 m entre eixos dels estreps, amb tres trams de llums respectives de 45-45-30 m. El tauler és de cantell constant e igual a 2.543 m (bigues de 2.20 m + Llosa de formigó in situ de 0.25 a 0.343 m) amb una relació cantell/llum de 17.5 al trams de 45 m, que es la més adequada per aquest tipus de tauler. La llosa es semi-continua a sobre de les piles, evitant així les juntes de dilatació intermèdies.

En la següent fotografia es mostra el aspecte del tram on es preveu emplaçar el futur pont.



Figura 1: Situació del futur pont

En la següent figura es presenta la situació en planta de la futura estructura.

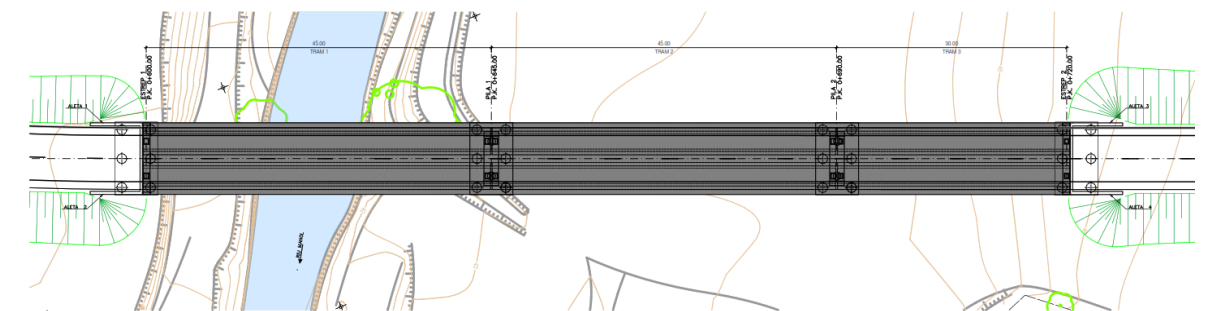


Figura 2. Situació en planta de la futura estructura OF 0.1.

En la següent figura es presenta l'alçat de l'estructura projectada.

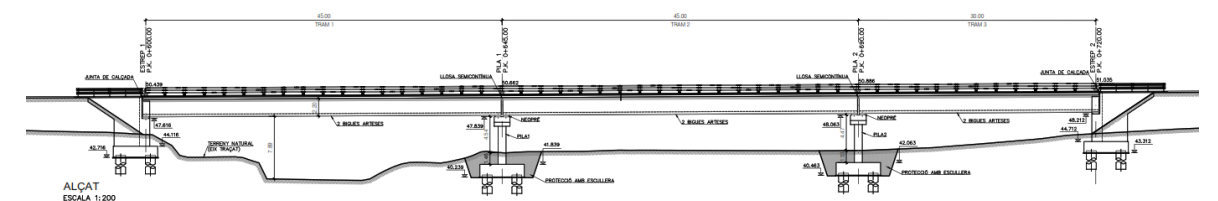


Figura 3. Perfil longitudinal de l'estructura projectada OF 0.1.

Els estreps de l'estructura es projectaran de tipus mur tancat que transmetran la càrrega al terreny competent mitjançant fonamentació profunda amb pilons executats in-situ.

Les piles, de doble fust amb biga superior, transmetran les càrregues al terreny mitjançant fonamentació profunda amb pilons executats in-situ.

L'estructura presenta en planta un traçat en recta. El traçat en alçat es una pendent constant. La següent figura recull la secció tipus definides en el pont de la OF 0.1.

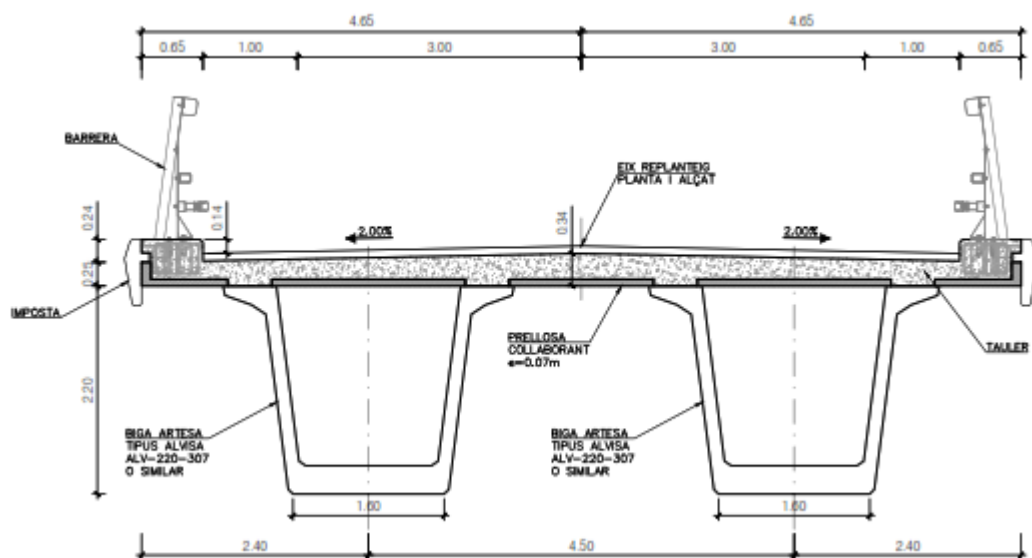


Figura 4. Seccions tipus de l'estructura projectada OF 0.1.

### 3 ACCIONS

Sobre les estructures que es contemplen en el present projecte actuen un seguit d'accions que s'han considerat en aquesta secció tenint en compte els condicionants de tipus climàtic, hidrològic, geotècnic i de trànsit que es recullen en annexes anteriors. S'ha considerat una vida útil nominal de 100 anys per a les estructures. En els següents apartats es recullen i concreten les accions a les que es veuen sotmeses les estructures al llarg del seu procés constructiu i de la seva vida útil.

#### 3.1 ACCIONS PERMANENTS

##### 3.1.1. PES PROPI

El pes propi dels elements estructurals de formigó s'obté considerant la geometria d'aquests amb una densitat del formigó armat de 25 kN/m<sup>3</sup>.

El pes propi dels elements estructurals d'acer s'obté considerat una densitat de l'acer de 78,5 kN/m<sup>3</sup>.

##### 3.1.2. CÀRREGUES MORTES

Les càrregues mortes considerades són les degudes al pes del paviment i barreres de seguretat.

- Pes del paviment (mescla bituminosa):  
Càrrega paviment = 0,08 (nominal) x 23kN/m<sup>3</sup> = 1,8kN/m<sup>2</sup>
- Pes de les barreres: Es considera un pes de barreres corresponent a l'ampit tipus H2 W2 junt amb el corresponent formigó per ancoratge de 4kN/m

La càrrega de paviment es majora en el càlcul amb un coeficient de 1.50, d'acord amb la IAP-11. A més, tot i que el ferm sobre l'estructura tindrà només una capa de rodadura amb espessor igual a 5 cm, per al càlcul estructural es consideren 8 cm d'espessor, per tal de tenir en compte un futur fresat de 2 cm + reforç de 5 cm.

#### 3.2 ACCIONS PERMANENTS DE VALOR NO CONSTANT

##### 3.2.1. PRESOL·LICITACIONS

L'estructura de la O.F. 0.1 correspon a una estructura pretensada. En aquest cas s'ha d'analitzar l'efecte del pretensat i el valor de les accions produïdes per el mateix. Es tenen en compte les pèrdues instantànies i les diferides.

- Pèrdues instantànies

$$\Delta P_i = \Delta P_1 + \Delta P_2 + \Delta P_3$$

A on:

$\Delta P_1$  corresponen a les pèrdues de tesat en la secció d'estudi degudes al fregament al llarg del conducte de pretesat.

$$\Delta P_1 = P_0 \cdot (1 - e^{-(\mu\alpha + Kx)})$$

Amb,

$\mu$  : és el coeficient de fregament a la corba.

$\alpha$  : correspon a la suma de les variacions angulars que descriu el tendó a la distància  $x$ .

$K$  : és el coeficient de fregament paràsit.

$x$  : és la distància entre la secció que es considera i l'ancoratge.

$\Delta P_2$  correspon a les pèrdues de tesat en la secció d'estudi per la penetració de les cunyes en els ancoratges.

$$\Delta P_2 = \frac{a}{L} E_p A_p$$

Amb,

$a$  : correspon a la penetració de la cunya.

$L$  : és la longitud del tendó.

$E_p$  : és el mòdul de deformació longitudinal de l'armadura activa.

$A_p$  : és la secció de la armadura activa.

$\Delta P_1$  i  $\Delta P_2$  no afecten a les bigues en cas d'armadures preteses.

$\Delta P_3$  correspon a les pèrdues degudes a l'escurçament elàstic del formigó.

$$\Delta P_3 = \sigma_{cp} \frac{n-1}{2n} \frac{E_p A_p}{E_c j}$$

Amb,

$\sigma_{cp}$  : correspon a la tensió de compressió a nivell del centre de gravetat de les armadures actives produïdes per la força  $P_0 - \Delta P_1 - \Delta P_2$  i els esforços deguts a les accions actants en el moment del tesat

$E_p$  : correspon al mòdul de deformació longitudinal de l'armadura activa.

$E_c j$  : és el mòdul de deformació longitudinal del formigó per a una edat  $j$  corresponent al moment de la disposició de l'armadura activa.

$A_p$  : correspon a la secció de l'armadura activa.

- Pèrdues diferides

$$\Delta P_{dif} = \frac{n\varphi(t, t_0)\sigma_{cp} + E_p \varepsilon_{cs}(t, t_0) + 0,80\Delta\sigma_{pr}}{1 + n \frac{A_p}{A_c} \left(1 + \frac{A_c y_p^2}{I_c}\right) (1 + \chi\varphi(t, t_0))} A_p$$

A on:

$y_p$  : és la distància del centre de gravetat de les armadures actives al centre de gravetat de la secció calculada.

$n$  : correspon al coeficient d'equivalència  $\frac{E_p}{E_c}$ .

$\varphi(t, t_0)$  : correspon al coeficient de fluència per a una edat d'activació de la càrrega igual a la edat del formigó en el moment del tesat ( $t_0$ ).

$\varepsilon_{cs}$  : correspon a la deformació de retracció que es desenvolupa a partir del tesat.

$\sigma_{cp}$  : correspon a la tensió del formigó a la fibra situada al centre de gravetat de les armadures actives degudes a l'acció de les càrregues permanents.

$\Delta\sigma_{pr}$  : correspon a la pèrdua de relaxació.

$A_c$  : correspon a la secció de formigó.

$I_c$  : correspon a la inèrcia de la secció de formigó.

$\chi$  : correspon al coeficient d'envelliment. En el cas de situacions a temps infinit es pot adoptar un valor de 0,80.

### 3.2.2. ACCIONS REOLÒGIQUES

Les accions reològiques s'han determinat d'acord amb les especificacions de la normativa vigent per al formigó estructural (EHE) diferenciant la retracció i la fluència del formigó. La humitat relativa (HR) considerada és del 70%.

RETRACCIÓ

$$\begin{aligned} \varepsilon_{cs}(t, t_s) &= \varepsilon_{cs0} \beta_s (t - t_s) \\ \varepsilon_{cs0} &= \beta_{HR} (570 - 5 f_{ck}) 10^{-6} && (f_{ck} \text{ en MPa}) \\ \beta_{HR} &= -1.55 (1 - (HR/100)^3) \end{aligned}$$

$$\beta_s = \sqrt{\frac{t - t_s}{0.035e^2 + (t - t_s)}} \quad e = \frac{2A_c}{u}$$

$t$  = edat del formigó a l'instant d'avaluació (en dies)

$t_s$  = edat del formigó al començament de la retracció (en dies)

$\varepsilon_{cs0}$  = coeficient bàsic de retracció

HR = humitat relativa

$\beta_s$  = coeficient que defineix l'evolució de la retracció en el temps

$e$  = gruix mitjà en mm

$A_c$  = àrea de la secció transversal

$u$  = perímetre en contacte amb l'atmosfera.

Així per a la consideració de la retracció s'ha considerat la formulació anterior mitjançant el software CIVICAD 2000 que considera de forma automàtica el càlcul del tauler amb els efectes de la deformació imposada deguda a la retracció.

FLUÈNCIA

$$\varepsilon_c(t, t_0) = \sigma(t_0) \left[ \frac{1}{E_{0,t_0}} + \frac{\varphi(t, t_0)}{E_0 \cdot 28} \right]$$

$\sigma_c$  = tensió mitja al formigó aplicada al temps  $t_0$

$E_{0,t_0}$  = mòdul de deformació al temps  $t_0$

$\varphi(t, t_0)$  = coeficient de fluència

$\varphi_0$  = coeficient bàsic de fluència

$$\varphi(t, t_0) = \varphi_0 \beta_c(t - t_0)$$

$$\varphi_0 = \varphi_{HR} \beta(f_{cm}) \beta(t_0)$$

$$\varphi_{HR} = 1 + \frac{100 - HR}{9.9e^{1/3}}$$

$$\beta(f_{cm}) = \frac{16.8}{\sqrt{f_{ck} + 8}}$$

$$\beta_{t_0} = \frac{1}{0.1 + t_0^{0.2}}$$

$$\beta_c(t - t_0) = \left[ \frac{t - t_0}{\beta_H + (t - t_0)} \right]^{0.3}$$

$$\beta_H = 1.5e \left[ 1 + (0.012HR)^{18} \right] + 250 > /1500$$

Així per a la consideració de la fluència s'ha considerat la formulació anterior mitjançant el software CIVICAD 2000 que considera de forma automàtica el càlcul del tauler amb els efectes de la deformació imposada deguda a la fluència.

### 3.2.3. EMPENTES DEL TERRENY

L'empenta de les terres s'ha considerat només en el cas de l'estructura de la OF 0.1 per el càlcul dels estreps tancats i les aletes, on s'han considerat els següents paràmetres:

ESTRAT DE REBLERT (R):

- Densitat aparent = 20,0 kN/m<sup>3</sup>
- Cohesió efectiva = 0,0 kN/m<sup>2</sup>
- Angle de fregament intern efectiu = 30°

## 3.3 ACCIONS VARIABLES

### 3.3.1. SOBRECÀRREGA D'ÚS

El tauler de l'estructura té un ample de plataforma 8 m. A efectes d'aplicació de la component vertical de la sobrecàrrega d'ús sobre el tauler del pont segons la IAP-11 considera la plataforma dividida en 2 carrils de 3,0 m i una amplada de l'àrea romanent de 2 m.

#### 3.3.1.1. CÀRREGUES VERTICALS

D'acord amb la instrucció IAP-11 (equivalent a EN-1991), les sobrecàrregues de tràfic verticals han de considerar els següents punts:

- Un o més vehicles pesats, segons el número de carrils virtuals (2 en el nostre cas). Cada vehicle pesant estarà constituït per dos eixos, essent  $Q_{ik}$  la càrrega de cada eix. En el nostre cas i segons la taula 4.1-b de la IAP-11 els valors seran de 2·300 kN per el carril virtual 1 i de 2·200 kN en el carril virtual 2. La separació transversal entre rodes serà de 2,00 m. La distància longitudinal entre eixos serà de 1,20 m. Les dues rodes del cada eix tindran la mateixa càrrega, que serà per tant igual a 0,5  $Q_{ik}$ . A efectes de les comprovacions generals, es suposarà que cada vehicle pesat actua centrat en el carril virtual. Per a les comprovacions locals, la càrrega puntual de cada roda d'un vehicle pesat es suposarà uniformement repartida en una superfície de contacte quadrada de 0,4 m x 0,4 m.
- Una sobrecàrrega uniforme de valor  $q_{ik}$  segons la taula 4.1-b de valor 9,0 kN/m<sup>2</sup> a la zona del carril virtual 1 i de 2,5 kN/m<sup>2</sup> a la zona del carril virtual 2 i a l'àrea romanent. La càrrega s'estendrà, longitudinal i transversalment, a totes les zones a on el seu efecte resulti desfavorable per a l'element d'estudi, inclús en aquelles zones ocupades per algun vehicle pesat.

#### 3.3.1.2. FORCES HORIZONTALS

D'acord amb la instrucció IAP-11 (equivalent a EN-1991), les sobrecàrregues degudes al trànsit horitzontals seran les següents:

- Frenada i arrencada: Es suposarà una força horitzontal uniformement distribuïda en la direcció longitudinal de la carretera aplicada al nivell de la superfície del paviment de valor característic  $Q_{ik} = 0,6 \cdot 2Q_{1k} + 0,1 \cdot q_{1k} \cdot w_1 L$  fracció del valor de la càrrega característica vertical que es considera actuant sobre el carril virtual número 1. La longitud L correspon a la distància entre juntes contigües o la longitud



Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

del pont si aquestes no existeixen. A partir dels valors considerats per a les càrregues verticals i amb una longitud màxima entre juntes de 100 m tindrem un valor de  $Q_{lk} = 632,7 \text{ kN}$ .

- o Força centrífuga: al tractar-se d'un pont amb planta recta, no es considera.

La concomitància de les diferents components de la sobrecàrrega d'ús, es tindrà en compte mitjançant la consideració dels grups de càrrega de tràfic indicats en la taula 4.1-c de la IAP-11.

### 3.3.2. VENT

En el cas del vent l'acció d'aquest s'assimila a una càrrega estàtica equivalent. Per a la consideració d'aquesta càrrega i segons la IAP-11 hem d'establir en primer lloc la velocitat bàsica del vent  $V_b(T)$  que depèn del període de retorn considerat ( $T=100$  anys) i de la zona (Figura 4.2-a Mapa de isotacas para la obtención de la velocidad básica fundamental del viento  $V_{b,0}$ ).

L'estructura segons la IAP-11 es troba situada en una zona amb una velocitat bàsica fonamental del vent de  $v_{b,0} = 29 \text{ m/s}$  (Zona C).



FIGURA 4.2-a MAPA DE ISOTACAS PARA LA OBTENCIÓN DE LA VELOCIDAD BÁSICA FUNDAMENTAL DEL VIENTO  $v_{b,0}$   
(Coincide con el mapa correspondiente del Código Técnico de la Edificación)

A efectes de càlcul s'ha considerat l'àrea d'estudi situada en un entorn de tipus II.

En el càlcul de la velocitat bàsica del vent intervenen els factors direccional del vent ( $C_{dir}=1,0$ ) i estacional del vent ( $C_{season}=1,0$ ). A partir d'aquests valors i dels paràmetres  $k=0,2$  i  $n=0,5$  s'obté un factor de probabilitat  $C_{prob}=1,04$ . Amb aquest valor finalment obtenim una velocitat bàsica del vent per el període de retorn considerat  $V_b(100)=30,1 \text{ m/s}$ .

Al tractar-se d'un entorn tipus II els valors de  $k_r=0,190$ ,  $z_0=0,050$  i  $z_{min}=2$ . Aquests valors donen lloc a un factor de rugositat de 1,041. Considerant un factor de topografia  $C_0=1$  obté finalment una velocitat mitja del vent de 31,4 m/s.

### 3.3.3. ACCIÓ TÈRMICA

Segons la IAP-11 i considerant una zona 2 de  $< 200 \text{ m}$  d'altitud tenim que la  $T_{min}=-11 \text{ }^\circ\text{C}$  i la  $T_{max}=46 \text{ }^\circ\text{C}$ . Amb el període de retorn considerat de 100 anys obtenim una temperatura màxima de l'aire a l'ombra per el període considerat de  $T_{p,max}=43,6 \text{ }^\circ\text{C}$  i una mínima de  $T_{p,min}=-12,2 \text{ }^\circ\text{C}$ .

Respecte a la component uniforme de la temperatura tindrem una temperatura efectiva mínima de  $-4,2 \text{ }^\circ\text{C}$  i de la temperatura efectiva màxima de  $45,6 \text{ }^\circ\text{C}$ . Pel que respecta al aparells de recolzament i juntes la màxima variació de la component uniforme de la temperatura en contracció  $\Delta T_{N,CON}=19,2 \text{ }^\circ\text{C}$  i la màxima variació de la component uniforme en dilatació  $\Delta T_{N,EXP}=30,6 \text{ }^\circ\text{C}$ .

Respecte de la component de la diferencia de temperatura entre les cares superior e inferior del tauler s'ha considerat un increment en secció parcial d'acer en condicions d'escalfament  $\Delta T_{M,HEAT}=15^\circ\text{C}$  i en condicions de refredament  $\Delta T_{M,COOL}=8^\circ\text{C}$ .

S'ha considerat un coeficient de dilatació tèrmica de  $10e-6^\circ\text{C}^{-1}$ .

## 3.4 ACCIONS ACCIDENTALS

### 3.4.1. ACCIÓ SÍSMICA

D'acord amb l'Estudi Geotècnic, l'acceleració de càlcul a considerar en el disseny del pont es de  $a_c=0,11g$ .

L'acceleració sísmica de càlcul  $a_c$  es defineix com el següent producte:

$$a_c = S \cdot \rho \cdot a_b$$

- On:
- $a_b$ : acceleració sísmica bàsica.  $a_b=0.09g$
  - $\rho$ : coeficient adimensional de risc, que per a infraestructures d'aquest tipus es considera igual a la unitat.
  - $S$ : coeficient d'amplificació del terreny, que té un valor de  $S=1.214$  segons l'Estudi Geotècnic.

S'obté l'espectre mostrar a la figura adjunta:

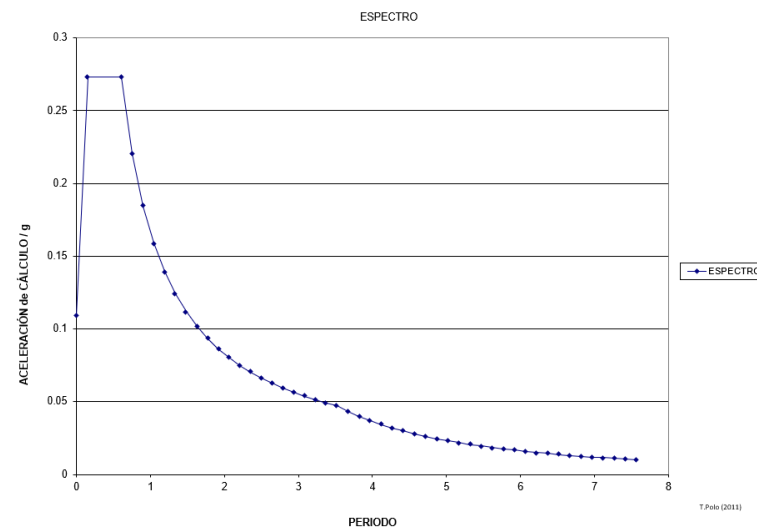


Figura 5. Espectre elàstic

#### 4 COEFICIENTS DE SEGURETAT, COMBINACIÓ, MATERIALS, NIVELLS DE CONTROL I NORMATIVES

##### 4.1 COEFICIENTS PARCIAIS

Els coeficients parcials de seguretat de les accions, per als Estats Límit Últims i de Servei, i els coeficients de combinació utilitzats per a obtenir els valors de disseny de les accions, d'acord amb la IAP (equivalent a EN-1991), es mostren a les següents taules.

ACCIÓN	EFECTO	
	FAVORABLE	DESFAVORABLE
Permanente de valor constante (G)	Peso propio	1,0 / 1,35
	Carga muerta	1,0 / 1,35
Permanente de valor no constante (G')	Pretensado $P_1$	1,0 / 1,2 <sup>(1)</sup> / 1,3 <sup>(2)</sup>
	Pretensado $P_2$	1,0 / 1,35
	Otras presolicitaciones	1,0 / 1,0
	Reológicas	1,0 / 1,35
	Empuje del terreno	1,0 / 1,5
	Asientos	0 / 1,2 / 1,35 <sup>(2)</sup>
Variable (Q)	Rozamiento de apoyos deslizantes	1,0 / 1,35
	Sobrecarga de uso	0 / 1,35
	Sobrecarga de uso en terraplenes	0 / 1,5
	Acciones climáticas	0 / 1,5
	Empuje hidrostático	0 / 1,5
	Empuje hidrodinámico	0 / 1,5
	Sobrecargas de construcción	0 / 1,35

Figura 6. Coeficients parcials de seguretat per a les accions en Estat Límit Últim

ACCIÓN	EFECTO	
	FAVORABLE	DESFAVORABLE
Permanente de valor constante (G)	Peso propio	1,0 / 1,0
	Carga muerta	1,0 / 1,0
Permanente de valor no constante (G')	Pretensado $P_1$	0,9 <sup>(1)</sup> / 1,1 <sup>(1)</sup>
	Pretensado $P_2$	1,0 / 1,0
	Otras presolicitaciones	1,0 / 1,0
	Reológicas	1,0 / 1,0
	Empuje del terreno	1,0 / 1,0
	Asientos	0 / 1,0
Variable (Q)	Rozamiento de apoyos deslizantes	1,0 / 1,0
	Sobrecarga de uso	0 / 1,0
	Sobrecarga de uso en terraplenes	0 / 1,0
	Acciones climáticas	0 / 1,0
	Empuje hidrostático	0 / 1,0
	Empuje hidrodinámico	0 / 1,0
	Sobrecargas de construcción	0 / 1,0

Figura 7. Coeficients parcials de seguretat per a les accions en Estat Límit de Servei

Per a les accions variables es consideren els valors representatius a partir dels valors característics de les mateixes multiplicats per els coeficients de combinació en funció de que es tracti del valor de combinació quan actuen varies accions de manera simultània (valor  $\psi_0$  de la següent taula), del valor freqüent quan aquest es sobrepassat en un període de curta duració respecte la vida útil del pont (valor  $\psi_1$  de la següent taula) o quasi permanent quan és superat durant una gran part de la vida útil (valor  $\psi_2$  de la següent taula). Els coeficients de combinació dels diferents tipus d'accions, d'acord amb la normativa IAP, es detallen a la següent taula.

ACCIÓN		$\psi_0$	$\psi_1$	$\psi_2$	
Sobrecarga de uso	gr 1, Cargas verticales	Vehiculos pesados	0,75	0,75	0
		Sobrecarga uniforme	0,4	0,4	0 / 0,2 <sup>(1)</sup>
		Carga en aceras	0,4	0,4	0
	gr 2, Fuerzas horizontales	0	0	0	
	gr 3, Peatones	0	0	0	
	gr 4, Aglomeraciones	0	0	0	
Sobrecarga de uso en pasarelas		0,4	0,4	0	
Viento	$F_{w,k}$	En situación persistente	0,6	0,2	0
		En construcción	0,8	0	0
		En pasarelas	0,3	0,2	0
Acción térmica	$T_r$	0,6	0,6	0,5	
Nieve	$Q_{s,k}$	0,8	0	0	
Acción del agua	$W_k$	Empuje hidrostático	1,0	1,0	1,0
		Empuje hidrodinámico	1,0	1,0	1,0
Sobrecargas de construcción	$Q_c$	1,0	0	1,0	

Figura 8. Coeficients de combinació de les accions variables

## 4.2 MATERIALS

La classe general d'exposició relativa a la corrosió de les armadures és IIa per a tots els elements de les estructures i no s'ha considerat cap classe específica d'exposició, llevat de les fonamentacions, on cal considerar Qa segons l'informe geotècnic.

Així, els formigons utilitzats són:

- **Bigues prefabricades: HP-50/B/20/IIa (fck= 50 MPa).**

Resistència característica = 50 MPa

Mòdul de deformació longitudinal = 32900 MPa

Coefficient de Poisson = 0.20

Coefficient de dilatació tèrmica =  $10^{-5}$

- **Llosa de compressió: HA-30/B/20/IIa (fck= 30 MPa).**

Resistència característica = 30 MPa

Mòdul de deformació longitudinal = 28600 MPa

Coefficient de Poisson = 0.20

Coefficient de dilatació tèrmica =  $10^{-5}$

- **Piles i estreps: HA-30/B/20/IIa (fck= 30 MPa).**

Resistència característica = 30 MPa

Mòdul de deformació longitudinal = 28600 MPa

Coefficient de Poisson = 0.20

Coefficient de dilatació tèrmica =  $10^{-5}$

- **Enceps: HA-30/B/20/IIa+Qa (fck= 30 MPa).**

Resistència característica = 30 MPa

Mòdul de deformació longitudinal = 28600 MPa

Coefficient de Poisson = 0.20

Coefficient de dilatació tèrmica =  $10^{-5}$

- **Pilons: HA-25/B/20/IIa+Qa (fck= 25 MPa).**

Resistència característica = 25 MPa

Mòdul de deformació longitudinal = 27500 MPa

Coefficient de Poisson = 0.20

Coefficient de dilatació tèrmica =  $10^{-5}$

- **Formigó de neteja: HL-150/P/30 (fck= 15MPa).**

Resistència característica = 15 MPa

Els acers utilitzats són:

- **Acer passiu: B500 S en barres corrugades (fyk=500 MPa).**

Resistència característica = 500 MPa (B 500S)

Mòdul de deformació longitudinal =  $2 \cdot 10^5$  MPa

- **Acer per a armadures actives: Y 1860 S7 en cordons (fyk=1860 MPa).**

Resistència característica = 1860 MPa

Mòdul de deformació longitudinal =  $2 \cdot 10^5$  MPa

Els coeficients de minoració de la resistència dels materials es mostra a la següent taula.



Material	Coefficients de seguretat
Formigons	$\gamma_c = 1,50$
Acer d'armar	$\gamma_s = 1,15$
Acer per a armadures actives	$\gamma_s = 1,15$

**Taula 2.** Coeficients de seguretat dels materials

Els valors de resistència de disseny dels materials són els següents:

$$f_{cd} = \frac{f_{ck}}{\gamma_c} = \frac{f_{ck}}{1.5}$$

$$f_{yd} = \frac{f_{yk}}{\gamma_y} = \frac{f_{yk}}{1.15}$$

#### 4.3 NIVELLS DE CONTROL

El nivell de control d'execució és Intens.

El nivell de control del formigó és Estadístic.

En nivell de control de l'acer és Normal.

#### 4.4 NORMATIVES

Les normatives considerades en el càlcul són les següents:

- Instrucción de Hormigón Estructural, EHE. Ministerio de Fomento. 2008
- Instrucción sobre las Acciones a considerar en el proyecto de puentes de carretera, IAP. Ministerio de Fomento. 2011
- Norma de construcción sismorresistente: Parte de puentes NCSP-07. Ministerio de Fomento. 2007
- UNE-EN 1337-3. Apoyos estructurales. Parte 3: Apoyos elastoméricos. 2005
- Guía de Cimentaciones en Obras de Carretera. Ministerio de Fomento. 2003
- Eurocódigo 1: Bases de Proyecto y acciones en estructuras. Parte 1: Bases de Proyecto (EC-1 Parte 1).
- Eurocódigo 1: Bases de Proyecto y acciones en estructuras. Parte 3: Cargas de tráfico en puentes (EC-1 Parte 3).
- Eurocódigo 2: Proyecto de estructuras de hormigón. Parte 1-1: Reglas generales y reglas para edificación
- Eurocódigo 2: Proyecto de estructuras de hormigón. Parte 2: Puentes de hormigón. Cálculo y disposiciones constructivas.

- Eurocódigo 8: Proyecto de estructuras sismorresistentes. Parte 1: Reglas generales, acciones sísmicas y reglas para edificación.
- Eurocódigo 8: Proyecto de estructuras sismorresistentes. Parte 2: Puentes.

## 5 AMBIENTS, RECOBRIMENTS, FISSURACIÓ I COMBINACIONS

### 5.1 AMBIENTS I RECOBRIMENTS

El recobriment nominal,  $r_{nom}$ , de les armadures s'obté a partir d'un recobriment mínim,  $r_{min}$ , al que s'afegeix un marge de recobriment  $\Delta r$  que depèn del tipus d'element i del nivell de control d'execució.

Bigues prefabricades:	HP-50/B/20/IIa	R = 25+0 = 25mm
Llosa:	HA-30/B/20/IIa	R = 30+5 = 35mm
Estreps i piles:	HA-30/B/20/IIa	R = 30+5 = 35mm
Fonamentacions:	HA-30/B/20/IIa+Qa	R = 30+5 = 35mm
Pilons:	HA-25/B/20/IIa+Qa	R = 75mm

### 5.2 FISSURACIÓ

La Instrucció EHE prescriu un valor màxim d'obertura de fissura del formigó armat per a l'ambient IIa de 0,30 mm, y de 0,20mm per al formigó pretensat (mantenint les armadures actives a la zona comprimida per a la combinació quasi-permanent)

### 5.3 HIPÒTESIS DE COMBINACIÓ D'ESFORÇOS

S'han considerat les combinacions d'hipòtesis de les accions recollides en la EHE, basats en la teoria d'estats límits, per les diferents situacions de càlcul de les estructures.

A continuació es descriu la formulació de les esmentades combinacions i seguidament es detallen els valors dels coeficients adoptats pels casos de càrrega considerats en els càlculs.

#### 5.3.1 ESTATS LÍMITS ÚLTIMS

Les hipòtesis de càlcul considerades són:

- Situacions persistents o transitòries  

$$\sum \gamma_{Gj} G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \gamma_{Q1} Q_{k1} + \sum \gamma_{Qi} \Psi_{0i} Q_{ki}$$

$$j \geq 1 \qquad i > 1$$
- Situacions accidentals  

$$\sum \gamma_{Ga} G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \gamma_A Q_A + \Psi_{11} Q_{k1} + \sum \gamma_{Qi} \Psi_{2i} Q_{ki}$$

$$j \geq 1 \qquad i > 1$$
- Situacions accidentals de sisme  

$$\sum G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \gamma_{iEd} A_{Ed} + \sum \gamma_{Qi} \Psi_{2i} Q_{ki}$$

$$j \geq 1 \qquad i > 1$$

On:

- G = Valor característic de les càrregues permanents.
- G\* = Valor característic de les càrregues permanents de valor no constant.
- Q<sub>k1</sub> = Valor característic de la càrrega variable dominant.
- A<sub>k</sub> = Valor característic de l'acció accidental.
- A<sub>eq</sub> = Valor característic de l'acció sísmica, calculada segons Norma Sismoresistent.

Els coeficients de seguretat i de combinació d'accions utilitzades es defineixen a la IAP i es recullen a l'apartat 4.1.

### 5.3.2 ESTATS LÍMITS DE SERVEI

Les hipòtesis de càlcul considerades són:

- Combinació característica:  

$$\sum \gamma_{Gj} G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \gamma_{Q1} Q_{k1} + \sum \gamma_{Qi} \Psi_{0i} Q_{ki}$$

$$j \geq 1 \qquad i > 1$$
- Combinació freqüent:  

$$\sum \gamma_{Gaj} G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \Psi_{11} Q_{k1} + \sum \gamma_{Qi} \Psi_{2i} Q_{ki}$$

$$j \geq 1 \qquad i > 1$$
- Combinació quasi permanent:  

$$\sum G_{kj} + \sum \gamma_{Gj} G_{kj}^* + \sum \gamma_{Qi} \Psi_{2i} Q_{ki}$$

$j \geq 1$        $i > 1$

Els coeficients de seguretat i de combinació d'accions utilitzades es defineixen a la IAP i es recullen a l'apartat 4.1.

## 6 CÀLCUL ESTRUCTURAL

### 6.1 OBRA DE FÀBRICA 0.1

#### 6.1.1 CÀLCUL DEL TAULER

El tauler es calcula utilitzant el software CivilCAD 2000, que permet el càlcul d'esforços, el dimensionat i la verificació de tots els estats límits, últims i de servei per a seccions de formigó pretensat.

El programa calcula les reaccions en els recolzament de les bigues per a totes les hipòtesis i combinacions de càrregues.

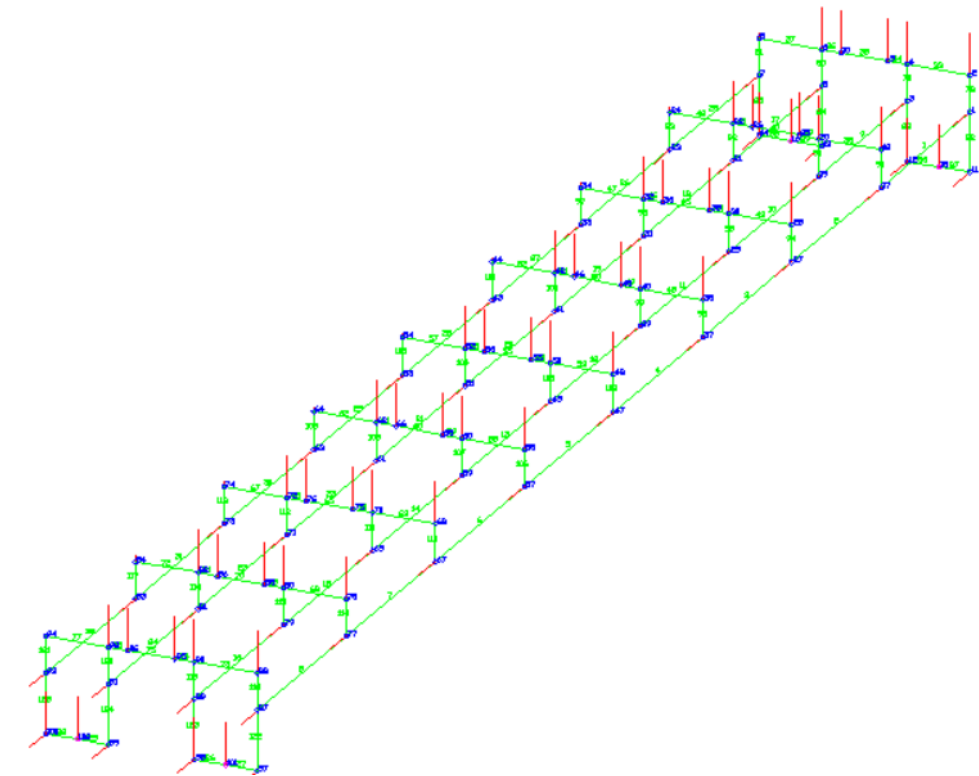


Figura 9. Esquema de discretització del tauler de 45m del pont corresponent a la OF 0.1.

En l'apèndix 1 que s'inclou al final d'aquest annex es poden consultar els llistats i els resultats de càlcul obtinguts per el càlcul del tauler de formigó.

### 6.1.2 CÀLCUL DELS ESTREPS I DE LA FONAMENTACIÓ

A partir de les reaccions del tauler calculades amb el programa CivilCAD s'ha dut a terme la verificació estructural dels dos estreps de l'estructura mitjançant eines Excel desenvolupades en AYESA.

El programa verifica i calcula els esforços en tots els elements estructurals del mur de l'estrep realitzant totes les comprovacions estructurals per als estat límits últims i de servei.

Les següent figures mostren les dimensions dels estreps i la fonamentació dimensionada per a aquesta estructura.

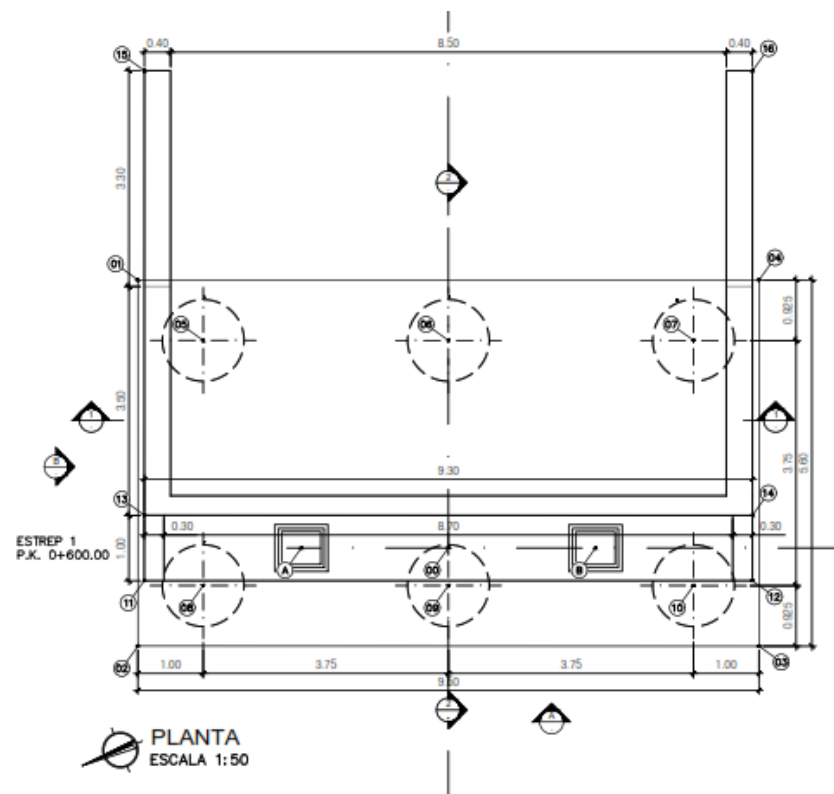


Figura 10. Planta de l'estrep E1 per a la OF 0.1.

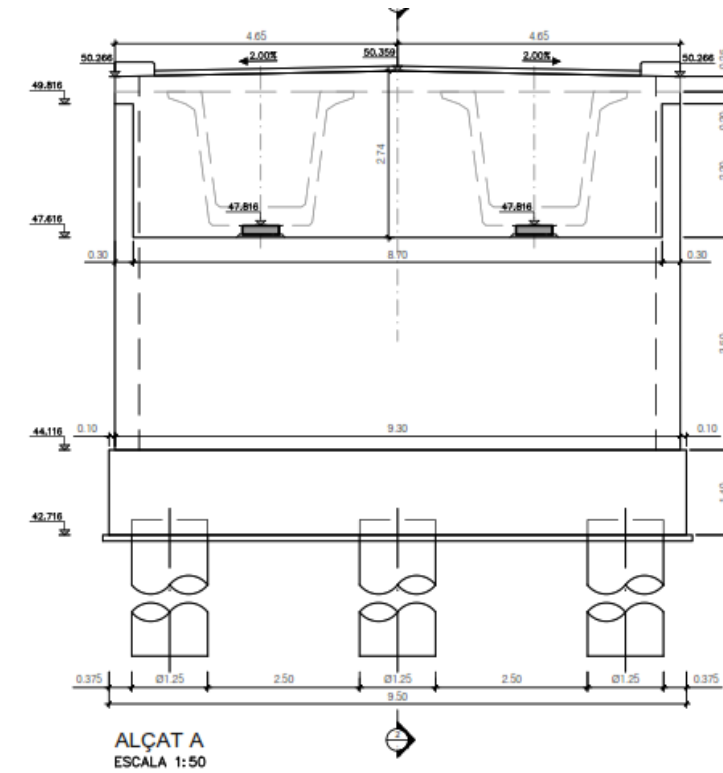
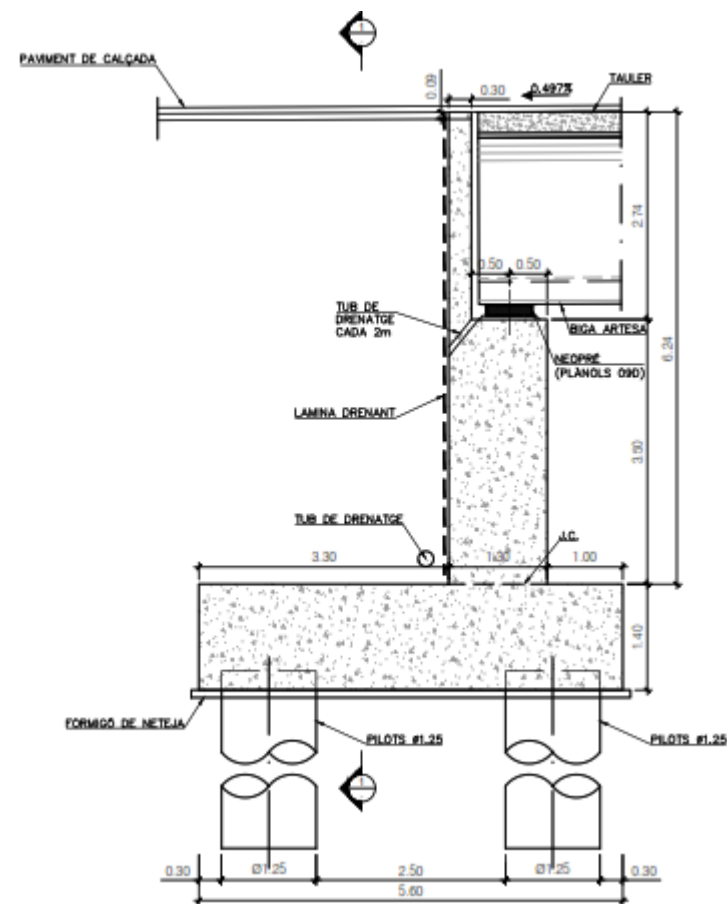


Figura 11. Alçat de l'estrep E1 per a la OF 0.1.

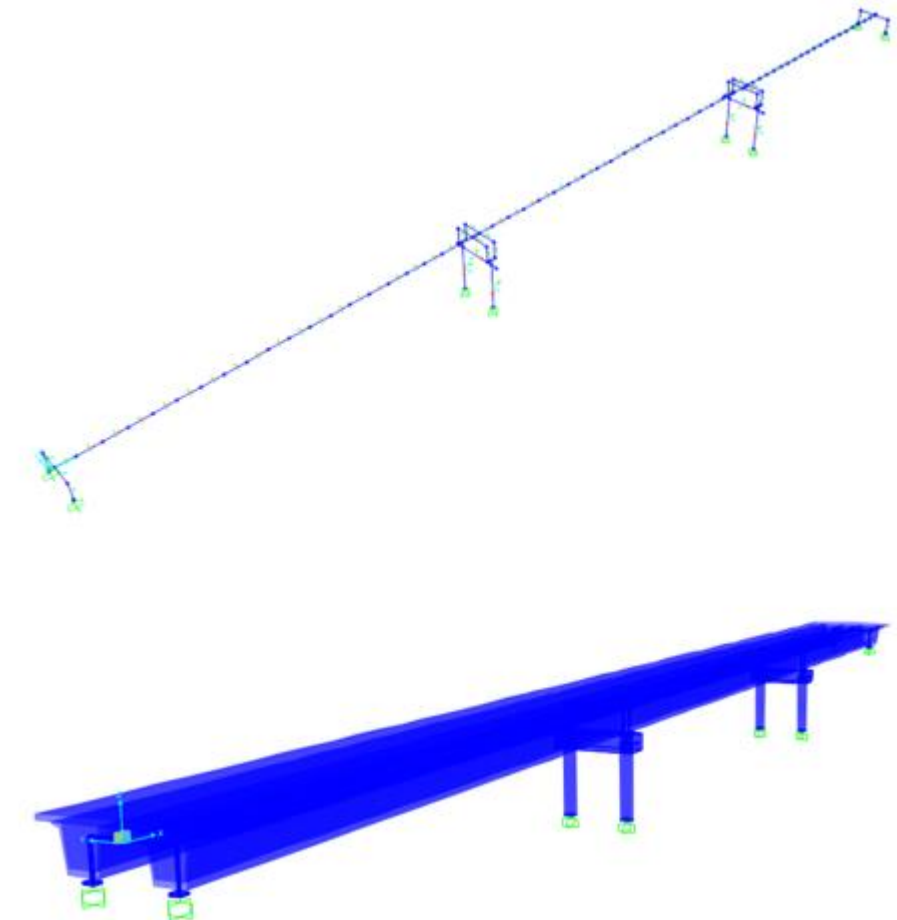


**Figura 12.** Secció de l'estrep E1 per a la OF 0.1.

En els apèndix corresponents a aquest annex es poden consultar els llistats amb els valors geotècnics considerats i les verificacions geotècniques i estructurals efectuades.

### 6.1.3 CÀLCUL DE LES PILES DE RECOLZAMENT

El càlcul s'ha realitzat amb els resultats obtinguts del model tridimensional realitzat que modelitza el tauler, els estreps i els neoprens. Veure figura adjunta:



**Figura 13.** Model de càlcul de l'estructura completa del pont.

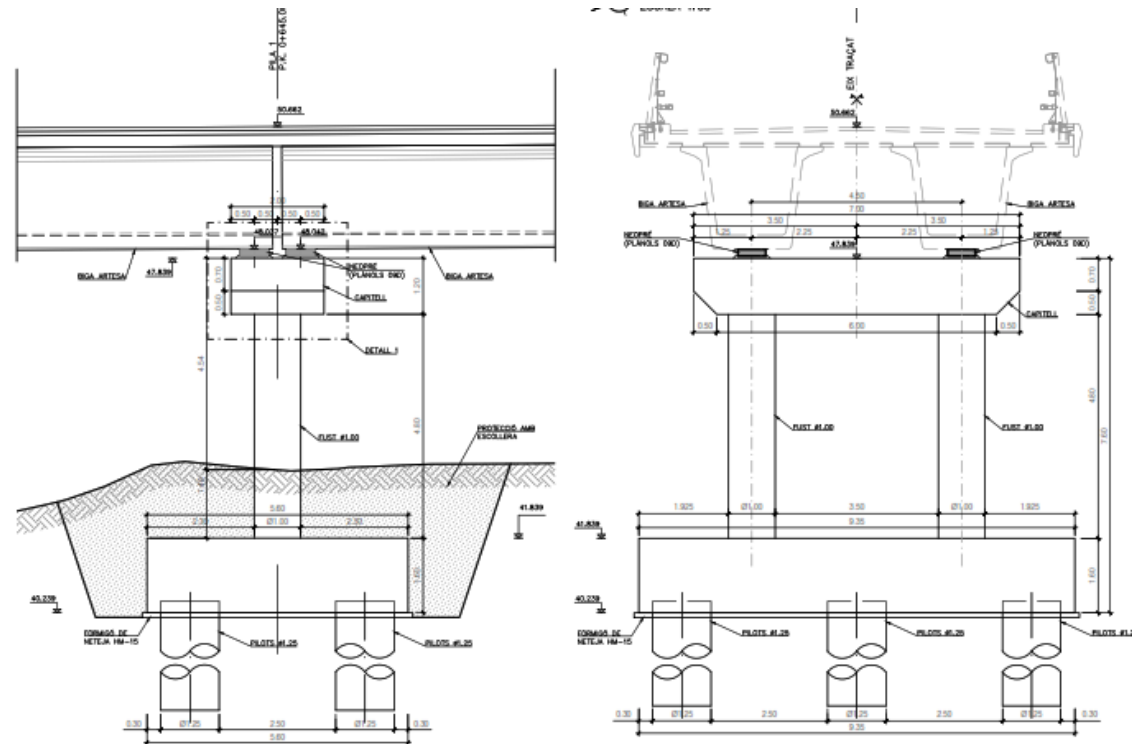


Figura 14. Alçat general de les piles.

L'apartat corresponent de l'apèndix 1 recull els esforços obtinguts, per les diferents hipòtesis de càrrega.

#### 6.1.4 CÀLCUL DELS NEOPRENS DE RECOLZAMENT

El mateix model de càlcul que en el cas anterior s'ha utilitzat per dissenyar els neoprens de recolzament, tenint en compte les diferents rigideses del formigó i dels neoprens enfront de les accions instantànies, diferides i sísmiques.

Els neoprens disposats finalment són els següents:

- Trams de 45m de llum: 600x500x(144/104)
- Trams de 30m de llum: 500x400x(129/93)

L'apartat corresponent de l'apèndix 1 recull les comprovacions fetes dels neoprens de recolzament.

#### 6.1.5 CÀLCULS LOCALS

S'ha portat a terme un seguit de càlculs d'elements localitzats de l'estructura com les bigues riostres dels estreps, l'armat de les volades del tauler o els reforços de les càrregues puntuals dels punts de recolzament de l'estructura que s'han realitzat per tal de completar la definició de l'estructura. Aquests càlculs es recullen a l'apartat corresponent de l'apèndix 1.

#### 6.1.6 PROVA DE CÀRREGA

La prova de càrrega es realitza seguint els criteris generals definits al document "Recomendaciones para la realización de pruebas de carga de recepción en puentes de carreteras" editat per el Ministerio de Fomento a l'any 1999.

Seguint aquestes recomanacions no es realitzarà prova de càrrega dinàmica al tractar-se d'un pont amb llums inferiors a 60 m. Per l'estructura projectada es defineix una única prova de càrrega estàtica amb tres etapes.

##### 6.1.6.1 PROVA DE CÀRREGA ESTÀTICA. SISTEMA DE MESURA

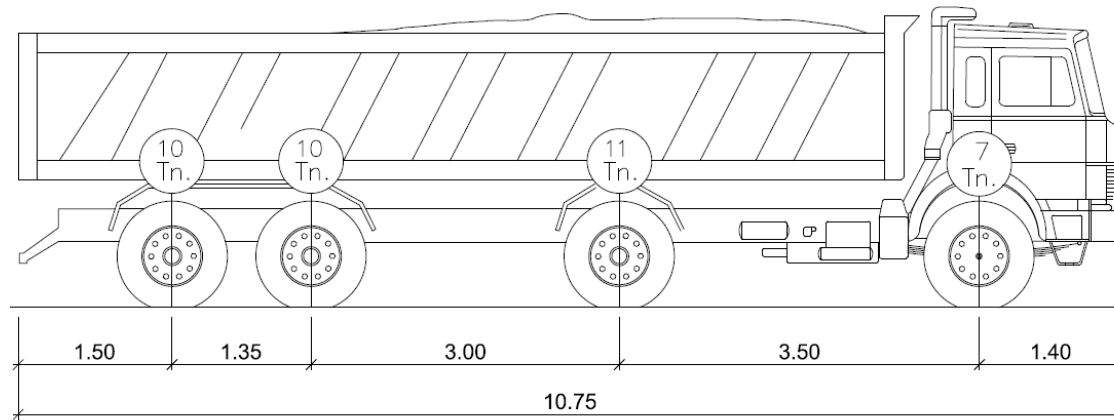
Es mesurarà la fletxa al centre de tram. Es mesurarà també el moviment vertical a les zones de recolzament.

Els aparells utilitzats han d'estar sancionats per experiència a proves similars, estar degudament calibrats i tenir una sensibilitat mínima de l'ordre del 5% dels valors més petits esperats. Així mateix el seu rang de mesura serà, com a mínim, superior al 50% dels valors mínims esperats d'aquestes magnituds.

Es recomana que l'equipament instrumental permeti el registre automàtic de les mesures que es realitzen i la seva visualització en temps real.

##### 6.1.6.2 TREN DE CÀRREGUES

Els vehicles utilitzats per al projecte de la prova de càrrega són quatre camions de quatre eixos, de 38 T de pes total. Les característiques d'aquests camions es mostren en la següent figura:



**Figura 15.** Característiques dels camions per a la prova de càrrega de la OF 0.1.

La posició dels camions sobre el tauler ve condicionada pels valors dels esforços que s'han d'aconseguir. De fet, en cada secció, els esforços de la prova de càrrega han de ser de l'ordre del 60% dels provocats pel tren de càrrega previst a la IAP ("Instrucció de Acciones a considerar en Puentes de Carretera"), no podent superar el 70% d'aquests. És important assenyalar que els esforços esmentats són esforços característics (sense majorar). El tauler s'anirà carregant de forma progressiva.

### 6.1.6.3 EXECUCIÓ DE LA PROVA

D'acord amb les característiques geomètriques de l'estructura, la prova consistirà en carregar estàticament el pont en tres etapes diferents:

- ETAPA 1: consisteix en carregar el tram 1 amb sis (6) camions, segons el plànol adjunt, centrats transversalment en el tauler i longitudinalment en el tram. Els camions es col·locaran amb la cabina en el sentit de l'avanç dels PK. Les fletxes mesurades proporcionaran la deformació associada a la flexió positiva del vanyol carregat.
- ETAPA 2: consisteix en carregar el tram 2 amb quatre (6) camions, segons el plànol adjunt, centrats transversalment en el tauler i longitudinalment en el tram. Els camions es col·locaran amb la cabina en el sentit de l'avanç dels PK. Les fletxes mesurades proporcionaran la deformació associada a la flexió positiva del tram carregat.
- ETAPA 3: consisteix en carregar el tram 3 amb quatre (4) camions, segons el plànol adjunt, centrats transversalment en el tauler i longitudinalment en el tram. Els camions es col·locaran amb la cabina en el sentit de l'avanç dels PK. Les fletxes mesurades proporcionaran la deformació associada a la flexió positiva del tram carregat.

Es carregarà progressivament el pont segons els Estats de Càrrega definits als plànols. La descàrrega es realitzarà en ordre invers al procés de càrrega.

Les pautes a seguir pel criteri d'estabilització de les mesures són les que s'indiquen a continuació. Per a cada una de les etapes quan tota la càrrega aplicada a la primera fase s'hagi situat al seu emplaçament definitiu es mesuraran les fletxes a tots els punts de mesura. Les fletxes instantànies obtingudes amb aquesta mesura es denominen  $f_0$ .

Als 10 minuts es procedirà a una nova lectura de les fletxes, obtenint així un valor  $f_{10}$ .

Si es verifica que  $(f_{10} - f_0) < 0,05 f_0$  es dona per finalitzada la primera fase de càrrega i es pot procedir a la segona. En cas contrari es mantindrà la càrrega deu minuts més, procedint a una nova lectura de fletxes que es denominen  $f_{20}$ .

En el cas que  $(f_{20} - f_{10}) < 0,20 (f_{10} - f_0)$ , es considera finalitzat la primera fase de càrrega, en cas contrari es farà el que decideixi el Director de la Prova.

La segona fase de càrrega es realitzarà seguint les mateixes pautes que la primera i prenent els mateixos criteris d'estabilització definits anteriorment.

Un cop finalitzada la segona fase es procedeix a descarregar el tauler en ordre invers al procés de càrrega per passar a la següent etapa de la prova seguint les mateixes pautes.

La diferència entre els valors de la fletxa registrats al finalitzar la descàrrega i abans de d'inici de la prova es defineix com valor romanent  $f_r$ .

S'anomena romanència  $\alpha$  al percentatge de la relació entre el valor romanent  $f_r$  i el valor de la fletxa total per a un determinat Estat de càrrega.

En base al valor de  $\alpha$  pot succeir:

- $\alpha \leq \alpha_{lim}$  La prova és vàlida
- $\alpha_{lim} \leq \alpha \leq 2 \alpha_{lim}$  S'ha de fer un segon cicle
- $\alpha \geq 2 \alpha_{lim}$  Es suspèn la prova de càrrega

On  $\alpha_{lim}$  és igual a 15% per a ponts pretensats.

#### 6.1.6.4 RESULTATS DE LA PROVA DE CÀRREGA

El càlcul d'esforços deguts a la prova de càrrega, així com les fletxes esperades durant la prova s'ha obtingut amb el mateix programa CivilCAD que permet també avaluar el percentatge dels esforços durant la prova de càrrega per tal de no sobrepassar el límits anteriorment indicats.

El valor corresponents de cada hipòtesis de càrrega es presenten als plànols i, els càlculs corresponents a l'apèndix 1.

## APÈNDIX 1. Càlcul del pont. OF 0.1



## Bases de disseny

MATERIALES (Precipitación media anual >600mm. >5km de la costa, no hay riesgo de helada)

VIGAS: HP-50/B/20/IIa R = 25+0 = 25mm

TABLERO: HA-30/B/20/IIa R = 30+5 = 35mm

ESTRIBOS Y PILAS: HA-30/B/20/IIa R = 30+5 = 35mm

CIMENTACIONES: HA-30/B/20/IIa+Qa R = 30+5 = 35mm

PILOTES: HA-25/B/20/IIa+Qa R = 75mm (Ver informe geotécnico)

CARACTERÍSTICAS MECÁNICAS HORMIGÓN S/EHE-08

fck,28=	50.0	MPa
t=	28	días (≤ 28)
fcm,28=	58.0	MPa
fct,m,28=	4.1	MPa (Art. 39)
fctk,28=	2.9	MPa

s=	0.2	← Coeficiente de dependencia del tipo de cemento (Art 31.3):
α=	0.667	s=0.2 para cementos de alta resistencia y de endurecimiento rápido (CEM42.5R, CEM52.5R)
βcc=	1.000	S=0.25 para cementos de endurecimiento normal y de endurecimiento rápido (CEM32.5R, CEM42.5)
fcm(t)=	58.0	Mpa s=0.38 para cementos de endurecimiento lento (CEM32.5)
fct,m(t)=	4.1	MPa

Módulo de deformación (Art 39.6):

Secante Ecm,28=	32902	MPa
Tangente Ec,28=	38660	MPa
G,28=	13709	MPa

Secante Ecm(t)=	32902	MPa
-----------------	-------	-----

Resistencia media a flexotracción 39.1

h=	500	Canto total del elemento en [mm]
fctm,fl=	4.5	MPa

CARACTERÍSTICAS MECÁNICAS HORMIGÓN S/EHE-08

fck,28=	30.0	MPa
t=	28	días (≤ 28)
fcm,28=	38.0	MPa
fct,m,28=	2.9	MPa (Art. 39)
fctk,28=	2.0	MPa

s=	0.2	← Coeficiente de dependencia del tipo de cemento (Art 31.3):
α=	0.667	s=0.2 para cementos de alta resistencia y de endurecimiento rápido (CEM42.5R, CEM52.5R)
βcc=	1.000	S=0.25 para cementos de endurecimiento normal y de endurecimiento rápido (CEM32.5R, CEM42.5)
fcm(t)=	38.0	Mpa s=0.38 para cementos de endurecimiento lento (CEM32.5)
fct,m(t)=	2.9	MPa

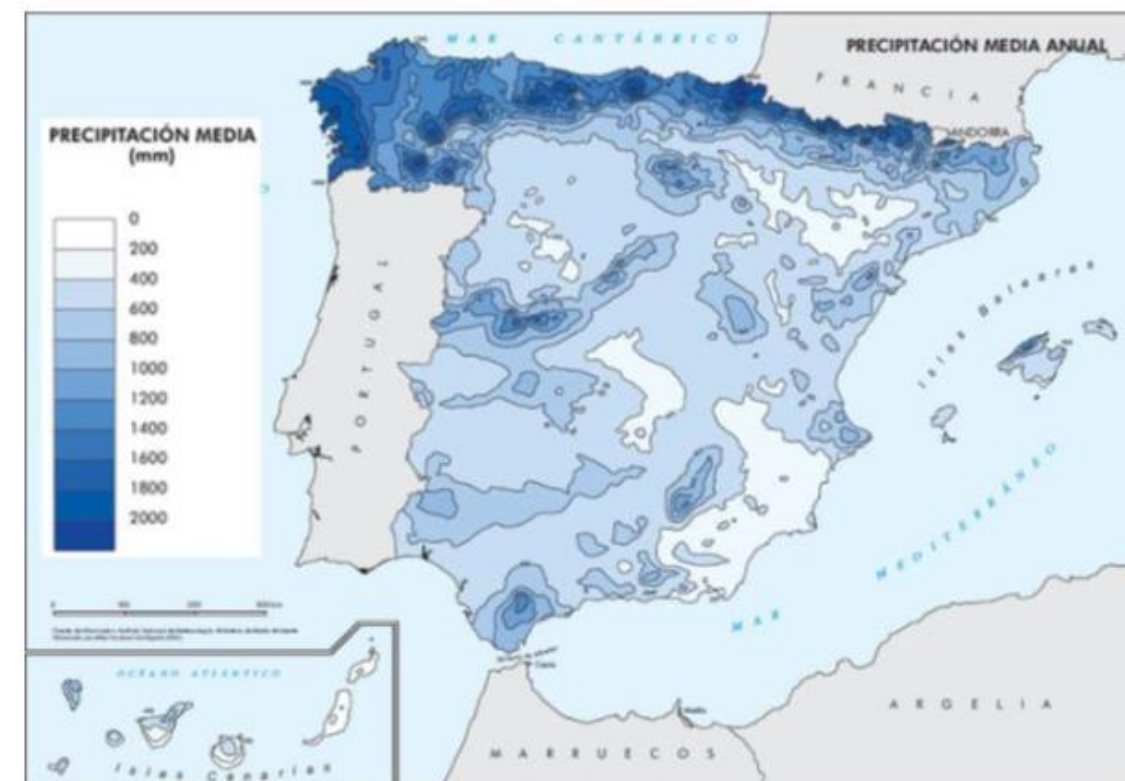
Módulo de deformación (Art 39.6):

Secante Ecm,28=	28577	MPa
Tangente Ec,28=	33578	MPa
G,28=	11907	MPa

Secante Ecm(t)=	28577	MPa
-----------------	-------	-----

Resistencia media a flexotracción 39.1

h=	500	Canto total del elemento en [mm]
fctm,fl=	3.2	MPa



Fuente: WEB del Instituto Geográfico Nacional.

HR=70%

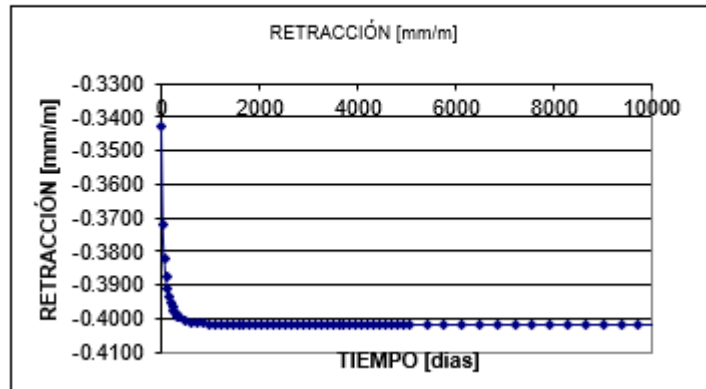
**RETRACCIÓN DEL HORMIGÓN**  
 s/ EHE08 Art: 39.7

fck =	50	MPa	$\alpha_{ds1}$ =	6.00
fcm =	58	MPa	$\alpha_{ds2}$ =	0.11
Ec,28 =	32902	MPa	Ke =	0.75
t =	10000	días		
ts =	1	días		
HR =	70	%		
e =	0.3	mm		

$\beta_{ds}(t-t_s)$ =	1.0000
$\beta_{HR}$ =	-1.0184
fcm0 =	10.00 N/mm <sup>2</sup>
$\epsilon_{cd,inf}(t_0)$ =	-0.000402 -0.0402%
$\epsilon_{cd}(t)$ =	-0.000302 -0.0302%

$\epsilon_{ca,inf}$ =	-0.000100
$\beta_{as}(t)$ =	1.000000
$\epsilon_{ca}(t)$ =	-0.000100

$\epsilon_{CS}$  = -0.000402       $\epsilon_{CS}$  = **-402 -10-s**



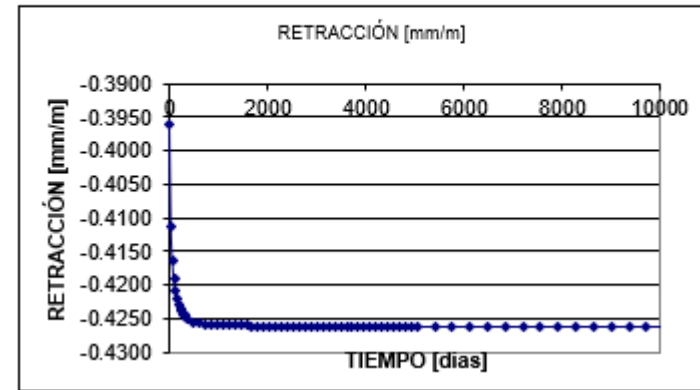
**RETRACCIÓN DEL HORMIGÓN**  
 s/ EHE08 Art: 39.7

fck =	30	MPa	$\alpha_{ds1}$ =	6.00
fcm =	38	MPa	$\alpha_{ds2}$ =	0.11
Ec,28 =	28577	MPa	Ke =	0.75
t =	10000	días		
ts =	1	días		
HR =	70	%		
e =	0.3	mm		

$\beta_{ds}(t-t_s)$ =	1.0000
$\beta_{HR}$ =	-1.0184
fcm0 =	10.00 N/mm <sup>2</sup>
$\epsilon_{cd,inf}(t_0)$ =	-0.000501 -0.0501%
$\epsilon_{cd}(t)$ =	-0.000376 -0.0376%

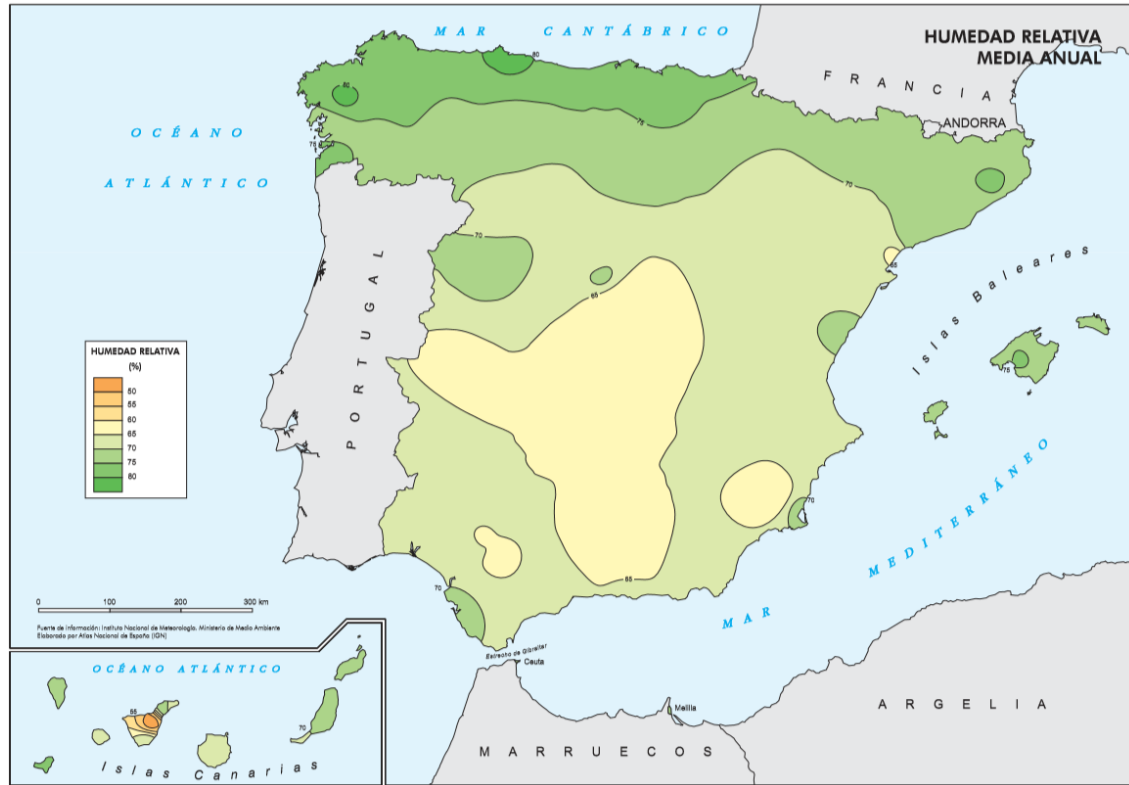
$\epsilon_{ca,inf}$ =	-0.000050
$\beta_{as}(t)$ =	1.000000
$\epsilon_{ca}(t)$ =	-0.000050

$\epsilon_{CS}$  = -0.000426       $\epsilon_{CS}$  = **-426 -10-s**

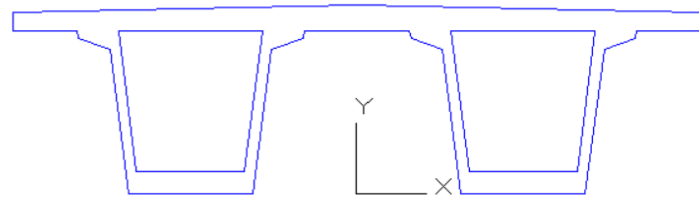


Página 1

Página 1

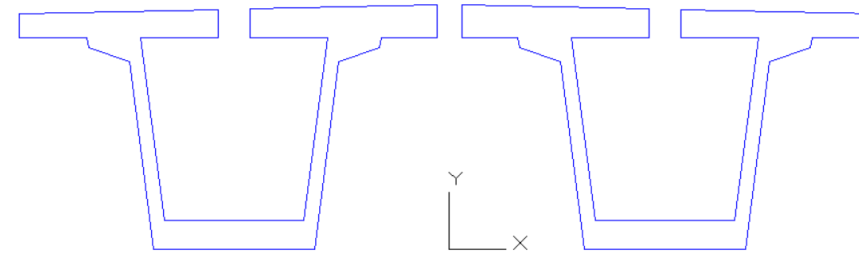


Fuente: WEB del Instituto Geográfico Nacional.



----- REGIONS -----  
 Area: 5.2270  
 Perimeter: 40.8668  
 Bounding box: X: -4.6500 -- 4.6500  
 Y: 0.0000 -- 2.5430  
 Centroid: X: 0.0000  
 Y: 1.6596  
 Moments of inertia: X: 18.6875  
 Y: 32.5492  
 Products of inertia: XY: 0.0000  
 Radii of gyration: X: 1.8908  
 Y: 2.4954  
 Principal moments and X-Y directions about centroid:  
 I: 4.2906 along [1.0000 0.0000]  
 J: 32.5492 along [0.0000 1.0000]

Sección homogeneizada respecto del HP-50



----- REGIONS -----  
 Area: 4.8601  
 Perimeter: 40.2653  
 Bounding box: X: -4.4958 -- 4.4958  
 Y: 0.0000 -- 2.5403  
 Centroid: X: 0.0000  
 Y: 1.6075  
 Moments of inertia: X: 16.6592  
 Y: 29.9244  
 Products of inertia: XY: 0.0000  
 Radii of gyration: X: 1.8514  
 Y: 2.4814  
 Principal moments and X-Y directions about centroid:  
 I: 4.0999 along [1.0000 0.0000]  
 J: 29.9244 along [0.0000 1.0000]

## EJECUCIÓN CONTROL INTENSO

### ACCIONES IAP-11

#### 4.1.2.1.- CARGAS VERTICALES DEBIDAS AL TRÁFICO DE VEHÍCULOS

Longitud puente, L: 120 m  
 Anchura plataforma, u: 8 m  
 Radio, R: 5000 m  
 n° carriles: 2  
 Anchura de carril: 3 m  
 Anchura área arriero: 2 m

Carril	Z Qik [kN/m]	[kN/m <sup>2</sup> ]
1	2.300	9.0
2	2.200	2.5
3	2.100	2.5
rota	0	2.5
Área arriero	0	2.5
Áceras	0	5.0

#### 4.1.3.1.- FRENADO

Qik- 684 kN  
 qik- 5.7 kN/m

#### 4.1.3.2.- FUERZA CENTRÍFUGA Y OTRAS FUERZAS TRANSVERSALES

Fuerza centrífuga:  
 Qv- 1000 kN  
 Qvk- 0 kN

Derrape:  
 Qtrk- 0 kN

#### GRUPOS DE CARGAS:

##### GR 1: Cargas verticales

Carril	Z Qik [kN/m]	[kN/m <sup>2</sup> ]
1	600	9.0
2	400	2.5
3	0	0.0
rota	0	0.0
Área arriero	0	2.5
Áceras	0	2.5

Frenada:	0 kN
F.centrif:	0 kN
F.derrape:	0 kN

##### GR2: Fuerzas horizontales

Carril	Z Qik [kN/m]	[kN/m <sup>2</sup> ]
1	450	3.6
2	300	1.0
3	0	0.0
rota	0	0.0
Área arriero	0	1.0
Áceras	0	0.0

Frenada:	684 kN
F.centrif:	0 kN
F.derrape:	0 kN

##### GR3: Peatonal

Carril	Z Qik [kN/m]	[kN/m <sup>2</sup> ]
1	0	0.0
2	0	0.0
3	0	0.0
rota	0	0.0
Área arriero	0	0.0
Áceras	0	5.0

Frenada:	0 kN
F.centrif:	0 kN
F.derrape:	0 kN

##### GR4: Peatonal

Carril	Z Qik [kN/m]	[kN/m <sup>2</sup> ]
1	0	5.0
2	0	5.0
3	0	5.0
rota	0	5.0
Área arriero	0	5.0
Áceras	0	5.0

Frenada:	0 kN
F.centrif:	0 kN
F.derrape:	0 kN

## Viento pilas:

VIENTO S/ IAP-11  
Art: 4.2

Velocidad básica fundamental Vb,0= 29 m/s  
Factor direccional Cdir= 1  
Factor estacional Cseason= 1  
Velocidad básica para T=50 años Vb= 29 m/s  
Periodo de retorno T= 100 años  
Factor de probabilidad Cprob(T)= 1.04  
Velocidad básica Vb(T)= 30.1 m/s

Factor de topografía C0 = 1  
Factor de rugosidad Cr(z)= 1.041  
Altura z= 12 m

Velocidad media Vm(z) = 31.4 m/s  
112.9 km/h

Coefficiente de fuerza Cf= 1.3  
Coeficiente de exposición Ce(z)= 2.47

Empuje de viento fw = 1.82 kN/m2

Entorno tipo:	2
Kr =	0.19
Z0 [m] =	0.05
Z mín [m] =	2
α =	0.52

### Periodos de retorno para situaciones transitorias

Duración de la situación	Periodo de retorno a considerar
menos de 3 días	2 años
menos de 3 meses	5 años
menos de 1 año	10 años
más de 1 año	50 años

## Viento dintel:

VIENTO S/ IAP-11  
Art: 4.2

Velocidad básica fundamental Vb,0= 29 m/s  
Factor direccional Cdir= 1  
Factor estacional Cseason= 1  
Velocidad básica para T=50 años Vb= 29 m/s  
Periodo de retorno T= 100 años  
Factor de probabilidad Cprob(T)= 1.04  
Velocidad básica Vb(T)= 30.1 m/s

Factor de topografía C0 = 1  
Factor de rugosidad Cr(z)= 1.041  
Altura z= 12 m

Velocidad media Vm(z) = 31.4 m/s  
112.9 km/h

Coefficiente de fuerza Cf= 1.8  
Coeficiente de exposición Ce(z)= 2.47

Empuje de viento fw = 2.52 kN/m2

Entorno tipo:	2
Kr =	0.19
Z0 [m] =	0.05
Z mín [m] =	2
α =	0.52

### Periodos de retorno para situaciones transitorias

Duración de la situación	Periodo de retorno a considerar
menos de 3 días	2 años
menos de 3 meses	5 años
menos de 1 año	10 años
más de 1 año	50 años

## Tablero sin SC:

VIENTO S/ IAP-11  
Art: 4.2

Velocidad básica fundamental Vb,0= 29 m/s  
Factor direccional Cdir= 1  
Factor estacional Cseason= 1  
Velocidad básica para T=50 años Vb= 29 m/s  
Periodo de retorno T= 100 años  
Factor de probabilidad Cprob(T)= 1.04  
Velocidad básica Vb(T)= 30.1 m/s

Factor de topografía C0 = 1  
Factor de rugosidad Cr(z)= 1.041  
Altura z= 12 m

Velocidad media Vm(z) = 31.4 m/s  
112.9 km/h

Coefficiente de fuerza Cf= 1.42  
Coeficiente de exposición Ce(z)= 2.47

Empuje de viento fw = 1.99 kN/m2

Empuje longitudinal:  
Fracción del empuje transversal = 25 %  
Longitud integral de turbulencia L(z) = 69.5 m  
Longitud total del puente = 120 m  
Φ [L/L(z)] = 0.329  
Coeficiente reductor = 0.815

Empuje longitudinal fw,long = 0.41 kN/m2

Empuje vertical fw,z= +/- 1.26 kN/m2

Entorno tipo:	2
Kr =	0.19
Z0 [m] =	0.05
Z mín [m] =	2
α =	0.52

### Periodos de retorno para situaciones transitorias

Duración de la situación	Periodo de retorno a considerar
menos de 3 días	2 años
menos de 3 meses	5 años
menos de 1 año	10 años
más de 1 año	50 años

## Tablero con sc:

VIENTO S/ IAP-11  
Art: 4.2

Velocidad básica fundamental Vb,0= 29 m/s  
Factor direccional Cdir= 1  
Factor estacional Cseason= 1  
Velocidad básica para T=50 años Vb= 29 m/s  
Periodo de retorno T= 100 años  
Factor de probabilidad Cprob(T)= 1.04  
Velocidad básica Vb(T)= 30.1 m/s

Factor de topografía C0 = 1  
Factor de rugosidad Cr(z)= 1.041  
Altura z= 12 m

Velocidad media Vm(z) = 31.4 m/s  
112.9 km/h

Coefficiente de fuerza Cf= 1.88  
Coeficiente de exposición Ce(z)= 2.47

Empuje de viento fw = 2.63 kN/m2

Empuje longitudinal:  
Fracción del empuje transversal = 25 %  
Longitud integral de turbulencia L(z) = 69.5 m  
Longitud total del puente = 120 m  
Φ [L/L(z)] = 0.329  
Coeficiente reductor = 0.815

Empuje longitudinal fw,long = 0.54 kN/m2

Empuje vertical fw,z= +/- 1.26 kN/m2

Entorno tipo:	2
Kr =	0.19
Z0 [m] =	0.05
Z mín [m] =	2
α =	0.52

### Periodos de retorno para situaciones transitorias

Duración de la situación	Periodo de retorno a considerar
menos de 3 días	2 años
menos de 3 meses	5 años
menos de 1 año	10 años
más de 1 año	50 años

CONTROL DE REACCIONES

VIENTO

VIENTO TRANSVERSAL SIN SC:		ESPESOR	FUERZA	
PILAS	1.82 kN/m <sup>2</sup>	1 m	1.82 kN/m	
DINTEL	0 kN/m <sup>2</sup>	1 m	0 kN/m	
TABLERO TRANSV:	1.99 kN/m <sup>2</sup>	2.5 m	4.98 kN/m	
TABLERO VERTICAL:	1.26 kN/m <sup>2</sup>	9.3 m	11.72 kN/m	
TORSOR:			27.7 kN-m/m	ESTABILIZADOR

VIENTO TRANSVERSAL CON SC:		ESPESOR	FUERZA	
PILAS	1.82 kN/m <sup>2</sup>	1 m	1.82 kN/m	
DINTEL	0 kN/m <sup>2</sup>	1 m	0 kN/m	
TABLERO TRANSV:	2.63 kN/m <sup>2</sup>	4.5 m	11.84 kN/m	
TABLERO VERTICAL:	1.26 kN/m <sup>2</sup>	9.3 m	11.72 kN/m	
TORSOR:			28.4 kN-m/m	ESTABILIZADOR

VIENTO LONG SIN SC:

PILAS	1.82 kN/m <sup>2</sup>	1 m	1.82 kN/m
DINTEL	2.52 kN/m <sup>2</sup>	1.2 m	3.024 kN/m
TABLERO LONG:	0.41 kN/m <sup>2</sup>	2.5 m	1.03 kN/m

VIENTO LONG CON SC:

PILAS	1.82 kN/m <sup>2</sup>	1 m	1.82 kN/m
DINTEL	2.52 kN/m <sup>2</sup>	1.2 m	3.024 kN/m
TABLERO LONG:	0.54 kN/m <sup>2</sup>	2.5 m	1.35 kN/m

excentricidad acción transversal:  $0.60 \cdot 2.5 = 1.5$   
 cdg = 1.6  
 excentricidad: -0.1m por debajo del cdg Estabilizador  
 excentricidad acción vertical =  $9.3/4 = 2.325$  estabilizador  
 torsor total

CONTROL DE REACCIONES

TRANSVERSAL SIN SC

PILAS		22.4 m	TOTAL	SAP	Error
F <sub>y</sub>	40.768 kN				
TABLERO		120 m			
F <sub>y</sub>	597 kN		F <sub>y</sub> = 637.768 kN	F <sub>y</sub> = 637.77 kN	1.000003136 OK
F <sub>z</sub>	1406.16 kN		F <sub>z</sub> = 1406.16 kN	F <sub>z</sub> = 1406.4 kN	1.000170678 OK
Torsor	3329.022 kN-m		Torsor = 3329.022 kN-m	Torsor = 3544.1 kN-m	1.064606963 OK

TRANSVERSAL CON SC

PILAS		22.4 m	TOTAL	SAP	Error
F <sub>y</sub>	40.768 kN				
TABLERO		120 m			
F <sub>y</sub>	1420.2 kN		F <sub>y</sub> = 1460.968 kN	F <sub>y</sub> = 1420.8 kN	0.9725059 OK
F <sub>z</sub>	1406.16 kN		F <sub>z</sub> = 1406.16 kN	F <sub>z</sub> = 1406.4 kN	1.000170678 OK
Torsor	3411.342 kN-m		Torsor = 3411.342 kN-m	Torsor = 3408 kN-m	0.999020327 OK

LONG SIN SC

PILAS		22.4 m	TOTAL	SAP	Error
F <sub>x</sub>	40.768 kN				
DINTEL		13.6 m			
F <sub>x</sub>	41.1264 kN				
TABLERO		120 m			
F <sub>x</sub>	123 kN		F <sub>y</sub> = 204.8944 kN	F <sub>y</sub> = 194.6 kN	0.949757534 OK

LONG CON SC

PILAS		22.4 m	TOTAL	SAP	Error
F <sub>x</sub>	40.768 kN				
DINTEL		13.6 m			
F <sub>x</sub>	41.1264 kN				
TABLERO		120 m			
F <sub>x</sub>	162 kN		F <sub>y</sub> = 243.8944 kN	F <sub>y</sub> = 233 kN	0.955334488 OK

TEMPERATURA:

Zona 2 y elevación sobre el nivel del mar de  $\approx 50$ m

ACCIÓN TÉRMICA S/IAP-11

Art: 4.3

Tablero tipo:

- Acero son ST cajón, viga armada o celosía
- Mixtos
- Hormigón armado o pretensado

Tipo de tablero:

3

COMPONENTE UNIFORME DE LA TEMPERATURA

Periodo de retorno T: 100 años

k1: 0.781

k2: 0.056

k3: 0.393

k4: 0.156

T<sub>máx</sub>: 42 °C

T<sub>máx,p</sub>: 43.6 °C

T<sub>mín</sub>: -11 °C

T<sub>mín,p</sub>: -12.2 °C

Δt<sub>e,máx</sub>: 2 °C

T<sub>e,max</sub>: 45.6 °C

Δt<sub>e,min</sub>: 8 °C

T<sub>e,min</sub>: -4.2 °C

ΔTN: 49.8 °C

Temperatura en el momento de coacción del tablero:

T<sub>0</sub>: 15 °C

ΔTN,con: 19.2 °C

ΔTN,exp: 30.6

Gradiente de temperatura:

Gradiente positivo ΔT = 15°C

Gradiente negativo ΔT = 8°C

## GRADIENTE DE TEMPERATURA

TABLA 4.3-d COMPONENTE LINEAL DE LA DIFERENCIA VERTICAL DE TEMPERATURA PARA TABLEROS TIPO 1 Y TIPO 3

TIPO DE TABLERO	FIBRA SUPERIOR MÁS CALIENTE	FIBRA SUPERIOR MÁS FRÍA
	$\Delta T_{M,super} [^{\circ}C]$	$\Delta T_{M,cool} [^{\circ}C]$
Tipo 1: Tablero de acero	18	13
Tipo 3: Tablero de hormigón		
— Sección cajón	10	5
— Sección de vigas	15	8
— Sección losa	15	8

TABLA 4.3-e COEFICIENTE  $k_{sur}$  DE INFLUENCIA DEL TIPO Y ESPESOR DE PAVIMENTO

ESPESOR DEL PAVIMENTO	TABLERO TIPO 1		TABLERO TIPO 3	
	FIBRA SUPERIOR MÁS CALIENTE	FIBRA SUPERIOR MÁS FRÍA	FIBRA SUPERIOR MÁS CALIENTE	FIBRA SUPERIOR MÁS FRÍA
	$k_{sur}$	$k_{sur}$	$k_{sur}$	$k_{sur}$
Sin impermeabilización ni pavimento	0,7	0,9	0,8	1,1
Con impermeabilización y sin pavimento <sup>(1)</sup>	1,6	0,6	1,5	1,0
50 mm	1,0	1,0	1,0	1,0
100 mm	0,7	1,2	0,7	1,0
150 mm	0,7	1,2	0,5	1,0

<sup>(1)</sup> Estos valores representan valores límite superiores para superficies de color oscuro.

## SISMO

### Importancia normal

SISMO S/ NCRP-07

ab/g = 0.09 Aceleración básica  
k = 1.00 Coeficiente de contribución

$\gamma I$  = 1 Factor de importancia  
 $\gamma II$  = 1 Factor modificador por el periodo de retorno  
 $\rho$  = 1 Coeficiente adimensional de riesgo

C = 1.517 Coeficiente del terreno

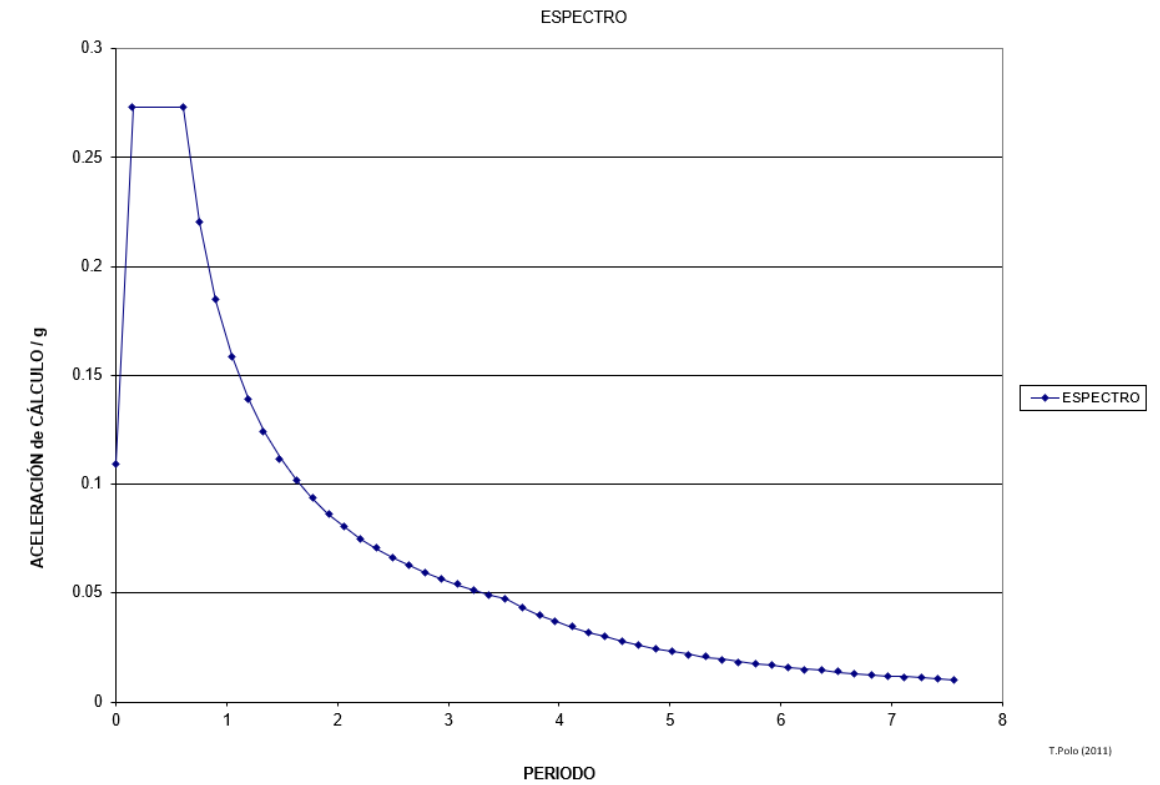
S = 1.214 Coeficiente de amplificación del terreno

ac/g = 0.11

g[%] = 5 Índice de amortiguamiento  
v = 1.000 Factor corrector por amortiguamiento

ESPECTRO DE ACELERACIONES:

TA= 0.15 seg.  
TB= 0.61 seg.  
TC= 3.52 seg.





Masas:

Masas adicionales a las de peso propio: Las de cargas permanentes, que se consideran con valor nominal, de acuerdo a la Normativa.

**CONTROL MASAS ENSAMBLADAS**

	LONG [m]	ÁREA [m]	DENSIDAD [Tn/m3]	
PILAS:	22.4	0.785	2.55	44.9 Tn
CAPITELES:	12	2.4	2.55	73.5 Tn
TABLERO:	120	5.227	2.55	1600.1 Tn
G2:	120		2.272	272.64 Tn
TOTAL:				1991.1 Tn
				1989.9 Tn
ERROR:				1.00 OK!

Masas movilizadas:

OutputCase	StepType Text	StepNum Unitless	Period Sec	UX Unitless	UY Unitless	UZ Unitless	SumUX Unitless	SumUY Unitless	SumUZ Unitless
MODAL	Mode	1	1.656947	0.96706	2.054E-19	2.15E-06	0.96706	2.054E-19	2.15E-06
MODAL	Mode	2	1.567322	2.719E-19	0.94593	0	0.96706	0.94593	2.15E-06
MODAL	Mode	3	1.382189	3.918E-19	0.01027	0	0.96706	0.9562	2.15E-06
MODAL	Mode	4	0.441478	0	0.00036	0	0.96706	0.95656	2.15E-06
MODAL	Mode	5	0.399387	2.796E-06	0	0.08164	0.96706	0.95656	0.08165
MODAL	Mode	6	0.395032	1.147E-06	0	0.48213	0.96706	0.95656	0.56378
MODAL	Mode	7	0.189402	0.00536	0	0.13107	0.97241	0.95656	0.69485
MODAL	Mode	8	0.173892	3.237E-19	2.195E-07	6.86E-19	0.97241	0.95656	0.69485
MODAL	Mode	9	0.168569	0.0159	0	0.0041	0.98831	0.95656	0.69895
MODAL	Mode	10	0.159314	0.00653	0	0.05994	0.99484	0.95656	0.75889
MODAL	Mode	11	0.104816	0.00058	0	0.00017	0.99542	0.95656	0.75906
MODAL	Mode	12	0.10281	0.0026	0	3.867E-06	0.99802	0.95656	0.75906
MODAL	Mode	13	0.096788	2.233E-19	0.02314	5.825E-20	0.99802	0.97971	0.75906
MODAL	Mode	14	0.096333	2.444E-18	0.02004	3.998E-18	0.99802	0.99975	0.75906
MODAL	Mode	15	0.093117	2.552E-18	0.00021	4.819E-18	0.99802	0.99996	0.75906
MODAL	Mode	16	0.082775	1.633E-18	3.466E-07	1.035E-18	0.99802	0.99996	0.75906
MODAL	Mode	17	0.082444	3.603E-19	3.057E-09	1.15E-18	0.99802	0.99996	0.75906
MODAL	Mode	18	0.069052	5.342E-08	0	4.242E-08	0.99802	0.99996	0.75906
MODAL	Mode	19	0.059322	1.351E-18	2.665E-07	5.876E-18	0.99802	0.99996	0.75906
MODAL	Mode	20	0.052171	4.035E-06	1.411E-19	0.06139	0.99802	0.99996	0.82046

De acuerdo a NCSP-07 Art: 2.4. se considera  $\psi_2=0.0$  para la sobrecarga de uso.



## Càlcul del tauler

**Trams de 45m:**

PROYECTO DE TABLERO DE VIGAS  
 \*\*\*\*\*

Listado generado el día 06-07-2020 a las 15:33:11.

Nombre del proyecto : 20200611 tablero\_45

Normativa utilizada (España): Instrucción IAP-2011/IAPF, EHE-2008

MEMORIA DEL PROYECTO  
 \*\*\*\*\*

Definición en planta  
 =====

Contorno izquierdo del tablero  
 -----

Punto	x	y
1	-0.000	9.300
2	64.500	9.300

Contorno derecho del tablero  
 -----

Punto	x	y
1	0.000	0.000
2	64.500	0.000

Ejes de apoyos  
 -----

Vano 1  
 -----

Eje 1			
Punto	x	y	
1	10.000	0.000	
2	10.000	9.300	
Eje 2			
Punto	x	y	
1	54.500	0.000	
2	54.500	9.300	

Ejes de las vigas  
 -----

Vano 1  
 -----

Viga 1  
 -----

Apoyo 1	
x1 =	10.000
y1 =	6.900
Apoyo 2	
x2 =	54.500
y2 =	6.900

Viga 2  
 -----

Apoyo 1	
x1 =	10.000
y1 =	2.400
Apoyo 2	
x2 =	54.500
y2 =	2.400

Descripción de los apoyos  
 -----

Vano 1  
 -----

Viga 1  
 -----

Longitud de culata : 0.500 m  
 Número de apoyos por extremo : 1

Viga 2  
 -----

Longitud de culata : 0.500 m  
 Número de apoyos por extremo : 1

Sección de las vigas  
 =====

Forma de la sección  
 -----

Vano 1  
 -----

Viga 1  
 -----

Forma : Artesa Tipo 1  
 Tipo : AR-ALV-220-307

Viga 2  
 -----

Forma : Artesa Tipo 1  
 Tipo : AR-ALV-220-307

Tipos de sección  
 -----

Sección tipo artesa

Tipo : AR-ALV-220-307

Parámetros :

A :	133.200 cm
B :	147.200 cm
C :	194.800 cm
D :	56.350 cm
E :	220.000 cm
F :	30.000 cm
G :	15.000 cm
H :	10.000 cm
I :	10.000 cm
J :	10.000 cm
K :	28.000 cm
L :	2.000 cm
M :	5.000 cm
N :	5.000 cm
O :	5.000 cm

Materiales  
 =====

Hormigón de las vigas :  
 -----

Nombre : HP-50

Tipo : Hormigón.

Módulo de Young E (T/m2) :	3357390.00
Resistencia característica fck(T/m2) :	5102.00
Coefic. de minoración para situación persistente :	1.500
Coefic. de minoración para situación accidental :	1.300
Deformación máxima de compresión :	0.00350

Deformación de cambio de tramo en la ley parábola-rectángulo : 0.00200

Hormigón de la losa :

Nombre : HA-30

Tipo : Hormigón.

Módulo de Young E (T/m2) : 2916000.00  
Resistencia característica fck(T/m2) : 3061.20  
Coefic. de minoración para situación persistente : 1.500  
Coefic. de minoración para situación accidental : 1.300  
Deformación máxima de compresión : 0.00350  
Deformación de cambio de tramo en la ley parábola-rectángulo : 0.00200

Acero de la armadura pasiva de la viga :

Nombre : B500S

Tipo : Acero de dureza natural.

Módulo de Young E (T/m2) : 20408160.00  
Resistencia característica fyk(T/m2) : 51020.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.01000  
Deformación máxima de tracción : -0.01000

Acero de la armadura pasiva de la losa :

Nombre : B500S

Tipo : Acero de dureza natural.

Módulo de Young E (T/m2) : 20408160.00  
Resistencia característica fyk(T/m2) : 51020.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.01000  
Deformación máxima de tracción : -0.01000

Acero de la armadura activa de la viga :

Nombre : Y1860S7

Tipo : Acero para pretensar.

Módulo de Young E (T/m2) : 19387760.00  
Resistencia característica fyk(T/m2) : 173660.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.03500  
Deformación máxima adicional a la inicial : -0.01000  
Deformación máxima de tracción : -0.03500

Espesor de la losa

Espesor constante de 0.250 m

Se ha optado por no incluir la prelosa en la sección resistente final viga + losa.

Espesor de la losa considerado para el cálculo de esfuerzos locales: 0.250 m

Definición del pretensado

Vano 1

Viga 1

Fila 1

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 3.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 2

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 3

Distancia cdg-fibra inferior : 0.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 16  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 5.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 4

Distancia cdg-fibra inferior : 0.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 5

Distancia cdg-fibra inferior : 0.150 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 16  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 7.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 6

Distancia cdg-fibra inferior : 0.150 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 7

Distancia cdg-fibra inferior : 2.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 4  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Viga 2

Fila 1

-----  
 Distancia cdg-fibra inferior : 0.050 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 16  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 2

-----  
 Distancia cdg-fibra inferior : 0.050 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 0.000 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 3

-----  
 Distancia cdg-fibra inferior : 0.100 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 16  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 4

-----  
 Distancia cdg-fibra inferior : 0.100 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 0.000 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 5

-----  
 Distancia cdg-fibra inferior : 0.150 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 16  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 6

-----  
 Distancia cdg-fibra inferior : 0.150 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 0.000 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 7

-----  
 Distancia cdg-fibra inferior : 0.200 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Definición de la armadura pasiva de las vigas

Vano 1

Viga 1

Fila 1

-----  
 Distancia cdg-fibra inferior : 0.050 cm  
 Diámetro de las barras : 12 mm  
 Número de barras : 12  
 Longitud de recorte : 0.050 m

Viga 2

Fila 1

-----  
 Distancia cdg-fibra inferior : 0.050 cm  
 Diámetro de las barras : 12 mm  
 Número de barras : 12  
 Longitud de recorte : 0.050 m

Definición de la armadura pasiva de la losa

Vano 1

-----  
 Armadura longitudinal superior : Fi 12 a 0.200 m  
 Armadura longitudinal inferior : Fi 12 a 0.200 m  
 Armadura transversal superior : Fi 16 a 0.200 m  
 Armadura transversal inferior : Fi 16 a 0.200 m

Recubrimiento mecánico superior : 0.050 m  
 Recubrimiento mecánico inferior : 0.050 m

Calendario

-----  
 Día en que se hormigona la viga : 0  
 Día en que se transfiere el pretensado : 5  
 Día en que se hormigona la losa : 30  
 Número de días entre hormigonado y fraguado de la losa : 1  
 Día en que se aplica la carga permanente sobre la losa : 90

Acciones sobre el puente

Peso Propio

-----  
 Densidad del hormigón (T/m3): 2,50

Superestructura

-----  
 Peso del pavimento con el espesor de proyecto (T/m2): 0,184  
 El programa incluye en el cálculo el aumento en un 50% del valor del peso de pavimento de proyecto, tal como se establece en la norma IAP.

Acera izquierda :

peso (T/m) : 0,400  
 anchura (m) : 0,650  
 distancia del centro de gravedad al borde del tablero (m) : 0,325

Acera derecha :

peso (T/m) : 0,400  
 anchura (m) : 0,650  
 distancia del centro de gravedad al borde del tablero (m) : 0,325

Tráfico en plataforma

-----  
 Anchura de los carriles virtuales:

Anchura de la plataforma (m)	Anchura del carril virtual (m)
0.000	0.000
3.000	3.000
5.399	3.000
5.400	2.700
6.000	3.000
1000.000	3.000

Nota: Para valores intermedios de la anchura de plataforma se interpola linealmente

Cargas de tráfico en plataforma:

Situación	Carga por rueda del vehículo pesado (t)	Sobrecarga uniforme (t/m2)
Carril 1	15.291	0.917
Carril 2	10.194	0.255
Carril 3	5.097	0.255
Resto de carriles	0.000	0.255
Área remanente	0.000	0.255

Posición de las ruedas de los vehículos pesados:

Carga 1:	Distancia longitudinal de la carga :	0.000m
	Distancia transversal de la carga :	-1.000m
Carga 2:	Distancia longitudinal de la carga :	0.000m
	Distancia transversal de la carga :	1.000m
Carga 3:	Distancia longitudinal de la carga :	1.200m
	Distancia transversal de la carga :	-1.000m
Carga 4:	Distancia longitudinal de la carga :	1.200m
	Distancia transversal de la carga :	1.000m

Distancia de avance de los vehículos pesados : 1.000m

Tráfico en aceras

Ancho de la acera izquierda (m):	0,000
Ancho de la acera derecha (m):	0,000
Carga en acera izquierda (t/m2):	0,255
Carga en acera derecha (t/m2):	0,255

Gradiente térmico

Coeficiente de dilatación térmica (E-5) (1/°C):	1,00
Diferencia de temp. positiva entre cara sup. e inf. (°C) :	15,000
Diferencia de temp. positiva entre cara inf. y sup. (°C) :	-8,000

Humedad

Humedad relativa (%): 70,00

Coeficientes de seguridad

Coeficientes parciales de seguridad

Est. Límite Servicio	Estado Límite Ultimo
Combinaciones caract. frecuente y casi-perm	Situac. Persistente y transitoria

Acción	Coef.Fav.	Coef.Desf.	Coef.Fav.	Coef.Desf.
PP	1.00	1.00	1.00	1.35
PL	1.00	1.00	1.00	1.35
SE	1.00	1.00	1.00	1.35
TF	0.00	1.00	0.00	1.35
TA	0.00	1.00	0.00	1.35
GT	0.00	1.00	0.00	1.50
DA	0.00	1.00	0.00	1.20
TI	0.95	1.05	1.00	1.00
TP	1.00	1.00	1.00	1.35
RT	0.00	1.00	0.00	1.35
FL	0.00	1.00	0.00	1.35

PP : Peso propio de la viga.  
 PL : Peso propio de la losa.  
 SE : Superestructura.  
 TF : Tráfico en plataforma.  
 TA : Tráfico en aceras.  
 GT : Gradiente térmico.  
 DA : Descenso de apoyos.  
 TI : Acción instantánea del pretensado.  
 TP : Pérdidas diferidas del pretensado.  
 RT : Retracción de los hormigones de viga y losa.  
 FL : Fluencia de los hormigones de viga y losa.

Coeficientes de combinación

Acción	Psi0	Psi1	Psi2
Vehículos pesados	0.750	0.750	0.000
Sobrecarga uniforme	0.400	0.400	0.000
Carga en aceras	0.400	0.400	0.000
Acción térmica	0.600	0.600	0.500

Coeficientes de retracción y fluencia a tiempo infinito:

Resistencia característica del hormigón de la viga (Kg/cm2): 510,20  
 Resistencia característica del hormigón de la losa (Kg/cm2): 306,12  
 Humedad relativa (%): 70,0  
 Día en que se produce el tesado de las vigas: 5,0

Vano 1.Viga 1

Espesor ficticio de la sección transversal de la viga (mm): 209,4  
 Espesor ficticio de la sección transversal de la losa (mm): 284,5  
 Coef. de retracción de la viga entre el fraguado de la losa y tiempo infinito: 0,00  
 Coef. de retracción de la losa a tiempo infinito: 0,00032717  
 Coef. de fluencia de la viga entre el fraguado de la losa y tiempo infinito:  
 - Por acción del tesado de la viga: 1,115  
 - Por peso propio de la losa: 1,109  
 - Por superestructura: 1,055  
 Coef. de fluencia de la losa a tiempo infinito:  
 - Por superestructura: 1,620

Vano 1.Viga 2

Espesor ficticio de la sección transversal de la viga (mm): 209,4  
 Espesor ficticio de la sección transversal de la losa (mm): 284,5  
 Coef. de retracción de la viga entre el fraguado de la losa y tiempo infinito: 0,00  
 Coef. de retracción de la losa a tiempo infinito: 0,00032717  
 Coef. de fluencia de la viga entre el fraguado de la losa y tiempo infinito:  
 - Por acción del tesado de la viga: 1,115  
 - Por peso propio de la losa: 1,109  
 - Por superestructura: 1,055  
 Coef. de fluencia de la losa a tiempo infinito:  
 - Por superestructura: 1,620

LISTADO DE CARACTERISTICAS GEOMETRICAS  
=====

Sección bruta : No incluye la armadura activa ni la pasiva.  
 Sección neta : Se añade a la sección bruta la armadura pasiva, que se homogeneiza respecto del hormigón. No incluye la armadura activa.  
 Se incluyen, sin embargo, los agujeros de las vainas de pretensado.  
 Sección homogeneizada : Se añade a la sección neta la armadura activa, que se homogeneiza respecto del hormigón.  
 A : área de la sección.  
 Ix : momento de inercia respecto del eje horizontal que pasa por el centro de gravedad.  
 Iy : momento de inercia respecto del eje vertical que pasa por el centro de gravedad.  
 Vs : Distancia del centro de gravedad a la fibra superior de la sección.  
 Vi : Distancia del centro de gravedad a la fibra inferior de la sección.

Secciones completas  
=====

Las secciones siguientes NO incluyen la reducción del ancho de losa asociada al coeficiente de ancho eficaz.

Vano 1 Viga 1  
-----

Sección completa bruta de la viga  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.24245	0.75283	0.87440	1.305	-0.895
0.000	1.24245	0.75283	0.87440	1.305	-0.895
0.060	1.24245	0.75283	0.87440	1.305	-0.895
2.490	1.24245	0.75283	0.87440	1.305	-0.895
3.060	1.24245	0.75283	0.87440	1.305	-0.895
4.450	1.24245	0.75283	0.87440	1.305	-0.895
4.490	1.24245	0.75283	0.87440	1.305	-0.895
5.060	1.24245	0.75283	0.87440	1.305	-0.895
6.490	1.24245	0.75283	0.87440	1.305	-0.895
7.060	1.24245	0.75283	0.87440	1.305	-0.895
8.900	1.24245	0.75283	0.87440	1.305	-0.895
13.350	1.24245	0.75283	0.87440	1.305	-0.895
17.800	1.24245	0.75283	0.87440	1.305	-0.895
22.250	1.24245	0.75283	0.87440	1.305	-0.895
26.700	1.24245	0.75283	0.87440	1.305	-0.895
31.150	1.24245	0.75283	0.87440	1.305	-0.895
35.600	1.24245	0.75283	0.87440	1.305	-0.895
37.440	1.24245	0.75283	0.87440	1.305	-0.895
38.010	1.24245	0.75283	0.87440	1.305	-0.895
39.440	1.24245	0.75283	0.87440	1.305	-0.895
40.010	1.24245	0.75283	0.87440	1.305	-0.895
40.050	1.24245	0.75283	0.87440	1.305	-0.895
41.440	1.24245	0.75283	0.87440	1.305	-0.895
42.010	1.24245	0.75283	0.87440	1.305	-0.895
44.440	1.24245	0.75283	0.87440	1.305	-0.895
44.500	1.24245	0.75283	0.87440	1.305	-0.895
45.000	1.24245	0.75283	0.87440	1.305	-0.895

Sección completa bruta de la viga + losa  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.060	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
3.060	2.01848	1.76954	2.26233	0.995	-1.455

4.450	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.060	2.01848	1.76954	2.26233	0.995	-1.455
6.490	2.01848	1.76954	2.26233	0.995	-1.455
7.060	2.01848	1.76954	2.26233	0.995	-1.455
8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
37.440	2.01848	1.76954	2.26233	0.995	-1.455
38.010	2.01848	1.76954	2.26233	0.995	-1.455
39.440	2.01848	1.76954	2.26233	0.995	-1.455
40.010	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
41.440	2.01848	1.76954	2.26233	0.995	-1.455
42.010	2.01848	1.76954	2.26233	0.995	-1.455
44.440	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección completa neta de la viga  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.23601	0.74828	0.87204	1.302	-0.898
0.000	1.24290	0.75380	0.87354	1.307	-0.893
0.060	1.24290	0.75380	0.87354	1.307	-0.893
2.490	1.24290	0.75380	0.87354	1.307	-0.893
3.060	1.24094	0.75240	0.87306	1.305	-0.895
4.450	1.24094	0.75240	0.87306	1.305	-0.895
4.490	1.24094	0.75240	0.87306	1.305	-0.895
5.060	1.23870	0.75099	0.87251	1.304	-0.896
6.490	1.23870	0.75099	0.87251	1.304	-0.896
7.060	1.23646	0.74974	0.87196	1.303	-0.897
8.900	1.23646	0.74974	0.87196	1.303	-0.897
13.350	1.23646	0.74974	0.87196	1.303	-0.897
17.800	1.23646	0.74974	0.87196	1.303	-0.897
22.250	1.23646	0.74974	0.87196	1.303	-0.897
26.700	1.23646	0.74974	0.87196	1.303	-0.897
31.150	1.23646	0.74974	0.87196	1.303	-0.897
35.600	1.23646	0.74974	0.87196	1.303	-0.897
37.440	1.23646	0.74974	0.87196	1.303	-0.897
38.010	1.23870	0.75099	0.87251	1.304	-0.896
39.440	1.23870	0.75099	0.87251	1.304	-0.896
40.010	1.24094	0.75240	0.87306	1.305	-0.895
40.050	1.24094	0.75240	0.87306	1.305	-0.895
41.440	1.24094	0.75240	0.87306	1.305	-0.895
42.010	1.24290	0.75380	0.87354	1.307	-0.893
44.440	1.24290	0.75380	0.87354	1.307	-0.893
44.500	1.24290	0.75380	0.87354	1.307	-0.893
45.000	1.23601	0.74828	0.87204	1.302	-0.898

Sección completa neta de la viga + losa  
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Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03914	1.78022	2.31098	0.979	-1.471
0.000	2.04603	1.79508	2.31248	0.984	-1.466
0.060	2.04603	1.79508	2.31248	0.984	-1.466
2.490	2.04603	1.79508	2.31248	0.984	-1.466
3.060	2.04407	1.79114	2.31200	0.983	-1.467
4.450	2.04407	1.79114	2.31200	0.983	-1.467
4.490	2.04407	1.79114	2.31200	0.983	-1.467
5.060	2.04183	1.78695	2.31145	0.981	-1.469

6.490	2.04183	1.78695	2.31145	0.981	-1.469
7.060	2.03959	1.78305	2.31090	0.980	-1.470
8.900	2.03959	1.78305	2.31090	0.980	-1.470
13.350	2.03959	1.78305	2.31090	0.980	-1.470
17.800	2.03959	1.78305	2.31090	0.980	-1.470
22.250	2.03959	1.78305	2.31090	0.980	-1.470
26.700	2.03959	1.78305	2.31090	0.980	-1.470
31.150	2.03959	1.78305	2.31090	0.980	-1.470
35.600	2.03959	1.78305	2.31090	0.980	-1.470
37.440	2.03959	1.78305	2.31090	0.980	-1.470
38.010	2.04183	1.78695	2.31145	0.981	-1.469
39.440	2.04183	1.78695	2.31145	0.981	-1.469
40.010	2.04407	1.79114	2.31200	0.983	-1.467
40.050	2.04407	1.79114	2.31200	0.983	-1.467
41.440	2.04407	1.79114	2.31200	0.983	-1.467
42.010	2.04603	1.79508	2.31248	0.984	-1.466
44.440	2.04603	1.79508	2.31248	0.984	-1.466
44.500	2.04603	1.79508	2.31248	0.984	-1.466
45.000	2.03914	1.78022	2.31098	0.979	-1.471

Sección completa homogeneizada de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.27320	0.77422	0.88564	1.320	-0.880
0.000	1.28009	0.77952	0.88714	1.325	-0.875
0.060	1.28009	0.77952	0.88714	1.325	-0.875
2.490	1.28009	0.77952	0.88714	1.325	-0.875
3.060	1.28945	0.78585	0.88944	1.331	-0.869
4.450	1.28945	0.78585	0.88944	1.331	-0.869
4.490	1.28945	0.78585	0.88944	1.331	-0.869
5.060	1.30015	0.79213	0.89206	1.337	-0.863
6.490	1.30015	0.79213	0.89206	1.337	-0.863
7.060	1.31084	0.79752	0.89472	1.343	-0.857
8.900	1.31084	0.79752	0.89472	1.343	-0.857
13.350	1.31084	0.79752	0.89472	1.343	-0.857
17.800	1.31084	0.79752	0.89472	1.343	-0.857
22.250	1.31084	0.79752	0.89472	1.343	-0.857
26.700	1.31084	0.79752	0.89472	1.343	-0.857
31.150	1.31084	0.79752	0.89472	1.343	-0.857
35.600	1.31084	0.79752	0.89472	1.343	-0.857
37.440	1.31084	0.79752	0.89472	1.343	-0.857
38.010	1.30015	0.79213	0.89206	1.337	-0.863
39.440	1.30015	0.79213	0.89206	1.337	-0.863
40.010	1.28945	0.78585	0.88944	1.331	-0.869
40.050	1.28945	0.78585	0.88944	1.331	-0.869
41.440	1.28945	0.78585	0.88944	1.331	-0.869
42.010	1.28009	0.77952	0.88714	1.325	-0.875
44.440	1.28009	0.77952	0.88714	1.325	-0.875
44.500	1.28009	0.77952	0.88714	1.325	-0.875
45.000	1.27320	0.77422	0.88564	1.320	-0.880

Sección completa homogeneizada de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07633	1.84443	2.32458	1.000	-1.450
0.000	2.08322	1.85885	2.32608	1.005	-1.445
0.060	2.08322	1.85885	2.32608	1.005	-1.445
2.490	2.08322	1.85885	2.32608	1.005	-1.445
3.060	2.09258	1.87698	2.32838	1.011	-1.439
4.450	2.09258	1.87698	2.32838	1.011	-1.439
4.490	2.09258	1.87698	2.32838	1.011	-1.439
5.060	2.10328	1.89604	2.33100	1.018	-1.432
6.490	2.10328	1.89604	2.33100	1.018	-1.432
7.060	2.11397	1.91352	2.33366	1.025	-1.425
8.900	2.11397	1.91352	2.33366	1.025	-1.425

13.350	2.11397	1.91352	2.33366	1.025	-1.425
17.800	2.11397	1.91352	2.33366	1.025	-1.425
22.250	2.11397	1.91352	2.33366	1.025	-1.425
26.700	2.11397	1.91352	2.33366	1.025	-1.425
31.150	2.11397	1.91352	2.33366	1.025	-1.425
35.600	2.11397	1.91352	2.33366	1.025	-1.425
37.440	2.11397	1.91352	2.33366	1.025	-1.425
38.010	2.10328	1.89604	2.33100	1.018	-1.432
39.440	2.10328	1.89604	2.33100	1.018	-1.432
40.010	2.09258	1.87698	2.32838	1.011	-1.439
40.050	2.09258	1.87698	2.32838	1.011	-1.439
41.440	2.09258	1.87698	2.32838	1.011	-1.439
42.010	2.08322	1.85885	2.32608	1.005	-1.445
44.440	2.08322	1.85885	2.32608	1.005	-1.445
44.500	2.08322	1.85885	2.32608	1.005	-1.445
45.000	2.07633	1.84443	2.32458	1.000	-1.450

Vano 1 Viga 2

Sección completa bruta de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.24245	0.75283	0.87440	1.305	-0.895
0.000	1.24245	0.75283	0.87440	1.305	-0.895
0.047	1.24245	0.75283	0.87440	1.305	-0.895
4.450	1.24245	0.75283	0.87440	1.305	-0.895
8.900	1.24245	0.75283	0.87440	1.305	-0.895
13.350	1.24245	0.75283	0.87440	1.305	-0.895
14.657	1.24245	0.75283	0.87440	1.305	-0.895
15.213	1.24245	0.75283	0.87440	1.305	-0.895
17.800	1.24245	0.75283	0.87440	1.305	-0.895
22.250	1.24245	0.75283	0.87440	1.305	-0.895
26.700	1.24245	0.75283	0.87440	1.305	-0.895
29.287	1.24245	0.75283	0.87440	1.305	-0.895
29.843	1.24245	0.75283	0.87440	1.305	-0.895
31.150	1.24245	0.75283	0.87440	1.305	-0.895
35.600	1.24245	0.75283	0.87440	1.305	-0.895
40.050	1.24245	0.75283	0.87440	1.305	-0.895
44.453	1.24245	0.75283	0.87440	1.305	-0.895
44.500	1.24245	0.75283	0.87440	1.305	-0.895
45.000	1.24245	0.75283	0.87440	1.305	-0.895

Sección completa bruta de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
4.450	2.01848	1.76954	2.26233	0.995	-1.455
8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
29.287	2.01848	1.76954	2.26233	0.995	-1.455
29.843	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
44.453	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455



Sección completa neta de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.23657	0.74908	0.87293	1.301	-0.899
0.000	1.24346	0.75462	0.87443	1.306	-0.894
0.047	1.24346	0.75462	0.87443	1.306	-0.894
4.450	1.24346	0.75462	0.87443	1.306	-0.894
8.900	1.24346	0.75462	0.87443	1.306	-0.894
13.350	1.24346	0.75462	0.87443	1.306	-0.894
14.657	1.24346	0.75462	0.87443	1.306	-0.894
15.213	1.23478	0.74939	0.87228	1.301	-0.899
17.800	1.23478	0.74939	0.87228	1.301	-0.899
22.250	1.23478	0.74939	0.87228	1.301	-0.899
26.700	1.23478	0.74939	0.87228	1.301	-0.899
29.287	1.23478	0.74939	0.87228	1.301	-0.899
29.843	1.24346	0.75462	0.87443	1.306	-0.894
31.150	1.24346	0.75462	0.87443	1.306	-0.894
35.600	1.24346	0.75462	0.87443	1.306	-0.894
40.050	1.24346	0.75462	0.87443	1.306	-0.894
44.453	1.24346	0.75462	0.87443	1.306	-0.894
44.500	1.24346	0.75462	0.87443	1.306	-0.894
45.000	1.23657	0.74908	0.87293	1.301	-0.899

Sección completa neta de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
4.450	2.04659	1.79530	2.31337	0.984	-1.466
8.900	2.04659	1.79530	2.31337	0.984	-1.466
13.350	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
15.213	2.03791	1.77954	2.31122	0.978	-1.472
17.800	2.03791	1.77954	2.31122	0.978	-1.472
22.250	2.03791	1.77954	2.31122	0.978	-1.472
26.700	2.03791	1.77954	2.31122	0.978	-1.472
29.287	2.03791	1.77954	2.31122	0.978	-1.472
29.843	2.04659	1.79530	2.31337	0.984	-1.466
31.150	2.04659	1.79530	2.31337	0.984	-1.466
35.600	2.04659	1.79530	2.31337	0.984	-1.466
40.050	2.04659	1.79530	2.31337	0.984	-1.466
44.453	2.04659	1.79530	2.31337	0.984	-1.466
44.500	2.04659	1.79530	2.31337	0.984	-1.466
45.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección completa homogeneizada de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.27053	0.77023	0.88140	1.322	-0.878
0.000	1.27742	0.77551	0.88290	1.327	-0.873
0.047	1.27742	0.77551	0.88290	1.327	-0.873
4.450	1.27742	0.77551	0.88290	1.327	-0.873
8.900	1.27742	0.77551	0.88290	1.327	-0.873
13.350	1.27742	0.77551	0.88290	1.327	-0.873
14.657	1.27742	0.77551	0.88290	1.327	-0.873
15.213	1.31886	0.79822	0.89316	1.351	-0.849
17.800	1.31886	0.79822	0.89316	1.351	-0.849
22.250	1.31886	0.79822	0.89316	1.351	-0.849
26.700	1.31886	0.79822	0.89316	1.351	-0.849
29.287	1.31886	0.79822	0.89316	1.351	-0.849
29.843	1.27742	0.77551	0.88290	1.327	-0.873

31.150	1.27742	0.77551	0.88290	1.327	-0.873
35.600	1.27742	0.77551	0.88290	1.327	-0.873
40.050	1.27742	0.77551	0.88290	1.327	-0.873
44.453	1.27742	0.77551	0.88290	1.327	-0.873
44.500	1.27742	0.77551	0.88290	1.327	-0.873
45.000	1.27053	0.77023	0.88140	1.322	-0.878

Sección completa homogeneizada de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
4.450	2.08055	1.85770	2.32184	1.006	-1.444
8.900	2.08055	1.85770	2.32184	1.006	-1.444
13.350	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.12199	1.92878	2.33210	1.032	-1.418
17.800	2.12199	1.92878	2.33210	1.032	-1.418
22.250	2.12199	1.92878	2.33210	1.032	-1.418
26.700	2.12199	1.92878	2.33210	1.032	-1.418
29.287	2.12199	1.92878	2.33210	1.032	-1.418
29.843	2.08055	1.85770	2.32184	1.006	-1.444
31.150	2.08055	1.85770	2.32184	1.006	-1.444
35.600	2.08055	1.85770	2.32184	1.006	-1.444
40.050	2.08055	1.85770	2.32184	1.006	-1.444
44.453	2.08055	1.85770	2.32184	1.006	-1.444
44.500	2.08055	1.85770	2.32184	1.006	-1.444
45.000	2.07366	1.84330	2.32034	1.001	-1.449

Secciones eficaces

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Las secciones siguientes SI incluyen la reducción del ancho de losa asociada al coeficiente de ancho eficaz.

Vano 1 Viga 1

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Sección eficaz bruta viga+losa para estado límite de servicio

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Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.060	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
3.060	2.01848	1.76954	2.26233	0.995	-1.455
4.450	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.060	2.01848	1.76954	2.26233	0.995	-1.455
6.490	2.01848	1.76954	2.26233	0.995	-1.455
7.060	2.01848	1.76954	2.26233	0.995	-1.455
8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
37.440	2.01848	1.76954	2.26233	0.995	-1.455
38.010	2.01848	1.76954	2.26233	0.995	-1.455
39.440	2.01848	1.76954	2.26233	0.995	-1.455
40.010	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
41.440	2.01848	1.76954	2.26233	0.995	-1.455

42.010	2.01848	1.76954	2.26233	0.995	-1.455
44.440	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz bruta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.060	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
3.060	2.01848	1.76954	2.26233	0.995	-1.455
4.450	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.060	2.01848	1.76954	2.26233	0.995	-1.455
6.490	2.01848	1.76954	2.26233	0.995	-1.455
7.060	2.01848	1.76954	2.26233	0.995	-1.455
8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
37.440	2.01848	1.76954	2.26233	0.995	-1.455
38.010	2.01848	1.76954	2.26233	0.995	-1.455
39.440	2.01848	1.76954	2.26233	0.995	-1.455
40.010	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
41.440	2.01848	1.76954	2.26233	0.995	-1.455
42.010	2.01848	1.76954	2.26233	0.995	-1.455
44.440	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz neta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03914	1.78022	2.31098	0.979	-1.471
0.000	2.04603	1.79508	2.31248	0.984	-1.466
0.060	2.04603	1.79508	2.31248	0.984	-1.466
2.490	2.04603	1.79508	2.31248	0.984	-1.466
3.060	2.04407	1.79114	2.31200	0.983	-1.467
4.450	2.04407	1.79114	2.31200	0.983	-1.467
4.490	2.04407	1.79114	2.31200	0.983	-1.467
5.060	2.04183	1.78695	2.31145	0.981	-1.469
6.490	2.04183	1.78695	2.31145	0.981	-1.469
7.060	2.03959	1.78305	2.31090	0.980	-1.470
8.900	2.03959	1.78305	2.31090	0.980	-1.470
13.350	2.03959	1.78305	2.31090	0.980	-1.470
17.800	2.03959	1.78305	2.31090	0.980	-1.470
22.250	2.03959	1.78305	2.31090	0.980	-1.470
26.700	2.03959	1.78305	2.31090	0.980	-1.470
31.150	2.03959	1.78305	2.31090	0.980	-1.470
35.600	2.03959	1.78305	2.31090	0.980	-1.470
37.440	2.03959	1.78305	2.31090	0.980	-1.470
38.010	2.04183	1.78695	2.31145	0.981	-1.469
39.440	2.04183	1.78695	2.31145	0.981	-1.469
40.010	2.04407	1.79114	2.31200	0.983	-1.467
40.050	2.04407	1.79114	2.31200	0.983	-1.467
41.440	2.04407	1.79114	2.31200	0.983	-1.467
42.010	2.04603	1.79508	2.31248	0.984	-1.466
44.440	2.04603	1.79508	2.31248	0.984	-1.466
44.500	2.04603	1.79508	2.31248	0.984	-1.466

45.000	2.03914	1.78022	2.31098	0.979	-1.471
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Sección eficaz neta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03914	1.78022	2.31098	0.979	-1.471
0.000	2.04603	1.79508	2.31248	0.984	-1.466
0.060	2.04603	1.79508	2.31248	0.984	-1.466
2.490	2.04603	1.79508	2.31248	0.984	-1.466
3.060	2.04407	1.79114	2.31200	0.983	-1.467
4.450	2.04407	1.79114	2.31200	0.983	-1.467
4.490	2.04407	1.79114	2.31200	0.983	-1.467
5.060	2.04183	1.78695	2.31145	0.981	-1.469
6.490	2.04183	1.78695	2.31145	0.981	-1.469
7.060	2.03959	1.78305	2.31090	0.980	-1.470
8.900	2.03959	1.78305	2.31090	0.980	-1.470
13.350	2.03959	1.78305	2.31090	0.980	-1.470
17.800	2.03959	1.78305	2.31090	0.980	-1.470
22.250	2.03959	1.78305	2.31090	0.980	-1.470
26.700	2.03959	1.78305	2.31090	0.980	-1.470
31.150	2.03959	1.78305	2.31090	0.980	-1.470
35.600	2.03959	1.78305	2.31090	0.980	-1.470
37.440	2.03959	1.78305	2.31090	0.980	-1.470
38.010	2.04183	1.78695	2.31145	0.981	-1.469
39.440	2.04183	1.78695	2.31145	0.981	-1.469
40.010	2.04407	1.79114	2.31200	0.983	-1.467
40.050	2.04407	1.79114	2.31200	0.983	-1.467
41.440	2.04407	1.79114	2.31200	0.983	-1.467
42.010	2.04603	1.79508	2.31248	0.984	-1.466
44.440	2.04603	1.79508	2.31248	0.984	-1.466
44.500	2.04603	1.79508	2.31248	0.984	-1.466
45.000	2.03914	1.78022	2.31098	0.979	-1.471

Sección eficaz homogeneizada viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07633	1.84443	2.32458	1.000	-1.450
0.000	2.08322	1.85885	2.32608	1.005	-1.445
0.060	2.08322	1.85885	2.32608	1.005	-1.445
2.490	2.08322	1.85885	2.32608	1.005	-1.445
3.060	2.09258	1.87698	2.32838	1.011	-1.439
4.450	2.09258	1.87698	2.32838	1.011	-1.439
4.490	2.09258	1.87698	2.32838	1.011	-1.439
5.060	2.10328	1.89604	2.33100	1.018	-1.432
6.490	2.10328	1.89604	2.33100	1.018	-1.432
7.060	2.11397	1.91352	2.33366	1.025	-1.425
8.900	2.11397	1.91352	2.33366	1.025	-1.425
13.350	2.11397	1.91352	2.33366	1.025	-1.425
17.800	2.11397	1.91352	2.33366	1.025	-1.425
22.250	2.11397	1.91352	2.33366	1.025	-1.425
26.700	2.11397	1.91352	2.33366	1.025	-1.425
31.150	2.11397	1.91352	2.33366	1.025	-1.425
35.600	2.11397	1.91352	2.33366	1.025	-1.425
37.440	2.11397	1.91352	2.33366	1.025	-1.425
38.010	2.10328	1.89604	2.33100	1.018	-1.432
39.440	2.10328	1.89604	2.33100	1.018	-1.432
40.010	2.09258	1.87698	2.32838	1.011	-1.439
40.050	2.09258	1.87698	2.32838	1.011	-1.439
41.440	2.09258	1.87698	2.32838	1.011	-1.439
42.010	2.08322	1.85885	2.32608	1.005	-1.445
44.440	2.08322	1.85885	2.32608	1.005	-1.445
44.500	2.08322	1.85885	2.32608	1.005	-1.445
45.000	2.07633	1.84443	2.32458	1.000	-1.450

Sección eficaz homogeneizada viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07633	1.84443	2.32458	1.000	-1.450
0.000	2.08322	1.85885	2.32608	1.005	-1.445
0.060	2.08322	1.85885	2.32608	1.005	-1.445
2.490	2.08322	1.85885	2.32608	1.005	-1.445
3.060	2.09258	1.87698	2.32838	1.011	-1.439
4.450	2.09258	1.87698	2.32838	1.011	-1.439
4.490	2.09258	1.87698	2.32838	1.011	-1.439
5.060	2.10328	1.89604	2.33100	1.018	-1.432
6.490	2.10328	1.89604	2.33100	1.018	-1.432
7.060	2.11397	1.91352	2.33366	1.025	-1.425
8.900	2.11397	1.91352	2.33366	1.025	-1.425
13.350	2.11397	1.91352	2.33366	1.025	-1.425
17.800	2.11397	1.91352	2.33366	1.025	-1.425
22.250	2.11397	1.91352	2.33366	1.025	-1.425
26.700	2.11397	1.91352	2.33366	1.025	-1.425
31.150	2.11397	1.91352	2.33366	1.025	-1.425
35.600	2.11397	1.91352	2.33366	1.025	-1.425
37.440	2.11397	1.91352	2.33366	1.025	-1.425
38.010	2.10328	1.89604	2.33100	1.018	-1.432
39.440	2.10328	1.89604	2.33100	1.018	-1.432
40.010	2.09258	1.87698	2.32838	1.011	-1.439
40.050	2.09258	1.87698	2.32838	1.011	-1.439
41.440	2.09258	1.87698	2.32838	1.011	-1.439
42.010	2.08322	1.85885	2.32608	1.005	-1.445
44.440	2.08322	1.85885	2.32608	1.005	-1.445
44.500	2.08322	1.85885	2.32608	1.005	-1.445
45.000	2.07633	1.84443	2.32458	1.000	-1.450

Vano 1 Viga 2

Sección eficaz bruta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
4.450	2.01848	1.76954	2.26233	0.995	-1.455
8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
29.287	2.01848	1.76954	2.26233	0.995	-1.455
29.843	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
44.453	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz bruta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
4.450	2.01848	1.76954	2.26233	0.995	-1.455

8.900	2.01848	1.76954	2.26233	0.995	-1.455
13.350	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.800	2.01848	1.76954	2.26233	0.995	-1.455
22.250	2.01848	1.76954	2.26233	0.995	-1.455
26.700	2.01848	1.76954	2.26233	0.995	-1.455
29.287	2.01848	1.76954	2.26233	0.995	-1.455
29.843	2.01848	1.76954	2.26233	0.995	-1.455
31.150	2.01848	1.76954	2.26233	0.995	-1.455
35.600	2.01848	1.76954	2.26233	0.995	-1.455
40.050	2.01848	1.76954	2.26233	0.995	-1.455
44.453	2.01848	1.76954	2.26233	0.995	-1.455
44.500	2.01848	1.76954	2.26233	0.995	-1.455
45.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz neta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
4.450	2.04659	1.79530	2.31337	0.984	-1.466
8.900	2.04659	1.79530	2.31337	0.984	-1.466
13.350	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
15.213	2.03791	1.77954	2.31122	0.978	-1.472
17.800	2.03791	1.77954	2.31122	0.978	-1.472
22.250	2.03791	1.77954	2.31122	0.978	-1.472
26.700	2.03791	1.77954	2.31122	0.978	-1.472
29.287	2.03791	1.77954	2.31122	0.978	-1.472
29.843	2.04659	1.79530	2.31337	0.984	-1.466
31.150	2.04659	1.79530	2.31337	0.984	-1.466
35.600	2.04659	1.79530	2.31337	0.984	-1.466
40.050	2.04659	1.79530	2.31337	0.984	-1.466
44.453	2.04659	1.79530	2.31337	0.984	-1.466
44.500	2.04659	1.79530	2.31337	0.984	-1.466
45.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección eficaz neta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
4.450	2.04659	1.79530	2.31337	0.984	-1.466
8.900	2.04659	1.79530	2.31337	0.984	-1.466
13.350	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
15.213	2.03791	1.77954	2.31122	0.978	-1.472
17.800	2.03791	1.77954	2.31122	0.978	-1.472
22.250	2.03791	1.77954	2.31122	0.978	-1.472
26.700	2.03791	1.77954	2.31122	0.978	-1.472
29.287	2.03791	1.77954	2.31122	0.978	-1.472
29.843	2.04659	1.79530	2.31337	0.984	-1.466
31.150	2.04659	1.79530	2.31337	0.984	-1.466
35.600	2.04659	1.79530	2.31337	0.984	-1.466
40.050	2.04659	1.79530	2.31337	0.984	-1.466
44.453	2.04659	1.79530	2.31337	0.984	-1.466
44.500	2.04659	1.79530	2.31337	0.984	-1.466
45.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección eficaz homogeneizada viga+losa para estado límite de servicio

Distancia (m)	A(m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
4.450	2.08055	1.85770	2.32184	1.006	-1.444
8.900	2.08055	1.85770	2.32184	1.006	-1.444
13.350	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.12199	1.92878	2.33210	1.032	-1.418
17.800	2.12199	1.92878	2.33210	1.032	-1.418
22.250	2.12199	1.92878	2.33210	1.032	-1.418
26.700	2.12199	1.92878	2.33210	1.032	-1.418
29.287	2.12199	1.92878	2.33210	1.032	-1.418
29.843	2.08055	1.85770	2.32184	1.006	-1.444
31.150	2.08055	1.85770	2.32184	1.006	-1.444
35.600	2.08055	1.85770	2.32184	1.006	-1.444
40.050	2.08055	1.85770	2.32184	1.006	-1.444
44.453	2.08055	1.85770	2.32184	1.006	-1.444
44.500	2.08055	1.85770	2.32184	1.006	-1.444
45.000	2.07366	1.84330	2.32034	1.001	-1.449

13.350	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
17.800	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
22.250	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
26.700	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
31.150	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
35.600	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
37.440	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
38.010	-933.146	-933.146	0.000	0.000	1334.863	1334.863
39.440	-933.146	-933.146	0.000	0.000	1334.863	1334.863
40.010	-708.617	-708.617	0.000	0.000	1052.229	1052.229
40.050	-708.617	-708.617	0.000	0.000	1052.229	1052.229
41.440	-708.617	-708.617	0.000	0.000	1052.229	1052.229
42.010	-500.392	-500.392	0.000	0.000	805.529	805.529
44.440	-500.392	-500.392	0.000	0.000	805.529	805.529
44.500	-430.494	-430.494	0.000	0.000	693.007	693.007
45.000	0.002	0.002	0.000	0.000	-0.003	-0.003

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Sección eficaz homogeneizada viga+losa para estado límite último

Distancia (m)	A(m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
4.450	2.08055	1.85770	2.32184	1.006	-1.444
8.900	2.08055	1.85770	2.32184	1.006	-1.444
13.350	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.12199	1.92878	2.33210	1.032	-1.418
17.800	2.12199	1.92878	2.33210	1.032	-1.418
22.250	2.12199	1.92878	2.33210	1.032	-1.418
26.700	2.12199	1.92878	2.33210	1.032	-1.418
29.287	2.12199	1.92878	2.33210	1.032	-1.418
29.843	2.08055	1.85770	2.32184	1.006	-1.444
31.150	2.08055	1.85770	2.32184	1.006	-1.444
35.600	2.08055	1.85770	2.32184	1.006	-1.444
40.050	2.08055	1.85770	2.32184	1.006	-1.444
44.453	2.08055	1.85770	2.32184	1.006	-1.444
44.500	2.08055	1.85770	2.32184	1.006	-1.444
45.000	2.07366	1.84330	2.32034	1.001	-1.449

LISTADO DE ESFUERZOS

Vano 1 Viga 1

Esfuerzos por pretensado instantáneo.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	-430.498	-430.498	0.000	0.000	693.014	693.014
0.060	-500.392	-500.392	0.000	0.000	805.529	805.529
2.490	-500.392	-500.392	0.000	0.000	805.529	805.529
3.060	-708.617	-708.617	0.000	0.000	1052.229	1052.229
4.450	-708.617	-708.617	0.000	0.000	1052.229	1052.229
4.490	-708.617	-708.617	0.000	0.000	1052.229	1052.229
5.060	-933.146	-933.146	0.000	0.000	1334.863	1334.863
6.490	-933.146	-933.146	0.000	0.000	1334.863	1334.863
7.060	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145
8.900	-1144.137	-1144.137	0.000	0.000	1618.145	1618.145

Esfuerzos por pérdidas de pretensado en fase 1.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	21.394	21.394	0.000	0.000	-29.421	-29.421
0.060	26.692	26.692	0.000	0.000	-37.412	-37.412
2.490	23.164	23.164	0.000	0.000	-34.296	-34.296
3.060	39.442	39.442	0.000	0.000	-54.477	-54.477
4.450	37.343	37.343	0.000	0.000	-52.459	-52.459
4.490	37.048	37.048	0.000	0.000	-52.176	-52.176
5.060	58.491	58.491	0.000	0.000	-80.064	-80.064
6.490	55.973	55.973	0.000	0.000	-77.475	-77.475
7.060	79.785	79.785	0.000	0.000	-110.172	-110.172
8.900	76.814	76.814	0.000	0.000	-106.949	-106.949
13.350	70.701	70.701	0.000	0.000	-100.318	-100.318
17.800	67.033	67.033	0.000	0.000	-96.339	-96.339
22.250	65.810	65.810	0.000	0.000	-95.013	-95.013
26.700	67.033	67.033	0.000	0.000	-96.339	-96.339
31.150	70.701	70.701	0.000	0.000	-100.318	-100.318
35.600	76.814	76.814	0.000	0.000	-106.949	-106.949
37.440	79.785	79.785	0.000	0.000	-110.172	-110.172
38.010	55.973	55.973	0.000	0.000	-77.475	-77.475
39.440	58.491	58.491	0.000	0.000	-80.064	-80.064
40.010	37.048	37.048	0.000	0.000	-52.176	-52.176
40.050	37.343	37.343	0.000	0.000	-52.459	-52.459
41.440	39.442	39.442	0.000	0.000	-54.477	-54.477
42.010	23.164	23.164	0.000	0.000	-34.296	-34.296
44.440	26.692	26.692	0.000	0.000	-37.412	-37.412
44.500	21.393	21.393	0.000	0.000	-29.421	-29.421
45.000	-0.002	-0.002	0.000	0.000	0.003	0.003

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por pérdidas de pretensado en fase 2.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	72.796	72.796	0.000	0.000	-53.906	-53.906
0.060	91.932	91.932	0.000	0.000	-68.219	-68.219
2.490	81.125	81.125	0.000	0.000	-61.226	-61.226

3.060	127.078	127.078	0.000	0.000	-92.162	-92.162
4.450	120.083	120.083	0.000	0.000	-87.604	-87.604
4.490	119.133	119.133	0.000	0.000	-86.985	-86.985
5.060	179.182	179.182	0.000	0.000	-128.461	-128.461
6.490	170.884	170.884	0.000	0.000	-122.980	-122.980
7.060	238.232	238.232	0.000	0.000	-170.787	-170.787
8.900	227.729	227.729	0.000	0.000	-163.739	-163.739
13.350	206.456	206.456	0.000	0.000	-149.467	-149.467
17.800	193.611	193.611	0.000	0.000	-140.849	-140.849
22.250	189.179	189.179	0.000	0.000	-137.877	-137.877
26.700	193.611	193.611	0.000	0.000	-140.849	-140.849
31.150	206.456	206.456	0.000	0.000	-149.467	-149.467
35.600	227.729	227.729	0.000	0.000	-163.739	-163.739
37.440	238.232	238.232	0.000	0.000	-170.787	-170.787
38.010	170.884	170.884	0.000	0.000	-122.980	-122.980
39.440	179.182	179.182	0.000	0.000	-128.461	-128.461
40.010	119.133	119.133	0.000	0.000	-86.985	-86.985
40.050	120.083	120.083	0.000	0.000	-87.604	-87.604
41.440	127.078	127.078	0.000	0.000	-92.162	-92.162
42.010	81.125	81.125	0.000	0.000	-61.226	-61.226
44.440	91.932	91.932	0.000	0.000	-68.219	-68.219
44.500	72.795	72.795	0.000	0.000	-53.906	-53.906
45.000	0.000	0.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.

M+,M- : Momento flector máximo positivo y mínimo negativo(mT).

Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por peso propio de la viga.

s (m)	M+	M-	Q+	Q-
-0.500	-0.000	-0.000	0.000	0.000
0.000	-0.248	-0.248	68.335	68.335
0.060	10.621	10.621	67.839	67.839
2.490	166.321	166.321	60.290	60.290
3.060	200.160	200.160	58.521	58.521
4.450	270.358	270.358	54.668	54.668
4.490	280.688	280.688	54.078	54.078
5.060	310.989	310.989	52.308	52.308
6.490	382.632	382.632	47.865	47.865
7.060	409.394	409.394	46.096	46.096
8.900	480.829	480.829	41.001	41.001
13.350	631.166	631.166	27.334	27.334
17.800	721.368	721.368	13.667	13.667
22.250	751.435	751.435	0.000	0.000
26.700	721.368	721.368	-13.667	-13.667
31.150	631.166	631.166	-27.334	-27.334
35.600	480.829	480.829	-41.001	-41.001
37.440	409.394	409.394	-46.096	-46.096
38.010	382.632	382.632	-47.865	-47.865
39.440	310.989	310.989	-52.308	-52.308
40.010	280.689	280.689	-54.078	-54.078
40.050	270.358	270.358	-54.668	-54.668
41.440	200.160	200.160	-58.521	-58.521
42.010	166.321	166.321	-60.290	-60.290
44.440	10.621	10.621	-67.839	-67.839
44.500	-0.248	-0.248	-68.335	-68.335
45.000	-0.000	-0.000	0.000	0.000

s(m) : distancia al inicio de la viga.

M+,M- : Momento flector máximo positivo y mínimo negativo(mT).

Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por peso propio de la losa.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	-0.277	-0.277	76.213	76.213
0.060	11.845	11.845	75.660	75.660
2.490	185.497	185.497	67.241	67.241
3.060	223.238	223.238	65.268	65.268
4.450	301.528	301.528	60.971	60.971
4.490	313.050	313.050	60.313	60.313
5.060	346.844	346.844	58.339	58.339
6.490	426.747	426.747	53.384	53.384
7.060	456.594	456.594	51.411	51.411
8.900	536.266	536.266	45.728	45.728
13.350	703.936	703.936	30.485	30.485
17.800	804.537	804.537	15.243	15.243
22.250	838.071	838.071	0.000	0.000
26.700	804.537	804.537	-15.243	-15.243
31.150	703.936	703.936	-30.485	-30.485
35.600	536.266	536.266	-45.728	-45.728
37.440	456.595	456.595	-51.411	-51.411
38.010	426.747	426.747	-53.384	-53.384
39.440	346.845	346.845	-58.339	-58.339
40.010	313.050	313.050	-60.313	-60.313
40.050	301.528	301.528	-60.971	-60.971
41.440	223.238	223.238	-65.268	-65.268
42.010	185.497	185.497	-67.241	-67.241
44.440	11.846	11.846	-75.660	-75.660
44.500	-0.277	-0.277	-76.213	-76.213
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.

M+,M- : Momento flector máximo positivo y mínimo negativo(mT).

Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por superestructura.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	12.933	-12.893	37.444	20.760
0.060	14.525	-11.414	37.340	20.709
2.490	79.415	48.833	33.110	18.627
3.060	94.624	62.954	32.119	18.139
4.450	131.746	97.420	29.699	16.949
4.490	132.814	98.412	29.629	16.915
5.060	149.540	111.843	28.638	16.427
6.490	185.335	136.286	26.192	15.141
7.060	197.551	145.114	25.227	14.616
8.900	237.017	173.635	22.110	12.919
13.350	313.018	228.960	14.652	8.704
17.800	360.134	263.629	7.302	4.360
22.250	378.885	277.247	0.038	-0.038
26.700	360.135	263.629	-4.360	-7.302
31.150	313.019	228.961	-8.704	-14.652
35.600	237.018	173.636	-12.919	-22.110
37.440	197.552	145.115	-14.616	-25.227
38.010	185.336	136.286	-15.141	-26.192
39.440	149.542	111.843	-16.427	-28.638
40.010	132.816	98.413	-16.914	-29.629
40.050	131.747	97.421	-16.949	-29.699
41.440	94.625	62.955	-18.139	-32.119
42.010	79.416	48.834	-18.627	-33.110
44.440	14.526	-11.413	-20.709	-37.340
44.500	12.933	-12.892	-20.760	-37.444
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.

M+,M- : Momento flector máximo positivo y mínimo negativo(mT).

Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

44.500 174.264 -208.623 7.467 -160.979  
 45.000 0.000 0.000 0.000 0.000

Esfuerzos por tráfico sobre las aceras

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000
0.060	0.000	0.000	0.000	0.000
2.490	0.000	0.000	0.000	0.000
3.060	0.000	0.000	0.000	0.000
4.450	0.000	0.000	0.000	0.000
4.490	0.000	0.000	0.000	0.000
5.060	0.000	0.000	0.000	0.000
6.490	0.000	0.000	0.000	0.000
7.060	0.000	0.000	0.000	0.000
8.900	0.000	0.000	0.000	0.000
13.350	0.000	0.000	0.000	0.000
17.800	0.000	0.000	0.000	0.000
22.250	0.000	0.000	0.000	0.000
26.700	0.000	0.000	0.000	0.000
31.150	0.000	0.000	0.000	0.000
35.600	0.000	0.000	0.000	0.000
37.440	0.000	0.000	0.000	0.000
38.010	0.000	0.000	0.000	0.000
39.440	0.000	0.000	0.000	0.000
40.010	0.000	0.000	0.000	0.000
40.050	0.000	0.000	0.000	0.000
41.440	0.000	0.000	0.000	0.000
42.010	0.000	0.000	0.000	0.000
44.440	0.000	0.000	0.000	0.000
44.500	0.000	0.000	0.000	0.000
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
 M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
 Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre la plataforma

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	174.260	-208.625	160.980	-7.466
0.060	180.040	-206.557	160.740	-7.574
2.490	415.583	-122.316	150.965	-12.363
3.060	470.791	-102.571	148.673	-13.519
4.450	612.659	-63.968	143.081	-16.342
4.490	616.746	-63.082	142.920	-16.424
5.060	674.957	-50.460	140.629	-17.580
6.490	787.796	-36.057	134.151	-21.073
7.060	833.511	-34.056	131.415	-22.591
8.900	981.207	-27.588	122.576	-28.815
13.350	1251.673	-16.894	102.405	-40.776
17.800	1402.371	-13.411	84.043	-53.836
22.250	1453.754	-12.344	67.497	-68.857
26.700	1402.371	-13.411	53.565	-84.315
31.150	1251.675	-16.894	40.776	-102.405
35.600	981.209	-27.588	28.816	-122.576
37.440	833.513	-34.056	22.591	-131.415
38.010	787.797	-36.057	21.074	-134.151
39.440	674.959	-50.460	17.581	-140.629
40.010	616.748	-63.083	16.424	-142.920
40.050	612.660	-63.969	16.343	-143.081
41.440	470.793	-102.568	13.520	-148.673
42.010	415.586	-122.313	12.363	-150.964
44.440	180.044	-206.556	7.575	-160.739

s(m) : distancia al inicio de la viga.  
 M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
 Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por gradiente térmico

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.226	-0.120	0.008	-0.015
0.060	0.226	-0.121	0.008	-0.015
2.490	0.237	-0.126	0.007	-0.012
3.060	0.240	-0.128	0.006	-0.012
4.450	0.282	-0.150	0.005	-0.010
4.490	0.283	-0.151	0.005	-0.010
5.060	0.301	-0.160	0.005	-0.009
6.490	0.320	-0.171	0.006	-0.008
7.060	0.322	-0.172	0.006	-0.008
8.900	0.330	-0.176	0.008	-0.007
13.350	0.289	-0.208	0.013	-0.008
17.800	0.203	-0.260	0.016	-0.009
22.250	0.161	-0.302	0.010	-0.010
26.700	0.203	-0.260	0.009	-0.016
31.150	0.289	-0.208	0.008	-0.013
35.600	0.330	-0.176	0.007	-0.008
37.440	0.322	-0.172	0.008	-0.006
38.010	0.320	-0.171	0.008	-0.006
39.440	0.301	-0.160	0.009	-0.005
40.010	0.283	-0.151	0.010	-0.005
40.050	0.282	-0.150	0.010	-0.005
41.440	0.240	-0.128	0.012	-0.006
42.010	0.237	-0.126	0.012	-0.007
44.440	0.226	-0.121	0.015	-0.008
44.500	0.226	-0.120	0.015	-0.008
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
 M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
 Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por retracción conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	41.166	58.978	-41.166	0.408
0.000	41.207	59.217	-41.207	0.407
0.060	41.207	59.217	-41.207	0.407
2.490	41.207	59.217	-41.207	0.407
3.060	41.251	59.506	-41.251	0.406
4.450	41.251	59.506	-41.251	0.406
4.490	41.251	59.506	-41.251	0.406
5.060	41.288	59.800	-41.288	0.405
6.490	41.288	59.800	-41.288	0.405
7.060	41.314	60.059	-41.314	0.404
8.900	41.314	60.059	-41.314	0.404
13.350	41.314	60.059	-41.314	0.404
17.800	41.314	60.059	-41.314	0.404
22.250	41.314	60.059	-41.314	0.404
26.700	41.314	60.059	-41.314	0.404
31.150	41.314	60.059	-41.314	0.404
35.600	41.314	60.059	-41.314	0.404
37.440	41.314	60.059	-41.314	0.404
38.010	41.288	59.800	-41.288	0.405
39.440	41.288	59.800	-41.288	0.405

40.010	41.251	59.506	-41.251	0.406
40.050	41.251	59.506	-41.251	0.406
41.440	41.251	59.506	-41.251	0.406
42.010	41.207	59.217	-41.207	0.407
44.440	41.207	59.217	-41.207	0.407
44.500	41.207	59.217	-41.207	0.407
45.000	41.166	58.978	-41.166	0.408

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

Esfuerzos por fluencia conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	7.352	10.654	-7.352	-0.048
0.000	33.279	49.575	-33.279	-1.424
0.060	31.630	47.180	-31.630	-1.414
2.490	-33.592	-47.590	33.592	-1.015
3.060	-26.283	-36.728	26.283	-1.444
4.450	-61.282	-87.772	61.282	-1.232
4.490	-62.146	-89.032	62.146	-1.227
5.060	-51.954	-74.026	51.954	-1.732
6.490	-81.768	-117.679	81.768	-1.552
7.060	-73.825	-105.998	73.825	-2.044
8.900	-109.637	-158.624	109.637	-1.829
13.350	-173.958	-253.142	173.958	-1.445
17.800	-212.512	-309.795	212.512	-1.215
22.250	-225.295	-328.578	225.295	-1.139
26.700	-212.512	-309.795	212.512	-1.215
31.150	-173.958	-253.142	173.958	-1.445
35.600	-109.637	-158.624	109.637	-1.829
37.440	-73.825	-105.998	73.825	-2.044
38.010	-81.768	-117.680	81.768	-1.552
39.440	-51.954	-74.026	51.954	-1.732
40.010	-62.146	-89.033	62.146	-1.227
40.050	-61.282	-87.772	61.282	-1.232
41.440	-26.283	-36.728	26.283	-1.444
42.010	-33.593	-47.590	33.593	-1.015
44.440	31.630	47.180	-31.630	-1.414
44.500	33.278	49.575	-33.278	-1.424
45.000	7.352	10.654	-7.352	-0.048

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

Vano 1 Viga 2

Esfuerzos por pretensado instantáneo.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	-503.107	-503.107	0.000	0.000	632.752	632.752
0.047	-569.681	-569.681	0.000	0.000	716.480	716.480
4.450	-569.681	-569.681	0.000	0.000	716.480	716.480
8.900	-569.681	-569.681	0.000	0.000	716.480	716.480
13.350	-569.681	-569.681	0.000	0.000	716.480	716.480
14.657	-569.681	-569.681	0.000	0.000	716.480	716.480
15.213	-1396.895	-1396.895	0.000	0.000	1787.114	1787.114

17.800	-1396.895	-1396.895	0.000	0.000	1787.114	1787.114
22.250	-1396.895	-1396.895	0.000	0.000	1787.114	1787.114
26.700	-1396.895	-1396.895	0.000	0.000	1787.114	1787.114
29.287	-1396.895	-1396.895	0.000	0.000	1787.114	1787.114
29.843	-569.681	-569.681	0.000	0.000	716.480	716.480
31.150	-569.681	-569.681	0.000	0.000	716.480	716.480
35.600	-569.681	-569.681	0.000	0.000	716.480	716.480
40.050	-569.681	-569.681	0.000	0.000	716.480	716.480
44.453	-569.681	-569.681	0.000	0.000	716.480	716.480
44.500	-503.103	-503.103	0.000	0.000	632.746	632.746
45.000	0.002	0.002	0.000	0.000	-0.002	-0.002

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por pérdidas de pretensado en fase 1.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	21.931	21.931	0.000	0.000	-28.280	-28.280
0.047	26.504	26.504	0.000	0.000	-34.180	-34.180
4.450	21.831	21.831	0.000	0.000	-28.165	-28.165
8.900	18.060	18.060	0.000	0.000	-23.312	-23.312
13.350	15.367	15.367	0.000	0.000	-19.845	-19.845
14.657	14.701	14.701	0.000	0.000	-18.988	-18.988
15.213	92.187	92.187	0.000	0.000	-124.503	-124.503
17.800	90.565	90.565	0.000	0.000	-122.320	-122.320
22.250	89.378	89.378	0.000	0.000	-120.723	-120.723
26.700	90.565	90.565	0.000	0.000	-122.320	-122.320
29.287	92.187	92.187	0.000	0.000	-124.503	-124.503
29.843	14.701	14.701	0.000	0.000	-18.988	-18.988
31.150	15.367	15.367	0.000	0.000	-19.845	-19.845
35.600	18.060	18.060	0.000	0.000	-23.312	-23.312
40.050	21.831	21.831	0.000	0.000	-28.165	-28.165
44.453	26.504	26.504	0.000	0.000	-34.180	-34.180
44.500	21.931	21.931	0.000	0.000	-28.280	-28.280
45.000	-0.002	-0.002	0.000	0.000	0.002	0.002

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por pérdidas de pretensado en fase 2.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	71.672	71.672	0.000	0.000	-48.712	-48.712
0.047	86.740	86.740	0.000	0.000	-58.953	-58.953
4.450	69.104	69.104	0.000	0.000	-46.974	-46.974
8.900	54.860	54.860	0.000	0.000	-37.299	-37.299
13.350	44.643	44.643	0.000	0.000	-30.359	-30.359
14.657	42.191	42.191	0.000	0.000	-28.693	-28.693
15.213	254.468	254.468	0.000	0.000	-177.243	-177.243
17.800	247.864	247.864	0.000	0.000	-172.648	-172.648
22.250	242.980	242.980	0.000	0.000	-169.249	-169.249
26.700	247.864	247.864	0.000	0.000	-172.648	-172.648
29.287	254.468	254.468	0.000	0.000	-177.243	-177.243
29.843	42.191	42.191	0.000	0.000	-28.693	-28.693
31.150	44.643	44.643	0.000	0.000	-30.359	-30.359
35.600	54.860	54.860	0.000	0.000	-37.299	-37.299
40.050	69.105	69.105	0.000	0.000	-46.974	-46.974
44.453	86.740	86.740	0.000	0.000	-58.953	-58.953



44.500	71.671	71.671	0.000	0.000	-48.711	-48.711
45.000	0.000	0.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por peso propio de la viga.

s (m)	M+	M-	Q+	Q-
-0.500	-0.000	-0.000	0.000	0.000
0.000	-0.248	-0.248	68.335	68.335
0.047	9.747	9.747	67.879	67.879
4.450	270.358	270.358	54.668	54.668
8.900	480.829	480.829	41.001	41.001
13.350	631.166	631.166	27.334	27.334
14.657	669.952	669.952	22.499	22.499
15.213	681.997	681.997	20.769	20.769
17.800	721.368	721.368	13.667	13.667
22.250	751.435	751.435	0.000	0.000
26.700	721.368	721.368	-13.667	-13.667
29.287	681.997	681.997	-20.769	-20.769
29.843	669.952	669.952	-22.499	-22.499
31.150	631.166	631.166	-27.334	-27.334
35.600	480.829	480.829	-41.001	-41.001
40.050	270.358	270.358	-54.668	-54.668
44.453	9.747	9.747	-67.879	-67.879
44.500	-0.248	-0.248	-68.335	-68.335
45.000	-0.000	-0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por peso propio de la losa.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	-0.277	-0.277	76.213	76.213
0.047	10.871	10.871	75.705	75.705
4.450	301.528	301.528	60.971	60.971
8.900	536.266	536.266	45.728	45.728
13.350	703.936	703.936	30.485	30.485
14.657	747.194	747.194	25.093	25.093
15.213	760.628	760.628	23.164	23.164
17.800	804.537	804.537	15.243	15.243
22.250	838.071	838.071	0.000	0.000
26.700	804.537	804.537	-15.243	-15.243
29.287	760.628	760.628	-23.164	-23.164
29.843	747.194	747.194	-25.093	-25.093
31.150	703.936	703.936	-30.485	-30.485
35.600	536.266	536.266	-45.728	-45.728
40.050	301.528	301.528	-60.971	-60.971
44.453	10.871	10.871	-75.705	-75.705
44.500	-0.277	-0.277	-76.213	-76.213
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por superestructura.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	13.382	-13.421	37.426	20.511
0.047	14.619	-12.266	37.345	20.470
4.450	131.064	96.518	29.682	16.681
8.900	235.140	172.001	22.095	12.697
13.350	310.661	226.752	14.641	8.583
14.657	327.209	239.009	12.476	7.351
15.213	334.259	244.231	11.554	6.827
17.800	357.645	261.617	7.296	4.344
22.250	376.512	275.852	0.035	-0.035
26.700	357.645	261.618	-4.344	-7.296
29.287	334.261	244.232	-6.827	-11.553
29.843	327.210	239.010	-7.351	-12.476
31.150	310.662	226.753	-8.583	-14.641
35.600	235.143	172.003	-12.697	-22.095
40.050	131.067	96.521	-16.681	-29.682
44.453	14.622	-12.263	-20.470	-37.345
44.500	13.385	-13.418	-20.510	-37.426
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre las aceras

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000
0.047	0.000	0.000	0.000	0.000
4.450	0.000	0.000	0.000	0.000
8.900	0.000	0.000	0.000	0.000
13.350	0.000	0.000	0.000	0.000
14.657	0.000	0.000	0.000	0.000
15.213	0.000	0.000	0.000	0.000
17.800	0.000	0.000	0.000	0.000
22.250	0.000	0.000	0.000	0.000
26.700	0.000	0.000	0.000	0.000
29.287	0.000	0.000	0.000	0.000
29.843	0.000	0.000	0.000	0.000
31.150	0.000	0.000	0.000	0.000
35.600	0.000	0.000	0.000	0.000
40.050	0.000	0.000	0.000	0.000
44.453	0.000	0.000	0.000	0.000
44.500	0.000	0.000	0.000	0.000
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre la plataforma

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	172.097	-208.652	160.892	-7.543
0.047	176.618	-207.031	160.703	-7.628
4.450	610.718	-63.937	142.955	-16.302
8.900	975.674	-27.999	122.419	-29.090
13.350	1244.676	-17.135	102.260	-40.940
14.657	1298.608	-15.353	96.705	-44.056
15.213	1321.588	-14.626	94.339	-45.727
17.800	1395.494	-13.617	83.960	-53.893



22.250	1447.747	-12.559	67.507	-68.866
26.700	1395.495	-13.617	53.621	-84.231
29.287	1321.591	-14.624	45.727	-94.338
29.843	1298.611	-15.350	44.056	-96.705
31.150	1244.677	-17.133	40.941	-102.259
35.600	975.680	-27.994	29.090	-122.418
40.050	610.727	-63.929	16.303	-142.954
44.453	176.630	-207.041	7.629	-160.703
44.500	172.108	-208.662	7.543	-160.891
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por gradiente térmico

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.118	-0.221	0.017	-0.009
0.047	0.118	-0.222	0.017	-0.009
4.450	0.148	-0.277	0.012	-0.006
8.900	0.169	-0.317	0.009	-0.010
13.350	0.204	-0.280	0.009	-0.015
14.657	0.222	-0.255	0.009	-0.016
15.213	0.230	-0.245	0.009	-0.017
17.800	0.262	-0.206	0.010	-0.017
22.250	0.304	-0.162	0.010	-0.010
26.700	0.262	-0.206	0.017	-0.010
29.287	0.231	-0.245	0.017	-0.009
29.843	0.223	-0.256	0.016	-0.009
31.150	0.204	-0.280	0.015	-0.009
35.600	0.169	-0.317	0.010	-0.009
40.050	0.148	-0.277	0.006	-0.012
44.453	0.119	-0.223	0.009	-0.017
44.500	0.119	-0.222	0.009	-0.017
45.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por retracción conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	40.956	58.770	-40.956	0.408
0.000	40.997	59.008	-40.997	0.407
0.047	40.997	59.008	-40.997	0.407
4.450	40.997	59.008	-40.997	0.407
8.900	40.997	59.008	-40.997	0.407
13.350	40.997	59.008	-40.997	0.407
14.657	40.997	59.008	-40.997	0.407
15.213	41.126	60.084	-41.126	0.404
17.800	41.126	60.084	-41.126	0.404
22.250	41.126	60.084	-41.126	0.404
26.700	41.126	60.084	-41.126	0.404
29.287	41.126	60.084	-41.126	0.404
29.843	40.997	59.008	-40.997	0.407
31.150	40.997	59.008	-40.997	0.407
35.600	40.997	59.008	-40.997	0.407
40.050	40.997	59.008	-40.997	0.407
44.453	40.997	59.008	-40.997	0.407
44.500	40.997	59.008	-40.997	0.407
45.000	40.956	58.770	-40.956	0.408

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

Esfuerzos por fluencia conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	7.361	10.684	-7.361	-0.048
0.000	55.698	82.162	-55.698	-1.442
0.047	54.404	80.278	-54.404	-1.434
4.450	-61.168	-87.919	61.168	-0.728
8.900	-152.033	-220.159	152.033	-0.173
13.350	-216.899	-314.561	216.899	0.222
14.657	-229.573	-333.006	229.573	0.299
15.213	-153.809	-224.363	153.809	-1.862
17.800	-174.759	-255.301	174.759	-1.738
22.250	-187.526	-274.154	187.526	-1.663
26.700	-174.759	-255.301	174.759	-1.738
29.287	-153.809	-224.363	153.809	-1.862
29.843	-229.573	-333.006	229.573	0.299
31.150	-216.899	-314.561	216.899	0.222
35.600	-152.033	-220.159	152.033	-0.173
40.050	-61.168	-87.919	61.168	-0.728
44.453	54.403	80.278	-54.403	-1.434
44.500	55.698	82.162	-55.698	-1.442
45.000	7.361	10.684	-7.361	-0.048

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

CALCULO DE TENSIONES

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Cálculo de tensiones en las viga

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Vano 1 Viga 1

Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa  
que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +											
T1	5	-	-0.500	-0.000	-0.000	0.000	0			8.900	120.913	106.836	157.374	109			
			0.000	-17.941	-19.825	112.340	101			13.350	176.991	162.641	119.095	70			
			0.060	-19.000	-21.190	129.354	116			17.800	210.712	196.161	95.995	47			
			2.490	7.458	5.268	111.870	99			22.250	222.083	207.400	88.124	39			
			3.060	-2.338	-6.151	155.248	138			26.700	210.712	196.161	95.995	47			
			4.450	9.548	5.735	147.482	130			31.150	176.991	162.641	119.095	70			
			4.490	11.297	7.484	146.339	129			35.600	120.913	106.837	157.374	109			
			5.060	0.898	-4.533	195.425	173			37.440	94.143	80.220	175.720	128			
			6.490	12.989	7.559	187.619	165			38.010	96.003	85.122	130.848	93			
			7.060	4.255	-2.553	235.585	208			39.440	69.211	58.540	149.191	111			
			8.900	16.282	9.475	227.906	201			40.010	71.917	64.489	104.170	76			
			13.350	41.594	34.786	211.747	185			40.050	68.201	60.749	106.664	78			
			17.800	56.781	49.973	202.052	175			41.440	41.740	34.218	125.743	97			
			22.250	61.843	55.036	198.820	172			42.010	43.444	38.794	87.264	67			
			26.700	56.781	49.973	202.052	175			44.440	-14.822	-19.602	128.950	108			
			31.150	41.594	34.786	211.747	185			44.500	-16.164	-20.357	113.411	95			
			35.600	16.282	9.475	227.906	201			45.000	0.487	-0.485	1.041	-1			
			37.440	4.255	-2.553	235.585	208										
			38.010	12.989	7.559	187.619	165			T4	-	Característica	-0.500	2.935	-7.091	19.135	-17
			39.440	0.898	-4.533	195.425	173						0.000	-13.716	-26.963	131.506	79
			40.010	11.297	7.484	146.339	129						0.060	-12.123	-26.146	146.861	91
			40.050	9.548	5.735	147.482	130						2.490	56.351	34.776	97.733	31
			41.440	-2.338	-6.151	155.248	138						3.060	57.029	30.796	134.352	57
			42.010	7.458	5.268	111.870	99						4.450	89.321	59.991	113.155	28
			44.440	-19.000	-21.190	129.354	116						4.490	93.205	63.768	110.616	25
44.500	-17.941	-19.825	112.339	101						5.060	92.815	58.362	154.879	57			
45.000	0.000	0.000	-0.000	-0						6.490	128.969	85.444	135.365	34			
T2	30	-	-0.500	-0.000	-0.000	0.000	0			7.060	128.934	80.504	179.932	67			
			0.000	-16.651	-19.872	112.371	96			8.900	161.699	107.025	160.747	37			
			0.060	-15.374	-19.177	128.024	109			13.350	228.643	162.568	120.978	-21			
			2.490	40.236	36.789	91.039	73			17.800	268.282	195.916	97.110	-56			
			3.060	37.915	31.648	130.551	105			22.250	281.614	207.340	89.010	-68			
			4.450	62.858	56.790	114.124	89			26.700	268.282	195.916	97.110	-56			
			4.490	66.530	60.490	111.706	86			31.150	228.643	162.568	120.978	-21			
			5.060	63.151	54.007	157.635	123			35.600	161.699	107.025	160.747	37			
			6.490	88.503	79.584	141.124	107			37.440	128.934	80.504	179.932	67			
			7.060	86.159	74.323	186.507	142			38.010	128.969	85.444	135.365	34			
			8.900	111.346	99.764	170.265	127			39.440	92.815	58.362	154.879	57			
			13.350	164.364	153.306	136.083	94			40.010	93.205	63.768	110.616	25			
			17.800	196.175	185.431	115.574	74			40.050	89.321	59.991	113.155	28			
			22.250	206.779	196.139	108.738	67			41.440	57.029	30.797	134.352	57			
			26.700	196.175	185.431	115.574	74			42.010	56.352	34.777	97.733	31			
			31.150	164.364	153.306	136.083	94			44.440	-12.123	-26.146	146.861	91			
			35.600	111.346	99.764	170.265	127			44.500	-13.716	-26.963	131.505	79			
			37.440	86.159	74.323	186.507	142			45.000	2.936	-7.090	19.135	-17			
			38.010	88.503	79.584	141.124	107						-0.500	1.819	-4.076	11.018	-9
			39.440	63.152	54.007	157.635	123						0.000	-14.833	-23.948	123.390	86
			40.010	66.530	60.490	111.706	86						0.060	-13.340	-23.161	138.828	99
			40.050	62.858	56.790	114.124	89						2.490	51.066	36.556	93.112	46
			41.440	37.915	31.648	130.551	105						3.060	50.794	32.292	130.581	74
			42.010	40.236	36.789	91.039	73						4.450	83.273	60.142	110.419	51
			44.440	-15.374	-19.177	128.024	109						4.490	87.098	63.900	107.905	48
44.500	-16.651	-19.872	112.370	96						5.060	85.865	58.236	152.541	82			
45.000	0.000	0.000	0.000	-0						6.490	115.707	85.140	133.548	58			
T3	90	-	-0.500	0.487	-0.485	1.041	-1			7.060	114.919	80.236	178.265	91			
			0.000	-16.164	-20.357	113.412	95			8.900	145.208	106.862	159.512	66			
			0.060	-14.822	-19.602	128.950	108			13.350	207.668	162.575	120.415	16			
			2.490	43.444	38.793	87.265	67			17.800	244.858	195.976	96.790	-13			
			3.060	41.740	34.218	125.743	97			22.250	257.339	207.349	88.758	-24			
			4.450	68.201	60.749	106.664	78			26.700	244.858	195.976	96.790	-13			
			4.490	71.916	64.489	104.170	76			31.150	207.668	162.575	120.415	16			
			5.060	69.211	58.540	149.191	111			35.600	145.208	106.862	159.512	66			
			6.490	96.003	85.122	130.848	93			37.440	114.918	80.236	178.265	91			
			7.060	94.143	80.220	175.720	128			38.010	115.707	85.140	133.548	58			
										39.440	85.865	58.236	152.541	82			
										40.010	87.098	63.900	107.905	48			
							40.050	83.273	60.142	110.420	51						
							41.440	50.794	32.293	130.581	74						
							42.010	51.066	36.556	93.111	46						
							44.440	-13.340	-23.161	138.828	99						

		44.500	-14.832	-23.948	123.388	86			22.250	271.780	135.756	88.758	-48		
		45.000	1.819	-4.076	11.018	-9			26.700	259.338	128.572	96.790	-38		
-	Casi-permanente	-0.500	0.504	-0.485	1.048	-1			31.150	222.261	107.801	120.415	-9		
		0.000	-16.147	-20.357	113.419	95			35.600	159.987	73.158	159.512	38		
		0.060	-14.805	-19.603	128.957	108			37.440	129.789	58.252	178.265	62		
		2.490	43.468	38.794	87.272	67			38.010	130.089	59.994	133.548	36		
		3.060	41.765	34.219	125.751	97			39.440	100.322	42.853	152.541	59		
		4.450	68.229	60.749	106.673	78			40.010	101.081	44.634	107.905	32		
		4.490	71.945	64.489	104.179	76			40.050	97.264	41.166	110.420	34		
		5.060	69.209	58.524	149.184	111			41.440	64.852	24.767	130.581	57		
		6.490	96.001	85.105	130.841	93			42.010	64.732	26.181	93.111	33		
		7.060	94.141	80.203	175.713	128			44.440	10.938	-23.161	138.828	82		
		8.900	120.911	106.820	157.368	109			44.500	9.892	-23.948	123.388	72		
		13.350	176.989	162.624	119.090	70			45.000	17.527	-4.076	11.018	-14		
		17.800	210.711	196.144	95.993	47		-	Casi-permanente	-0.500	16.212	-0.485	1.048	-5	
		22.250	222.083	207.379	88.125	39			0.000	8.577	-20.357	113.419	81		
		26.700	210.711	196.144	95.993	47			0.060	9.473	-19.603	128.957	91		
		31.150	176.989	162.624	119.090	70			2.490	57.133	28.418	87.272	54		
		35.600	120.911	106.820	157.368	109			3.060	55.823	26.693	125.751	80		
		37.440	94.141	80.203	175.713	128			4.450	82.221	41.774	106.673	62		
		38.010	96.001	85.105	130.841	93			4.490	85.928	45.224	104.179	59		
		39.440	69.210	58.524	149.184	111			5.060	83.667	43.141	149.184	88		
		40.010	71.946	64.490	104.179	76			6.490	110.383	59.959	130.841	71		
		40.050	68.229	60.749	106.672	78			7.060	109.011	58.219	175.713	98		
		41.440	41.765	34.219	125.751	97			8.900	135.690	73.116	157.368	81		
		42.010	43.468	38.794	87.272	67			13.350	191.582	107.850	119.090	45		
		44.440	-14.804	-19.602	128.957	108			17.800	225.191	128.740	95.993	23		
		44.500	-16.147	-20.357	113.418	95			22.250	236.524	135.786	88.125	15		
		45.000	0.505	-0.485	1.048	-1			26.700	225.191	128.740	95.993	23		
T5	-	Característica	-0.500	18.643	-7.091	19.135	-21		31.150	191.582	107.850	119.090	45		
			0.000	11.008	-26.963	131.506	64		35.600	135.690	73.116	157.368	81		
			0.060	12.154	-26.146	146.861	75		37.440	109.012	58.219	175.713	98		
			2.490	70.017	24.401	97.733	18		38.010	110.383	59.959	130.841	71		
			3.060	71.087	23.270	134.352	40		39.440	83.667	43.142	149.184	88		
			4.450	103.313	41.015	113.155	11		40.010	85.928	45.224	104.179	59		
			4.490	107.187	44.502	110.616	8		40.050	82.221	41.774	106.672	62		
			5.060	107.273	42.979	154.879	34		41.440	55.823	26.693	125.751	80		
			6.490	143.351	60.298	135.365	12		42.010	57.133	28.418	87.272	54		
			7.060	143.805	58.520	179.932	37		44.440	9.473	-19.602	128.957	91		
			8.900	176.478	73.321	160.747	9		44.500	8.577	-20.357	113.418	81		
			13.350	243.236	107.794	120.978	-47		45.000	16.212	-0.485	1.048	-5		
			17.800	282.762	128.512	97.110	-80	Env	-	Característica	-0.500	18.643	-7.091	19.135	-21
			22.250	296.056	135.747	89.010	-92			0.000	11.008	-26.963	131.506	64	
			26.700	282.762	128.512	97.110	-80			0.060	12.154	-26.146	146.861	75	
			31.150	243.236	107.794	120.978	-47			2.490	70.017	5.268	111.870	18	
			35.600	176.478	73.321	160.747	9			3.060	71.087	-6.151	155.248	40	
			37.440	143.805	58.520	179.932	37			4.450	103.313	5.735	147.482	11	
			38.010	143.351	60.298	135.365	12			4.490	107.187	7.484	146.339	8	
			39.440	107.273	42.979	154.879	34			5.060	107.273	-4.533	195.425	34	
			40.010	107.187	44.502	110.616	8			6.490	143.351	7.559	187.619	12	
			40.050	103.313	41.015	113.155	11			7.060	143.805	-2.553	235.585	37	
			41.440	71.087	23.271	134.352	40			8.900	176.478	9.475	227.906	9	
			42.010	70.017	24.401	97.733	18			13.350	243.236	34.786	211.747	-47	
			44.440	12.155	-26.146	146.861	75			17.800	282.762	49.973	202.052	-80	
			44.500	11.008	-26.963	131.505	64			22.250	296.056	55.036	198.820	-92	
			45.000	18.644	-7.090	19.135	-21			26.700	282.762	49.973	202.052	-80	
	-	Frecuente	-0.500	17.527	-4.076	11.018	-14			31.150	243.236	34.786	211.747	-47	
			0.000	9.891	-23.948	123.390	72			35.600	176.478	9.475	227.906	9	
			0.060	10.938	-23.161	138.828	82			37.440	143.805	-2.553	235.585	37	
			2.490	64.731	26.181	93.112	33			38.010	143.351	7.559	187.619	12	
			3.060	64.852	24.766	130.581	57			39.440	107.273	-4.533	195.425	34	
			4.450	97.265	41.166	110.419	34			40.010	107.187	7.484	146.339	8	
			4.490	101.081	44.634	107.905	32			40.050	103.313	5.735	147.482	11	
			5.060	100.322	42.853	152.541	59			41.440	71.087	-6.151	155.248	40	
			6.490	130.089	59.994	133.548	36			42.010	70.017	5.268	111.870	18	
			7.060	129.789	58.252	178.265	62			44.440	12.155	-26.146	146.861	75	
			8.900	159.987	73.158	159.512	38			44.500	11.008	-26.963	131.505	64	
			13.350	222.261	107.801	120.415	-9			45.000	18.644	-7.090	19.135	-21	
			17.800	259.338	128.572	96.790	-38		-	Frecuente	-0.500	17.527	-4.076	11.018	-14

	0.000	9.891	-23.948	123.390	72	
	0.060	10.938	-23.161	138.828	82	
	2.490	64.731	5.268	111.870	33	
	3.060	64.852	-6.151	155.248	57	
	4.450	97.265	5.735	147.482	34	
	4.490	101.081	7.484	146.339	32	
	5.060	100.322	-4.533	195.425	59	
	6.490	130.089	7.559	187.619	36	
	7.060	129.789	-2.553	235.585	62	
	8.900	159.987	9.475	227.906	38	
	13.350	222.261	34.786	211.747	-9	
	17.800	259.338	49.973	202.052	-38	
	22.250	271.780	55.036	198.820	-48	
	26.700	259.338	49.973	202.052	-38	
	31.150	222.261	34.786	211.747	-9	
	35.600	159.987	9.475	227.906	38	
	37.440	129.789	-2.553	235.585	62	
	38.010	130.089	7.559	187.619	36	
	39.440	100.322	-4.533	195.425	59	
	40.010	101.081	7.484	146.339	32	
	40.050	97.264	5.735	147.482	34	
	41.440	64.852	-6.151	155.248	57	
	42.010	64.732	5.268	111.870	33	
	44.440	10.938	-23.161	138.828	82	
	44.500	9.892	-23.948	123.388	72	
	45.000	17.527	-4.076	11.018	-14	
-	Casi-permanente	-0.500	16.212	-0.485	1.048	-5
		0.000	8.577	-20.357	113.419	81
		0.060	9.473	-21.190	129.354	91
		2.490	57.133	5.268	111.870	54
		3.060	55.823	-6.151	155.248	80
		4.450	82.221	5.735	147.482	62
		4.490	85.928	7.484	146.339	59
		5.060	83.667	-4.533	195.425	88
		6.490	110.383	7.559	187.619	71
		7.060	109.011	-2.553	235.585	98
		8.900	135.690	9.475	227.906	81
		13.350	191.582	34.786	211.747	45
		17.800	225.191	49.973	202.052	23
		22.250	236.524	55.036	198.820	15
		26.700	225.191	49.973	202.052	23
		31.150	191.582	34.786	211.747	45
		35.600	135.690	9.475	227.906	81
		37.440	109.012	-2.553	235.585	98
		38.010	110.383	7.559	187.619	71
		39.440	83.667	-4.533	195.425	88
		40.010	85.928	7.484	146.339	59
		40.050	82.221	5.735	147.482	62
		41.440	55.823	-6.151	155.248	80
		42.010	57.133	5.268	111.870	54
		44.440	9.473	-21.190	129.354	91
		44.500	8.577	-20.357	113.418	81
		45.000	16.212	-0.485	1.048	-5

Vano 1 Viga 2

Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	-0.000	-0.000	0.000	0
			0.000	-34.505	-38.133	116.312	105
			0.047	-37.355	-41.463	130.575	118
			4.450	7.246	3.138	101.244	88
			8.900	43.265	39.158	77.556	65
			13.350	68.994	64.886	60.636	48
			14.657	75.632	71.524	56.270	43
			15.213	22.034	12.206	252.867	221
			17.800	28.697	18.868	248.678	217
			22.250	33.785	23.956	245.479	214
			26.700	28.697	18.868	248.678	217
			29.287	22.034	12.206	252.866	221
			29.843	75.632	71.524	56.270	43
			31.150	68.994	64.886	60.636	48
			35.600	43.265	39.158	77.556	65
			40.050	7.246	3.138	101.244	88
			44.453	-37.355	-41.463	130.575	118
			44.500	-34.505	-38.133	116.311	105
			45.000	0.000	0.000	-0.000	-0
T2	30	-	-0.500	-0.000	-0.000	0.000	0
			0.000	-33.013	-38.181	116.343	100
			0.047	-33.635	-39.602	129.351	111
			4.450	60.380	54.741	67.307	50
			8.900	136.307	130.934	17.201	0
			13.350	190.541	185.357	-18.590	-34
			14.657	204.535	199.398	-27.824	-43
			15.213	156.909	140.920	171.943	121
			17.800	170.893	155.013	163.083	113
			22.250	181.576	165.776	156.316	106
			26.700	170.893	155.013	163.083	113
			29.287	156.909	140.920	171.943	121
			29.843	204.535	199.398	-27.824	-43
			31.150	190.541	185.357	-18.590	-34
			35.600	136.307	130.934	17.200	0
			40.050	60.380	54.741	67.307	50
			44.453	-33.634	-39.602	129.351	111
			44.500	-33.013	-38.180	116.342	100
			45.000	0.000	-0.000	0.000	-0
T3	90	-	-0.500	0.503	-0.505	1.085	-1
			0.000	-32.511	-38.685	117.428	99
			0.047	-33.081	-40.061	130.346	109
			4.450	65.700	58.679	59.815	39
			8.900	145.858	137.948	3.846	-17
			13.350	203.148	194.621	-36.180	-58
			14.657	217.814	209.165	-46.362	-68
			15.213	170.420	150.861	154.026	97
			17.800	185.349	165.667	143.896	86
			22.250	196.793	177.023	136.099	78
			26.700	185.349	165.667	143.896	86
			29.287	170.420	150.861	154.026	97
			29.843	217.814	209.165	-46.362	-68
			31.150	203.148	194.621	-36.180	-58
			35.600	145.858	137.949	3.846	-17
			40.050	65.701	58.679	59.815	39
			44.453	-33.081	-40.060	130.345	109

			44.500	-32.510	-38.685	117.427	99			26.700	257.956	110.732	145.007	-44
			45.000	0.503	-0.505	1.084	-1			29.287	240.166	102.849	155.501	-29
T4	-	Característica	-0.500	3.027	-7.209	19.106	-17			29.843	285.257	134.262	-29.709	-177
			0.000	-29.986	-45.390	135.449	83			31.150	268.468	123.965	-20.603	-162
			0.047	-30.361	-46.716	148.224	93			35.600	200.369	88.866	14.224	-101
			4.450	86.828	57.860	66.272	-11			40.050	100.710	38.551	66.272	-22
			8.900	186.602	138.077	7.313	-92			44.453	1.686	-46.717	148.224	75
			13.350	254.783	194.522	-34.229	-154			44.500	2.364	-45.391	135.448	67
			14.657	271.593	208.994	-44.696	-168			45.000	18.772	-7.210	19.105	-21
			15.213	224.881	150.654	155.501	0			-0.500	17.619	-4.149	11.026	-14
			17.800	242.721	165.431	145.007	-14		-	0.000	1.211	-42.329	127.369	74
			22.250	256.172	176.980	136.992	-26		Frecuente	0.047	0.455	-43.679	140.210	83
			26.700	242.721	165.431	145.007	-14			4.450	94.606	38.730	63.533	1
			29.287	224.881	150.655	155.501	0			8.900	183.904	88.723	12.956	-71
			29.843	271.592	208.995	-44.696	-168			13.350	247.508	123.978	-21.187	-123
			31.150	254.782	194.523	-34.229	-154			14.657	263.414	134.298	-30.201	-136
			35.600	186.602	138.078	7.313	-92			15.213	218.040	102.897	155.067	9
			40.050	86.828	57.860	66.272	-11			17.800	234.619	110.790	144.688	-3
			44.453	-30.362	-46.717	148.224	93			22.250	247.163	118.078	136.738	-12
			44.500	-29.987	-45.391	135.448	83			26.700	234.619	110.790	144.688	-3
			45.000	3.026	-7.210	19.105	-17			29.287	218.040	102.897	155.067	9
	-	Frecuente	-0.500	1.873	-4.149	11.026	-9			29.843	263.414	134.298	-30.201	-136
			0.000	-31.140	-42.329	127.369	90			31.150	247.508	123.978	-21.187	-123
			0.047	-31.593	-43.679	140.210	100			35.600	183.904	88.724	12.956	-71
			4.450	80.724	58.039	63.533	12			40.050	94.607	38.730	63.533	1
			8.900	170.137	137.935	6.044	-62			44.453	0.454	-43.679	140.209	83
			13.350	233.823	194.536	-34.813	-115			44.500	1.210	-42.330	127.368	74
			14.657	249.749	209.030	-45.189	-128			45.000	17.618	-4.150	11.026	-14
			15.213	202.755	150.702	155.067	39		-	-0.500	16.258	-0.505	1.098	-5
			17.800	219.384	165.489	144.688	26		Casi-permanente	0.000	-0.150	-38.685	117.441	83
			22.250	231.966	176.985	136.738	16			0.047	-1.024	-40.061	130.359	92
			26.700	219.384	165.489	144.688	26			4.450	79.598	39.372	59.831	28
			29.287	202.754	150.702	155.067	39			8.900	159.624	88.705	10.745	-27
			29.843	249.749	209.031	-45.189	-128			13.350	216.831	124.037	-22.549	-66
			31.150	233.823	194.537	-34.813	-115			14.657	231.477	134.410	-31.371	-77
			35.600	170.137	137.935	6.044	-62			15.213	185.704	103.036	154.030	66
			40.050	80.725	58.039	63.533	12			17.800	200.582	110.953	143.898	57
			44.453	-31.594	-43.679	140.209	100			22.250	211.988	118.105	136.102	49
			44.500	-31.141	-42.330	127.368	90			26.700	200.582	110.953	143.898	57
			45.000	1.873	-4.150	11.026	-9			29.287	185.704	103.036	154.029	66
	-	Casi-permanente	-0.500	0.512	-0.505	1.098	-1			29.843	231.478	134.410	-31.371	-77
			0.000	-32.501	-38.685	117.441	99			31.150	216.832	124.037	-22.550	-66
			0.047	-33.072	-40.061	130.359	109			35.600	159.624	88.705	10.745	-27
			4.450	65.716	58.681	59.831	39			40.050	79.598	39.372	59.831	28
			8.900	145.857	137.917	3.833	-17			44.453	-1.024	-40.060	130.358	92
			13.350	203.146	194.595	-36.175	-58			44.500	-0.150	-38.685	117.440	83
			14.657	217.812	209.143	-46.359	-68			45.000	16.258	-0.505	1.097	-5
			15.213	170.419	150.841	154.030	97		Env	-0.500	18.773	-7.209	19.106	-21
			17.800	185.348	165.653	143.898	86		-	0.000	2.365	-45.390	135.449	67
			22.250	196.792	177.012	136.102	78		Característica	0.047	1.686	-46.716	148.224	75
			26.700	185.348	165.653	143.898	86			4.450	100.710	3.138	101.244	-22
			29.287	170.419	150.841	154.029	97			8.900	200.370	39.158	77.556	-101
			29.843	217.812	209.143	-46.359	-68			13.350	268.468	64.886	60.636	-162
			31.150	203.146	194.595	-36.175	-58			14.657	285.258	71.524	56.270	-177
			35.600	145.857	137.917	3.833	-17			15.213	240.167	12.206	252.867	-29
			40.050	65.716	58.681	59.831	39			17.800	257.956	18.868	248.678	-44
			44.453	-33.072	-40.060	130.358	109			22.250	271.369	23.956	245.479	-55
			44.500	-32.501	-38.685	117.440	99			26.700	257.956	18.868	248.678	-44
			45.000	0.512	-0.505	1.097	-1			29.287	240.166	12.206	252.866	-29
T5	-	Característica	-0.500	18.773	-7.209	19.106	-21			29.843	285.257	71.524	56.270	-177
			0.000	2.365	-45.390	135.449	67			31.150	268.468	64.886	60.636	-162
			0.047	1.686	-46.716	148.224	75			35.600	200.369	39.158	77.556	-101
			4.450	100.710	38.551	66.272	-22			40.050	100.710	3.138	101.244	-22
			8.900	200.370	88.866	14.225	-101			44.453	1.686	-46.717	148.224	75
			13.350	268.468	123.964	-20.603	-162			44.500	2.364	-45.391	135.448	67
			14.657	285.258	134.261	-29.708	-177			45.000	18.772	-7.210	19.105	-21
			15.213	240.167	102.849	155.501	-29		-	-0.500	17.619	-4.149	11.026	-14
			17.800	257.956	110.731	145.007	-44		Frecuente	0.000	1.211	-42.329	127.369	74
			22.250	271.369	118.073	136.992	-55			0.047	0.455	-43.679	140.210	83

4.450	94.606	3.138	101.244	1		
8.900	183.904	39.158	77.556	-71		
13.350	247.508	64.886	60.636	-123		
14.657	263.414	71.524	56.270	-136		
15.213	218.040	12.206	252.867	9		
17.800	234.619	18.868	248.678	-3		
22.250	247.163	23.956	245.479	-12		
26.700	234.619	18.868	248.678	-3		
29.287	218.040	12.206	252.866	9		
29.843	263.414	71.524	56.270	-136		
31.150	247.508	64.886	60.636	-123		
35.600	183.904	39.158	77.556	-71		
40.050	94.607	3.138	101.244	1		
44.453	0.454	-43.679	140.209	83		
44.500	1.210	-42.330	127.368	74		
45.000	17.618	-4.150	11.026	-14		
-	Casi-permanente	-0.500	16.258	-0.505	1.098	-5
		0.000	-0.150	-38.685	117.441	83
		0.047	-1.024	-41.463	130.575	92
		4.450	79.598	3.138	101.244	28
		8.900	159.624	39.158	77.556	-27
		13.350	216.831	64.886	60.636	-66
		14.657	231.477	71.524	56.270	-77
		15.213	185.704	12.206	252.867	66
		17.800	200.582	18.868	248.678	57
		22.250	211.988	23.956	245.479	49
		26.700	200.582	18.868	248.678	57
		29.287	185.704	12.206	252.866	66
		29.843	231.478	71.524	56.270	-77
		31.150	216.832	64.886	60.636	-66
		35.600	159.624	39.158	77.556	-27
		40.050	79.598	3.138	101.244	28
		44.453	-1.024	-41.463	130.575	92
		44.500	-0.150	-38.685	117.440	83
		45.000	16.258	-0.505	1.097	-5

T1 : Al transferir el pretensado.  
T2 : Al hormigonar la losa.  
T3 : Al disponer la superestructura.  
T4 : Al abrir al tráfico.  
T5 : A tiempo infinito.  
Env : Envoltente de tensiones.

Día : número de días transcurridos entre el hormigonado de la viga y el instante considerado.

s(m): distancia al inicio de la viga.

Tsup + (kg/cm2): máxima tensión positiva en la fibra superior de la viga.

Tsup - (kg/cm2): máxima tensión negativa en la fibra superior de la viga.

Tinf + (kg/cm2): máxima tensión positiva en la fibra inferior de la viga.

Tinf - (kg/cm2): máxima tensión negativa en la fibra inferior de la viga.

Tsup- y Tinf+ corresponden a la situación de transferencia de pretensado.

Cálculo de tensiones en la losa

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Vano 1 Viga 1

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Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa

que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	Tinf -
T1	5	-	-0.500	0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000	0.000
			0.060	0.000	0.000	0.000	0.000
			2.490	0.000	0.000	0.000	0.000
			3.060	0.000	0.000	0.000	0.000
			4.450	0.000	0.000	0.000	0.000
			4.490	0.000	0.000	0.000	0.000
			5.060	0.000	0.000	0.000	0.000
			6.490	0.000	0.000	0.000	0.000
			7.060	0.000	0.000	0.000	0.000
			8.900	0.000	0.000	0.000	0.000
			13.350	0.000	0.000	0.000	0.000
			17.800	0.000	0.000	0.000	0.000
			22.250	0.000	0.000	0.000	0.000
			26.700	0.000	0.000	0.000	0.000
			31.150	0.000	0.000	0.000	0.000
			35.600	0.000	0.000	0.000	0.000
			37.440	0.000	0.000	0.000	0.000
			38.010	0.000	0.000	0.000	0.000
			39.440	0.000	0.000	0.000	0.000
			40.010	0.000	0.000	0.000	0.000
			40.050	0.000	0.000	0.000	0.000
			41.440	0.000	0.000	0.000	0.000
			42.010	0.000	0.000	0.000	0.000
			44.440	0.000	0.000	0.000	0.000
			44.500	0.000	0.000	0.000	0.000
			45.000	0.000	0.000	0.000	0.000
T2	30	-	-0.500	0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000	0.000
			0.060	0.000	0.000	0.000	0.000
			2.490	0.000	0.000	0.000	0.000
			3.060	0.000	0.000	0.000	0.000
			4.450	0.000	0.000	0.000	0.000
			4.490	0.000	0.000	0.000	0.000
			5.060	0.000	0.000	0.000	0.000
			6.490	0.000	0.000	0.000	0.000
			7.060	0.000	0.000	0.000	0.000
			8.900	0.000	0.000	0.000	0.000
			13.350	0.000	0.000	0.000	0.000
			17.800	0.000	0.000	0.000	0.000
			22.250	0.000	0.000	0.000	0.000
			26.700	0.000	0.000	0.000	0.000
			31.150	0.000	0.000	0.000	0.000
			35.600	0.000	0.000	0.000	0.000
			37.440	0.000	0.000	0.000	0.000
			38.010	0.000	0.000	0.000	0.000
			39.440	0.000	0.000	0.000	0.000
			40.010	0.000	0.000	0.000	0.000
			40.050	0.000	0.000	0.000	0.000
			41.440	0.000	0.000	0.000	0.000
			42.010	0.000	0.000	0.000	0.000
			44.440	0.000	0.000	0.000	0.000
			44.500	0.000	0.000	0.000	0.000





0.060	4.468	-11.575	2.419	-7
2.490	15.152	-1.799	14.608	-4
3.060	17.579	-0.606	16.998	-3
4.450	28.071	2.959	25.980	-0
4.490	28.310	3.006	26.166	-0
5.060	29.918	4.593	28.625	0
6.490	37.759	6.121	34.587	1
7.060	38.998	6.533	36.706	2
8.900	48.087	7.926	43.614	3
13.350	64.699	10.512	56.247	4
17.800	74.351	12.054	63.576	5
22.250	77.663	12.815	66.088	6
26.700	74.351	12.054	63.576	5
31.150	64.699	10.512	56.247	4
35.600	48.087	7.926	43.614	3
37.440	38.998	6.533	36.706	2
38.010	37.759	6.121	34.587	1
39.440	29.918	4.593	28.625	0
40.010	28.310	3.006	26.166	-0
40.050	28.071	2.959	25.979	-0
41.440	17.579	-0.606	16.998	-3
42.010	15.153	-1.799	14.608	-4
44.440	4.468	-11.574	2.419	-7
44.500	3.918	-12.145	2.036	-7
45.000	2.746	-8.363	1.580	-8
-0.500	0.590	-3.906	0.438	-5
0.000	1.762	-7.688	0.894	-4
0.060	2.139	-7.158	1.147	-4
2.490	5.756	0.942	8.009	-2
3.060	6.563	1.734	9.156	-1
4.450	10.816	3.917	12.914	-0
4.490	10.930	3.944	13.006	-0
5.060	10.880	5.203	14.160	0
6.490	15.237	6.355	17.471	1
7.060	15.291	6.753	18.660	2
8.900	20.345	8.097	22.511	3
13.350	29.620	10.690	29.602	4
17.800	35.260	12.295	33.919	6
22.250	37.278	12.907	35.467	6
26.700	35.260	12.295	33.919	6
31.150	29.620	10.690	29.602	4
35.600	20.345	8.097	22.511	3
37.440	15.291	6.753	18.660	2
38.010	15.237	6.355	17.471	1
39.440	10.880	5.203	14.160	0
40.010	10.930	3.944	13.006	-0
40.050	10.816	3.917	12.914	-0
41.440	6.563	1.734	9.156	-1
42.010	5.756	0.942	8.009	-2
44.440	2.139	-7.158	1.147	-4
44.500	1.762	-7.688	0.894	-4
45.000	0.590	-3.905	0.438	-5
-0.500	4.546	-12.080	2.550	-10
0.000	5.718	-15.862	3.006	-10
0.060	6.384	-15.255	3.475	-9
2.490	21.763	-3.976	19.199	-5
3.060	25.264	-2.425	22.413	-4
4.450	36.222	0.000	31.232	-0
4.490	36.529	0.000	31.470	-0
5.060	39.095	0.000	34.662	0
6.490	52.893	0.000	46.105	0
7.060	54.969	0.000	48.879	0
8.900	66.905	0.000	57.937	0
13.350	88.686	0.000	74.465	0
17.800	101.176	0.000	83.921	0
22.250	105.479	0.000	87.172	0
26.700	101.176	0.000	83.921	0
31.150	88.686	0.000	74.465	0
35.600	66.905	0.000	57.937	0

- Casi-permanente

- Frecuente

- Casi-permanente

Env - Característica

Vano 1 Viga 2

Coeficientes de anchura eficaz empleados

37.440	54.969	0.000	48.879	0
38.010	52.892	0.000	46.105	0
39.440	39.095	0.000	34.662	0
40.010	36.530	0.000	31.470	-0
40.050	36.222	0.000	31.233	-0
41.440	25.264	-2.425	22.413	-4
42.010	21.763	-3.976	19.199	-5
44.440	6.384	-15.254	3.476	-9
44.500	5.718	-15.862	3.006	-10
45.000	4.546	-12.080	2.550	-10
-0.500	2.746	-8.363	1.580	-8
0.000	3.917	-12.145	2.036	-7
0.060	4.468	-11.575	2.419	-7
2.490	15.152	-1.799	14.608	-4
3.060	17.579	-0.606	16.998	-3
4.450	28.071	0.000	25.980	-0
4.490	28.310	0.000	26.166	-0
5.060	29.918	0.000	28.625	0
6.490	37.759	0.000	34.587	0
7.060	38.998	0.000	36.706	0
8.900	48.087	0.000	43.614	0
13.350	64.699	0.000	56.247	0
17.800	74.351	0.000	63.576	0
22.250	77.663	0.000	66.088	0
26.700	74.351	0.000	63.576	0
31.150	64.699	0.000	56.247	0
35.600	48.087	0.000	43.614	0
37.440	38.998	0.000	36.706	0
38.010	37.759	0.000	34.587	0
39.440	29.918	0.000	28.625	0
40.010	28.310	0.000	26.166	-0
40.050	28.071	0.000	25.979	-0
41.440	17.579	-0.606	16.998	-3
42.010	15.153	-1.799	14.608	-4
44.440	4.468	-11.574	2.419	-7
44.500	3.918	-12.145	2.036	-7
45.000	2.746	-8.363	1.580	-8
-0.500	0.590	-3.906	0.438	-5
0.000	1.762	-7.688	0.894	-4
0.060	2.139	-7.158	1.147	-4
2.490	5.756	0.942	8.009	-2
3.060	6.563	1.734	9.156	-1
4.450	10.816	3.917	12.914	-0
4.490	10.930	3.944	13.006	-0
5.060	10.880	5.203	14.160	0
6.490	15.237	6.355	17.471	1
7.060	15.291	6.753	18.660	2
8.900	20.345	8.097	22.511	3
13.350	29.620	10.690	29.602	4
17.800	35.260	12.295	33.919	6
22.250	37.278	12.907	35.467	6
26.700	35.260	12.295	33.919	6
31.150	29.620	10.690	29.602	4
35.600	20.345	8.097	22.511	3
37.440	15.291	6.753	18.660	2
38.010	15.237	6.355	17.471	1
39.440	10.880	5.203	14.160	0
40.010	10.930	3.944	13.006	-0
40.050	10.816	3.917	12.914	-0
41.440	6.563	1.734	9.156	-1
42.010	5.756	0.942	8.009	-2
44.440	2.139	-7.158	1.147	-4
44.500	1.762	-7.688	0.894	-4
45.000	0.590	-3.905	0.438	-5
-0.500	4.546	-12.080	2.550	-10
0.000	5.718	-15.862	3.006	-10
0.060	6.384	-15.255	3.475	-9
2.490	21.763	-3.976	19.199	-5
3.060	25.264	-2.425	22.413	-4
4.450	36.222	0.000	31.232	-0
4.490	36.529	0.000	31.470	-0
5.060	39.095	0.000	34.662	0
6.490	52.893	0.000	46.105	0
7.060	54.969	0.000	48.879	0
8.900	66.905	0.000	57.937	0
13.350	88.686	0.000	74.465	0
17.800	101.176	0.000	83.921	0
22.250	105.479	0.000	87.172	0
26.700	101.176	0.000	83.921	0
31.150	88.686	0.000	74.465	0
35.600	66.905	0.000	57.937	0

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	0.000	0.000	0.000	0
			0.000	0.000	0.000	0.000	0
			0.047	0.000	0.000	0.000	0
			4.450	0.000	0.000	0.000	0
			8.900	0.000	0.000	0.000	0
			13.350	0.000	0.000	0.000	0
			14.657	0.000	0.000	0.000	0
			15.213	0.000	0.000	0.000	0
			17.800	0.000	0.000	0.000	0
			22.250	0.000	0.000	0.000	0
			26.700	0.000	0.000	0.000	0
			29.287	0.000	0.000	0.000	0
			29.843	0.000	0.000	0.000	0
			31.150	0.000	0.000	0.000	0
			35.600	0.000	0.000	0.000	0
			40.050	0.000	0.000	0.000	0
			44.453	0.000	0.000	0.000	0
44.500	0.000	0.000	0.000	0			
45.000	0.000	0.000	0.000	0			
T2	30	-	-0.500	0.000	0.000	0.000	0
			0.000	0.000	0.000	0.000	0
			0.047	0.000	0.000	0.000	0
			4.450	0.000	0.000	0.000	0
			8.900	0.000	0.000	0.000	0
			13.350	0.000	0.000	0.000	0
			14.657	0.000	0.000	0.000	0
			15.213	0.000	0.000	0.000	0
			17.800	0.000	0.000	0.000	0
			22.250	0.000	0.000	0.000	0
			26.700	0.000	0.000	0.000	0
			29.287	0.000	0.000	0.000	0
			29.843	0.000	0.000	0.000	0
			31.150	0.000	0.000	0.000	0
			35.600	0.000	0.000	0.000	0
			40.050	0.000	0.000	0.000	0
			44.453	0.000	0.000	0.000	0
44.500	0.000	0.000	0.000	0			
45.000	0.000	0.000	0.000	0			
T3	90	-	-0.500	0.593	-0.595	0.437	-0
			0.000	0.593	-0.595	0.437	-0
			0.047	0.651	-0.541	0.481	-0
			4.450	6.153	4.549	4.621	3
			8.900	11.043	8.103	8.295	6
			13.350	14.581	10.696	10.949	8

T4 - Característica

- Frecuente

- Casi-permanente

14.657	15.357	11.276	11.533	8
15.213	15.498	11.383	11.735	8
17.800	16.582	12.199	12.556	9
22.250	17.456	12.874	13.217	9
26.700	16.582	12.199	12.556	9
29.287	15.498	11.383	11.735	8
29.843	15.357	11.276	11.533	8
31.150	14.581	10.696	10.949	8
35.600	11.044	8.103	8.295	6
40.050	6.153	4.549	4.621	3
44.453	0.652	-0.541	0.481	-0
44.500	0.593	-0.595	0.437	-0
45.000	0.593	-0.595	0.437	-0
-0.500	4.631	-8.859	2.629	-6
0.000	4.631	-8.859	2.629	-6
0.047	4.915	-8.743	2.843	-6
4.450	31.642	3.118	22.971	2
8.900	57.836	7.885	43.683	6
13.350	73.976	10.409	55.796	7
14.657	77.245	10.947	58.241	8
15.213	77.677	11.038	59.036	8
17.800	82.122	11.860	62.386	9
22.250	85.327	12.744	64.790	9
26.700	82.122	11.860	62.385	9
29.287	77.677	11.038	59.036	8
29.843	77.245	10.947	58.241	8
31.150	73.976	10.409	55.796	7
35.600	57.836	7.886	43.683	6
40.050	31.642	3.119	22.971	2
44.453	4.914	-8.744	2.842	-6
44.500	4.630	-8.860	2.628	-6
45.000	4.630	-8.860	2.628	-6
-0.500	2.798	-5.101	1.627	-3
0.000	2.798	-5.101	1.627	-3
0.047	2.992	-5.014	1.773	-3
4.450	23.408	3.562	17.670	2
8.900	38.932	7.873	29.382	6
13.350	49.862	10.480	37.592	7
14.657	52.103	11.031	39.269	8
15.213	52.411	11.127	39.819	8
17.800	55.457	11.948	42.117	9
22.250	57.654	12.775	43.766	9
26.700	55.457	11.948	42.116	9
29.287	52.410	11.127	39.818	8
29.843	52.103	11.031	39.269	8
31.150	49.862	10.480	37.591	7
35.600	38.932	7.873	29.382	6
40.050	23.409	3.563	17.670	2
44.453	2.992	-5.015	1.772	-3
44.500	2.798	-5.102	1.626	-3
45.000	2.798	-5.102	1.626	-3
-0.500	0.602	-0.597	0.445	-0
0.000	0.602	-0.597	0.445	-0
0.047	0.660	-0.543	0.489	-0
4.450	6.167	4.549	4.634	3
8.900	11.043	8.074	8.294	6
13.350	14.580	10.673	10.948	8
14.657	15.356	11.256	11.531	8
15.213	15.497	11.365	11.734	8
17.800	16.581	12.185	12.555	9
22.250	17.455	12.863	13.216	9
26.700	16.581	12.185	12.555	9
29.287	15.497	11.365	11.734	8
29.843	15.357	11.256	11.532	8
31.150	14.580	10.673	10.948	8
35.600	11.043	8.074	8.294	6
40.050	6.167	4.549	4.634	3
44.453	0.660	-0.542	0.489	-0
44.500	0.602	-0.597	0.445	-0

T5	-	Característica	45.000	0.602	-0.597	0.445	-0	29.287	91.358	0.000	77.428	0
			-0.500	4.631	-12.174	2.629	-11	29.843	97.845	0.000	77.132	0
			0.000	5.968	-17.701	3.129	-11	31.150	93.407	0.000	73.800	0
			0.047	6.533	-17.179	3.448	-11	35.600	71.232	0.000	57.141	0
			4.450	36.581	1.799	30.063	-1	40.050	36.581	0.000	30.063	-1
			8.900	71.232	6.300	57.141	2	44.453	6.533	-17.180	3.447	-11
			13.350	93.407	8.632	73.801	4	44.500	5.968	-17.702	3.128	-11
			14.657	97.846	9.125	77.132	4	45.000	4.630	-12.175	2.628	-11
			15.213	91.358	11.038	77.428	5	-0.500	2.798	-8.416	1.627	-8
			17.800	97.689	11.860	82.231	6	0.000	4.136	-13.943	2.127	-9
			22.250	102.025	12.744	85.517	7	0.047	4.611	-13.451	2.378	-8
			26.700	97.688	11.860	82.230	6	4.450	28.347	0.000	24.762	-0
			29.287	91.358	11.038	77.428	5	8.900	52.327	0.000	42.841	0
			29.843	97.845	9.126	77.132	4	13.350	69.293	0.000	55.596	0
			31.150	93.407	8.633	73.800	4	14.657	72.704	0.000	58.160	0
			35.600	71.232	6.301	57.141	2	15.213	66.091	0.000	58.210	0
			40.050	36.581	1.800	30.063	-1	17.800	71.024	0.000	61.962	0
			44.453	6.533	-17.180	3.447	-11	22.250	74.351	0.000	64.493	0
			44.500	5.968	-17.702	3.128	-11	26.700	71.024	0.000	61.961	0
			45.000	4.630	-12.175	2.628	-11	29.287	66.091	0.000	58.210	0
			-0.500	2.798	-8.416	1.627	-8	29.843	72.704	0.000	58.160	0
			0.000	4.136	-13.943	2.127	-9	31.150	69.293	0.000	55.596	0
			0.047	4.611	-13.451	2.378	-8	35.600	52.327	0.000	42.840	0
			4.450	28.347	2.243	24.762	-0	40.050	28.348	0.000	24.762	-0
			8.900	52.327	6.287	42.841	2	44.453	4.610	-13.451	2.378	-8
			13.350	69.293	8.704	55.596	4	44.500	4.135	-13.944	2.126	-9
			14.657	72.704	9.209	58.160	4	45.000	2.798	-8.417	1.626	-8
			15.213	66.091	11.127	58.210	5	-0.500	0.602	-3.912	0.445	-5
			17.800	71.024	11.948	61.962	6	0.000	1.939	-9.438	0.945	-5
			22.250	74.351	12.775	64.493	7	0.047	2.279	-8.979	1.094	-5
			26.700	71.024	11.948	61.961	6	4.450	11.106	0.000	11.726	-0
			29.287	66.091	11.127	58.210	5	8.900	24.439	0.000	21.753	0
			29.843	72.704	9.209	58.160	4	13.350	34.011	0.000	28.953	0
			31.150	69.293	8.704	55.596	4	14.657	35.957	0.000	30.422	0
			35.600	52.327	6.288	42.840	2	15.213	29.178	0.000	30.126	0
			40.050	28.348	2.244	24.762	-0	17.800	32.148	0.000	32.400	0
			44.453	4.610	-13.451	2.378	-8	22.250	34.153	0.000	33.943	0
			44.500	4.135	-13.944	2.126	-9	26.700	32.148	0.000	32.400	0
			45.000	2.798	-8.417	1.626	-8	29.287	29.178	0.000	30.126	0
			-0.500	0.602	-3.912	0.445	-5	29.843	35.957	0.000	30.422	0
			0.000	1.939	-9.438	0.945	-5	31.150	34.011	0.000	28.953	0
			0.047	2.279	-8.979	1.094	-5	35.600	24.439	0.000	21.753	0
			4.450	11.106	3.229	11.726	-0	40.050	11.106	0.000	11.726	-0
			8.900	24.439	6.488	21.753	2	44.453	2.279	-8.979	1.094	-5
			13.350	34.011	8.896	28.953	4	44.500	1.939	-9.438	0.945	-5
14.657	35.957	9.434	30.422	4	45.000	0.602	-3.912	0.445	-5			
15.213	29.178	11.365	30.126	6								
17.800	32.148	12.185	32.400	6								
22.250	34.153	12.863	33.943	7								
26.700	32.148	12.185	32.400	6								
29.287	29.178	11.365	30.126	6								
29.843	35.957	9.434	30.422	4								
31.150	34.011	8.897	28.953	4								
35.600	24.439	6.488	21.753	2								
40.050	11.106	3.230	11.726	-0								
44.453	2.279	-8.979	1.094	-5								
44.500	1.939	-9.438	0.945	-5								
45.000	0.602	-3.912	0.445	-5								
-0.500	4.631	-12.174	2.629	-11								
0.000	5.968	-17.701	3.129	-11								
0.047	6.533	-17.179	3.448	-11								
4.450	36.581	0.000	30.063	-1								
8.900	71.232	0.000	57.141	0								
13.350	93.407	0.000	73.801	0								
14.657	97.846	0.000	77.132	0								
15.213	91.358	0.000	77.428	0								
17.800	97.689	0.000	82.231	0								
22.250	102.025	0.000	85.517	0								
26.700	97.688	0.000	82.230	0								
Env	-	Característica										

- Frecuente

- Casi-permanente

- T1 : Al transferir el pretensado.
- T2 : Al hormigonar la losa.
- T3 : Al disponer la superestructura.
- T4 : Al abrir al tráfico.
- T5 : A tiempo infinito.
- Env : Envoltente de tensiones.

Día : número de días transcurridos entre el hormigonado de la viga y el instante considerado.  
s(m) : distancia al inicio de la viga.  
Tsup + (kg/cm2): máxima tensión positiva en la fibra superior de la losa.  
Tsup - (kg/cm2): máxima tensión negativa en la fibra superior de la losa.  
Tinf + (kg/cm2): máxima tensión positiva en la fibra inferior de la losa.  
Tinf - (kg/cm2): máxima tensión negativa en la fibra inferior de la losa.  
Tsup- y Tinf+ corresponden a la situación de transferencia de pretensado.

CALCULO A ROTURA POR FLEXION  
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Cálculo a rotura por flexión en la viga aislada.

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Esfuerzos decalados (apartado 44.2.3.4.2 de la EHE).

Vano 1 Viga 1  
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Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	0.000	0.000	-		
0.000	0.000	0.000	-		
1.213	1756.138	493.886	3.556	3.500	-6.425
1.236	1773.093	498.129	3.560	3.500	-6.225
2.490	1773.340	704.249	2.518	3.500	-6.225
4.237	2165.406	1007.041	2.150	3.500	-2.862
4.450	2165.406	1039.575	2.083	3.500	-2.862
4.490	2165.406	1046.409	2.069	3.500	-2.862
6.237	2446.643	1287.436	1.900	3.500	-1.178
6.490	2446.643	1317.472	1.857	3.500	-1.178
8.236	2560.997	1492.124	1.716	3.500	-0.448
8.900	2560.997	1556.182	1.646	3.500	-0.448
13.350	2560.997	1912.249	1.339	3.500	-0.448
17.800	2560.997	2096.593	1.222	3.500	-0.448
22.250	2560.997	2145.834	1.193	3.500	-0.448
26.700	2560.997	2096.593	1.222	3.500	-0.448
31.150	2560.997	1912.250	1.339	3.500	-0.448
35.600	2560.997	1556.182	1.646	3.500	-0.448
36.264	2560.997	1492.124	1.716	3.500	-0.448
38.010	2446.643	1317.472	1.857	3.500	-1.178
38.263	2446.643	1287.437	1.900	3.500	-1.178
40.010	2165.406	1046.409	2.069	3.500	-2.862
40.050	2165.406	1039.575	2.083	3.500	-2.862
40.263	2165.406	1007.042	2.150	3.500	-2.862
42.010	1773.340	704.250	2.518	3.500	-6.225
43.263	1773.340	498.347	3.558	3.500	-6.225
43.287	1756.138	493.886	3.556	3.500	-6.425
44.500	0.000	0.000	-		
45.000	0.000	0.000	-		

Vano 1 Viga 2  
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Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	0.000	0.000	-		
0.000	0.000	0.000	-		
1.276	1796.648	461.834	3.890	3.500	-7.101
4.450	1797.421	975.026	1.843	3.500	-7.101
8.900	1797.421	1535.733	1.170	3.500	-7.101
13.350	1797.421	1949.428	0.922	3.500	-7.101
14.657	1797.421	2006.224	0.896	3.500	-7.101
16.440	2674.489	2070.140	1.292	3.500	-0.196
17.800	2676.040	2096.373	1.277	3.500	-0.196
22.250	2676.040	2145.834	1.247	3.500	-0.196
26.700	2676.040	2096.373	1.277	3.500	-0.196
28.054	2676.039	2070.251	1.293	3.500	-0.196
29.843	1797.421	2006.224	0.896	3.500	-7.101
31.150	1797.421	1949.428	0.922	3.500	-7.101
35.600	1797.421	1535.734	1.170	3.500	-7.101
40.050	1797.421	975.026	1.843	3.500	-7.101
43.221	1797.421	462.512	3.886	3.500	-7.101
44.500	0.000	0.000	-		
45.000	0.000	0.000	-		

s (m) : distancia al inicio de la viga.

Mu (mT) : momento flector último de signo positivo en la sección de la viga.

Md (mT) : momento flector de cálculo de signo positivo en la sección de la viga.

K : coeficiente de seguridad a rotura (Mu/Md).

esup (o/oo) : deformación en la fibra superior de la viga.

einf (o/oo) : deformación en la fibra inferior de la viga.

Cálculo a rotura por flexión en la viga + losa.

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Esfuerzos decalados (apartado 44.2.3.4.2 de la EHE).

Vano 1 Viga 1  
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Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	2.541	143.759	0.01768	0.159	-10.212
0.000	739.764	230.525	3.20904	0.617	-10.002
1.213	2150.242	1155.931	1.86018	1.209	-10.002
1.236	2175.507	1164.172	1.86872	1.219	-10.002
2.490	2174.707	1587.981	1.36948	1.206	-10.002
4.237	2839.166	2182.545	1.30085	1.438	-10.002
4.450	2838.328	2238.613	1.26790	1.434	-10.002
4.490	2837.428	2249.524	1.26135	1.430	-10.002
6.237	3567.694	2702.952	1.31993	1.707	-10.002
6.490	3565.714	2768.208	1.28809	1.700	-10.002
8.236	4265.898	3207.981	1.32978	2.040	-10.003
8.900	4264.243	3370.630	1.26512	2.025	-10.003
13.350	4254.707	4141.121	1.02743	1.942	-10.003
17.800	4249.646	4525.545	0.93904	1.897	-10.003
22.250	4249.333	4619.952	0.91978	1.884	-10.003
26.700	4249.646	4525.546	0.93904	1.897	-10.003
31.150	4254.707	4141.124	1.02743	1.942	-10.003
35.600	4264.243	3370.635	1.26512	2.025	-10.003
36.264	4265.898	3207.986	1.32977	2.040	-10.003
38.010	3565.714	2768.211	1.28809	1.700	-10.002
38.263	3567.694	2702.955	1.31992	1.707	-10.002
40.010	2837.428	2249.526	1.26135	1.430	-10.002
40.050	2838.328	2238.613	1.26790	1.434	-10.002
40.263	2839.166	2182.546	1.30085	1.438	-10.002
42.010	2174.707	1587.987	1.36947	1.206	-10.002
43.263	2175.930	1164.601	1.86839	1.219	-10.002
43.287	2150.243	1155.937	1.86017	1.209	-10.002
44.500	739.761	230.532	3.20893	0.617	-10.002
45.000	2.541	143.767	0.01768	0.159	-10.212

Vano 1 Viga 2

Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	2.541	144.618	0.01757	0.159	-10.212
0.000	719.977	230.927	3.11777	0.588	-10.002
1.276	2155.436	1133.695	1.90125	1.145	-10.002
4.450	2154.526	2177.882	0.98928	1.118	-10.002
8.900	2146.211	3325.576	0.64537	1.069	-10.002
13.350	2136.743	4135.824	0.51664	1.025	-10.002
14.657	2133.690	4301.938	0.49598	1.013	-10.002
16.440	4923.349	4450.305	1.10629	2.302	-10.003
17.800	4925.456	4513.099	1.09137	2.289	-10.003
22.250	4924.147	4608.689	1.06845	2.270	-10.003
26.700	4925.456	4513.102	1.09137	2.289	-10.003
28.054	4929.264	4450.583	1.10755	2.309	-10.003
29.843	2133.690	4301.946	0.49598	1.013	-10.002
31.150	2136.743	4135.830	0.51664	1.025	-10.002
35.600	2146.211	3325.586	0.64536	1.069	-10.002
40.050	2154.526	2177.896	0.98927	1.118	-10.002
43.221	2158.025	1135.039	1.90128	1.147	-10.002
44.500	719.975	230.926	3.11778	0.588	-10.002
45.000	2.541	144.615	0.01757	0.159	-10.212

s (m) : distancia al inicio de la viga + losa.

Mu (mT) : momento flector último de signo positivo en la sección de la viga + losa.

Md (mT) : momento flector de cálculo de signo positivo en la sección de la viga + losa.

K : coeficiente de seguridad a rotura (Mu/Md).

esup (o/oo) : deformación en la fibra superior de la losa.

einf (o/oo) : deformación en la fibra inferior de la viga.

CALCULO A CORTANTE

Listado de cortantes de las acciones exteriores permanentes

Valores obtenidos con coeficientes de seguridad unitarios.

Vano	1	Viga	1
Punto	s(m)	Vpp	Vpl
1	-0.500	0.000	0.000
2	0.000	-1.242	-1.386
3	0.000	68.335	76.213
4	11.125	34.167	38.107
5	22.250	0.000	0.000
6	33.375	-34.167	-38.107
7	44.500	-68.335	-76.213
8	44.500	1.242	1.386
9	45.000	0.000	0.000

Vano	1	Viga	2
Punto	s(m)	Vpp	Vpl
1	-0.500	0.000	0.000
2	0.000	-1.242	-1.386
3	0.000	68.335	76.213
4	11.125	34.167	38.107
5	22.250	0.000	0.000
6	33.375	-34.167	-38.107
7	44.500	-68.335	-76.213
8	44.500	1.242	1.386
9	45.000	0.000	0.000

s(m): Distancia del punto al primer eje de apoyos.  
Vpp(T): cortante máximo por peso propio de la viga.  
Vpl(T): cortante máximo por peso de la losa.

Vano	1	Viga	1	
Punto	s(m)	Vse	Vda	Vdp
1	-0.500	0.000	0.000	0.000
2	0.000	37.444	0.000	0.000
3	11.125	18.341	0.000	0.000
4	22.250	0.038	0.000	0.000
5	33.375	-18.341	0.000	0.000
6	44.500	-37.444	0.000	0.000
7	45.000	0.000	0.000	0.000

Vano	1	Viga	2	
Punto	s(m)	Vse	Vda	Vdp
1	-0.500	0.000	0.000	0.000
2	0.000	37.426	0.000	0.000
3	11.125	18.327	0.000	0.000
4	22.250	0.035	0.000	0.000
5	33.375	-18.327	0.000	0.000
6	44.500	-37.426	0.000	0.000
7	45.000	0.000	0.000	0.000

s(m): Distancia del punto al primer eje de apoyos.  
Vse(T): cortante máximo por superestructura.  
Vda(T): cortante máximo por descenso de apoyo instantáneo.  
Vdp(T): cortante máximo por descenso de apoyo a tiempo infinito.

Listado de cortantes de las acciones exteriores variables

Valores obtenidos con coeficientes de seguridad unitarios.

Vano	1	Viga	1				
Punto	s(m)	Vtra+	Vtra-	Vtrp+	Vtrp-	Vgt+	Vgt-
1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	160.980	-7.466	0.008	-0.015
3	11.125	0.000	0.000	111.889	-36.363	0.011	-0.007
4	22.250	0.000	0.000	67.497	-68.857	0.010	-0.010
5	33.375	0.000	0.000	36.364	-111.890	0.007	-0.011
6	44.500	0.000	0.000	7.467	-160.979	0.015	-0.008
7	45.000	0.000	0.000	0.000	0.000	0.000	0.000

Vano	1	Viga	2				
Punto	s(m)	Vtra+	Vtra-	Vtrp+	Vtrp-	Vgt+	Vgt-

1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	160.892	-7.543	0.017	-0.009
3	11.125	0.000	0.000	111.718	-36.680	0.008	-0.013
4	22.250	0.000	0.000	67.507	-68.866	0.010	-0.010
5	33.375	0.000	0.000	36.681	-111.717	0.013	-0.008
6	44.500	0.000	0.000	7.543	-160.891	0.009	-0.017
7	45.000	0.000	0.000	0.000	0.000	0.000	0.000

s(m): Distancia del punto al primer eje de apoyos.  
Vtra+(T): cortante máximo positivo por tráfico en aceras.  
Vtra-(T): cortante máximo negativo por tráfico en aceras.  
Vtrp+(T): cortante máximo positivo por tráfico en plataforma.  
Vtrp-(T): cortante máximo negativo por tráfico en plataforma.  
Vgt+(T): cortante máximo positivo por gradiente térmico.  
Vgt-(T): cortante máximo negativo por gradiente térmico.

Listado de cortantes efectivos de cálculo

Valores obtenidos con coeficientes de seguridad correspondientes al estado límite último.

s(m): Distancia del punto al primer eje de apoyos.  
Vrd1+(T): cortante efectivo máximo positivo tras transferir el pretensado.  
Vrd2+(T): cortante efectivo máximo positivo tras hormigonar la losa.  
Vrd3+(T): cortante efectivo máximo positivo tras disponer la superestructura.  
Vrd4+(T): cortante efectivo máximo positivo tras abrir al tráfico.  
Vrd5+(T): cortante efectivo máximo positivo a tiempo infinito.  
Vrd1-(T): cortante efectivo máximo negativo tras transferir el pretensado.  
Vrd2-(T): cortante efectivo máximo negativo tras hormigonar la losa.  
Vrd3-(T): cortante efectivo máximo negativo tras disponer la superestructura.  
Vrd4-(T): cortante efectivo máximo negativo tras abrir al tráfico.  
Vrd5-(T): cortante efectivo máximo negativo a tiempo infinito.  
Vrd+(T): cortante efectivo máximo positivo total.  
Vrd-(T): cortante efectivo máximo negativo total.

Vano	1	Viga	1				
Punto	s(m)	Vrd1+	Vrd2+	Vrd3+	Vrd4+	Vrd5+	Vrd+
1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	-1.242	-2.628	-2.628	-2.628	-2.628	-1.242
3	0.000	92.252	195.140	245.690	463.013	463.013	463.013
4	11.125	46.126	97.570	122.331	273.384	273.384	273.384
5	22.250	0.000	0.000	0.111	91.234	91.234	91.234
6	33.375	-34.167	-72.274	-83.142	-34.045	-34.045	-34.045
7	44.500	-68.335	-144.548	-165.308	-155.214	-155.214	-68.335
8	44.500	1.677	3.548	3.548	3.548	3.548	3.548
9	45.000	0.000	0.000	0.000	0.000	0.000	0.000

Vano	1	Viga	1				
Punto	s(m)	Vrd1-	Vrd2-	Vrd3-	Vrd4-	Vrd5-	Vrd-
1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	-1.242	-2.628	-2.628	-2.628	-2.628	-2.628
3	0.000	68.335	144.548	165.308	155.215	155.215	68.335
4	11.125	34.167	72.274	83.142	34.046	34.046	34.046
5	22.250	0.000	0.000	-0.111	-93.069	-93.069	-93.069
6	33.375	-46.126	-97.570	-122.330	-273.384	-273.384	-273.384
7	44.500	-92.252	-195.140	-245.690	-463.012	-463.012	-463.012
8	44.500	1.242	2.628	2.628	2.628	2.628	1.242
9	45.000	0.000	0.000	0.000	0.000	0.000	0.000

Vano	1	Viga	2				
Punto	s(m)	Vrd1+	Vrd2+	Vrd3+	Vrd4+	Vrd5+	Vrd+
1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	-1.242	-2.628	-2.628	-2.628	-2.628	-1.242

3	0.000	92.252	195.140	245.666	462.871	462.871	462.871
4	11.125	46.126	97.570	122.312	273.136	273.136	273.136
5	22.250	0.000	0.000	0.111	91.247	91.247	91.247
6	33.375	-34.167	-72.274	-82.954	-33.423	-33.423	-33.423
7	44.500	-68.335	-144.548	-165.059	-154.867	-154.867	-68.335
8	44.500	1.677	3.548	3.548	3.548	3.548	3.548
9	45.000	0.000	0.000	0.000	0.000	0.000	0.000

Punto	s(m)	Vrd1-	Vrd2-	Vrd3-	Vrd4-	Vrd5-	Vrd-
1	-0.500	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	-1.242	-2.628	-2.628	-2.628	-2.628	-2.628
3	0.000	68.335	144.548	165.059	154.868	154.868	68.335
4	11.125	34.167	72.274	82.954	33.424	33.424	33.424
5	22.250	0.000	0.000	-0.111	-93.083	-93.083	-93.083
6	33.375	-46.126	-97.570	-122.312	-273.135	-273.135	-273.135
7	44.500	-92.252	-195.140	-245.666	-462.870	-462.870	-462.870
8	44.500	1.242	2.628	2.628	2.628	2.628	1.242
9	45.000	0.000	0.000	0.000	0.000	0.000	0.000

Comprobación de rotura por cortante por compresión

Vano 1 Viga 1

Punto	s(m)	Vrd	Vu1	Vrd/Vu1
1	-0.500	0.000	725.311	0.000
2	0.000	2.628	760.053	0.003
3	0.000	463.013	760.053	0.609
4	11.125	273.384	872.039	0.313
5	22.250	93.069	874.939	0.106
6	33.375	273.384	872.039	0.313
7	44.500	463.012	760.053	0.609
8	44.500	3.548	760.053	0.005
9	45.000	0.000	725.311	0.000

Vano 1 Viga 2

Punto	s(m)	Vrd	Vu1	Vrd/Vu1
1	-0.500	0.000	725.311	0.000
2	0.000	2.628	757.405	0.003
3	0.000	462.871	757.405	0.611
4	11.125	273.136	801.464	0.341
5	22.250	93.083	882.037	0.106
6	33.375	273.135	801.464	0.341
7	44.500	462.870	757.406	0.611
8	44.500	3.548	757.406	0.005
9	45.000	0.000	725.311	0.000

s(m): Distancia del punto al primer eje de apoyos.

Vrd(T): cortante efectivo máximo total.

Vu1(T): cortante de agotamiento por compresión oblicua del alma.

Comprobación de rotura por cortante por tracción

Vano 1 Viga 1

Punto	s(m)	Vrd	Vcu	Vsu	As
1	-0.500	0.000	37.629	0.000	0.000
2	0.000	2.628	52.368	0.000	0.000
3	0.000	463.013	52.368	410.645	47.194

4	11.125	273.384	109.745	163.639	18.885
5	22.250	93.069	111.195	0.000	0.000
6	33.375	273.384	109.745	163.639	18.885
7	44.500	463.012	52.369	410.644	47.194
8	44.500	3.548	52.369	0.000	0.000
9	45.000	0.000	37.629	0.000	0.000

Vano 1 Viga 2

Punto	s(m)	Vrd	Vcu	Vsu	As
1	-0.500	0.000	37.629	0.000	0.000
2	0.000	2.628	51.044	0.000	0.000
3	0.000	462.871	51.044	411.827	47.330
4	11.125	273.136	73.074	200.062	22.992
5	22.250	93.083	116.532	0.000	0.000
6	33.375	273.135	73.074	200.062	22.992
7	44.500	462.870	51.045	411.825	47.330
8	44.500	3.548	51.045	0.000	0.000
9	45.000	0.000	37.629	0.000	0.000

s(m): Distancia del punto al primer eje de apoyos.

Vrd(T): cortante efectivo máximo total.

Vcu(T): contribución del hormigón a la resistencia a esfuerzo cortante.

Vsu(T): contribución de la armadura transversal del alma a la resistencia a cortante.

As(cm2/m): área de la armadura transversal de cálculo por viga (no incluye la arm. mín)

LISTADO DE FUERZAS DE PRETENSADO

Coefficientes de seguridad empleados : unitarios.

Fuerza de pretensado a lo largo de cada cable en cada instante

Vano 1 Viga 1

Punto	s (m)	Cable	P1 (T)	P2 (T)	P3 (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	245.161	232.804	211.136
		3	0.000	0.000	0.000
		4	245.161	233.006	211.507
		5	0.000	0.000	0.000
		6	245.161	233.208	211.878
		7	70.046	68.883	64.668
3	0.060	1	0.000	0.000	0.000
		2	245.161	232.837	211.235
		3	0.000	0.000	0.000
		4	245.161	233.037	211.601
		5	0.000	0.000	0.000
		6	245.161	233.238	211.968
		7	70.046	68.869	64.646
4	2.490	1	0.000	0.000	0.000
		2	245.161	234.151	215.133
		3	0.000	0.000	0.000
		4	245.161	234.272	215.330
		5	0.000	0.000	0.000
		6	245.161	234.393	215.527
		7	70.046	68.314	63.777



5	3.060	1	245.520	232.133	210.097	15	26.700	7	70.354	67.125	61.251
		2	245.520	232.133	210.097			1	246.239	231.400	210.245
		3	0.000	0.000	0.000			2	246.239	231.400	210.245
		4	245.520	232.321	210.427			3	281.417	264.566	240.412
		5	0.000	0.000	0.000			4	246.239	231.495	210.361
		6	245.520	232.508	210.758			5	281.417	264.675	240.544
		7	70.149	68.524	63.901			6	246.239	231.591	210.476
6	4.450	1	245.520	232.806	212.159	16	31.150	7	70.354	67.233	61.427
		2	245.520	232.806	212.159			1	246.239	230.657	207.994
		3	0.000	0.000	0.000			2	246.239	230.657	207.994
		4	245.520	232.953	212.401			3	281.417	263.770	237.952
		5	0.000	0.000	0.000			4	246.239	230.799	208.208
		6	245.520	233.100	212.642			5	281.417	263.931	238.198
		7	70.149	68.237	63.442			6	246.239	230.940	208.423
7	4.490	1	245.520	232.824	212.213	17	35.600	7	70.354	67.558	61.943
		2	245.520	232.824	212.213			1	246.239	229.420	204.259
		3	0.000	0.000	0.000			2	246.239	229.420	204.259
		4	245.520	232.969	212.451			3	281.417	262.443	233.872
		5	0.000	0.000	0.000			4	246.239	229.637	204.638
		6	245.520	233.115	212.690			5	281.417	262.691	234.305
		7	70.149	68.229	63.430			6	246.239	229.855	205.017
8	5.060	1	245.896	230.478	206.315	18	37.440	7	70.354	68.098	62.801
		2	245.896	230.478	206.315			1	246.239	228.749	202.219
		3	281.024	263.658	236.239			2	246.239	228.749	202.219
		4	245.896	230.701	206.709			3	281.417	261.724	231.643
		5	0.000	0.000	0.000			4	246.239	229.008	202.687
		6	245.896	230.923	207.104			5	281.417	262.020	232.178
		7	70.256	68.456	63.568			6	246.239	229.267	203.156
9	6.490	1	245.896	231.068	208.071	19	38.010	7	70.354	68.391	63.266
		2	245.896	231.068	208.071			1	245.896	231.068	208.071
		3	281.024	264.290	238.159			2	245.896	231.068	208.071
		4	245.896	231.254	208.389			3	281.024	264.290	238.159
		5	0.000	0.000	0.000			4	245.896	231.254	208.389
		6	245.896	231.440	208.706			5	0.000	0.000	0.000
		7	70.256	68.201	63.168			6	245.896	231.440	208.706
10	7.060	1	246.239	228.749	202.219	20	39.440	7	70.256	68.201	63.168
		2	246.239	228.749	202.219			1	245.896	230.478	206.315
		3	281.417	261.724	231.643			2	245.896	230.478	206.315
		4	246.239	229.008	202.687			3	281.024	263.658	236.239
		5	281.417	262.020	232.178			4	245.896	230.701	206.710
		6	246.239	229.267	203.156			5	0.000	0.000	0.000
		7	70.354	68.391	63.266			6	245.896	230.923	207.104
11	8.900	1	246.239	229.420	204.259	21	40.010	7	70.256	68.456	63.568
		2	246.239	229.420	204.259			1	245.520	232.824	212.213
		3	281.417	262.443	233.872			2	245.520	232.824	212.213
		4	246.239	229.637	204.638			3	0.000	0.000	0.000
		5	281.417	262.691	234.305			4	245.520	232.969	212.451
		6	246.239	229.855	205.017			5	0.000	0.000	0.000
		7	70.354	68.098	62.801			6	245.520	233.115	212.690
12	13.350	1	246.239	230.657	207.994	22	40.050	7	70.149	68.229	63.430
		2	246.239	230.657	207.994			1	245.520	232.806	212.159
		3	281.417	263.770	237.952			2	245.520	232.806	212.159
		4	246.239	230.799	208.208			3	0.000	0.000	0.000
		5	281.417	263.931	238.198			4	245.520	232.953	212.401
		6	246.239	230.940	208.423			5	0.000	0.000	0.000
		7	70.354	67.558	61.943			6	245.520	233.100	212.642
13	17.800	1	246.239	231.400	210.245	23	41.440	7	70.149	68.237	63.442
		2	246.239	231.400	210.245			1	245.520	232.133	210.097
		3	281.417	264.566	240.412			2	245.520	232.133	210.097
		4	246.239	231.495	210.361			3	0.000	0.000	0.000
		5	281.417	264.675	240.544			4	245.520	232.321	210.427
		6	246.239	231.591	210.476			5	0.000	0.000	0.000
		7	70.354	67.233	61.427			6	245.520	232.508	210.758
14	22.250	1	246.239	231.647	211.013	24	42.010	7	70.149	68.524	63.901
		2	246.239	231.647	211.013			1	0.000	0.000	0.000
		3	281.417	264.831	241.252			2	245.161	234.151	215.133
		4	246.239	231.727	211.096			3	0.000	0.000	0.000
		5	281.417	264.923	241.346			4	245.161	234.272	215.330
		6	246.239	231.808	211.178			5	0.000	0.000	0.000

		6	245.161	234.393	215.527
		7	70.046	68.314	63.777
25	44.440	1	0.000	0.000	0.000
		2	245.161	232.837	211.235
		3	0.000	0.000	0.000
		4	245.161	233.037	211.601
		5	0.000	0.000	0.000
		6	245.161	233.238	211.968
		7	70.046	68.869	64.646
26	44.500	1	0.000	0.000	0.000
		2	245.161	232.804	211.136
		3	0.000	0.000	0.000
		4	245.161	233.006	211.507
		5	0.000	0.000	0.000
		6	245.161	233.208	211.878
		7	70.046	68.883	64.668
27	45.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000

P1 : fuerza de pretensado después de tesar.

P2 : fuerza de pretensado después de hormigonar la losa.

P3 : fuerza de pretensado a tiempo infinito.

Vano 1 Viga 2

Punto	s (m)	Cable	P1 (T)	P2 (T)	P3 (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	238.827	227.135	207.160
		3	0.000	0.000	0.000
		4	238.827	227.358	207.548
		5	0.000	0.000	0.000
		6	238.827	227.581	207.936
		7	0.000	0.000	0.000
3	0.047	1	0.000	0.000	0.000
		2	238.827	227.160	207.234
		3	0.000	0.000	0.000
		4	238.827	227.382	207.619
		5	0.000	0.000	0.000
		6	238.827	227.603	208.004
		7	0.000	0.000	0.000
4	4.450	1	0.000	0.000	0.000
		2	238.827	229.388	213.876
		3	0.000	0.000	0.000
		4	238.827	229.474	213.973
		5	0.000	0.000	0.000
		6	238.827	229.560	214.069
		7	0.000	0.000	0.000
5	8.900	1	0.000	0.000	0.000
		2	238.827	231.140	219.109
		3	0.000	0.000	0.000
		4	238.827	231.120	218.978
		5	0.000	0.000	0.000
		6	238.827	231.100	218.847
		7	0.000	0.000	0.000
6	13.350	1	0.000	0.000	0.000

		2	238.827	232.392	222.856
		3	0.000	0.000	0.000
		4	238.827	232.296	222.562
		5	0.000	0.000	0.000
		6	238.827	232.200	222.268
		7	0.000	0.000	0.000
7	14.657	1	0.000	0.000	0.000
		2	238.827	232.652	223.618
		3	0.000	0.000	0.000
		4	238.827	232.541	223.291
		5	0.000	0.000	0.000
		6	238.827	232.429	222.964
		7	0.000	0.000	0.000
8	15.213	1	274.941	255.524	228.326
		2	240.573	223.584	199.786
		3	274.941	255.770	228.722
		4	240.573	223.799	200.132
		5	274.941	256.015	229.118
		6	240.573	224.013	200.479
		7	240.573	224.228	200.825
9	17.800	1	274.941	255.947	229.624
		2	240.573	223.953	200.921
		3	274.941	256.166	229.962
		4	240.573	224.145	201.217
		5	274.941	256.385	230.301
		6	240.573	224.337	201.514
		7	240.573	224.528	201.810
10	22.250	1	274.941	256.218	230.464
		2	240.573	224.191	201.656
		3	274.941	256.420	230.766
		4	240.573	224.368	201.920
		5	274.941	256.622	231.068
		6	240.573	224.544	202.184
		7	240.573	224.721	202.448
11	26.700	1	274.941	255.947	229.624
		2	240.573	223.953	200.921
		3	274.941	256.166	229.962
		4	240.573	224.145	201.217
		5	274.941	256.385	230.301
		6	240.573	224.337	201.514
		7	240.573	224.528	201.810
12	29.287	1	274.941	255.524	228.326
		2	240.573	223.584	199.786
		3	274.941	255.770	228.722
		4	240.573	223.799	200.132
		5	274.941	256.015	229.118
		6	240.573	224.013	200.479
		7	240.573	224.228	200.825
13	29.843	1	0.000	0.000	0.000
		2	238.827	232.652	223.618
		3	0.000	0.000	0.000
		4	238.827	232.541	223.291
		5	0.000	0.000	0.000
		6	238.827	232.429	222.964
		7	0.000	0.000	0.000
14	31.150	1	0.000	0.000	0.000
		2	238.827	232.392	222.856
		3	0.000	0.000	0.000
		4	238.827	232.296	222.562
		5	0.000	0.000	0.000
		6	238.827	232.200	222.268
		7	0.000	0.000	0.000
15	35.600	1	0.000	0.000	0.000
		2	238.827	231.140	219.109
		3	0.000	0.000	0.000
		4	238.827	231.120	218.978
		5	0.000	0.000	0.000
		6	238.827	231.100	218.847
		7	0.000	0.000	0.000

16	40.050	1	0.000	0.000	0.000	5	3.060	1	2.498	8.367	2.522
		2	238.827	229.388	213.876			2	2.498	8.367	2.522
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	238.827	229.474	213.973			4	2.498	8.180	2.522
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	238.827	229.560	214.069			6	2.498	7.992	2.522
		7	0.000	0.000	0.000			7	0.714	0.190	0.721
17	44.453	1	0.000	0.000	0.000	6	4.450	1	2.498	7.694	2.522
		2	238.827	227.160	207.234			2	2.498	7.694	2.522
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	238.827	227.382	207.619			4	2.498	7.547	2.522
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	238.827	227.603	208.004			6	2.498	7.401	2.522
		7	0.000	0.000	0.000			7	0.714	0.478	0.721
18	44.500	1	0.000	0.000	0.000	7	4.490	1	2.498	7.677	2.522
		2	238.827	227.135	207.160			2	2.498	7.677	2.522
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	238.827	227.358	207.548			4	2.498	7.531	2.522
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	238.827	227.581	207.936			6	2.498	7.385	2.522
		7	0.000	0.000	0.000			7	0.714	0.485	0.721
19	45.000	1	0.000	0.000	0.000	8	5.060	1	2.498	10.378	2.542
		2	0.000	0.000	0.000			2	2.498	10.378	2.542
		3	0.000	0.000	0.000			3	2.854	11.606	2.905
		4	0.000	0.000	0.000			4	2.498	10.155	2.542
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	0.000	0.000	0.000			6	2.498	9.933	2.542
		7	0.000	0.000	0.000			7	0.714	0.360	0.726
								1	2.498	9.789	2.542
								2	2.498	9.789	2.542
								3	2.854	10.974	2.905
								4	2.498	9.602	2.542
								5	0.000	0.000	0.000
								6	2.498	9.416	2.542
								7	0.714	0.615	0.726
								1	2.498	12.432	2.560
								2	2.498	12.432	2.560
								3	2.854	13.912	2.926
								4	2.498	12.173	2.560
								5	2.854	13.616	2.926
								6	2.498	11.914	2.560
								7	0.714	0.518	0.732
1	2.498	11.762	2.560								
2	2.498	11.762	2.560								
3	2.854	13.193	2.926								
4	2.498	11.544	2.560								
5	2.854	12.945	2.926								
6	2.498	11.327	2.560								
7	0.714	0.811	0.732								
1	2.498	10.524	2.560								
2	2.498	10.524	2.560								
3	2.854	11.866	2.926								
4	2.498	10.383	2.560								
5	2.854	11.705	2.926								
6	2.498	10.242	2.560								
7	0.714	1.351	0.732								
1	2.498	9.782	2.560								
2	2.498	9.782	2.560								
3	2.854	11.070	2.926								
4	2.498	9.686	2.560								
5	2.854	10.961	2.926								
6	2.498	9.591	2.560								
7	0.714	1.676	0.732								
1	2.498	9.534	2.560								
2	2.498	9.534	2.560								
3	2.854	10.805	2.926								
4	2.498	9.454	2.560								
5	2.854	10.713	2.926								
6	2.498	9.374	2.560								

P1 : fuerza de pretensado después de tesar.

P2 : fuerza de pretensado después de hormigonar la losa.

P3 : fuerza de pretensado a tiempo infinito.

Pérdidas de pretensado entre tesado y hormigonado de losa

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Vano 1 Viga 1

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Punto	s (m)	Cable	Prt (T)	Pfl (T)	Pr1 (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	-0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	2.498	7.356	2.503
		3	0.000	0.000	0.000
		4	2.498	7.154	2.503
		5	0.000	0.000	0.000
		6	2.498	6.952	2.503
		7	0.714	-0.266	0.715
3	0.060	1	0.000	0.000	0.000
		2	2.498	7.323	2.503
		3	0.000	0.000	0.000
		4	2.498	7.122	2.503
		5	0.000	0.000	0.000
		6	2.498	6.922	2.503
		7	0.714	-0.252	0.715
4	2.490	1	0.000	0.000	0.000
		2	2.498	6.008	2.503
		3	0.000	0.000	0.000
		4	2.498	5.888	2.503
		5	0.000	0.000	0.000
		6	2.498	5.767	2.503
		7	0.714	0.303	0.715

15	26.700	7	0.714	1.784	0.732
		1	2.498	9.782	2.560
		2	2.498	9.782	2.560
		3	2.854	11.070	2.926
		4	2.498	9.686	2.560
		5	2.854	10.961	2.926
		6	2.498	9.591	2.560
		7	0.714	1.676	0.732
16	31.150	1	2.498	10.524	2.560
		2	2.498	10.524	2.560
		3	2.854	11.866	2.926
		4	2.498	10.383	2.560
		5	2.854	11.705	2.926
		6	2.498	10.242	2.560
		7	0.714	1.351	0.732
17	35.600	1	2.498	11.762	2.560
		2	2.498	11.762	2.560
		3	2.854	13.193	2.926
		4	2.498	11.544	2.560
		5	2.854	12.945	2.926
		6	2.498	11.327	2.560
		7	0.714	0.811	0.732
18	37.440	1	2.498	12.432	2.560
		2	2.498	12.432	2.560
		3	2.854	13.912	2.926
		4	2.498	12.173	2.560
		5	2.854	13.616	2.926
		6	2.498	11.914	2.560
		7	0.714	0.518	0.732
19	38.010	1	2.498	9.789	2.542
		2	2.498	9.789	2.542
		3	2.854	10.974	2.905
		4	2.498	9.602	2.542
		5	0.000	0.000	0.000
		6	2.498	9.416	2.542
		7	0.714	0.615	0.726
20	39.440	1	2.498	10.378	2.542
		2	2.498	10.378	2.542
		3	2.854	11.606	2.905
		4	2.498	10.155	2.542
		5	0.000	0.000	0.000
		6	2.498	9.933	2.542
		7	0.714	0.360	0.726
21	40.010	1	2.498	7.677	2.522
		2	2.498	7.677	2.522
		3	0.000	0.000	0.000
		4	2.498	7.531	2.522
		5	0.000	0.000	0.000
		6	2.498	7.385	2.522
		7	0.714	0.485	0.721
22	40.050	1	2.498	7.694	2.522
		2	2.498	7.694	2.522
		3	0.000	0.000	0.000
		4	2.498	7.547	2.522
		5	0.000	0.000	0.000
		6	2.498	7.401	2.522
		7	0.714	0.478	0.721
23	41.440	1	2.498	8.367	2.522
		2	2.498	8.367	2.522
		3	0.000	0.000	0.000
		4	2.498	8.180	2.522
		5	0.000	0.000	0.000
		6	2.498	7.992	2.522
		7	0.714	0.190	0.721
24	42.010	1	0.000	0.000	0.000
		2	2.498	6.008	2.503
		3	0.000	0.000	0.000
		4	2.498	5.888	2.503
		5	0.000	0.000	0.000

		6	2.498	5.767	2.503
		7	0.714	0.303	0.715
25	44.440	1	0.000	0.000	0.000
		2	2.498	7.323	2.503
		3	0.000	0.000	0.000
		4	2.498	7.122	2.503
		5	0.000	0.000	0.000
		6	2.498	6.922	2.503
		7	0.714	-0.252	0.715
26	44.500	1	0.000	0.000	0.000
		2	2.498	7.356	2.503
		3	0.000	0.000	0.000
		4	2.498	7.154	2.503
		5	0.000	0.000	0.000
		6	2.498	6.952	2.503
		7	0.714	-0.266	0.715
27	45.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	-0.000	0.000

Prt : pérdida de pretensado por retracción del hormigón.

Pfl : pérdida de pretensado por fluencia del hormigón.

Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Vano 1 Viga 2

Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	2.420	7.163	2.110
		3	0.000	0.000	0.000
		4	2.420	6.940	2.110
		5	0.000	0.000	0.000
		6	2.420	6.717	2.110
		7	0.000	0.000	0.000
3	0.047	1	0.000	0.000	0.000
		2	2.420	7.137	2.110
		3	0.000	0.000	0.000
		4	2.420	6.916	2.110
		5	0.000	0.000	0.000
		6	2.420	6.694	2.110
		7	0.000	0.000	0.000
4	4.450	1	0.000	0.000	0.000
		2	2.420	4.910	2.110
		3	0.000	0.000	0.000
		4	2.420	4.823	2.110
		5	0.000	0.000	0.000
		6	2.420	4.737	2.110
		7	0.000	0.000	0.000
5	8.900	1	0.000	0.000	0.000
		2	2.420	3.157	2.110
		3	0.000	0.000	0.000
		4	2.420	3.177	2.110
		5	0.000	0.000	0.000
		6	2.420	3.197	2.110
		7	0.000	0.000	0.000
6	13.350	1	0.000	0.000	0.000

		2	2.420	1.906	2.110	16	40.050	1	0.000	0.000	0.000
		3	0.000	0.000	0.000			2	2.420	4.910	2.110
		4	2.420	2.001	2.110			3	0.000	0.000	0.000
		5	0.000	0.000	0.000			4	2.420	4.823	2.110
		6	2.420	2.097	2.110			5	0.000	0.000	0.000
7	14.657	7	0.000	0.000	0.000			6	2.420	4.737	2.110
		1	0.000	0.000	0.000			7	0.000	0.000	0.000
		2	2.420	1.645	2.110	17	44.453	1	0.000	0.000	0.000
		3	0.000	0.000	0.000			2	2.420	7.137	2.110
		4	2.420	1.757	2.110			3	0.000	0.000	0.000
		5	0.000	0.000	0.000			4	2.420	6.916	2.110
		6	2.420	1.868	2.110			5	0.000	0.000	0.000
8	15.213	7	0.000	0.000	0.000			6	2.420	6.694	2.110
		1	2.765	14.142	2.509			7	0.000	0.000	0.000
		2	2.420	12.374	2.195	18	44.500	1	0.000	0.000	0.000
		3	2.765	13.897	2.509			2	2.420	7.163	2.110
		4	2.420	12.159	2.195			3	0.000	0.000	0.000
		5	2.765	13.651	2.509			4	2.420	6.940	2.110
		6	2.420	11.945	2.195			5	0.000	0.000	0.000
		7	2.420	11.730	2.195			6	2.420	6.717	2.110
9	17.800	1	2.765	13.720	2.509			7	0.000	0.000	0.000
		2	2.420	12.005	2.195	19	45.000	1	0.000	0.000	0.000
		3	2.765	13.501	2.509			2	0.000	0.000	0.000
		4	2.420	11.813	2.195			3	0.000	0.000	0.000
		5	2.765	13.282	2.509			4	0.000	0.000	0.000
		6	2.420	11.621	2.195			5	0.000	0.000	0.000
10	22.250	7	2.420	11.430	2.195			6	0.000	0.000	0.000
		1	2.765	13.448	2.509			7	0.000	0.000	0.000
		2	2.420	11.767	2.195						
		3	2.765	13.246	2.509						
		4	2.420	11.590	2.195						
		5	2.765	13.044	2.509						
		6	2.420	11.414	2.195						
		7	2.420	11.237	2.195						
11	26.700	1	2.765	13.720	2.509						
		2	2.420	12.005	2.195						
		3	2.765	13.501	2.509						
		4	2.420	11.813	2.195						
		5	2.765	13.282	2.509						
		6	2.420	11.621	2.195						
		7	2.420	11.430	2.195						
12	29.287	1	2.765	14.142	2.509						
		2	2.420	12.374	2.195						
		3	2.765	13.897	2.509						
		4	2.420	12.159	2.195						
		5	2.765	13.651	2.509						
		6	2.420	11.945	2.195						
		7	2.420	11.730	2.195						
13	29.843	1	0.000	0.000	0.000			2	0.000	0.000	0.000
		2	2.420	1.645	2.110			2	6.421	10.191	5.055
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	2.420	1.757	2.110			4	6.489	9.954	5.055
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	2.420	1.868	2.110			6	6.557	9.718	5.055
		7	0.000	0.000	0.000			7	2.626	0.144	1.444
14	31.150	1	0.000	0.000	0.000			3	0.000	0.000	0.000
		2	2.420	1.906	2.110			2	6.421	10.126	5.055
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	2.420	2.001	2.110			4	6.489	9.892	5.055
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	2.420	2.097	2.110			6	6.557	9.658	5.055
		7	0.000	0.000	0.000			7	2.626	0.152	1.444
15	35.600	1	0.000	0.000	0.000			4	0.000	0.000	0.000
		2	2.420	3.157	2.110			2	6.421	7.542	5.055
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	2.420	3.177	2.110			4	6.489	7.398	5.055
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	2.420	3.197	2.110			6	6.557	7.254	5.055
		7	0.000	0.000	0.000			7	2.626	0.466	1.444

Prt : pérdida de pretensado por retracción del hormigón.

Pfl : pérdida de pretensado por fluencia del hormigón.

Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Pérdidas de pretensado entre hormigonado de losa y tiempo infinito

Vano 1 Viga 1

Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	-0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	6.421	10.191	5.055
		3	0.000	0.000	0.000
		4	6.489	9.954	5.055
		5	0.000	0.000	0.000
		6	6.557	9.718	5.055
		7	2.626	0.144	1.444
3	0.060	1	0.000	0.000	0.000
		2	6.421	10.126	5.055
		3	0.000	0.000	0.000
		4	6.489	9.892	5.055
		5	0.000	0.000	0.000
		6	6.557	9.658	5.055
		7	2.626	0.152	1.444
4	2.490	1	0.000	0.000	0.000
		2	6.421	7.542	5.055
		3	0.000	0.000	0.000
		4	6.489	7.398	5.055
		5	0.000	0.000	0.000
		6	6.557	7.254	5.055
		7	2.626	0.466	1.444

5	3.060	1	6.428	10.514	5.093	15	26.700	7	2.626	1.770	1.477
		2	6.428	10.514	5.093			1	6.441	9.544	5.170
		3	0.000	0.000	0.000			2	6.441	9.544	5.170
		4	6.496	10.304	5.093			3	7.437	10.808	5.909
		5	0.000	0.000	0.000			4	6.508	9.457	5.170
		6	6.563	10.094	5.093			5	7.514	10.708	5.909
		7	2.626	0.541	1.455			6	6.575	9.369	5.170
6	4.450	1	6.428	9.125	5.093	16	31.150	7	2.626	1.703	1.477
		2	6.428	9.125	5.093			1	6.441	11.053	5.170
		3	0.000	0.000	0.000			2	6.441	11.053	5.170
		4	6.496	8.963	5.093			3	7.437	12.471	5.909
		5	0.000	0.000	0.000			4	6.508	10.912	5.170
		6	6.563	8.801	5.093			5	7.514	12.311	5.909
		7	2.626	0.713	1.455			6	6.575	10.772	5.170
7	4.490	1	6.428	9.089	5.093	17	35.600	7	2.626	1.511	1.477
		2	6.428	9.089	5.093			1	6.441	13.550	5.170
		3	0.000	0.000	0.000			2	6.441	13.550	5.170
		4	6.496	8.929	5.093			3	7.437	15.225	5.909
		5	0.000	0.000	0.000			4	6.508	13.322	5.170
		6	6.563	8.768	5.093			5	7.514	14.964	5.909
		7	2.626	0.717	1.455			6	6.575	13.093	5.170
8	5.060	1	6.435	12.595	5.133	18	37.440	7	2.626	1.194	1.477
		2	6.435	12.595	5.133			1	6.441	14.920	5.170
		3	7.431	14.121	5.867			2	6.441	14.920	5.170
		4	6.502	12.355	5.133			3	7.437	16.735	5.909
		5	0.000	0.000	0.000			4	6.508	14.643	5.170
		6	6.570	12.116	5.133			5	7.514	16.419	5.909
		7	2.626	0.795	1.467			6	6.575	14.367	5.170
9	6.490	1	6.435	11.428	5.133	19	38.010	7	2.626	1.021	1.477
		2	6.435	11.428	5.133			1	6.435	11.428	5.133
		3	7.431	12.833	5.867			2	6.435	11.428	5.133
		4	6.502	11.229	5.133			3	7.431	12.833	5.867
		5	0.000	0.000	0.000			4	6.502	11.229	5.133
		6	6.570	11.031	5.133			5	0.000	0.000	0.000
		7	2.626	0.941	1.467			6	6.570	11.031	5.133
10	7.060	1	6.441	14.920	5.170	20	39.440	7	2.626	0.941	1.467
		2	6.441	14.920	5.170			1	6.435	12.595	5.133
		3	7.437	16.735	5.909			2	6.435	12.595	5.133
		4	6.508	14.643	5.170			3	7.431	14.120	5.867
		5	7.514	16.419	5.909			4	6.502	12.355	5.133
		6	6.575	14.367	5.170			5	0.000	0.000	0.000
		7	2.626	1.021	1.477			6	6.570	12.116	5.133
11	8.900	1	6.441	13.550	5.170	21	40.010	7	2.626	0.795	1.467
		2	6.441	13.550	5.170			1	6.428	9.089	5.093
		3	7.437	15.225	5.909			2	6.428	9.089	5.093
		4	6.508	13.322	5.170			3	0.000	0.000	0.000
		5	7.514	14.964	5.909			4	6.496	8.929	5.093
		6	6.575	13.093	5.170			5	0.000	0.000	0.000
		7	2.626	1.194	1.477			6	6.563	8.768	5.093
12	13.350	1	6.441	11.053	5.170	22	40.050	7	2.626	0.717	1.455
		2	6.441	11.053	5.170			1	6.428	9.125	5.093
		3	7.437	12.471	5.909			2	6.428	9.125	5.093
		4	6.508	10.912	5.170			3	0.000	0.000	0.000
		5	7.514	12.311	5.909			4	6.496	8.963	5.093
		6	6.575	10.772	5.170			5	0.000	0.000	0.000
		7	2.626	1.511	1.477			6	6.563	8.801	5.093
13	17.800	1	6.441	9.544	5.170	23	41.440	7	2.626	0.713	1.455
		2	6.441	9.544	5.170			1	6.428	10.514	5.093
		3	7.437	10.808	5.909			2	6.428	10.514	5.093
		4	6.508	9.457	5.170			3	0.000	0.000	0.000
		5	7.514	10.708	5.909			4	6.496	10.304	5.093
		6	6.575	9.369	5.170			5	0.000	0.000	0.000
		7	2.626	1.703	1.477			6	6.563	10.094	5.093
14	22.250	1	6.441	9.023	5.170	24	42.010	7	2.626	0.541	1.455
		2	6.441	9.023	5.170			1	0.000	0.000	0.000
		3	7.437	10.233	5.909			2	6.421	7.542	5.055
		4	6.508	8.954	5.170			3	0.000	0.000	0.000
		5	7.514	10.155	5.909			4	6.489	7.398	5.055
		6	6.575	8.885	5.170			5	0.000	0.000	0.000

		6	6.557	7.254	5.055			2	6.179	-0.875	4.231
		7	2.626	0.466	1.444			3	0.000	0.000	0.000
25	44.440	1	0.000	0.000	0.000			4	6.244	-0.742	4.231
		2	6.421	10.126	5.055			5	0.000	0.000	0.000
		3	0.000	0.000	0.000			6	6.309	-0.609	4.231
		4	6.489	9.892	5.055			7	0.000	0.000	0.000
		5	0.000	0.000	0.000	7	14.657	1	0.000	0.000	0.000
		6	6.557	9.658	5.055			2	6.179	-1.376	4.231
		7	2.626	0.152	1.444			3	0.000	0.000	0.000
26	44.500	1	0.000	0.000	0.000			4	6.244	-1.225	4.231
		2	6.421	10.191	5.055			5	0.000	0.000	0.000
		3	0.000	0.000	0.000			6	6.309	-1.075	4.231
		4	6.489	9.954	5.055			7	0.000	0.000	0.000
		5	0.000	0.000	0.000	8	15.213	1	7.088	15.078	5.032
		6	6.557	9.718	5.055			2	6.202	13.193	4.403
		7	2.626	0.144	1.444			3	7.162	14.854	5.032
27	45.000	1	0.000	0.000	0.000			4	6.266	12.997	4.403
		2	0.000	0.000	0.000			5	7.235	14.629	5.032
		3	0.000	0.000	0.000			6	6.331	12.800	4.403
		4	0.000	0.000	0.000			7	6.396	12.604	4.403
		5	0.000	0.000	0.000	9	17.800	1	7.088	14.203	5.032
		6	0.000	0.000	0.000			2	6.202	12.428	4.403
		7	0.000	-0.000	0.000			3	7.162	14.009	5.032

Prt : pérdida de pretensado por retracción del hormigón.

Pfl : pérdida de pretensado por fluencia del hormigón.

Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Vano 1 Viga 2

Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)						
1	-0.500	1	0.000	0.000	0.000			1	7.088	13.633	5.032
		2	0.000	0.000	0.000			2	6.202	11.929	4.403
		3	0.000	0.000	0.000			3	7.162	13.460	5.032
		4	0.000	0.000	0.000			4	6.266	11.778	4.403
		5	0.000	0.000	0.000			5	7.235	13.287	5.032
		6	0.000	0.000	0.000			6	6.331	11.626	4.403
		7	0.000	0.000	0.000			7	6.396	11.474	4.403
2	0.000	1	0.000	0.000	0.000			1	7.088	14.203	5.032
		2	6.179	9.565	4.231	11	26.700	2	6.202	12.428	4.403
		3	0.000	0.000	0.000			3	7.162	14.009	5.032
		4	6.244	9.335	4.231			4	6.266	12.258	4.403
		5	0.000	0.000	0.000			5	7.235	13.816	5.032
		6	6.309	9.104	4.231			6	6.331	12.089	4.403
		7	0.000	0.000	0.000			7	6.396	11.920	4.403
3	0.047	1	0.000	0.000	0.000			1	7.088	14.203	5.032
		2	6.179	9.516	4.231	12	29.287	2	6.202	12.428	4.403
		3	0.000	0.000	0.000			3	7.162	14.009	5.032
		4	6.244	9.287	4.231			4	6.266	12.258	4.403
		5	0.000	0.000	0.000			5	7.235	14.629	5.032
		6	6.309	9.059	4.231			6	6.331	12.800	4.403
		7	0.000	0.000	0.000			7	6.396	12.604	4.403
4	4.450	1	0.000	0.000	0.000			1	0.000	0.000	0.000
		2	6.179	9.516	4.231	13	29.843	2	6.179	-1.376	4.231
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	6.244	9.287	4.231			4	6.244	-1.225	4.231
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	6.309	9.059	4.231			6	6.309	-1.075	4.231
		7	0.000	0.000	0.000			7	0.000	0.000	0.000
5	8.900	1	0.000	0.000	0.000			1	0.000	0.000	0.000
		2	6.179	5.101	4.231	14	31.150	2	6.179	-0.875	4.231
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	6.244	5.026	4.231			4	6.244	-0.742	4.231
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	6.309	4.951	4.231			6	6.309	-0.609	4.231
		7	0.000	0.000	0.000			7	0.000	0.000	0.000
6	13.350	1	0.000	0.000	0.000			1	0.000	0.000	0.000
		2	6.179	1.621	4.231	15	35.600	2	6.179	1.621	4.231
		3	0.000	0.000	0.000			3	0.000	0.000	0.000
		4	6.244	1.667	4.231			4	6.244	1.667	4.231
		5	0.000	0.000	0.000			5	0.000	0.000	0.000
		6	6.309	1.713	4.231			6	6.309	1.713	4.231
		7	0.000	0.000	0.000			7	0.000	0.000	0.000



16	40.050	1	0.000	0.000	0.000
		2	6.179	5.101	4.231
		3	0.000	0.000	0.000
		4	6.244	5.026	4.231
		5	0.000	0.000	0.000
		6	6.309	4.951	4.231
		7	0.000	0.000	0.000
17	44.453	1	0.000	0.000	0.000
		2	6.179	9.516	4.231
		3	0.000	0.000	0.000
		4	6.244	9.287	4.231
		5	0.000	0.000	0.000
		6	6.309	9.059	4.231
		7	0.000	0.000	0.000
18	44.500	1	0.000	0.000	0.000
		2	6.179	9.565	4.231
		3	0.000	0.000	0.000
		4	6.244	9.335	4.231
		5	0.000	0.000	0.000
		6	6.309	9.104	4.231
		7	0.000	0.000	0.000
19	45.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000

Prt : pérdida de pretensado por retracción del hormigón.  
Pfl : pérdida de pretensado por fluencia del hormigón.  
Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Pérdidas de pretensado totales (T)

Vano 1 Viga 1

Punto	s (m)	P0 (T)	DP1a (T)	DP1b (T)	DP1 (T)	DP2 (T)
1	-0.500	1796.760	14.983	1781.777	1796.760	0.000
2	0.000	1796.760	14.983	976.248	991.231	106.340
3	0.060	1796.760	14.983	976.248	991.231	106.079
4	2.490	1796.760	14.983	976.248	991.231	95.762
5	3.060	1796.760	14.983	729.548	744.531	146.948
6	4.450	1796.760	14.983	729.548	744.531	139.426
7	4.490	1796.760	14.983	729.548	744.531	139.232
8	5.060	1796.760	14.983	446.914	461.897	208.612
9	6.490	1796.760	14.983	446.914	461.897	200.299
10	7.060	1796.760	14.983	163.632	178.615	280.777
11	8.900	1796.760	14.983	163.632	178.615	268.995
12	13.350	1796.760	14.983	163.632	178.615	247.433
13	17.800	1796.760	14.983	163.632	178.615	234.435
14	22.250	1796.760	14.983	163.632	178.615	229.996
15	26.700	1796.760	14.983	163.632	178.615	234.435
16	31.150	1796.760	14.983	163.632	178.615	247.433
17	35.600	1796.760	14.983	163.632	178.615	268.995
18	37.440	1796.760	14.983	163.632	178.615	280.777
19	38.010	1796.760	14.983	446.914	461.897	200.299
20	39.440	1796.760	14.983	446.914	461.897	208.612
21	40.010	1796.760	14.983	729.548	744.531	139.232
22	40.050	1796.760	14.983	729.548	744.531	139.426
23	41.440	1796.760	14.983	729.548	744.531	146.948
24	42.010	1796.760	14.983	976.248	991.231	95.762
25	44.440	1796.760	14.983	976.248	991.231	106.079
26	44.500	1796.760	14.983	976.248	991.231	106.340
27	45.000	1796.760	14.983	1781.777	1796.760	0.000

Vano 1 Viga 2

Punto	s (m)	P0 (T)	DP1a (T)	DP1b (T)	DP1 (T)	DP2 (T)
1	-0.500	2031.120	16.937	2014.183	2031.120	0.000
2	0.000	2031.120	16.937	1297.703	1314.640	93.838
3	0.047	2031.120	16.937	1297.703	1314.640	93.624
4	4.450	2031.120	16.937	1297.703	1314.640	74.562
5	8.900	2031.120	16.937	1297.703	1314.640	59.547
6	13.350	2031.120	16.937	1297.703	1314.640	48.793
7	14.657	2031.120	16.937	1297.703	1314.640	46.608
8	15.213	2031.120	16.937	227.069	244.006	299.726
9	17.800	2031.120	16.937	227.069	244.006	291.765
10	22.250	2031.120	16.937	227.069	244.006	286.606
11	26.700	2031.120	16.937	227.069	244.006	291.765
12	29.287	2031.120	16.937	227.069	244.006	299.726
13	29.843	2031.120	16.937	1297.703	1314.640	46.608
14	31.150	2031.120	16.937	1297.703	1314.640	48.793
15	35.600	2031.120	16.937	1297.703	1314.640	59.547
16	40.050	2031.120	16.937	1297.703	1314.640	74.562
17	44.453	2031.120	16.937	1297.703	1314.640	93.624
18	44.500	2031.120	16.937	1297.703	1314.640	93.838
19	45.000	2031.120	16.937	2014.183	2031.120	0.000

Pérdidas de pretensado totales (%)

Vano 1 Viga 1

Punto	s (m)	DP1 (%)	DP2 (%)	DP3 (%)
1	-0.500	100.000	0.000	100.000
2	0.000	55.168	5.918	61.086
3	0.060	55.168	5.904	61.072
4	2.490	55.168	5.330	60.497
5	3.060	41.437	8.179	49.616
6	4.450	41.437	7.760	49.197
7	4.490	41.437	7.749	49.186
8	5.060	25.707	11.610	37.318
9	6.490	25.707	11.148	36.855
10	7.060	9.941	15.627	25.568
11	8.900	9.941	14.971	24.912
12	13.350	9.941	13.771	23.712
13	17.800	9.941	13.048	22.989
14	22.250	9.941	12.801	22.742
15	26.700	9.941	13.048	22.989
16	31.150	9.941	13.771	23.712
17	35.600	9.941	14.971	24.912
18	37.440	9.941	15.627	25.568
19	38.010	25.707	11.148	36.855
20	39.440	25.707	11.610	37.318
21	40.010	41.437	7.749	49.186
22	40.050	41.437	7.760	49.197
23	41.440	41.437	8.179	49.616
24	42.010	55.168	5.330	60.497
25	44.440	55.168	5.904	61.072
26	44.500	55.168	5.918	61.086
27	45.000	100.000	0.000	100.000

P0: Fuerza de tesado

DP1a: Pérdidas de pretensado por penetración de cuñas.

DP1b: Pérdidas de pretensado por acortamiento elástico.

DP1: Pérdidas totales instantáneas de pretensado.

DP2: Pérdidas totales diferidas de pretensado.

DP3: Pérdidas totales de pretensado.

Vano 1 Viga 2

Punto	s (m)	DP1 (%)	DP2 (%)	DP3 (%)
1	-0.500	100.000	0.000	100.000
2	0.000	64.725	4.620	69.345
3	0.047	64.725	4.609	69.334
4	4.450	64.725	3.671	68.396
5	8.900	64.725	2.932	67.657
6	13.350	64.725	2.402	67.127
7	14.657	64.725	2.295	67.020
8	15.213	12.013	14.757	26.770
9	17.800	12.013	14.365	26.378
10	22.250	12.013	14.111	26.124
11	26.700	12.013	14.365	26.378
12	29.287	12.013	14.757	26.770
13	29.843	64.725	2.295	67.020
14	31.150	64.725	2.402	67.127
15	35.600	64.725	2.932	67.657
16	40.050	64.725	3.671	68.396
17	44.453	64.725	4.609	69.334
18	44.500	64.725	4.620	69.345
19	45.000	100.000	0.000	100.000

P0: Fuerza de tesado  
 DP1a: Pérdidas de pretensado por penetración de cuñas.  
 DP1b: Pérdidas de pretensado por acortamiento elástico.  
 DP1: Pérdidas totales instantáneas de pretensado.  
 DP2: Pérdidas totales diferidas de pretensado.  
 DP3: Pérdidas totales de pretensado.

LISTADO DE DESPIECES EN LA VIGA

Vano 1 Viga 1

1) Armadura transversal en el alma

A: DATOS

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Xi (m)	0.10	2.47	4.58	7.88	11.18	14.47	17.77
cotg(teta)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
sep. máx.(cm)	45.00	45.00	45.00	45.00	45.00	45.00	60.00
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Xi (m) : distancia de cada punto en estudio al extremo inicial de la viga.  
 cotg(teta): cotangente del ángulo entre las bielas de compresión de hormigón y el eje  
 sep. máx. : separación máxima entre estribos, de acuerdo con el art. 44.2.3.4.1 de la  
 Diámetro (mm): Diámetro de los estribos a disponer.

B: RESULTADOS PARA LA VIGA AISLADA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	194.26	173.49	154.96	126.05	97.13	68.22	39.30
Vu1 (T)	729.75	778.12	818.05	813.60	813.60	813.60	813.60
Vu2(sin arm.)	72.46	102.42	123.92	144.06	145.02	145.02	145.02
Vcu (T)	72.46	96.64	118.15	144.06	145.02	145.02	145.02
Vsu (T)	121.81	76.85	36.82	0.00	0.00	0.00	0.00

Vrd (T): Cortante de cálculo.  
 Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.

Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie  
 Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.  
 Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	9.87	4.73	0.00	0.00	0.00	0.00
Apret(cm2/m)	58.84	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	58.84	9.87	4.73	4.14	4.14	4.14	4.14

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
 Acort(cm2/ml): Cuantía por cortante.  
 Apret(cm2/ml): Cuantía por la introducción del pretensado.  
 Atotal : Cuantía total.

C: RESULTADOS PARA LA VIGA + LOSA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	461.36	422.16	387.10	330.08	273.39	217.59	163.24
Td (T)	77.92	83.73	90.51	95.09	94.77	93.90	87.74
Vu1 (T)	774.63	806.39	830.77	864.21	872.06	873.48	874.47
Tu1 (T)	976.05	976.05	976.05	976.05	976.05	976.05	976.05
Vu2(sin arm.)	59.66	80.53	92.48	117.47	124.30	125.01	125.50
Vcu (T)	59.66	75.54	87.48	105.83	109.76	110.47	110.96
Vsu (T)	401.70	346.62	299.61	224.26	163.63	107.12	52.28
Td-Vrd	0.63	0.57	0.51	0.44	0.38	0.32	0.25

Vrd (T): Cortante de cálculo.  
 Td (T): Torsor de cálculo.  
 Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.  
 Tu1 (T): Esfuerzo torsor que pueden resistir las bielas comprimidas de hormigón.  
 Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie  
 Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.  
 Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante  
 Td-Vrd: comprobación de la torsión combinada con cortante (art. 45.3.2.2 de la EHE)

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	39.84	34.41	25.88	18.88	12.36	6.03
Ators(cm2/m)	2.25	2.41	2.61	2.74	2.73	2.71	2.53
Apret(cm2/m)	58.84	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	61.09	44.35	37.02	28.62	21.61	15.07	8.56

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
 Acort(cm2/ml): Cuantía por cortante.  
 Ators(cm2/ml): Cuantía por torsión.  
 Apret(cm2/ml): Cuantía por la introducción del pretensado.  
 Atotal : Cuantía total.

Despieces :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L teor. (m)	0.55	5.72	3.30	3.30	3.30	3.30	3.30
L real (m)	0.60	5.74	3.36	3.30	3.36	3.40	2.99
Nº estribos	12	82	42	33	24	17	9
sep. (cm)	5.00	7.00	8.00	10.00	14.00	20.00	36.00

L teor. (m) : Longitud de cada uno de los tramos de definición del despiece.  
 L real (m) : Longitud final para la definición del despiece, de acuerdo con la separ

N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición d  
 sep. (cm) : Separación real entre los estribos dispuestos en cada tramo.

Armadura longitudinal :  
 Longitud mínima necesaria (desde el borde del neopreno, m) :2,533

2) Armadura de refuerzo de rasante viga-losa

A: DATOS

Armadura de refuerzo :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	0	0	0	0	0	0	0
Arm.saliente	sí	sí	sí	sí	sí	sí	sí

Diámetro (mm): Diámetro de los estribos de refuerzo a disponer.  
 N° estribos : Número de estribos de refuerzo a disponer.

Ancho de la losa en contacto con la viga (m) :0,807  
 Coeficiente β de tipo de superficie (tabla 47.2.2.2 EHE) :0,200  
 Coeficiente μ de tipo de superficie (tabla 47.2.2.2 EHE) :0,600

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.60	5.74	3.36	3.30	3.36	3.40	2.99
N° estribos	12	82	42	33	24	17	9

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura total resultante :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2	37.70	257.61	131.95	103.67	75.40	53.41	28.27
cm2/m	62.83	44.88	39.27	31.42	22.44	15.71	9.46

Tensión rasante de cálculo (tmd, T/m2) :84,456  
 Longitud de redistribución plástica (ar, m) :22,750  
 Sección de barra necesarias para coser la junta (cm2) :629,986  
 Sección de barra dispuestas para coser la junta (cm2) :688,009  
 Armadura mínima para considerar la colaboración de armadura (cm2/ml) :8,070

3) Armadura de rasante en el ala superior

A: DATOS

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	2	20	12	11	12	12	10

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
 N° estribos : Número de estribos a disponer en las alas.

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.60	5.74	3.36	3.30	3.36	3.40	2.99
N° estribos	12	82	42	33	24	17	9

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	29.00	28.00	27.00	29.00	27.00	28.00	29.00
cm2 neces.	0.50	4.77	2.79	2.74	2.79	2.82	2.48
cm2 disp.	1.57	15.71	9.42	8.64	9.42	9.42	7.85

Longitud de redistribución plástica (m) :22,750  
 Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :2,599  
 Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
 Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :2,599  
 Sección de barra necesarias en la longitud de redistribución plástica (cm2) :14,498  
 Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :62,047

4) Armadura transversal de rasante en el ala inferior

A: DATOS

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	46	25	12	11	12	12	10

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
 N° estribos : Número de estribos a disponer en las alas.

Porcentaje de los cordones ubicados en cada ala (%) :40,000

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.60	5.74	3.36	3.30	3.36	3.40	2.99
N° estribos	12	82	42	33	24	17	9

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	1.00	22.00	27.00	29.00	27.00	28.00	29.00
cm2 neces.	35.98	18.98	4.38	4.52	4.59	4.60	3.78
cm2 disp.	72.26	39.27	18.85	17.28	18.85	18.85	15.71

Longitud de redistribución plástica (m) :22,750  
 Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :-1,000  
 Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
 Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :-1,000  
 Sección de barra necesarias en la longitud de redistribución plástica (cm2) :49,377  
 Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :201,062

5) Armadura de refuerzo

- Armadura longitudinal:

A: DATOS

Diámetro (mm) :6,000

B: RESULTADOS PARA LA VIGA AISLADA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	30.44	0.00	0.00	0.00	0.00	0.00	0.00

C: RESULTADOS PARA LA VIGA + LOSA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	56.09	1.53	0.00	0.00	0.00	0.00	0.00

Longitud mínima necesaria (desde el borde del neopreno, m) :2,533

Longitud horizontal dispuesta de armadura (m) :3,033

Longitud de anclaje (desde el borde del neopreno, m) :0,153

Número de barras por extremo :199

longitud vertical (patillas, m) :0,000

- Armadura vertical:

Cuantía necesaria (cm2): 58,842

Número de barras de la posición principal: 0

Diámetro de las barras de la posición principal (mm): 0,000

Número de barras de la posición secundaria: 0

Diámetro de las barras de la posición principal (mm): 0,000

Vano 1 Viga 2

1) Armadura transversal en el alma

A: DATOS

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Xi (m)	0.10	2.47	4.58	7.88	11.18	14.47	17.77
cotg(teta)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
sep. máx. (cm)	45.00	45.00	45.00	45.00	45.00	45.00	60.00
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Xi (m) : distancia de cada punto en estudio al extremo inicial de la viga.

cotg(teta): cotangente del ángulo entre las bielas de compresión de hormigón y el eje

sep. máx. : separación máxima entre estribos, de acuerdo con el art. 44.2.3.4.1 de la

Diámetro (mm): Diámetro de los estribos a disponer.

B: RESULTADOS PARA LA VIGA AISLADA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	194.26	173.49	154.96	126.05	97.13	68.22	39.30
Vu1 (T)	721.36	745.00	764.77	764.77	764.77	764.77	808.71
Vu2(sin arm.)	68.26	84.87	94.76	94.76	94.76	94.76	144.18
Vcu (T)	68.26	80.08	89.97	89.97	89.97	94.76	144.18
Vsu (T)	126.00	93.41	64.99	36.08	7.16	0.00	0.00

Vrd (T): Cortante de cálculo.

Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.

Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie

Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.

Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort (cm2/m)	0.00	12.00	8.35	4.64	0.92	0.00	0.00
Apert (cm2/m)	64.99	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	64.99	12.00	8.35	4.64	4.14	4.14	4.14

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)

Acort (cm2/ml): Cuantía por cortante.

Apert (cm2/ml): Cuantía por la introducción del pretensado.

Atotal : Cuantía total.

C: RESULTADOS PARA LA VIGA + LOSA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	461.21	421.99	386.90	329.86	273.17	217.40	163.12
Td (T)	79.67	84.23	90.81	94.10	94.03	92.41	86.20
Vu1 (T)	769.59	785.80	799.41	800.55	801.48	802.25	881.00
Tu1 (T)	976.05	976.05	976.05	976.05	976.05	976.05	976.05
Vu2(sin arm.)	57.14	69.19	75.99	76.57	77.03	77.41	130.51
Vcu (T)	57.14	65.24	72.05	72.62	73.08	73.47	116.01
Vsu (T)	404.08	356.74	314.86	257.24	200.09	143.94	47.11
Td-Vrd	0.64	0.58	0.53	0.47	0.41	0.34	0.25

Vrd (T): Cortante de cálculo.

Td (T): Torsor de cálculo.

Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.

Tu1 (T): Esfuerzo torsor que pueden resistir las bielas comprimidas de hormigón.

Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie

Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.

Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante

Td-Vrd: comprobación de la torsión combinada con cortante (art. 45.3.2.2 de la EHE)

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort (cm2/m)	0.00	41.00	36.19	29.56	23.00	16.54	5.47
Ators (cm2/m)	2.30	2.43	2.62	2.71	2.71	2.66	2.48
Apert (cm2/m)	64.99	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	67.28	45.53	38.80	32.28	25.71	19.21	7.95

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)

Acort (cm2/ml): Cuantía por cortante.

Ators (cm2/ml): Cuantía por torsión.

Apert (cm2/ml): Cuantía por la introducción del pretensado.

Atotal : Cuantía total.

Despieces :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L teor. (m)	0.55	5.72	3.30	3.30	3.30	3.30	3.30
L real (m)	0.56	5.76	3.36	3.33	3.36	3.36	3.02
Nº estribos	14	96	42	37	28	21	8
sep. (cm)	4.00	6.00	8.00	9.00	12.00	16.00	39.00

L teor. (m) : Longitud de cada uno de los tramos de definición del despiece.

L real (m) : Longitud final para la definición del despiece, de acuerdo con la separ

Nº estribos : Número de estribos dispuestos en cada uno de los tramos de definición d

sep. (cm) : Separación real entre los estribos dispuestos en cada tramo.

Armadura longitudinal :  
 Longitud mínima necesaria (desde el borde del neopreno, m) :1,265

2) Armadura de refuerzo de rasante viga-losa

A: DATOS

Armadura de refuerzo :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	0	0	0	0	0	0	0
Arm.saliente	sí	sí	sí	sí	sí	sí	sí

Diámetro (mm): Diámetro de los estribos de refuerzo a disponer.  
 N° estribos : Número de estribos de refuerzo a disponer.

Ancho de la losa en contacto con la viga (m) :0,807  
 Coeficiente β de tipo de superficie (tabla 47.2.2.2 EHE) :0,200  
 Coeficiente μ de tipo de superficie (tabla 47.2.2.2 EHE) :0,600

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.56	5.76	3.36	3.33	3.36	3.36	3.02
N° estribos	14	96	42	37	28	21	8

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura total resultante :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2	43.98	301.59	131.95	116.24	87.96	65.97	25.13
cm2/m	78.54	52.36	39.27	34.91	26.18	19.63	8.32

Tensión rasante de cálculo (tmd, T/m2) :92,659  
 Longitud de redistribución plástica (ar, m) :22,750  
 Sección de barra necesarias para coser la junta (cm2) :691,548  
 Sección de barra dispuestas para coser la junta (cm2) :772,832  
 Armadura mínima para considerar la colaboración de armadura (cm2/ml) :8,070

3) Armadura de rasante en el ala superior

A: DATOS

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	2	20	12	12	12	12	11

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
 N° estribos : Número de estribos a disponer en las alas.

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
-------	---------	---------	---------	---------	---------	---------	---------

L real (m)	0.56	5.76	3.36	3.33	3.36	3.36	3.02
N° estribos	14	96	42	37	28	21	8

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	28.00	28.00	27.00	27.00	27.00	27.00	27.00
cm2 neces.	0.47	4.78	2.79	2.77	2.79	2.79	2.51
cm2 disp.	1.57	15.71	9.42	9.42	9.42	9.42	8.64

Longitud de redistribución plástica (m) :22,750  
 Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :4,619  
 Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
 Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :4,619  
 Sección de barra necesarias en la longitud de redistribución plástica (cm2) :25,773  
 Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :63,617

4) Armadura transversal de rasante en el ala inferior

A: DATOS

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	48	25	12	12	12	12	11

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
 N° estribos : Número de estribos a disponer en las alas.

Porcentaje de los cordones ubicados en cada ala (%) :40,000

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.56	5.76	3.36	3.33	3.36	3.36	3.02
N° estribos	14	96	42	37	28	21	8

L real (m) : Longitud final para la definición del despiece  
 N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	1.00	23.00	27.00	27.00	27.00	27.00	27.00
cm2 neces.	37.03	19.09	4.40	4.51	4.55	4.47	3.75
cm2 disp.	75.40	39.27	18.85	18.85	18.85	18.85	17.28

Longitud de redistribución plástica (m) :22,750  
 Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :-1,000  
 Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
 Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :-1,000  
 Sección de barra necesarias en la longitud de redistribución plástica (cm2) :50,542  
 Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :207,345

5) Armadura de refuerzo

- Armadura longitudinal:

A: DATOS

Diámetro (mm) :6,000

B: RESULTADOS PARA LA VIGA AISLADA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	28.58	0.00	0.00	0.00	0.00	0.00	0.00

C: RESULTADOS PARA LA VIGA + LOSA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	54.91	0.00	0.00	0.00	0.00	0.00	0.00

Longitud mínima necesaria (desde el borde del neopreno, m) :1,265

Longitud horizontal dispuesta de armadura (m) :1,765

Longitud de anclaje (desde el borde del neopreno, m) :0,152

Número de barras por extremo :195

longitud vertical (patillas, m) :0,000

- Armadura vertical:

Cuantía necesaria (cm2): 64,986

Número de barras de la posición principal: 0

Diámetro de las barras de la posición principal (mm): 0,000

Número de barras de la posición secundaria: 0

Diámetro de las barras de la posición principal (mm): 0,000

#### LISTADO DE REACCIONES

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Vano 1

Las reacciones correspondientes a las acciones han sido obtenidas con coeficientes de seguridad unitarios.

Las reacciones correspondientes a las combinaciones características, frecuentes y casi permanentes han sido obtenidas con los coeficientes de seguridad del estado límite de servicio.

Las reacciones correspondientes a las combinaciones persistentes han sido obtenidas con los coeficientes de seguridad del estado límite último.

Unidades utilizadas : t

Viga 1

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Apoyo inicial :

PP : Peso propio de la viga.  
Rz+ = 69.577 Rz- = 69.577

PL : Peso de la losa.  
Rz+ = 77.599 Rz- = 77.599

SE : Superestructura.  
Rz+ = 33.466 Rz- = 25.279

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 173.439 Rz- = -20.786

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.

Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.

Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.

Rz+ = 69.577 Rz- = 69.577

C2 : Combinación característica tras hormigonar la losa.

Rz+ = 147.177 Rz- = 147.177

C3 : Combinación característica tras disponer la superestructura.

Rz+ = 180.643 Rz- = 172.455

C4 : Combinación característica tras abrir al tráfico.

Rz+ = 354.082 Rz- = 151.669

C5 : Combinación característica a tiempo infinito.

Rz+ = 354.082 Rz- = 151.669

C6 : Combinación característica. Envolvente global.

Rz+ = 354.082 Rz- = 69.577

F4 : Combinación frecuente tras abrir al tráfico.

Rz+ = 281.712 Rz- = 161.171

F5 : Combinación frecuente a tiempo infinito.

Rz+ = 281.712 Rz- = 161.171

F6 : Combinación frecuente. Envolvente global.

Rz+ = 281.712 Rz- = 69.577

P4 : Combinación casi permanente tras abrir al tráfico.

Rz+ = 180.643 Rz- = 172.455

P5 : Combinación casi permanente a tiempo infinito.

Rz+ = 180.643 Rz- = 172.455

P6 : Combinación casi permanente. Envolvente global.

Rz+ = 180.643 Rz- = 69.577

D1 : Combinación persistente tras transferir el pretensado.

Rz+ = 93.929 Rz- = 69.577

D2 : Combinación persistente tras hormigonar la losa.

Rz+ = 198.688 Rz- = 147.177

D3 : Combinación persistente tras disponer la superestructura.

Rz+ = 243.868 Rz- = 172.455

D4 : Combinación persistente tras abrir al tráfico.

Rz+ = 478.010 Rz- = 144.394

D5 : Combinación persistente a tiempo infinito.

Rz+ = 478.010 Rz- = 144.394

D6 : Combinación persistente. Envolvente global.

Rz+ = 478.010 Rz- = 69.577

Apoyo final :

PP : Peso propio de la viga.

Rz+ = 69.577 Rz- = 69.577

PL : Peso de la losa.

Rz+ = 77.599 Rz- = 77.599

SE : Superestructura.

Rz+ = 33.466 Rz- = 25.279

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 173.439 Rz- = -20.786

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 69.577 Rz- = 69.577

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 147.176 Rz- = 147.176

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 180.643 Rz- = 172.455

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 354.082 Rz- = 151.669

C5 : Combinación característica a tiempo infinito.  
Rz+ = 354.082 Rz- = 151.669

C6 : Combinación característica. Envolvente global.  
Rz+ = 354.082 Rz- = 69.577

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 281.712 Rz- = 161.171

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 281.712 Rz- = 161.171

F6 : Combinación frecuente. Envolvente global.  
Rz+ = 281.712 Rz- = 69.577

P4 : Combinación casi permanente tras abrir al tráfico.  
Rz+ = 180.643 Rz- = 172.455

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 180.643 Rz- = 172.455

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 180.643 Rz- = 69.577

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 93.929 Rz- = 69.577

D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 198.688 Rz- = 147.176

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 243.868 Rz- = 172.455

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 478.010 Rz- = 144.394

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 478.010 Rz- = 144.394

D6 : Combinación persistente. Envolvente global.  
Rz+ = 478.010 Rz- = 69.577

Viga 2  
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Apoyo inicial :

PP : Peso propio de la viga.  
Rz+ = 69.577 Rz- = 69.577

PL : Peso de la losa.  
Rz+ = 77.599 Rz- = 77.599

SE : Superestructura.  
Rz+ = 33.462 Rz- = 25.273

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 173.420 Rz- = -20.797

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 69.577 Rz- = 69.577

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 147.177 Rz- = 147.177

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 180.638 Rz- = 172.450

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 354.058 Rz- = 151.652

C5 : Combinación característica a tiempo infinito.  
Rz+ = 354.058 Rz- = 151.652

C6 : Combinación característica. Envolvente global.  
Rz+ = 354.058 Rz- = 69.577

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 281.697 Rz- = 161.157

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 281.697 Rz- = 161.157

F6 : Combinación frecuente. Envolvente global.  
Rz+ = 281.697 Rz- = 69.577

P4 : Combinación casi permanente tras abrir al tráfico.  
Rz+ = 180.638 Rz- = 172.450

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 180.638 Rz- = 172.450

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 180.638 Rz- = 69.577

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 93.929 Rz- = 69.577



D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 198.688 Rz- = 147.177

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 243.861 Rz- = 172.450

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 477.979 Rz- = 144.373

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 477.979 Rz- = 144.373

D6 : Combinación persistente. Envolvente global.  
Rz+ = 477.979 Rz- = 69.577

Apoyo final :

PP : Peso propio de la viga.  
Rz+ = 69.577 Rz- = 69.577

PL : Peso de la losa.  
Rz+ = 77.599 Rz- = 77.599

SE : Superestructura.  
Rz+ = 33.462 Rz- = 25.273

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 173.420 Rz- = -20.797

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 69.577 Rz- = 69.577

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 147.177 Rz- = 147.177

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 180.638 Rz- = 172.450

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 354.058 Rz- = 151.652

C5 : Combinación característica a tiempo infinito.  
Rz+ = 354.058 Rz- = 151.652

C6 : Combinación característica. Envolvente global.  
Rz+ = 354.058 Rz- = 69.577

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 281.697 Rz- = 161.157

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 281.697 Rz- = 161.157

F6 : Combinación frecuente. Envolvente global.  
Rz+ = 281.697 Rz- = 69.577

P4 : Combinación casi permanente tras abrir al tráfico.

Rz+ = 180.638 Rz- = 172.450

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 180.638 Rz- = 172.450

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 180.638 Rz- = 69.577

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 93.929 Rz- = 69.577

D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 198.688 Rz- = 147.177

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 243.861 Rz- = 172.450

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 477.979 Rz- = 144.373

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 477.979 Rz- = 144.373

D6 : Combinación persistente. Envolvente global.  
Rz+ = 477.979 Rz- = 69.577

#### CALCULO DE LA LOSA

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#### Listado de esfuerzos locales. Vano 1

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El presente listado define la envolvente de momentos flectores en la losa, pero no incluye el valor de la envolvente de los esfuerzos de cortante.

El presente cálculo NO incluye los esfuerzos obtenidos por paseo de las cargas puntuales del carro, sobrecarga de tráfico o acción de la superestructura en el voladizo de la losa existente junto a las vigas extremas del tablero.

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas puntuales del carro.

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-
1	22	0.045	-1.180	0.045	-1.180	0.061	-1.594
	23	0.367	-0.041	0.367	-0.041	0.495	-0.056
2	23	0.017	-0.270	0.017	-0.270	0.023	-0.365
	24	0.098	-0.031	0.098	-0.031	0.132	-0.041
3	24	0.024	-0.021	0.024	-0.021	0.032	-0.028
	25	0.026	-0.033	0.026	-0.033	0.035	-0.044
4	25	0.027	-0.023	0.027	-0.023	0.036	-0.031
	26	0.029	-0.032	0.029	-0.032	0.040	-0.044
5	26	0.030	-0.022	0.030	-0.022	0.041	-0.030
	27	0.029	-0.032	0.029	-0.032	0.040	-0.043
6	27	0.030	-0.024	0.030	-0.024	0.041	-0.033
	28	0.029	-0.031	0.029	-0.031	0.039	-0.042
7	28	0.030	-0.025	0.030	-0.025	0.040	-0.034
	29	0.029	-0.030	0.029	-0.030	0.039	-0.041
8	29	0.029	-0.026	0.029	-0.026	0.039	-0.035
	30	0.029	-0.029	0.029	-0.029	0.039	-0.040
9	30	0.029	-0.027	0.029	-0.027	0.039	-0.036
	31	0.029	-0.029	0.029	-0.029	0.039	-0.039
10	31	0.029	-0.027	0.029	-0.027	0.039	-0.037
	32	0.029	-0.028	0.029	-0.028	0.039	-0.038
11	32	0.029	-0.028	0.029	-0.028	0.039	-0.038
	33	0.029	-0.027	0.029	-0.027	0.039	-0.037
12	33	0.029	-0.029	0.029	-0.029	0.039	-0.039
	34	0.029	-0.027	0.029	-0.027	0.039	-0.036

13	34	0.029	-0.029	0.029	-0.029	0.039	-0.040		71	0.502	-0.320	0.502	-0.320	0.677	-0.432
	35	0.029	-0.026	0.029	-0.026	0.039	-0.035	48	71	0.440	-0.416	0.440	-0.416	0.593	-0.561
14	35	0.029	-0.030	0.029	-0.030	0.039	-0.041		72	0.491	-0.336	0.491	-0.336	0.663	-0.454
	36	0.030	-0.025	0.030	-0.025	0.040	-0.034	49	72	0.450	-0.400	0.450	-0.400	0.607	-0.540
15	36	0.029	-0.031	0.029	-0.031	0.039	-0.042		73	0.481	-0.352	0.481	-0.352	0.649	-0.475
	37	0.030	-0.024	0.030	-0.024	0.041	-0.033	50	73	0.460	-0.384	0.460	-0.384	0.621	-0.518
16	37	0.029	-0.032	0.029	-0.032	0.040	-0.043		74	0.470	-0.368	0.470	-0.368	0.635	-0.497
	38	0.030	-0.022	0.030	-0.022	0.041	-0.030	51	74	0.470	-0.368	0.470	-0.368	0.635	-0.497
17	38	0.029	-0.032	0.029	-0.032	0.040	-0.044		75	0.460	-0.384	0.460	-0.384	0.621	-0.518
	39	0.027	-0.023	0.027	-0.023	0.036	-0.031	52	75	0.481	-0.352	0.481	-0.352	0.649	-0.475
18	39	0.026	-0.033	0.026	-0.033	0.035	-0.044		76	0.450	-0.400	0.450	-0.400	0.607	-0.540
	40	0.024	-0.021	0.024	-0.021	0.032	-0.028	53	76	0.491	-0.336	0.491	-0.336	0.663	-0.454
19	40	0.098	-0.031	0.098	-0.031	0.132	-0.041		77	0.440	-0.416	0.440	-0.416	0.593	-0.561
	41	0.017	-0.270	0.017	-0.270	0.023	-0.365	54	77	0.502	-0.320	0.502	-0.320	0.677	-0.432
20	41	0.367	-0.041	0.367	-0.041	0.495	-0.056		78	0.429	-0.432	0.429	-0.432	0.580	-0.583
	42	0.045	-1.180	0.045	-1.180	0.061	-1.593	55	78	0.512	-0.304	0.512	-0.304	0.692	-0.411
21	43	0.023	-0.714	0.023	-0.714	0.032	-0.964		79	0.419	-0.448	0.419	-0.448	0.566	-0.604
	44	0.207	-2.386	0.207	-2.386	0.280	-3.221	56	79	0.523	-0.285	0.523	-0.285	0.706	-0.385
22	44	0.112	-0.663	0.112	-0.663	0.151	-0.896		80	0.405	-0.464	0.405	-0.464	0.547	-0.626
	45	0.231	-0.085	0.231	-0.085	0.312	-0.115	57	80	0.529	-0.222	0.529	-0.222	0.715	-0.300
23	45	0.153	-0.226	0.153	-0.226	0.207	-0.305		81	0.343	-0.476	0.343	-0.476	0.463	-0.642
	46	0.254	-0.112	0.254	-0.112	0.343	-0.151	58	81	0.488	-0.230	0.488	-0.230	0.659	-0.311
24	46	0.186	-0.243	0.186	-0.243	0.252	-0.327		82	0.281	-0.445	0.281	-0.445	0.379	-0.601
	47	0.277	-0.110	0.277	-0.110	0.374	-0.149	59	82	0.447	-0.125	0.447	-0.125	0.604	-0.169
25	47	0.219	-0.236	0.219	-0.236	0.296	-0.319		83	0.201	-0.900	0.201	-0.900	0.271	-1.215
	48	0.275	-0.143	0.275	-0.143	0.371	-0.193	60	83	0.394	-4.482	0.394	-4.482	0.532	-6.051
26	48	0.226	-0.228	0.226	-0.228	0.306	-0.308		84	0.406	-0.120	0.406	-0.120	0.547	-0.162
	49	0.270	-0.153	0.270	-0.153	0.364	-0.207	61	85	0.628	-0.120	0.628	-0.120	0.848	-0.162
27	49	0.231	-0.220	0.231	-0.220	0.312	-0.297		86	0.435	-5.178	0.435	-5.178	0.587	-6.990
	50	0.265	-0.162	0.265	-0.162	0.358	-0.218	62	86	0.240	-0.967	0.240	-0.967	0.324	-1.306
28	50	0.236	-0.211	0.236	-0.211	0.319	-0.285		87	0.544	-0.140	0.544	-0.140	0.735	-0.189
	51	0.260	-0.170	0.260	-0.170	0.351	-0.229	63	87	0.337	-0.541	0.337	-0.541	0.455	-0.731
29	51	0.241	-0.203	0.241	-0.203	0.325	-0.274		88	0.594	-0.282	0.594	-0.282	0.801	-0.381
	52	0.255	-0.178	0.255	-0.178	0.345	-0.241	64	88	0.413	-0.579	0.413	-0.579	0.557	-0.781
30	52	0.246	-0.195	0.246	-0.195	0.332	-0.263		89	0.644	-0.269	0.644	-0.269	0.869	-0.364
	53	0.251	-0.186	0.251	-0.186	0.338	-0.252	65	89	0.489	-0.564	0.489	-0.564	0.660	-0.761
31	53	0.251	-0.186	0.251	-0.186	0.338	-0.252		90	0.636	-0.345	0.636	-0.345	0.859	-0.466
	54	0.246	-0.195	0.246	-0.195	0.332	-0.263	66	90	0.507	-0.544	0.507	-0.544	0.684	-0.735
32	54	0.255	-0.178	0.255	-0.178	0.345	-0.241		91	0.623	-0.369	0.623	-0.369	0.841	-0.499
	55	0.241	-0.203	0.241	-0.203	0.325	-0.274	67	91	0.520	-0.525	0.520	-0.525	0.701	-0.708
33	55	0.260	-0.170	0.260	-0.170	0.351	-0.229		92	0.610	-0.389	0.610	-0.389	0.824	-0.525
	56	0.236	-0.211	0.236	-0.211	0.319	-0.285	68	92	0.533	-0.505	0.533	-0.505	0.719	-0.682
34	56	0.265	-0.162	0.265	-0.162	0.358	-0.218		93	0.597	-0.408	0.597	-0.408	0.806	-0.551
	57	0.231	-0.220	0.231	-0.220	0.312	-0.297	69	93	0.545	-0.486	0.545	-0.486	0.736	-0.656
35	57	0.270	-0.153	0.270	-0.153	0.364	-0.207		94	0.584	-0.428	0.584	-0.428	0.789	-0.577
	58	0.226	-0.228	0.226	-0.228	0.306	-0.308	70	94	0.558	-0.466	0.558	-0.466	0.754	-0.630
36	58	0.275	-0.143	0.275	-0.143	0.371	-0.193		95	0.571	-0.447	0.571	-0.447	0.771	-0.603
	59	0.219	-0.236	0.219	-0.236	0.296	-0.319	71	95	0.571	-0.447	0.571	-0.447	0.771	-0.603
37	59	0.277	-0.110	0.277	-0.110	0.374	-0.149		96	0.558	-0.466	0.558	-0.466	0.754	-0.630
	60	0.186	-0.243	0.186	-0.243	0.252	-0.327	72	96	0.584	-0.428	0.584	-0.428	0.789	-0.577
38	60	0.254	-0.112	0.254	-0.112	0.343	-0.151		97	0.545	-0.486	0.545	-0.486	0.736	-0.656
	61	0.153	-0.226	0.153	-0.226	0.207	-0.305	73	97	0.597	-0.408	0.597	-0.408	0.806	-0.551
39	61	0.231	-0.085	0.231	-0.085	0.312	-0.115		98	0.533	-0.505	0.533	-0.505	0.719	-0.682
	62	0.112	-0.663	0.112	-0.663	0.151	-0.896	74	98	0.610	-0.389	0.610	-0.389	0.824	-0.525
40	62	0.207	-2.386	0.207	-2.386	0.280	-3.221		99	0.520	-0.525	0.520	-0.525	0.701	-0.708
	63	0.023	-0.714	0.023	-0.714	0.032	-0.964	75	99	0.623	-0.369	0.623	-0.369	0.841	-0.499
41	64	0.405	-0.120	0.405	-0.120	0.547	-0.162		100	0.507	-0.544	0.507	-0.544	0.684	-0.735
	65	0.394	-4.482	0.394	-4.482	0.532	-6.051	76	100	0.636	-0.345	0.636	-0.345	0.859	-0.466
42	65	0.201	-0.900	0.201	-0.900	0.271	-1.215		101	0.489	-0.564	0.489	-0.564	0.660	-0.761
	66	0.447	-0.125	0.447	-0.125	0.604	-0.169	77	101	0.644	-0.269	0.644	-0.269	0.869	-0.364
43	66	0.281	-0.445	0.281	-0.445	0.379	-0.601		102	0.413	-0.579	0.413	-0.579	0.557	-0.781
	67	0.488	-0.230	0.488	-0.230	0.659	-0.311	78	102	0.594	-0.282	0.594	-0.282	0.801	-0.381
44	67	0.343	-0.476	0.343	-0.476	0.463	-0.642		103	0.337	-0.541	0.337	-0.541	0.455	-0.731
	68	0.529	-0.222	0.529	-0.222	0.715	-0.300	79	103	0.544	-0.140	0.544	-0.140	0.735	-0.189
45	68	0.405	-0.464	0.405	-0.464	0.547	-0.626		104	0.240	-0.967	0.240	-0.967	0.324	-1.306
	69	0.523	-0.285	0.523	-0.285	0.706	-0.385	80	104	0.435	-5.178	0.435	-5.178	0.587	-6.990
46	69	0.419	-0.448	0.419	-0.448	0.566	-0.604		105	0.628	-0.120	0.628	-0.120	0.848	-0.162
	70	0.512	-0.304	0.512	-0.304	0.692	-0.411	81	106	0.405	-0.143	0.405	-0.143	0.547	-0.193
47	70	0.429	-0.432	0.429	-0.432	0.580	-0.583		107	0.394	-4.482	0.394	-4.482	0.532	-6.051

82	107	0.201	-0.900	0.201	-0.900	0.271	-1.215		143	0.219	-0.236	0.219	-0.236	0.296	-0.319
	108	0.447	-0.125	0.447	-0.125	0.604	-0.169	117	143	0.277	-0.110	0.277	-0.110	0.374	-0.149
83	108	0.281	-0.445	0.281	-0.445	0.379	-0.601		144	0.186	-0.243	0.186	-0.243	0.252	-0.327
	109	0.488	-0.230	0.488	-0.230	0.659	-0.311	118	144	0.254	-0.112	0.254	-0.112	0.343	-0.151
84	109	0.343	-0.476	0.343	-0.476	0.463	-0.642		145	0.153	-0.226	0.153	-0.226	0.207	-0.305
	110	0.529	-0.222	0.529	-0.222	0.715	-0.300	119	145	0.231	-0.085	0.231	-0.085	0.312	-0.115
85	110	0.405	-0.464	0.405	-0.464	0.547	-0.626		146	0.112	-0.663	0.112	-0.663	0.151	-0.896
	111	0.523	-0.285	0.523	-0.285	0.706	-0.385	120	146	0.207	-2.386	0.207	-2.386	0.280	-3.221
86	111	0.419	-0.448	0.419	-0.448	0.566	-0.604		147	0.023	-0.714	0.023	-0.714	0.032	-0.964
	112	0.512	-0.304	0.512	-0.304	0.692	-0.411	121	148	0.045	-1.180	0.045	-1.180	0.061	-1.594
87	112	0.429	-0.432	0.429	-0.432	0.580	-0.583		149	0.367	-0.041	0.367	-0.041	0.495	-0.056
	113	0.502	-0.320	0.502	-0.320	0.677	-0.432	122	149	0.017	-0.270	0.017	-0.270	0.023	-0.365
88	113	0.440	-0.416	0.440	-0.416	0.593	-0.561		150	0.098	-0.031	0.098	-0.031	0.132	-0.041
	114	0.491	-0.336	0.491	-0.336	0.663	-0.454	123	150	0.024	-0.021	0.024	-0.021	0.032	-0.028
89	114	0.450	-0.400	0.450	-0.400	0.607	-0.540		151	0.026	-0.033	0.026	-0.033	0.035	-0.044
	115	0.481	-0.352	0.481	-0.352	0.649	-0.475	124	151	0.027	-0.023	0.027	-0.023	0.036	-0.031
90	115	0.460	-0.384	0.460	-0.384	0.621	-0.518		152	0.029	-0.032	0.029	-0.032	0.040	-0.044
	116	0.470	-0.368	0.470	-0.368	0.635	-0.497	125	152	0.030	-0.022	0.030	-0.022	0.041	-0.030
91	116	0.470	-0.368	0.470	-0.368	0.635	-0.497		153	0.029	-0.032	0.029	-0.032	0.040	-0.043
	117	0.460	-0.384	0.460	-0.384	0.621	-0.518	126	153	0.030	-0.024	0.030	-0.024	0.041	-0.033
92	117	0.481	-0.352	0.481	-0.352	0.649	-0.475		154	0.029	-0.031	0.029	-0.031	0.039	-0.042
	118	0.450	-0.400	0.450	-0.400	0.607	-0.540	127	154	0.030	-0.025	0.030	-0.025	0.040	-0.034
93	118	0.491	-0.336	0.491	-0.336	0.663	-0.454		155	0.029	-0.030	0.029	-0.030	0.039	-0.041
	119	0.440	-0.416	0.440	-0.416	0.593	-0.561	128	155	0.029	-0.026	0.029	-0.026	0.039	-0.035
94	119	0.502	-0.320	0.502	-0.320	0.677	-0.432		156	0.029	-0.029	0.029	-0.029	0.039	-0.040
	120	0.429	-0.432	0.429	-0.432	0.580	-0.583	129	156	0.029	-0.027	0.029	-0.027	0.039	-0.036
95	120	0.512	-0.304	0.512	-0.304	0.692	-0.411		157	0.029	-0.029	0.029	-0.029	0.039	-0.039
	121	0.419	-0.448	0.419	-0.448	0.566	-0.604	130	157	0.029	-0.027	0.029	-0.027	0.039	-0.037
96	121	0.523	-0.285	0.523	-0.285	0.706	-0.385		158	0.029	-0.028	0.029	-0.028	0.039	-0.038
	122	0.405	-0.464	0.405	-0.464	0.547	-0.626	131	158	0.029	-0.028	0.029	-0.028	0.039	-0.038
97	122	0.529	-0.222	0.529	-0.222	0.715	-0.300		159	0.029	-0.027	0.029	-0.027	0.039	-0.037
	123	0.343	-0.476	0.343	-0.476	0.463	-0.642	132	159	0.029	-0.029	0.029	-0.029	0.039	-0.039
98	123	0.488	-0.230	0.488	-0.230	0.659	-0.311		160	0.029	-0.027	0.029	-0.027	0.039	-0.036
	124	0.281	-0.445	0.281	-0.445	0.379	-0.601	133	160	0.029	-0.029	0.029	-0.029	0.039	-0.040
99	124	0.447	-0.125	0.447	-0.125	0.604	-0.169		161	0.029	-0.026	0.029	-0.026	0.039	-0.035
	125	0.201	-0.900	0.201	-0.900	0.271	-1.215	134	161	0.029	-0.030	0.029	-0.030	0.039	-0.041
100	125	0.394	-4.482	0.394	-4.482	0.532	-6.051		162	0.030	-0.025	0.030	-0.025	0.040	-0.034
	126	0.406	-0.143	0.406	-0.143	0.547	-0.193	135	162	0.029	-0.031	0.029	-0.031	0.039	-0.042
101	127	0.023	-0.714	0.023	-0.714	0.032	-0.964		163	0.030	-0.024	0.030	-0.024	0.041	-0.033
	128	0.207	-2.386	0.207	-2.386	0.280	-3.221	136	163	0.029	-0.032	0.029	-0.032	0.040	-0.043
102	128	0.112	-0.663	0.112	-0.663	0.151	-0.896		164	0.030	-0.022	0.030	-0.022	0.041	-0.030
	129	0.231	-0.085	0.231	-0.085	0.312	-0.115	137	164	0.029	-0.032	0.029	-0.032	0.040	-0.044
103	129	0.153	-0.226	0.153	-0.226	0.207	-0.305		165	0.027	-0.023	0.027	-0.023	0.036	-0.031
	130	0.254	-0.112	0.254	-0.112	0.343	-0.151	138	165	0.026	-0.033	0.026	-0.033	0.035	-0.044
104	130	0.186	-0.243	0.186	-0.243	0.252	-0.327		166	0.024	-0.021	0.024	-0.021	0.032	-0.028
	131	0.277	-0.110	0.277	-0.110	0.374	-0.149	139	166	0.098	-0.031	0.098	-0.031	0.132	-0.041
105	131	0.219	-0.236	0.219	-0.236	0.296	-0.319		167	0.017	-0.270	0.017	-0.270	0.023	-0.365
	132	0.275	-0.143	0.275	-0.143	0.371	-0.193	140	167	0.367	-0.041	0.367	-0.041	0.495	-0.056
106	132	0.226	-0.228	0.226	-0.228	0.306	-0.308		168	0.045	-1.180	0.045	-1.180	0.061	-1.593
	133	0.270	-0.153	0.270	-0.153	0.364	-0.207	141	1	0.160	-26.467	0.160	-26.467	0.216	-35.731
107	133	0.231	-0.220	0.231	-0.220	0.312	-0.297		22	1.957	-12.662	1.957	-12.662	2.641	-17.094
	134	0.265	-0.162	0.265	-0.162	0.358	-0.218	142	2	0.012	-3.462	0.012	-3.462	0.016	-4.673
108	134	0.236	-0.211	0.236	-0.211	0.319	-0.285		23	0.008	-2.478	0.008	-2.478	0.011	-3.345
	135	0.260	-0.170	0.260	-0.170	0.351	-0.229	143	3	0.024	-3.100	0.024	-3.100	0.032	-4.185
109	135	0.241	-0.203	0.241	-0.203	0.325	-0.274		24	0.011	-2.003	0.011	-2.003	0.014	-2.704
	136	0.255	-0.178	0.255	-0.178	0.345	-0.241	144	4	0.008	-3.294	0.008	-3.294	0.011	-4.447
110	136	0.246	-0.195	0.246	-0.195	0.332	-0.263		25	0.013	-2.127	0.013	-2.127	0.017	-2.871
	137	0.251	-0.186	0.251	-0.186	0.338	-0.252	145	5	0.006	-3.488	0.006	-3.488	0.008	-4.709
111	137	0.251	-0.186	0.251	-0.186	0.338	-0.252		26	0.015	-2.250	0.015	-2.250	0.021	-3.037
	138	0.246	-0.195	0.246	-0.195	0.332	-0.263	146	6	0.005	-3.503	0.005	-3.503	0.007	-4.729
112	138	0.255	-0.178	0.255	-0.178	0.345	-0.241		27	0.015	-2.260	0.015	-2.260	0.021	-3.050
	139	0.241	-0.203	0.241	-0.203	0.325	-0.274	147	7	0.004	-3.503	0.004	-3.503	0.006	-4.729
113	139	0.260	-0.170	0.260	-0.170	0.351	-0.229		28	0.015	-2.260	0.015	-2.260	0.021	-3.050
	140	0.236	-0.211	0.236	-0.211	0.319	-0.285	148	8	0.003	-3.503	0.003	-3.503	0.004	-4.729
114	140	0.265	-0.162	0.265	-0.162	0.358	-0.218		29	0.015	-2.260	0.015	-2.260	0.021	-3.050
	141	0.231	-0.220	0.231	-0.220	0.312	-0.297	149	9	0.003	-3.503	0.003	-3.503	0.004	-4.729
115	141	0.270	-0.153	0.270	-0.153	0.364	-0.207		30	0.015	-2.260	0.015	-2.260	0.021	-3.050
	142	0.226	-0.228	0.226	-0.228	0.306	-0.308	150	10	0.003	-3.503	0.003	-3.503	0.003	-4.729
116	142	0.275	-0.143	0.275	-0.143	0.371	-0.193		31	0.015	-2.260	0.015	-2.260	0.021	-3.050

151	11	0.002	-3.503	0.002	-3.503	0.003	-4.729		66	2.237	-0.027	2.237	-0.027	3.019	-0.036
	32	0.015	-2.260	0.015	-2.260	0.021	-3.050	186	46	1.214	-0.459	1.214	-0.459	1.639	-0.620
152	12	0.003	-3.503	0.003	-3.503	0.003	-4.729		67	2.380	-0.005	2.380	-0.005	3.213	-0.007
	33	0.015	-2.260	0.015	-2.260	0.021	-3.050	187	47	1.289	-0.488	1.289	-0.488	1.740	-0.659
153	13	0.003	-3.503	0.003	-3.503	0.004	-4.729		68	2.524	-0.003	2.524	-0.003	3.407	-0.004
	34	0.015	-2.260	0.015	-2.260	0.021	-3.050	188	48	1.295	-0.490	1.295	-0.490	1.748	-0.662
154	14	0.003	-3.503	0.003	-3.503	0.004	-4.729		69	2.535	-0.003	2.535	-0.003	3.422	-0.003
	35	0.015	-2.260	0.015	-2.260	0.021	-3.050	189	49	1.295	-0.490	1.295	-0.490	1.748	-0.662
155	15	0.004	-3.503	0.004	-3.503	0.006	-4.729		70	2.535	-0.002	2.535	-0.002	3.422	-0.003
	36	0.015	-2.260	0.015	-2.260	0.021	-3.050	190	50	1.295	-0.490	1.295	-0.490	1.748	-0.662
156	16	0.005	-3.503	0.005	-3.503	0.007	-4.729		71	2.535	-0.002	2.535	-0.002	3.422	-0.002
	37	0.015	-2.260	0.015	-2.260	0.021	-3.050	191	51	1.295	-0.490	1.295	-0.490	1.748	-0.662
157	17	0.006	-3.488	0.006	-3.488	0.008	-4.709		72	2.535	-0.001	2.535	-0.001	3.422	-0.002
	38	0.015	-2.250	0.015	-2.250	0.021	-3.037	192	52	1.295	-0.490	1.295	-0.490	1.748	-0.662
158	18	0.008	-3.294	0.008	-3.294	0.011	-4.447		73	2.535	-0.001	2.535	-0.001	3.422	-0.002
	39	0.013	-2.126	0.013	-2.126	0.017	-2.871	193	53	1.295	-0.490	1.295	-0.490	1.748	-0.662
159	19	0.024	-3.100	0.024	-3.100	0.032	-4.185		74	2.535	-0.001	2.535	-0.001	3.422	-0.001
	40	0.011	-2.003	0.011	-2.003	0.014	-2.704	194	54	1.295	-0.490	1.295	-0.490	1.748	-0.662
160	20	0.012	-3.462	0.012	-3.462	0.016	-4.673		75	2.535	-0.001	2.535	-0.001	3.422	-0.002
	41	0.008	-2.478	0.008	-2.478	0.011	-3.345	195	55	1.295	-0.490	1.295	-0.490	1.748	-0.662
161	21	0.160	-26.467	0.160	-26.467	0.216	-35.730		76	2.535	-0.001	2.535	-0.001	3.422	-0.002
	42	1.957	-12.662	1.957	-12.662	2.641	-17.093	196	56	1.295	-0.490	1.295	-0.490	1.748	-0.662
162	22	0.113	-17.475	0.113	-17.475	0.152	-23.591		77	2.535	-0.002	2.535	-0.002	3.422	-0.002
	43	15.418	-0.586	15.418	-0.586	20.814	-0.791	197	57	1.295	-0.490	1.295	-0.490	1.748	-0.662
163	23	0.008	-2.213	0.008	-2.213	0.011	-2.987		78	2.535	-0.002	2.535	-0.002	3.422	-0.003
	44	1.086	-0.621	1.086	-0.621	1.466	-0.838	198	58	1.295	-0.490	1.295	-0.490	1.748	-0.662
164	24	0.016	-2.040	0.016	-2.040	0.021	-2.755		79	2.535	-0.003	2.535	-0.003	3.422	-0.003
	45	1.173	-0.386	1.173	-0.386	1.583	-0.521	199	59	1.289	-0.488	1.289	-0.488	1.740	-0.659
165	25	0.006	-2.169	0.006	-2.169	0.008	-2.928		80	2.524	-0.003	2.524	-0.003	3.407	-0.004
	46	1.252	-0.409	1.252	-0.409	1.690	-0.552	200	60	1.214	-0.459	1.214	-0.459	1.639	-0.620
166	26	0.004	-2.297	0.004	-2.297	0.005	-3.101		81	2.380	-0.005	2.380	-0.005	3.213	-0.007
	47	1.331	-0.431	1.331	-0.431	1.797	-0.583	201	61	1.139	-0.430	1.139	-0.430	1.538	-0.581
167	27	0.003	-2.307	0.003	-2.307	0.004	-3.115		82	2.237	-0.027	2.237	-0.027	3.019	-0.036
	48	1.337	-0.433	1.337	-0.433	1.805	-0.585	202	62	1.062	-0.396	1.062	-0.396	1.433	-0.535
168	28	0.003	-2.307	0.003	-2.307	0.004	-3.115		83	2.184	-0.006	2.184	-0.006	2.949	-0.008
	49	1.337	-0.433	1.337	-0.433	1.805	-0.585	203	63	11.802	-6.126	11.802	-6.126	15.933	-8.270
169	29	0.002	-2.307	0.002	-2.307	0.003	-3.115		84	21.224	-0.092	21.224	-0.092	28.652	-0.125
	50	1.337	-0.433	1.337	-0.433	1.805	-0.585	204	64	18.666	-1.706	18.666	-1.706	25.199	-2.304
170	30	0.002	-2.307	0.002	-2.307	0.003	-3.115		85	18.114	-0.093	18.114	-0.093	24.454	-0.125
	51	1.337	-0.433	1.337	-0.433	1.805	-0.585	205	65	2.320	-0.003	2.320	-0.003	3.132	-0.005
171	31	0.002	-2.307	0.002	-2.307	0.002	-3.115		86	2.686	-0.006	2.686	-0.006	3.627	-0.008
	52	1.337	-0.433	1.337	-0.433	1.805	-0.585	206	66	2.206	-0.004	2.206	-0.004	2.979	-0.005
172	32	0.001	-2.307	0.001	-2.307	0.002	-3.115		87	2.349	-0.007	2.349	-0.007	3.171	-0.009
	53	1.337	-0.433	1.337	-0.433	1.805	-0.585	207	67	2.346	-0.001	2.346	-0.001	3.167	-0.002
173	33	0.002	-2.307	0.002	-2.307	0.002	-3.115		88	2.496	-0.004	2.496	-0.004	3.369	-0.005
	54	1.337	-0.433	1.337	-0.433	1.805	-0.585	208	68	2.486	-0.002	2.486	-0.002	3.356	-0.002
174	34	0.002	-2.307	0.002	-2.307	0.003	-3.115		89	2.643	-0.003	2.643	-0.003	3.568	-0.004
	55	1.337	-0.433	1.337	-0.433	1.805	-0.585	209	69	2.497	-0.002	2.497	-0.002	3.370	-0.002
175	35	0.002	-2.307	0.002	-2.307	0.003	-3.115		90	2.654	-0.003	2.654	-0.003	3.583	-0.003
	56	1.337	-0.433	1.337	-0.433	1.805	-0.585	210	70	2.497	-0.001	2.497	-0.001	3.370	-0.002
176	36	0.003	-2.307	0.003	-2.307	0.004	-3.115		91	2.654	-0.002	2.654	-0.002	3.583	-0.003
	57	1.337	-0.433	1.337	-0.433	1.805	-0.585	211	71	2.497	-0.001	2.497	-0.001	3.370	-0.001
177	37	0.003	-2.307	0.003	-2.307	0.004	-3.115		92	2.654	-0.002	2.654	-0.002	3.583	-0.002
	58	1.337	-0.433	1.337	-0.433	1.805	-0.585	212	72	2.497	-0.001	2.497	-0.001	3.370	-0.001
178	38	0.004	-2.297	0.004	-2.297	0.005	-3.101		93	2.654	-0.001	2.654	-0.001	3.583	-0.002
	59	1.331	-0.431	1.331	-0.431	1.797	-0.583	213	73	2.497	-0.001	2.497	-0.001	3.370	-0.001
179	39	0.006	-2.169	0.006	-2.169	0.008	-2.928		94	2.654	-0.001	2.654	-0.001	3.583	-0.002
	60	1.252	-0.409	1.252	-0.409	1.690	-0.552	214	74	2.497	-0.001	2.497	-0.001	3.370	-0.001
180	40	0.016	-2.040	0.016	-2.040	0.021	-2.755		95	2.654	-0.001	2.654	-0.001	3.583	-0.001
	61	1.173	-0.386	1.173	-0.386	1.583	-0.521	215	75	2.497	-0.001	2.497	-0.001	3.370	-0.001
181	41	0.008	-2.213	0.008	-2.213	0.011	-2.987		96	2.654	-0.001	2.654	-0.001	3.583	-0.002
	62	1.086	-0.621	1.086	-0.621	1.466	-0.838	216	76	2.497	-0.001	2.497	-0.001	3.370	-0.001
182	42	0.113	-17.474	0.113	-17.474	0.152	-23.590		97	2.654	-0.001	2.654	-0.001	3.583	-0.002
	63	15.418	-0.586	15.418	-0.586	20.814	-0.791	217	77	2.497	-0.001	2.497	-0.001	3.370	-0.001
183	43	11.803	-6.126	11.803	-6.126	15.933	-8.270		98	2.654	-0.002	2.654	-0.002	3.583	-0.002
	64	21.224	-0.092	21.224	-0.092	28.652	-0.125	218	78	2.497	-0.001	2.497	-0.001	3.370	-0.002
184	44	1.062	-0.396	1.062	-0.396	1.433	-0.535		99	2.654	-0.002	2.654	-0.002	3.583	-0.003
	65	2.184	-0.006	2.184	-0.006	2.949	-0.008	219	79	2.497	-0.002	2.497	-0.002	3.370	-0.002
185	45	1.139	-0.430	1.139	-0.430	1.538	-0.581		100	2.654	-0.003	2.654	-0.003	3.583	-0.003

220	80	2.486	-0.002	2.486	-0.002	3.356	-0.002		135	1.295	-0.490	1.295	-0.490	1.748	-0.662
	101	2.643	-0.003	2.643	-0.003	3.568	-0.004	255	115	2.535	-0.001	2.535	-0.001	3.422	-0.002
221	81	2.346	-0.001	2.346	-0.001	3.167	-0.002		136	1.295	-0.490	1.295	-0.490	1.748	-0.662
	102	2.496	-0.004	2.496	-0.004	3.369	-0.005	256	116	2.535	-0.001	2.535	-0.001	3.422	-0.001
222	82	2.206	-0.004	2.206	-0.004	2.979	-0.005		137	1.295	-0.490	1.295	-0.490	1.748	-0.662
	103	2.349	-0.007	2.349	-0.007	3.171	-0.009	257	117	2.535	-0.001	2.535	-0.001	3.422	-0.002
223	83	2.320	-0.003	2.320	-0.003	3.132	-0.005		138	1.295	-0.490	1.295	-0.490	1.748	-0.662
	104	2.686	-0.006	2.686	-0.006	3.627	-0.008	258	118	2.535	-0.001	2.535	-0.001	3.422	-0.002
224	84	18.666	-1.706	18.666	-1.706	25.199	-2.304		139	1.295	-0.490	1.295	-0.490	1.748	-0.662
	105	18.114	-0.093	18.114	-0.093	24.454	-0.125	259	119	2.535	-0.002	2.535	-0.002	3.422	-0.002
225	85	18.114	-0.093	18.114	-0.093	24.454	-0.125		140	1.295	-0.490	1.295	-0.490	1.748	-0.662
	106	19.001	-1.706	19.001	-1.706	25.651	-2.304	260	120	2.535	-0.002	2.535	-0.002	3.422	-0.003
226	86	2.686	-0.006	2.686	-0.006	3.627	-0.008		141	1.295	-0.490	1.295	-0.490	1.748	-0.662
	107	2.327	-0.003	2.327	-0.003	3.141	-0.005	261	121	2.535	-0.003	2.535	-0.003	3.422	-0.003
227	87	2.349	-0.007	2.349	-0.007	3.171	-0.009		142	1.295	-0.490	1.295	-0.490	1.748	-0.662
	108	2.206	-0.004	2.206	-0.004	2.979	-0.005	262	122	2.524	-0.003	2.524	-0.003	3.407	-0.004
228	88	2.496	-0.004	2.496	-0.004	3.369	-0.005		143	1.289	-0.488	1.289	-0.488	1.740	-0.659
	109	2.346	-0.001	2.346	-0.001	3.167	-0.002	263	123	2.380	-0.005	2.380	-0.005	3.213	-0.007
229	89	2.643	-0.003	2.643	-0.003	3.568	-0.004		144	1.214	-0.459	1.214	-0.459	1.639	-0.620
	110	2.486	-0.002	2.486	-0.002	3.356	-0.002	264	124	2.237	-0.026	2.237	-0.026	3.019	-0.036
230	90	2.654	-0.003	2.654	-0.003	3.583	-0.003		145	1.139	-0.430	1.139	-0.430	1.538	-0.581
	111	2.497	-0.002	2.497	-0.002	3.370	-0.002	265	125	2.182	-0.006	2.182	-0.006	2.945	-0.008
231	91	2.654	-0.002	2.654	-0.002	3.583	-0.003		146	1.062	-0.396	1.062	-0.396	1.433	-0.535
	112	2.497	-0.001	2.497	-0.001	3.370	-0.002	266	126	21.709	-0.092	21.709	-0.092	29.307	-0.125
232	92	2.654	-0.002	2.654	-0.002	3.583	-0.002		147	11.802	-6.126	11.802	-6.126	15.933	-8.270
	113	2.497	-0.001	2.497	-0.001	3.370	-0.001	267	127	15.418	-0.586	15.418	-0.586	20.814	-0.791
233	93	2.654	-0.001	2.654	-0.001	3.583	-0.002		148	0.113	-17.447	0.113	-17.447	0.152	-23.553
	114	2.497	-0.001	2.497	-0.001	3.370	-0.001	268	128	1.086	-0.621	1.086	-0.621	1.466	-0.838
234	94	2.654	-0.001	2.654	-0.001	3.583	-0.002		149	0.008	-2.213	0.008	-2.213	0.011	-2.987
	115	2.497	-0.001	2.497	-0.001	3.370	-0.001	269	129	1.173	-0.386	1.173	-0.386	1.583	-0.521
235	95	2.654	-0.001	2.654	-0.001	3.583	-0.001		150	0.016	-2.040	0.016	-2.040	0.021	-2.755
	116	2.497	-0.001	2.497	-0.001	3.370	-0.001	270	130	1.252	-0.409	1.252	-0.409	1.690	-0.552
236	96	2.654	-0.001	2.654	-0.001	3.583	-0.002		151	0.006	-2.169	0.006	-2.169	0.008	-2.928
	117	2.497	-0.001	2.497	-0.001	3.370	-0.001	271	131	1.331	-0.431	1.331	-0.431	1.797	-0.583
237	97	2.654	-0.001	2.654	-0.001	3.583	-0.002		152	0.004	-2.297	0.004	-2.297	0.005	-3.101
	118	2.497	-0.001	2.497	-0.001	3.370	-0.001	272	132	1.337	-0.433	1.337	-0.433	1.805	-0.585
238	98	2.654	-0.002	2.654	-0.002	3.583	-0.002		153	0.003	-2.307	0.003	-2.307	0.004	-3.115
	119	2.497	-0.001	2.497	-0.001	3.370	-0.001	273	133	1.337	-0.433	1.337	-0.433	1.805	-0.585
239	99	2.654	-0.002	2.654	-0.002	3.583	-0.003		154	0.003	-2.307	0.003	-2.307	0.004	-3.115
	120	2.497	-0.001	2.497	-0.001	3.370	-0.002	274	134	1.337	-0.433	1.337	-0.433	1.805	-0.585
240	100	2.654	-0.003	2.654	-0.003	3.583	-0.003		155	0.002	-2.307	0.002	-2.307	0.003	-3.115
	121	2.497	-0.002	2.497	-0.002	3.370	-0.002	275	135	1.337	-0.433	1.337	-0.433	1.805	-0.585
241	101	2.643	-0.003	2.643	-0.003	3.568	-0.004		156	0.002	-2.307	0.002	-2.307	0.003	-3.115
	122	2.486	-0.002	2.486	-0.002	3.356	-0.002	276	136	1.337	-0.433	1.337	-0.433	1.805	-0.585
242	102	2.496	-0.004	2.496	-0.004	3.369	-0.005		157	0.002	-2.307	0.002	-2.307	0.002	-3.115
	123	2.346	-0.001	2.346	-0.001	3.167	-0.002	277	137	1.337	-0.433	1.337	-0.433	1.805	-0.585
243	103	2.349	-0.007	2.349	-0.007	3.171	-0.009		158	0.001	-2.307	0.001	-2.307	0.002	-3.115
	124	2.206	-0.004	2.206	-0.004	2.979	-0.005	278	138	1.337	-0.433	1.337	-0.433	1.805	-0.585
244	104	2.686	-0.006	2.686	-0.006	3.627	-0.008		159	0.002	-2.307	0.002	-2.307	0.002	-3.115
	125	2.327	-0.003	2.327	-0.003	3.141	-0.005	279	139	1.337	-0.433	1.337	-0.433	1.805	-0.585
245	105	18.114	-0.093	18.114	-0.093	24.454	-0.125		160	0.002	-2.307	0.002	-2.307	0.003	-3.115
	126	19.001	-1.706	19.001	-1.706	25.651	-2.304	280	140	1.337	-0.433	1.337	-0.433	1.805	-0.585
246	106	21.709	-0.092	21.709	-0.092	29.307	-0.125		161	0.002	-2.307	0.002	-2.307	0.003	-3.115
	127	11.802	-6.126	11.802	-6.126	15.933	-8.270	281	141	1.337	-0.433	1.337	-0.433	1.805	-0.585
247	107	2.182	-0.006	2.182	-0.006	2.945	-0.008		162	0.003	-2.307	0.003	-2.307	0.004	-3.115
	128	1.062	-0.396	1.062	-0.396	1.433	-0.535	282	142	1.337	-0.433	1.337	-0.433	1.805	-0.585
248	108	2.237	-0.026	2.237	-0.026	3.019	-0.036		163	0.003	-2.307	0.003	-2.307	0.004	-3.115
	129	1.139	-0.430	1.139	-0.430	1.538	-0.581	283	143	1.331	-0.431	1.331	-0.431	1.797	-0.583
249	109	2.380	-0.005	2.380	-0.005	3.213	-0.007		164	0.004	-2.297	0.004	-2.297	0.005	-3.101
	130	1.214	-0.459	1.214	-0.459	1.639	-0.620	284	144	1.252	-0.409	1.252	-0.409	1.690	-0.552
250	110	2.524	-0.003	2.524	-0.003	3.407	-0.004		165	0.006	-2.169	0.006	-2.169	0.008	-2.928
	131	1.289	-0.488	1.289	-0.488	1.740	-0.659	285	145	1.173	-0.386	1.173	-0.386	1.583	-0.521
251	111	2.535	-0.003	2.535	-0.003	3.422	-0.003		166	0.016	-2.040	0.016	-2.040	0.021	-2.755
	132	1.295	-0.490	1.295	-0.490	1.748	-0.662	286	146	1.086	-0.621	1.086	-0.621	1.466	-0.838
252	112	2.535	-0.002	2.535	-0.002	3.422	-0.003		167	0.008	-2.213	0.008	-2.213	0.011	-2.987
	133	1.295	-0.490	1.295	-0.490	1.748	-0.662	287	147	15.418	-0.586	15.418	-0.586	20.814	-0.791
253	113	2.535	-0.002	2.535	-0.002	3.422	-0.002		168	0.113	-17.447	0.113	-17.447	0.152	-23.553
	134	1.295	-0.490	1.295	-0.490	1.748	-0.662	288	148	1.957	-12.651	1.957	-12.651	2.641	-17.079
254	114	2.535	-0.001	2.535	-0.001	3.422	-0.002		169	0.160	-26.467	0.160	-26.467	0.216	-35.731













254	114	0.062	0.041	0.062	0.041	0.083	0.041	169	-0.191	-0.287	-0.191	-0.287	-0.191	-0.388	
	135	0.005	0.003	0.005	0.003	0.006	0.003	289	149	-0.056	-0.084	-0.056	-0.084	-0.056	-0.114
255	115	0.062	0.041	0.062	0.041	0.083	0.041		170	-0.095	-0.142	-0.095	-0.142	-0.095	-0.192
	136	0.005	0.003	0.005	0.003	0.006	0.003	290	150	-0.060	-0.091	-0.060	-0.091	-0.060	-0.122
256	116	0.062	0.041	0.062	0.041	0.083	0.041		171	-0.105	-0.157	-0.105	-0.157	-0.105	-0.213
	137	0.005	0.003	0.005	0.003	0.006	0.003	291	151	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
257	117	0.062	0.041	0.062	0.041	0.083	0.041		172	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	138	0.005	0.003	0.005	0.003	0.006	0.003	292	152	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
258	118	0.062	0.041	0.062	0.041	0.083	0.041		173	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	139	0.005	0.003	0.005	0.003	0.006	0.003	293	153	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
259	119	0.062	0.041	0.062	0.041	0.083	0.041		174	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	140	0.005	0.003	0.005	0.003	0.006	0.003	294	154	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
260	120	0.062	0.041	0.062	0.041	0.083	0.041		175	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	141	0.005	0.003	0.005	0.003	0.006	0.003	295	155	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
261	121	0.062	0.041	0.062	0.041	0.083	0.041		176	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	142	0.005	0.003	0.005	0.003	0.006	0.003	296	156	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
262	122	0.062	0.041	0.062	0.041	0.083	0.041		177	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	143	0.005	0.003	0.005	0.003	0.006	0.003	297	157	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
263	123	0.062	0.041	0.062	0.041	0.083	0.041		178	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	144	0.005	0.003	0.005	0.003	0.006	0.003	298	158	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
264	124	0.062	0.041	0.062	0.041	0.084	0.041		179	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	145	0.005	0.003	0.005	0.003	0.006	0.003	299	159	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
265	125	0.056	0.037	0.056	0.037	0.076	0.037		180	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	146	0.005	0.003	0.005	0.003	0.006	0.003	300	160	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
266	126	0.109	0.073	0.109	0.073	0.147	0.073		181	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	147	0.004	0.002	0.004	0.002	0.005	0.002	301	161	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
267	127	0.042	0.028	0.042	0.028	0.057	0.028		182	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	148	-0.103	-0.155	-0.103	-0.155	-0.103	-0.209	302	162	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
268	128	0.002	0.001	0.002	0.001	0.003	0.001		183	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	149	-0.055	-0.082	-0.055	-0.082	-0.055	-0.111	303	163	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
269	129	0.005	0.003	0.005	0.003	0.007	0.003		184	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	150	-0.060	-0.091	-0.060	-0.091	-0.060	-0.122	304	164	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
270	130	0.005	0.003	0.005	0.003	0.006	0.003		185	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	151	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122	305	165	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122
271	131	0.005	0.003	0.005	0.003	0.006	0.003		186	-0.104	-0.156	-0.104	-0.156	-0.104	-0.211
	152	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122	306	166	-0.060	-0.091	-0.060	-0.091	-0.060	-0.122
272	132	0.005	0.003	0.005	0.003	0.006	0.003		187	-0.105	-0.157	-0.105	-0.157	-0.105	-0.213
	153	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122	307	167	-0.056	-0.084	-0.056	-0.084	-0.056	-0.114
273	133	0.005	0.003	0.005	0.003	0.006	0.003		188	-0.095	-0.142	-0.095	-0.142	-0.095	-0.192
	154	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122	308	168	-0.084	-0.126	-0.084	-0.126	-0.084	-0.170
274	134	0.005	0.003	0.005	0.003	0.006	0.003		189	-0.191	-0.287	-0.191	-0.287	-0.191	-0.388
	155	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
275	135	0.005	0.003	0.005	0.003	0.006	0.003								
	156	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
276	136	0.005	0.003	0.005	0.003	0.006	0.003								
	157	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
277	137	0.005	0.003	0.005	0.003	0.006	0.003								
	158	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
278	138	0.005	0.003	0.005	0.003	0.006	0.003								
	159	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
279	139	0.005	0.003	0.005	0.003	0.006	0.003								
	160	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
280	140	0.005	0.003	0.005	0.003	0.006	0.003								
	161	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
281	141	0.005	0.003	0.005	0.003	0.006	0.003								
	162	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
282	142	0.005	0.003	0.005	0.003	0.006	0.003								
	163	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
283	143	0.005	0.003	0.005	0.003	0.006	0.003								
	164	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
284	144	0.005	0.003	0.005	0.003	0.006	0.003								
	165	-0.060	-0.090	-0.060	-0.090	-0.060	-0.122								
285	145	0.005	0.003	0.005	0.003	0.007	0.003								
	166	-0.060	-0.091	-0.060	-0.091	-0.060	-0.122								
286	146	0.002	0.001	0.002	0.001	0.003	0.001								
	167	-0.055	-0.082	-0.055	-0.082	-0.055	-0.111								
287	147	0.042	0.028	0.042	0.028	0.057	0.028								
	168	-0.103	-0.155	-0.103	-0.155	-0.103	-0.209								
288	148	-0.084	-0.126	-0.084	-0.126	-0.084	-0.170								

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas debidas a la sobrecarga de tráfico.

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-
1	22	0.030	-0.081	0.030	-0.081	0.040	-0.110
	23	0.023	-0.213	0.023	-0.213	0.031	-0.288
2	23	0.037	-0.432	0.037	-0.432	0.050	-0.583
	24	0.032	-0.453	0.032	-0.453	0.043	-0.612
3	24	0.040	-0.454	0.040	-0.454	0.054	-0.614
	25	0.041	-0.454	0.041	-0.454	0.056	-0.613
4	25	0.041	-0.455	0.041	-0.455	0.056	-0.614
	26	0.041	-0.455	0.041	-0.455	0.056	-0.614
5	26	0.041	-0.455	0.041	-0.455	0.056	-0.614
	27	0.041	-0.455	0.041	-0.455	0.056	-0.614
6	27	0.041	-0.455	0.041	-0.455	0.056	-0.614
	28	0.041	-0.455	0.041	-0.455	0.056	-0.614
7	28	0.041	-0.455	0.041	-0.455	0.056	-0.614
	29	0.041	-0.455	0.041	-0.455	0.056	-0.614
8	29	0.041	-0.455	0.041	-0.455	0.056	-0.614
	30	0.041	-0.455	0.041	-0.455	0.056	-0.614
9	30	0.041	-0.455	0.041	-0.455	0.056	-0.614
	31	0.041	-0.455	0.041	-0.455	0.056	-0.614
10	31	0.041	-0.455	0.041	-0.455	0.056	-0.614
	32	0.041	-0.455	0.041	-0.455	0.056	-0.614
11	32	0.041	-0.455	0.041	-0.455	0.056	-0.614
	33	0.041	-0.455	0.041	-0.455	0.056	-0.614

12	33	0.041	-0.455	0.041	-0.455	0.056	-0.614		70	0.085	-0.499	0.085	-0.499	0.115	-0.673
	34	0.041	-0.455	0.041	-0.455	0.056	-0.614	47	70	0.085	-0.499	0.085	-0.499	0.115	-0.673
13	34	0.041	-0.455	0.041	-0.455	0.056	-0.614		71	0.085	-0.499	0.085	-0.499	0.115	-0.673
	35	0.041	-0.455	0.041	-0.455	0.056	-0.614	48	71	0.085	-0.499	0.085	-0.499	0.115	-0.673
14	35	0.041	-0.455	0.041	-0.455	0.056	-0.614		72	0.085	-0.499	0.085	-0.499	0.115	-0.673
	36	0.041	-0.455	0.041	-0.455	0.056	-0.614	49	72	0.085	-0.499	0.085	-0.499	0.115	-0.673
15	36	0.041	-0.455	0.041	-0.455	0.056	-0.614		73	0.085	-0.499	0.085	-0.499	0.115	-0.673
	37	0.041	-0.455	0.041	-0.455	0.056	-0.614	50	73	0.085	-0.499	0.085	-0.499	0.115	-0.673
16	37	0.041	-0.455	0.041	-0.455	0.056	-0.614		74	0.085	-0.499	0.085	-0.499	0.115	-0.673
	38	0.041	-0.455	0.041	-0.455	0.056	-0.614	51	74	0.085	-0.499	0.085	-0.499	0.115	-0.673
17	38	0.041	-0.455	0.041	-0.455	0.056	-0.614		75	0.085	-0.499	0.085	-0.499	0.115	-0.673
	39	0.041	-0.455	0.041	-0.455	0.056	-0.614	52	75	0.085	-0.499	0.085	-0.499	0.115	-0.673
18	39	0.041	-0.454	0.041	-0.454	0.056	-0.613		76	0.085	-0.499	0.085	-0.499	0.115	-0.673
	40	0.040	-0.454	0.040	-0.454	0.054	-0.614	53	76	0.085	-0.499	0.085	-0.499	0.115	-0.673
19	40	0.032	-0.453	0.032	-0.453	0.043	-0.612		77	0.085	-0.499	0.085	-0.499	0.115	-0.673
	41	0.037	-0.432	0.037	-0.432	0.050	-0.583	54	77	0.085	-0.499	0.085	-0.499	0.115	-0.673
20	41	0.023	-0.213	0.023	-0.213	0.031	-0.288		78	0.085	-0.499	0.085	-0.499	0.115	-0.673
	42	0.030	-0.081	0.030	-0.081	0.040	-0.110	55	78	0.085	-0.499	0.085	-0.499	0.115	-0.673
21	43	0.044	-0.045	0.044	-0.045	0.060	-0.061		79	0.085	-0.499	0.085	-0.499	0.115	-0.673
	44	0.009	-0.302	0.009	-0.302	0.012	-0.408	56	79	0.085	-0.499	0.085	-0.499	0.115	-0.673
22	44	0.068	-0.453	0.068	-0.453	0.091	-0.611		80	0.085	-0.499	0.085	-0.499	0.115	-0.673
	45	0.063	-0.487	0.063	-0.487	0.085	-0.657	57	80	0.085	-0.499	0.085	-0.499	0.115	-0.673
23	45	0.072	-0.488	0.072	-0.488	0.098	-0.659		81	0.085	-0.498	0.085	-0.498	0.115	-0.673
	46	0.076	-0.488	0.076	-0.488	0.102	-0.659	58	81	0.085	-0.497	0.085	-0.497	0.114	-0.672
24	46	0.076	-0.489	0.076	-0.489	0.102	-0.660		82	0.081	-0.497	0.081	-0.497	0.110	-0.672
	47	0.076	-0.489	0.076	-0.489	0.102	-0.661	59	82	0.075	-0.496	0.075	-0.496	0.101	-0.669
25	47	0.076	-0.489	0.076	-0.489	0.102	-0.661		83	0.076	-0.461	0.076	-0.461	0.102	-0.622
	48	0.076	-0.489	0.076	-0.489	0.102	-0.661	60	83	0.008	-0.366	0.008	-0.366	0.011	-0.494
26	48	0.076	-0.489	0.076	-0.489	0.102	-0.661		84	0.066	-0.045	0.066	-0.045	0.088	-0.061
	49	0.076	-0.489	0.076	-0.489	0.102	-0.661	61	85	0.073	-0.048	0.073	-0.048	0.099	-0.064
27	49	0.076	-0.489	0.076	-0.489	0.102	-0.661		86	0.007	-0.386	0.007	-0.386	0.010	-0.521
	50	0.076	-0.489	0.076	-0.489	0.102	-0.661	62	86	0.077	-0.463	0.077	-0.463	0.104	-0.625
28	50	0.076	-0.489	0.076	-0.489	0.102	-0.661		87	0.077	-0.497	0.077	-0.497	0.105	-0.671
	51	0.076	-0.489	0.076	-0.489	0.102	-0.661	63	87	0.082	-0.498	0.082	-0.498	0.111	-0.673
29	51	0.076	-0.489	0.076	-0.489	0.102	-0.661		88	0.086	-0.499	0.086	-0.499	0.116	-0.673
	52	0.076	-0.489	0.076	-0.489	0.102	-0.661	64	88	0.086	-0.499	0.086	-0.499	0.116	-0.674
30	52	0.076	-0.489	0.076	-0.489	0.102	-0.661		89	0.086	-0.500	0.086	-0.500	0.116	-0.674
	53	0.076	-0.489	0.076	-0.489	0.102	-0.661	65	89	0.086	-0.500	0.086	-0.500	0.116	-0.675
31	53	0.076	-0.489	0.076	-0.489	0.102	-0.661		90	0.086	-0.500	0.086	-0.500	0.116	-0.675
	54	0.076	-0.489	0.076	-0.489	0.102	-0.661	66	90	0.086	-0.500	0.086	-0.500	0.116	-0.675
32	54	0.076	-0.489	0.076	-0.489	0.102	-0.661		91	0.086	-0.500	0.086	-0.500	0.116	-0.675
	55	0.076	-0.489	0.076	-0.489	0.102	-0.661	67	91	0.086	-0.500	0.086	-0.500	0.116	-0.675
33	55	0.076	-0.489	0.076	-0.489	0.102	-0.661		92	0.086	-0.500	0.086	-0.500	0.116	-0.675
	56	0.076	-0.489	0.076	-0.489	0.102	-0.661	68	92	0.086	-0.500	0.086	-0.500	0.116	-0.675
34	56	0.076	-0.489	0.076	-0.489	0.102	-0.661		93	0.086	-0.500	0.086	-0.500	0.116	-0.675
	57	0.076	-0.489	0.076	-0.489	0.102	-0.661	69	93	0.086	-0.500	0.086	-0.500	0.116	-0.675
35	57	0.076	-0.489	0.076	-0.489	0.102	-0.661		94	0.086	-0.500	0.086	-0.500	0.116	-0.675
	58	0.076	-0.489	0.076	-0.489	0.102	-0.661	70	94	0.086	-0.500	0.086	-0.500	0.116	-0.675
36	58	0.076	-0.489	0.076	-0.489	0.102	-0.661		95	0.086	-0.500	0.086	-0.500	0.116	-0.675
	59	0.076	-0.489	0.076	-0.489	0.102	-0.661	71	95	0.086	-0.500	0.086	-0.500	0.116	-0.675
37	59	0.076	-0.489	0.076	-0.489	0.102	-0.661		96	0.086	-0.500	0.086	-0.500	0.116	-0.675
	60	0.076	-0.489	0.076	-0.489	0.102	-0.660	72	96	0.086	-0.500	0.086	-0.500	0.116	-0.675
38	60	0.076	-0.488	0.076	-0.488	0.102	-0.659		97	0.086	-0.500	0.086	-0.500	0.116	-0.675
	61	0.072	-0.488	0.072	-0.488	0.098	-0.659	73	97	0.086	-0.500	0.086	-0.500	0.116	-0.675
39	61	0.063	-0.487	0.063	-0.487	0.085	-0.657		98	0.086	-0.500	0.086	-0.500	0.116	-0.675
	62	0.068	-0.453	0.068	-0.453	0.091	-0.611	74	98	0.086	-0.500	0.086	-0.500	0.116	-0.675
40	62	0.009	-0.302	0.009	-0.302	0.012	-0.408		99	0.086	-0.500	0.086	-0.500	0.116	-0.675
	63	0.044	-0.045	0.044	-0.045	0.060	-0.061	75	99	0.086	-0.500	0.086	-0.500	0.116	-0.675
41	64	0.066	-0.045	0.066	-0.045	0.088	-0.061		100	0.086	-0.500	0.086	-0.500	0.116	-0.675
	65	0.008	-0.366	0.008	-0.366	0.011	-0.494	76	100	0.086	-0.500	0.086	-0.500	0.116	-0.675
42	65	0.076	-0.461	0.076	-0.461	0.102	-0.622		101	0.086	-0.500	0.086	-0.500	0.116	-0.675
	66	0.075	-0.496	0.075	-0.496	0.101	-0.669	77	101	0.086	-0.500	0.086	-0.500	0.116	-0.674
43	66	0.081	-0.497	0.081	-0.497	0.110	-0.672		102	0.086	-0.499	0.086	-0.499	0.116	-0.674
	67	0.085	-0.497	0.085	-0.497	0.114	-0.672	78	102	0.086	-0.499	0.086	-0.499	0.116	-0.673
44	67	0.085	-0.498	0.085	-0.498	0.115	-0.673		103	0.082	-0.498	0.082	-0.498	0.111	-0.673
	68	0.085	-0.499	0.085	-0.499	0.115	-0.673	79	103	0.077	-0.497	0.077	-0.497	0.105	-0.671
45	68	0.085	-0.499	0.085	-0.499	0.115	-0.673		104	0.077	-0.463	0.077	-0.463	0.104	-0.625
	69	0.085	-0.499	0.085	-0.499	0.115	-0.673	80	104	0.007	-0.386	0.007	-0.386	0.010	-0.521
46	69	0.085	-0.499	0.085	-0.499	0.115	-0.673		105	0.073	-0.048	0.073	-0.048	0.099	-0.064

81	106	0.066	-0.045	0.066	-0.045	0.088	-0.061		142	0.076	-0.489	0.076	-0.489	0.102	-0.661
	107	0.008	-0.366	0.008	-0.366	0.011	-0.494	116	142	0.076	-0.489	0.076	-0.489	0.102	-0.661
82	107	0.076	-0.461	0.076	-0.461	0.102	-0.622		143	0.076	-0.489	0.076	-0.489	0.102	-0.661
	108	0.075	-0.496	0.075	-0.496	0.101	-0.669	117	143	0.076	-0.489	0.076	-0.489	0.102	-0.661
83	108	0.081	-0.497	0.081	-0.497	0.110	-0.672		144	0.076	-0.489	0.076	-0.489	0.102	-0.660
	109	0.085	-0.497	0.085	-0.497	0.114	-0.672	118	144	0.076	-0.488	0.076	-0.488	0.102	-0.659
84	109	0.085	-0.498	0.085	-0.498	0.115	-0.673		145	0.072	-0.488	0.072	-0.488	0.098	-0.659
	110	0.085	-0.499	0.085	-0.499	0.115	-0.673	119	145	0.063	-0.487	0.063	-0.487	0.085	-0.657
85	110	0.085	-0.499	0.085	-0.499	0.115	-0.673		146	0.068	-0.453	0.068	-0.453	0.091	-0.611
	111	0.085	-0.499	0.085	-0.499	0.115	-0.673	120	146	0.009	-0.302	0.009	-0.302	0.012	-0.408
86	111	0.085	-0.499	0.085	-0.499	0.115	-0.673		147	0.044	-0.045	0.044	-0.045	0.060	-0.061
	112	0.085	-0.499	0.085	-0.499	0.115	-0.673	121	148	0.030	-0.081	0.030	-0.081	0.040	-0.110
87	112	0.085	-0.499	0.085	-0.499	0.115	-0.673		149	0.023	-0.213	0.023	-0.213	0.031	-0.288
	113	0.085	-0.499	0.085	-0.499	0.115	-0.673	122	149	0.037	-0.432	0.037	-0.432	0.050	-0.583
88	113	0.085	-0.499	0.085	-0.499	0.115	-0.673		150	0.032	-0.453	0.032	-0.453	0.043	-0.612
	114	0.085	-0.499	0.085	-0.499	0.115	-0.673	123	150	0.040	-0.454	0.040	-0.454	0.054	-0.614
89	114	0.085	-0.499	0.085	-0.499	0.115	-0.673		151	0.041	-0.454	0.041	-0.454	0.056	-0.613
	115	0.085	-0.499	0.085	-0.499	0.115	-0.673	124	151	0.041	-0.455	0.041	-0.455	0.056	-0.614
90	115	0.085	-0.499	0.085	-0.499	0.115	-0.673		152	0.041	-0.455	0.041	-0.455	0.056	-0.614
	116	0.085	-0.499	0.085	-0.499	0.115	-0.673	125	152	0.041	-0.455	0.041	-0.455	0.056	-0.614
91	116	0.085	-0.499	0.085	-0.499	0.115	-0.673		153	0.041	-0.455	0.041	-0.455	0.056	-0.614
	117	0.085	-0.499	0.085	-0.499	0.115	-0.673	126	153	0.041	-0.455	0.041	-0.455	0.056	-0.614
92	117	0.085	-0.499	0.085	-0.499	0.115	-0.673		154	0.041	-0.455	0.041	-0.455	0.056	-0.614
	118	0.085	-0.499	0.085	-0.499	0.115	-0.673	127	154	0.041	-0.455	0.041	-0.455	0.056	-0.614
93	118	0.085	-0.499	0.085	-0.499	0.115	-0.673		155	0.041	-0.455	0.041	-0.455	0.056	-0.614
	119	0.085	-0.499	0.085	-0.499	0.115	-0.673	128	155	0.041	-0.455	0.041	-0.455	0.056	-0.614
94	119	0.085	-0.499	0.085	-0.499	0.115	-0.673		156	0.041	-0.455	0.041	-0.455	0.056	-0.614
	120	0.085	-0.499	0.085	-0.499	0.115	-0.673	129	156	0.041	-0.455	0.041	-0.455	0.056	-0.614
95	120	0.085	-0.499	0.085	-0.499	0.115	-0.673		157	0.041	-0.455	0.041	-0.455	0.056	-0.614
	121	0.085	-0.499	0.085	-0.499	0.115	-0.673	130	157	0.041	-0.455	0.041	-0.455	0.056	-0.614
96	121	0.085	-0.499	0.085	-0.499	0.115	-0.673		158	0.041	-0.455	0.041	-0.455	0.056	-0.614
	122	0.085	-0.499	0.085	-0.499	0.115	-0.673	131	158	0.041	-0.455	0.041	-0.455	0.056	-0.614
97	122	0.085	-0.499	0.085	-0.499	0.115	-0.673		159	0.041	-0.455	0.041	-0.455	0.056	-0.614
	123	0.085	-0.498	0.085	-0.498	0.115	-0.673	132	159	0.041	-0.455	0.041	-0.455	0.056	-0.614
98	123	0.085	-0.497	0.085	-0.497	0.114	-0.672		160	0.041	-0.455	0.041	-0.455	0.056	-0.614
	124	0.081	-0.497	0.081	-0.497	0.110	-0.672	133	160	0.041	-0.455	0.041	-0.455	0.056	-0.614
99	124	0.075	-0.496	0.075	-0.496	0.101	-0.669		161	0.041	-0.455	0.041	-0.455	0.056	-0.614
	125	0.076	-0.461	0.076	-0.461	0.102	-0.622	134	161	0.041	-0.455	0.041	-0.455	0.056	-0.614
100	125	0.008	-0.366	0.008	-0.366	0.011	-0.494		162	0.041	-0.455	0.041	-0.455	0.056	-0.614
	126	0.066	-0.045	0.066	-0.045	0.088	-0.061	135	162	0.041	-0.455	0.041	-0.455	0.056	-0.614
101	127	0.044	-0.045	0.044	-0.045	0.060	-0.061		163	0.041	-0.455	0.041	-0.455	0.056	-0.614
	128	0.009	-0.302	0.009	-0.302	0.012	-0.408	136	163	0.041	-0.455	0.041	-0.455	0.056	-0.614
102	128	0.068	-0.453	0.068	-0.453	0.091	-0.611		164	0.041	-0.455	0.041	-0.455	0.056	-0.614
	129	0.063	-0.487	0.063	-0.487	0.085	-0.657	137	164	0.041	-0.455	0.041	-0.455	0.056	-0.614
103	129	0.072	-0.488	0.072	-0.488	0.098	-0.659		165	0.041	-0.455	0.041	-0.455	0.056	-0.614
	130	0.076	-0.488	0.076	-0.488	0.102	-0.659	138	165	0.041	-0.454	0.041	-0.454	0.056	-0.613
104	130	0.076	-0.489	0.076	-0.489	0.102	-0.660		166	0.040	-0.454	0.040	-0.454	0.054	-0.614
	131	0.076	-0.489	0.076	-0.489	0.102	-0.661	139	166	0.032	-0.453	0.032	-0.453	0.043	-0.612
105	131	0.076	-0.489	0.076	-0.489	0.102	-0.661		167	0.037	-0.432	0.037	-0.432	0.050	-0.583
	132	0.076	-0.489	0.076	-0.489	0.102	-0.661	140	167	0.023	-0.213	0.023	-0.213	0.031	-0.288
106	132	0.076	-0.489	0.076	-0.489	0.102	-0.661		168	0.030	-0.081	0.030	-0.081	0.040	-0.110
	133	0.076	-0.489	0.076	-0.489	0.102	-0.661	141	1	0.140	-1.094	0.140	-1.094	0.189	-1.477
107	133	0.076	-0.489	0.076	-0.489	0.102	-0.661		22	0.061	-0.479	0.061	-0.479	0.083	-0.647
	134	0.076	-0.489	0.076	-0.489	0.102	-0.661	142	2	0.009	-0.481	0.009	-0.481	0.012	-0.649
108	134	0.076	-0.489	0.076	-0.489	0.102	-0.661		23	0.008	-0.288	0.008	-0.288	0.010	-0.389
	135	0.076	-0.489	0.076	-0.489	0.102	-0.661	143	3	0.013	-0.536	0.013	-0.536	0.017	-0.723
109	135	0.076	-0.489	0.076	-0.489	0.102	-0.661		24	0.012	-0.312	0.012	-0.312	0.016	-0.422
	136	0.076	-0.489	0.076	-0.489	0.102	-0.661	144	4	0.017	-0.537	0.017	-0.537	0.023	-0.724
110	136	0.076	-0.489	0.076	-0.489	0.102	-0.661		25	0.014	-0.313	0.014	-0.313	0.019	-0.422
	137	0.076	-0.489	0.076	-0.489	0.102	-0.661	145	5	0.017	-0.537	0.017	-0.537	0.023	-0.725
111	137	0.076	-0.489	0.076	-0.489	0.102	-0.661		26	0.014	-0.313	0.014	-0.313	0.019	-0.423
	138	0.076	-0.489	0.076	-0.489	0.102	-0.661	146	6	0.017	-0.537	0.017	-0.537	0.023	-0.725
112	138	0.076	-0.489	0.076	-0.489	0.102	-0.661		27	0.014	-0.313	0.014	-0.313	0.019	-0.423
	139	0.076	-0.489	0.076	-0.489	0.102	-0.661	147	7	0.017	-0.537	0.017	-0.537	0.023	-0.725
113	139	0.076	-0.489	0.076	-0.489	0.102	-0.661		28	0.014	-0.313	0.014	-0.313	0.019	-0.423
	140	0.076	-0.489	0.076	-0.489	0.102	-0.661	148	8	0.017	-0.537	0.017	-0.537	0.023	-0.725
114	140	0.076	-0.489	0.076	-0.489	0.102	-0.661		29	0.014	-0.313	0.014	-0.313	0.019	-0.423
	141	0.076	-0.489	0.076	-0.489	0.102	-0.661	149	9	0.017	-0.537	0.017	-0.537	0.023	-0.725
115	141	0.076	-0.489	0.076	-0.489	0.102	-0.661		30	0.014	-0.313	0.014	-0.313	0.019	-0.423

150	10	0.017	-0.537	0.017	-0.537	0.023	-0.725		65	0.191	-0.004	0.191	-0.004	0.258	-0.006
	31	0.014	-0.313	0.014	-0.313	0.019	-0.423	185	45	0.062	-0.046	0.062	-0.046	0.084	-0.062
151	11	0.017	-0.537	0.017	-0.537	0.023	-0.725		66	0.213	-0.007	0.213	-0.007	0.288	-0.009
	32	0.014	-0.313	0.014	-0.313	0.019	-0.423	186	46	0.062	-0.046	0.062	-0.046	0.084	-0.063
152	12	0.017	-0.537	0.017	-0.537	0.023	-0.725		67	0.213	-0.009	0.213	-0.009	0.288	-0.012
	33	0.014	-0.313	0.014	-0.313	0.019	-0.423	187	47	0.062	-0.047	0.062	-0.047	0.084	-0.063
153	13	0.017	-0.537	0.017	-0.537	0.023	-0.725		68	0.214	-0.009	0.214	-0.009	0.288	-0.012
	34	0.014	-0.313	0.014	-0.313	0.019	-0.423	188	48	0.062	-0.047	0.062	-0.047	0.084	-0.063
154	14	0.017	-0.537	0.017	-0.537	0.023	-0.725		69	0.214	-0.009	0.214	-0.009	0.288	-0.012
	35	0.014	-0.313	0.014	-0.313	0.019	-0.423	189	49	0.062	-0.047	0.062	-0.047	0.084	-0.063
155	15	0.017	-0.537	0.017	-0.537	0.023	-0.725		70	0.214	-0.009	0.214	-0.009	0.288	-0.012
	36	0.014	-0.313	0.014	-0.313	0.019	-0.423	190	50	0.062	-0.047	0.062	-0.047	0.084	-0.063
156	16	0.017	-0.537	0.017	-0.537	0.023	-0.725		71	0.214	-0.009	0.214	-0.009	0.288	-0.012
	37	0.014	-0.313	0.014	-0.313	0.019	-0.423	191	51	0.062	-0.047	0.062	-0.047	0.084	-0.063
157	17	0.017	-0.537	0.017	-0.537	0.023	-0.725		72	0.214	-0.009	0.214	-0.009	0.288	-0.012
	38	0.014	-0.313	0.014	-0.313	0.019	-0.423	192	52	0.062	-0.047	0.062	-0.047	0.084	-0.063
158	18	0.017	-0.537	0.017	-0.537	0.023	-0.724		73	0.214	-0.009	0.214	-0.009	0.288	-0.012
	39	0.014	-0.313	0.014	-0.313	0.019	-0.422	193	53	0.062	-0.047	0.062	-0.047	0.084	-0.063
159	19	0.013	-0.536	0.013	-0.536	0.017	-0.723		74	0.214	-0.009	0.214	-0.009	0.288	-0.012
	40	0.012	-0.312	0.012	-0.312	0.016	-0.422	194	54	0.062	-0.047	0.062	-0.047	0.084	-0.063
160	20	0.009	-0.481	0.009	-0.481	0.012	-0.649		75	0.214	-0.009	0.214	-0.009	0.288	-0.012
	41	0.008	-0.288	0.008	-0.288	0.010	-0.389	195	55	0.062	-0.047	0.062	-0.047	0.084	-0.063
161	21	0.140	-1.094	0.140	-1.094	0.189	-1.477		76	0.214	-0.009	0.214	-0.009	0.288	-0.012
	42	0.061	-0.479	0.061	-0.479	0.083	-0.647	196	56	0.062	-0.047	0.062	-0.047	0.084	-0.063
162	22	0.132	-0.646	0.132	-0.646	0.179	-0.872		77	0.214	-0.009	0.214	-0.009	0.288	-0.012
	43	0.253	-0.113	0.253	-0.113	0.341	-0.152	197	57	0.062	-0.047	0.062	-0.047	0.084	-0.063
163	23	0.011	-0.285	0.011	-0.285	0.015	-0.385		78	0.214	-0.009	0.214	-0.009	0.288	-0.012
	44	0.051	-0.044	0.051	-0.044	0.069	-0.060	198	58	0.062	-0.047	0.062	-0.047	0.084	-0.063
164	24	0.015	-0.317	0.015	-0.317	0.021	-0.428		79	0.214	-0.009	0.214	-0.009	0.288	-0.012
	45	0.063	-0.047	0.063	-0.047	0.085	-0.063	199	59	0.062	-0.047	0.062	-0.047	0.084	-0.063
165	25	0.018	-0.317	0.018	-0.317	0.025	-0.428		80	0.214	-0.009	0.214	-0.009	0.288	-0.012
	46	0.063	-0.047	0.063	-0.047	0.085	-0.064	200	60	0.062	-0.046	0.062	-0.046	0.084	-0.063
166	26	0.018	-0.318	0.018	-0.318	0.025	-0.429		81	0.213	-0.009	0.213	-0.009	0.288	-0.012
	47	0.063	-0.047	0.063	-0.047	0.085	-0.064	201	61	0.062	-0.046	0.062	-0.046	0.084	-0.062
167	27	0.018	-0.318	0.018	-0.318	0.025	-0.429		82	0.213	-0.007	0.213	-0.007	0.288	-0.009
	48	0.063	-0.048	0.063	-0.048	0.085	-0.064	202	62	0.054	-0.039	0.054	-0.039	0.073	-0.053
168	28	0.018	-0.318	0.018	-0.318	0.025	-0.429		83	0.191	-0.004	0.191	-0.004	0.258	-0.006
	49	0.063	-0.048	0.063	-0.048	0.085	-0.064	203	63	0.192	-0.180	0.192	-0.180	0.259	-0.243
169	29	0.018	-0.318	0.018	-0.318	0.025	-0.429		84	0.439	-0.076	0.439	-0.076	0.592	-0.103
	50	0.063	-0.048	0.063	-0.048	0.085	-0.064	204	64	0.329	-0.042	0.329	-0.042	0.445	-0.057
170	30	0.018	-0.318	0.018	-0.318	0.025	-0.429		85	0.429	-0.031	0.429	-0.031	0.579	-0.042
	51	0.063	-0.048	0.063	-0.048	0.085	-0.064	205	65	0.194	-0.002	0.194	-0.002	0.261	-0.002
171	31	0.018	-0.318	0.018	-0.318	0.025	-0.429		86	0.253	-0.003	0.253	-0.003	0.341	-0.005
	52	0.063	-0.048	0.063	-0.048	0.085	-0.064	206	66	0.208	-0.002	0.208	-0.002	0.281	-0.003
172	32	0.018	-0.318	0.018	-0.318	0.025	-0.429		87	0.274	-0.005	0.274	-0.005	0.370	-0.006
	53	0.063	-0.048	0.063	-0.048	0.085	-0.064	207	67	0.208	-0.003	0.208	-0.003	0.281	-0.005
173	33	0.018	-0.318	0.018	-0.318	0.025	-0.429		88	0.275	-0.007	0.275	-0.007	0.371	-0.009
	54	0.063	-0.048	0.063	-0.048	0.085	-0.064	208	68	0.208	-0.003	0.208	-0.003	0.281	-0.005
174	34	0.018	-0.318	0.018	-0.318	0.025	-0.429		89	0.275	-0.007	0.275	-0.007	0.371	-0.009
	55	0.063	-0.048	0.063	-0.048	0.085	-0.064	209	69	0.208	-0.003	0.208	-0.003	0.281	-0.005
175	35	0.018	-0.318	0.018	-0.318	0.025	-0.429		90	0.275	-0.007	0.275	-0.007	0.371	-0.009
	56	0.063	-0.048	0.063	-0.048	0.085	-0.064	210	70	0.208	-0.003	0.208	-0.003	0.281	-0.005
176	36	0.018	-0.318	0.018	-0.318	0.025	-0.429		91	0.275	-0.007	0.275	-0.007	0.371	-0.009
	57	0.063	-0.048	0.063	-0.048	0.085	-0.064	211	71	0.208	-0.003	0.208	-0.003	0.281	-0.005
177	37	0.018	-0.318	0.018	-0.318	0.025	-0.429		92	0.275	-0.007	0.275	-0.007	0.371	-0.009
	58	0.063	-0.048	0.063	-0.048	0.085	-0.064	212	72	0.208	-0.003	0.208	-0.003	0.281	-0.005
178	38	0.018	-0.318	0.018	-0.318	0.025	-0.429		93	0.275	-0.007	0.275	-0.007	0.371	-0.009
	59	0.063	-0.047	0.063	-0.047	0.085	-0.064	213	73	0.208	-0.003	0.208	-0.003	0.281	-0.005
179	39	0.018	-0.317	0.018	-0.317	0.025	-0.428		94	0.275	-0.007	0.275	-0.007	0.371	-0.009
	60	0.063	-0.047	0.063	-0.047	0.085	-0.064	214	74	0.208	-0.003	0.208	-0.003	0.281	-0.005
180	40	0.015	-0.317	0.015	-0.317	0.021	-0.428		95	0.275	-0.007	0.275	-0.007	0.371	-0.009
	61	0.063	-0.047	0.063	-0.047	0.085	-0.063	215	75	0.208	-0.003	0.208	-0.003	0.281	-0.005
181	41	0.011	-0.285	0.011	-0.285	0.015	-0.385		96	0.275	-0.007	0.275	-0.007	0.371	-0.009
	62	0.051	-0.044	0.051	-0.044	0.069	-0.060	216	76	0.208	-0.003	0.208	-0.003	0.281	-0.005
182	42	0.132	-0.646	0.132	-0.646	0.179	-0.872		97	0.275	-0.007	0.275	-0.007	0.371	-0.009
	63	0.253	-0.113	0.253	-0.113	0.341	-0.152	217	77	0.208	-0.003	0.208	-0.003	0.281	-0.005
183	43	0.192	-0.180	0.192	-0.180	0.259	-0.243		98	0.275	-0.007	0.275	-0.007	0.371	-0.009
	64	0.439	-0.076	0.439	-0.076	0.592	-0.103	218	78	0.208	-0.003	0.208	-0.003	0.281	-0.005
184	44	0.054	-0.039	0.054	-0.039	0.073	-0.053		99	0.275	-0.007	0.275	-0.007	0.371	-0.009



219	79	0.208	-0.003	0.208	-0.003	0.281	-0.005		134	0.062	-0.047	0.062	-0.047	0.084	-0.063
	100	0.275	-0.007	0.275	-0.007	0.371	-0.009	254	114	0.214	-0.009	0.214	-0.009	0.288	-0.012
220	80	0.208	-0.003	0.208	-0.003	0.281	-0.005		135	0.062	-0.047	0.062	-0.047	0.084	-0.063
	101	0.275	-0.007	0.275	-0.007	0.371	-0.009	255	115	0.214	-0.009	0.214	-0.009	0.288	-0.012
221	81	0.208	-0.003	0.208	-0.003	0.281	-0.005		136	0.062	-0.047	0.062	-0.047	0.084	-0.063
	102	0.275	-0.007	0.275	-0.007	0.371	-0.009	256	116	0.214	-0.009	0.214	-0.009	0.288	-0.012
222	82	0.208	-0.002	0.208	-0.002	0.281	-0.003		137	0.062	-0.047	0.062	-0.047	0.084	-0.063
	103	0.274	-0.005	0.274	-0.005	0.370	-0.006	257	117	0.214	-0.009	0.214	-0.009	0.288	-0.012
223	83	0.194	-0.002	0.194	-0.002	0.261	-0.002		138	0.062	-0.047	0.062	-0.047	0.084	-0.063
	104	0.253	-0.003	0.253	-0.003	0.341	-0.005	258	118	0.214	-0.009	0.214	-0.009	0.288	-0.012
224	84	0.329	-0.042	0.329	-0.042	0.445	-0.057		139	0.062	-0.047	0.062	-0.047	0.084	-0.063
	105	0.429	-0.031	0.429	-0.031	0.579	-0.042	259	119	0.214	-0.009	0.214	-0.009	0.288	-0.012
225	85	0.429	-0.031	0.429	-0.031	0.579	-0.042		140	0.062	-0.047	0.062	-0.047	0.084	-0.063
	106	0.329	-0.042	0.329	-0.042	0.445	-0.057	260	120	0.214	-0.009	0.214	-0.009	0.288	-0.012
226	86	0.253	-0.003	0.253	-0.003	0.341	-0.005		141	0.062	-0.047	0.062	-0.047	0.084	-0.063
	107	0.194	-0.002	0.194	-0.002	0.261	-0.002	261	121	0.214	-0.009	0.214	-0.009	0.288	-0.012
227	87	0.274	-0.005	0.274	-0.005	0.370	-0.006		142	0.062	-0.047	0.062	-0.047	0.084	-0.063
	108	0.208	-0.002	0.208	-0.002	0.281	-0.003	262	122	0.214	-0.009	0.214	-0.009	0.288	-0.012
228	88	0.275	-0.007	0.275	-0.007	0.371	-0.009		143	0.062	-0.047	0.062	-0.047	0.084	-0.063
	109	0.208	-0.003	0.208	-0.003	0.281	-0.005	263	123	0.213	-0.009	0.213	-0.009	0.288	-0.012
229	89	0.275	-0.007	0.275	-0.007	0.371	-0.009		144	0.062	-0.046	0.062	-0.046	0.084	-0.063
	110	0.208	-0.003	0.208	-0.003	0.281	-0.005	264	124	0.213	-0.007	0.213	-0.007	0.288	-0.009
230	90	0.275	-0.007	0.275	-0.007	0.371	-0.009		145	0.062	-0.046	0.062	-0.046	0.084	-0.062
	111	0.208	-0.003	0.208	-0.003	0.281	-0.005	265	125	0.191	-0.004	0.191	-0.004	0.258	-0.006
231	91	0.275	-0.007	0.275	-0.007	0.371	-0.009		146	0.054	-0.039	0.054	-0.039	0.073	-0.053
	112	0.208	-0.003	0.208	-0.003	0.281	-0.005	266	126	0.439	-0.076	0.439	-0.076	0.592	-0.103
232	92	0.275	-0.007	0.275	-0.007	0.371	-0.009		147	0.192	-0.180	0.192	-0.180	0.259	-0.243
	113	0.208	-0.003	0.208	-0.003	0.281	-0.005	267	127	0.253	-0.113	0.253	-0.113	0.341	-0.152
233	93	0.275	-0.007	0.275	-0.007	0.371	-0.009		148	0.132	-0.646	0.132	-0.646	0.179	-0.872
	114	0.208	-0.003	0.208	-0.003	0.281	-0.005	268	128	0.051	-0.044	0.051	-0.044	0.069	-0.060
234	94	0.275	-0.007	0.275	-0.007	0.371	-0.009		149	0.011	-0.285	0.011	-0.285	0.015	-0.385
	115	0.208	-0.003	0.208	-0.003	0.281	-0.005	269	129	0.063	-0.047	0.063	-0.047	0.085	-0.063
235	95	0.275	-0.007	0.275	-0.007	0.371	-0.009		150	0.015	-0.317	0.015	-0.317	0.021	-0.428
	116	0.208	-0.003	0.208	-0.003	0.281	-0.005	270	130	0.063	-0.047	0.063	-0.047	0.085	-0.064
236	96	0.275	-0.007	0.275	-0.007	0.371	-0.009		151	0.018	-0.317	0.018	-0.317	0.025	-0.428
	117	0.208	-0.003	0.208	-0.003	0.281	-0.005	271	131	0.063	-0.047	0.063	-0.047	0.085	-0.064
237	97	0.275	-0.007	0.275	-0.007	0.371	-0.009		152	0.018	-0.318	0.018	-0.318	0.025	-0.429
	118	0.208	-0.003	0.208	-0.003	0.281	-0.005	272	132	0.063	-0.048	0.063	-0.048	0.085	-0.064
238	98	0.275	-0.007	0.275	-0.007	0.371	-0.009		153	0.018	-0.318	0.018	-0.318	0.025	-0.429
	119	0.208	-0.003	0.208	-0.003	0.281	-0.005	273	133	0.063	-0.048	0.063	-0.048	0.085	-0.064
239	99	0.275	-0.007	0.275	-0.007	0.371	-0.009		154	0.018	-0.318	0.018	-0.318	0.025	-0.429
	120	0.208	-0.003	0.208	-0.003	0.281	-0.005	274	134	0.063	-0.048	0.063	-0.048	0.085	-0.064
240	100	0.275	-0.007	0.275	-0.007	0.371	-0.009		155	0.018	-0.318	0.018	-0.318	0.025	-0.429
	121	0.208	-0.003	0.208	-0.003	0.281	-0.005	275	135	0.063	-0.048	0.063	-0.048	0.085	-0.064
241	101	0.275	-0.007	0.275	-0.007	0.371	-0.009		156	0.018	-0.318	0.018	-0.318	0.025	-0.429
	122	0.208	-0.003	0.208	-0.003	0.281	-0.005	276	136	0.063	-0.048	0.063	-0.048	0.085	-0.064
242	102	0.275	-0.007	0.275	-0.007	0.371	-0.009		157	0.018	-0.318	0.018	-0.318	0.025	-0.429
	123	0.208	-0.003	0.208	-0.003	0.281	-0.005	277	137	0.063	-0.048	0.063	-0.048	0.085	-0.064
243	103	0.274	-0.005	0.274	-0.005	0.370	-0.006		158	0.018	-0.318	0.018	-0.318	0.025	-0.429
	124	0.208	-0.002	0.208	-0.002	0.281	-0.003	278	138	0.063	-0.048	0.063	-0.048	0.085	-0.064
244	104	0.253	-0.003	0.253	-0.003	0.341	-0.005		159	0.018	-0.318	0.018	-0.318	0.025	-0.429
	125	0.194	-0.002	0.194	-0.002	0.261	-0.002	279	139	0.063	-0.048	0.063	-0.048	0.085	-0.064
245	105	0.429	-0.031	0.429	-0.031	0.579	-0.042		160	0.018	-0.318	0.018	-0.318	0.025	-0.429
	126	0.329	-0.042	0.329	-0.042	0.445	-0.057	280	140	0.063	-0.048	0.063	-0.048	0.085	-0.064
246	106	0.439	-0.076	0.439	-0.076	0.592	-0.103		161	0.018	-0.318	0.018	-0.318	0.025	-0.429
	127	0.192	-0.180	0.192	-0.180	0.259	-0.243	281	141	0.063	-0.048	0.063	-0.048	0.085	-0.064
247	107	0.191	-0.004	0.191	-0.004	0.258	-0.006		162	0.018	-0.318	0.018	-0.318	0.025	-0.429
	128	0.054	-0.039	0.054	-0.039	0.073	-0.053	282	142	0.063	-0.048	0.063	-0.048	0.085	-0.064
248	108	0.213	-0.007	0.213	-0.007	0.288	-0.009		163	0.018	-0.318	0.018	-0.318	0.025	-0.429
	129	0.062	-0.046	0.062	-0.046	0.084	-0.062	283	143	0.063	-0.047	0.063	-0.047	0.085	-0.064
249	109	0.213	-0.009	0.213	-0.009	0.288	-0.012		164	0.018	-0.318	0.018	-0.318	0.025	-0.429
	130	0.062	-0.046	0.062	-0.046	0.084	-0.063	284	144	0.063	-0.047	0.063	-0.047	0.085	-0.064
250	110	0.214	-0.009	0.214	-0.009	0.288	-0.012		165	0.018	-0.317	0.018	-0.317	0.025	-0.428
	131	0.062	-0.047	0.062	-0.047	0.084	-0.063	285	145	0.063	-0.047	0.063	-0.047	0.085	-0.063
251	111	0.214	-0.009	0.214	-0.009	0.288	-0.012		166	0.015	-0.317	0.015	-0.317	0.021	-0.428
	132	0.062	-0.047	0.062	-0.047	0.084	-0.063	286	146	0.051	-0.044	0.051	-0.044	0.069	-0.060
252	112	0.214	-0.009	0.214	-0.009	0.288	-0.012		167	0.011	-0.285	0.011	-0.285	0.015	-0.385
	133	0.062	-0.047	0.062	-0.047	0.084	-0.063	287	147	0.253	-0.113	0.253	-0.113	0.341	-0.152
253	113	0.214	-0.009	0.214	-0.009	0.288	-0.012		168	0.132	-0.646	0.132	-0.646	0.179	-0.872

288	148	0.061	-0.479	0.061	-0.479	0.083	-0.647		33	-0.013	-0.607	-0.013	-0.607	0.012	-0.819
	169	0.140	-1.094	0.140	-1.094	0.189	-1.477	12	33	-0.013	-0.608	-0.013	-0.608	0.012	-0.821
289	149	0.008	-0.288	0.008	-0.288	0.010	-0.389		34	-0.013	-0.606	-0.013	-0.606	0.012	-0.818
	170	0.009	-0.481	0.009	-0.481	0.012	-0.649	13	34	-0.013	-0.609	-0.013	-0.609	0.012	-0.822
290	150	0.012	-0.312	0.012	-0.312	0.016	-0.422		35	-0.013	-0.605	-0.013	-0.605	0.012	-0.817
	171	0.013	-0.536	0.013	-0.536	0.017	-0.723	14	35	-0.013	-0.610	-0.013	-0.610	0.012	-0.823
291	151	0.014	-0.313	0.014	-0.313	0.019	-0.422		36	-0.012	-0.604	-0.012	-0.604	0.013	-0.816
	172	0.017	-0.537	0.017	-0.537	0.023	-0.724	15	36	-0.012	-0.610	-0.012	-0.610	0.012	-0.824
292	152	0.014	-0.313	0.014	-0.313	0.019	-0.423		37	-0.012	-0.604	-0.012	-0.604	0.013	-0.815
	173	0.017	-0.537	0.017	-0.537	0.023	-0.725	16	37	-0.012	-0.611	-0.012	-0.611	0.012	-0.825
293	153	0.014	-0.313	0.014	-0.313	0.019	-0.423		38	-0.012	-0.601	-0.012	-0.601	0.013	-0.812
	174	0.017	-0.537	0.017	-0.537	0.023	-0.725	17	38	-0.012	-0.612	-0.012	-0.612	0.012	-0.826
294	154	0.014	-0.313	0.014	-0.313	0.019	-0.423		39	-0.015	-0.602	-0.015	-0.602	0.009	-0.812
	175	0.017	-0.537	0.017	-0.537	0.023	-0.725	18	39	-0.016	-0.611	-0.016	-0.611	0.008	-0.825
295	155	0.014	-0.313	0.014	-0.313	0.019	-0.423		40	-0.020	-0.600	-0.020	-0.600	0.003	-0.810
	176	0.017	-0.537	0.017	-0.537	0.023	-0.725	19	40	0.045	-0.611	0.045	-0.611	0.090	-0.825
296	156	0.014	-0.313	0.014	-0.313	0.019	-0.423		41	-0.025	-0.821	-0.025	-0.821	-0.007	-1.108
	177	0.017	-0.537	0.017	-0.537	0.023	-0.725	20	41	0.351	-0.312	0.351	-0.312	0.487	-0.421
297	157	0.014	-0.313	0.014	-0.313	0.019	-0.423		42	0.065	-1.277	0.065	-1.277	0.091	-1.724
	178	0.017	-0.537	0.017	-0.537	0.023	-0.725	21	43	0.067	-0.759	0.067	-0.759	0.091	-1.025
298	158	0.014	-0.313	0.014	-0.313	0.019	-0.423		44	0.157	-2.777	0.157	-2.777	0.232	-3.749
	179	0.017	-0.537	0.017	-0.537	0.023	-0.725	22	44	0.102	-1.232	0.102	-1.232	0.165	-1.663
299	159	0.014	-0.313	0.014	-0.313	0.019	-0.423		45	0.209	-0.699	0.209	-0.699	0.312	-0.944
	180	0.017	-0.537	0.017	-0.537	0.023	-0.725	23	45	0.143	-0.840	0.143	-0.840	0.222	-1.134
300	160	0.014	-0.313	0.014	-0.313	0.019	-0.423		46	0.247	-0.724	0.247	-0.724	0.362	-0.977
	181	0.017	-0.537	0.017	-0.537	0.023	-0.725	24	46	0.179	-0.856	0.179	-0.856	0.271	-1.156
301	161	0.014	-0.313	0.014	-0.313	0.019	-0.423		47	0.270	-0.724	0.270	-0.724	0.394	-0.977
	182	0.017	-0.537	0.017	-0.537	0.023	-0.725	25	47	0.212	-0.850	0.212	-0.850	0.316	-1.148
302	162	0.014	-0.313	0.014	-0.313	0.019	-0.423		48	0.268	-0.757	0.268	-0.757	0.390	-1.022
	183	0.017	-0.537	0.017	-0.537	0.023	-0.725	26	48	0.219	-0.842	0.219	-0.842	0.325	-1.136
303	163	0.014	-0.313	0.014	-0.313	0.019	-0.423		49	0.263	-0.767	0.263	-0.767	0.384	-1.036
	184	0.017	-0.537	0.017	-0.537	0.023	-0.725	27	49	0.224	-0.833	0.224	-0.833	0.332	-1.125
304	164	0.014	-0.313	0.014	-0.313	0.019	-0.423		50	0.258	-0.775	0.258	-0.775	0.377	-1.047
	185	0.017	-0.537	0.017	-0.537	0.023	-0.725	28	50	0.229	-0.825	0.229	-0.825	0.338	-1.114
305	165	0.014	-0.313	0.014	-0.313	0.019	-0.422		51	0.253	-0.784	0.253	-0.784	0.371	-1.058
	186	0.017	-0.537	0.017	-0.537	0.023	-0.724	29	51	0.234	-0.817	0.234	-0.817	0.345	-1.103
306	166	0.012	-0.312	0.012	-0.312	0.016	-0.422		52	0.248	-0.792	0.248	-0.792	0.364	-1.069
	187	0.013	-0.536	0.013	-0.536	0.017	-0.723	30	52	0.239	-0.809	0.239	-0.809	0.351	-1.092
307	167	0.008	-0.288	0.008	-0.288	0.010	-0.389		53	0.243	-0.800	0.243	-0.800	0.358	-1.080
	188	0.009	-0.481	0.009	-0.481	0.012	-0.649	31	53	0.243	-0.800	0.243	-0.800	0.358	-1.080
308	168	0.061	-0.479	0.061	-0.479	0.083	-0.647		54	0.239	-0.809	0.239	-0.809	0.351	-1.092
	189	0.140	-1.094	0.140	-1.094	0.189	-1.477	32	54	0.248	-0.792	0.248	-0.792	0.364	-1.069
									55	0.234	-0.817	0.234	-0.817	0.345	-1.103
									56	0.253	-0.784	0.253	-0.784	0.371	-1.058
									57	0.229	-0.825	0.229	-0.825	0.338	-1.114
									58	0.258	-0.775	0.258	-0.775	0.377	-1.047
									59	0.224	-0.833	0.224	-0.833	0.332	-1.125
									60	0.263	-0.767	0.263	-0.767	0.384	-1.036
									61	0.219	-0.842	0.219	-0.842	0.325	-1.136
									62	0.268	-0.757	0.268	-0.757	0.390	-1.022
									63	0.212	-0.850	0.212	-0.850	0.316	-1.148
									64	0.270	-0.724	0.270	-0.724	0.394	-0.977
									65	0.179	-0.856	0.179	-0.856	0.271	-1.156
									66	0.247	-0.724	0.247	-0.724	0.362	-0.977
									67	0.143	-0.840	0.143	-0.840	0.222	-1.134
									68	0.209	-0.699	0.209	-0.699	0.312	-0.944
									69	0.102	-1.232	0.102	-1.232	0.165	-1.663
									70	0.157	-2.777	0.157	-2.777	0.232	-3.749
									71	0.067	-0.759	0.067	-0.759	0.091	-1.024
									72	0.477	-0.161	0.477	-0.161	0.644	-0.219
									73	0.330	-4.956	0.330	-4.956	0.471	-6.690
									74	0.199	-1.477	0.199	-1.477	0.296	-1.993
									75	0.437	-0.748	0.437	-0.748	0.620	-1.010
									76	0.278	-1.068	0.278	-1.068	0.405	-1.442
									77	0.490	-0.852	0.490	-0.852	0.690	-1.150
									78	0.345	-1.098	0.345	-1.098	0.494	-1.483
									79	0.531	-0.845	0.531	-0.845	0.746	-1.141
									80	0.407	-1.087	0.407	-1.087	0.579	-1.467
									81	0.525	-0.908	0.525	-0.908	0.738	-1.226

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas debidas al carro, superestructura y so

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-
1	22	0.065	-1.277	0.065	-1.277	0.091	-1.724
	23	0.351	-0.312	0.351	-0.312	0.487	-0.421
2	23	-0.025	-0.821	-0.025	-0.821	-0.007	-1.108
	24	0.045	-0.611	0.045	-0.611	0.090	-0.825
3	24	-0.020	-0.600	-0.020	-0.600	0.003	-0.810
	25	-0.016	-0.611	-0.016	-0.611	0.008	-0.825
4	25	-0.015	-0.602	-0.015	-0.602	0.009	-0.812
	26	-0.012	-0.612	-0.012	-0.612	0.012	-0.826
5	26	-0.012	-0.601	-0.012	-0.601	0.013	-0.812
	27	-0.012	-0.611	-0.012	-0.611	0.012	-0.825
6	27	-0.012	-0.604	-0.012	-0.604	0.013	-0.815
	28	-0.012	-0.610	-0.012	-0.610	0.012	-0.824
7	28	-0.012	-0.604	-0.012	-0.604	0.013	-0.816
	29	-0.013	-0.610	-0.013	-0.610	0.012	-0.823
8	29	-0.013	-0.605	-0.013	-0.605	0.012	-0.817
	30	-0.013	-0.609	-0.013	-0.609	0.012	-0.822
9	30	-0.013	-0.606	-0.013	-0.606	0.012	-0.818
	31	-0.013	-0.608	-0.013	-0.608	0.012	-0.821
10	31	-0.013	-0.607	-0.013	-0.607	0.012	-0.819
	32	-0.013	-0.607	-0.013	-0.607	0.012	-0.820
11	32	-0.013	-0.607	-0.013	-0.607	0.012	-0.820



46	69	0.421	-1.071	0.421	-1.071	0.598	-1.445		105	0.709	-0.162	0.709	-0.162	0.957	-0.221
	70	0.514	-0.927	0.514	-0.927	0.724	-1.252	81	106	0.477	-0.184	0.477	-0.184	0.644	-0.250
47	70	0.432	-1.055	0.432	-1.055	0.612	-1.424		107	0.330	-4.956	0.330	-4.956	0.471	-6.690
	71	0.504	-0.943	0.504	-0.943	0.709	-1.274	82	107	0.199	-1.477	0.199	-1.477	0.296	-1.993
48	71	0.442	-1.039	0.442	-1.039	0.625	-1.403		108	0.437	-0.748	0.437	-0.748	0.620	-1.010
	72	0.493	-0.959	0.493	-0.959	0.695	-1.295	83	108	0.278	-1.068	0.278	-1.068	0.405	-1.442
49	72	0.452	-1.023	0.452	-1.023	0.639	-1.381		109	0.490	-0.852	0.490	-0.852	0.690	-1.150
	73	0.483	-0.975	0.483	-0.975	0.681	-1.317	84	109	0.345	-1.098	0.345	-1.098	0.494	-1.483
50	73	0.462	-1.007	0.462	-1.007	0.653	-1.360		110	0.531	-0.845	0.531	-0.845	0.746	-1.141
	74	0.472	-0.991	0.472	-0.991	0.666	-1.338	85	110	0.407	-1.087	0.407	-1.087	0.579	-1.467
51	74	0.472	-0.991	0.472	-0.991	0.666	-1.338		111	0.525	-0.908	0.525	-0.908	0.738	-1.226
	75	0.462	-1.007	0.462	-1.007	0.653	-1.360	86	111	0.421	-1.071	0.421	-1.071	0.598	-1.445
52	75	0.483	-0.975	0.483	-0.975	0.681	-1.317		112	0.514	-0.927	0.514	-0.927	0.724	-1.252
	76	0.452	-1.023	0.452	-1.023	0.639	-1.381	87	112	0.432	-1.055	0.432	-1.055	0.612	-1.424
53	76	0.493	-0.959	0.493	-0.959	0.695	-1.295		113	0.504	-0.943	0.504	-0.943	0.709	-1.274
	77	0.442	-1.039	0.442	-1.039	0.625	-1.403	88	113	0.442	-1.039	0.442	-1.039	0.625	-1.403
54	77	0.504	-0.943	0.504	-0.943	0.709	-1.274		114	0.493	-0.959	0.493	-0.959	0.695	-1.295
	78	0.432	-1.055	0.432	-1.055	0.612	-1.424	89	114	0.452	-1.023	0.452	-1.023	0.639	-1.381
55	78	0.514	-0.927	0.514	-0.927	0.724	-1.252		115	0.483	-0.975	0.483	-0.975	0.681	-1.317
	79	0.421	-1.071	0.421	-1.071	0.598	-1.445	90	115	0.462	-1.007	0.462	-1.007	0.653	-1.360
56	79	0.525	-0.908	0.525	-0.908	0.738	-1.226		116	0.472	-0.991	0.472	-0.991	0.666	-1.338
	80	0.407	-1.087	0.407	-1.087	0.579	-1.467	91	116	0.472	-0.991	0.472	-0.991	0.666	-1.338
57	80	0.531	-0.845	0.531	-0.845	0.746	-1.141		117	0.462	-1.007	0.462	-1.007	0.653	-1.360
	81	0.345	-1.098	0.345	-1.098	0.494	-1.483	92	117	0.483	-0.975	0.483	-0.975	0.681	-1.317
58	81	0.490	-0.852	0.490	-0.852	0.690	-1.150		118	0.452	-1.023	0.452	-1.023	0.639	-1.381
	82	0.278	-1.068	0.278	-1.068	0.405	-1.442	93	118	0.493	-0.959	0.493	-0.959	0.695	-1.295
59	82	0.437	-0.748	0.437	-0.748	0.620	-1.010		119	0.442	-1.039	0.442	-1.039	0.625	-1.403
	83	0.199	-1.477	0.199	-1.477	0.296	-1.993	94	119	0.504	-0.943	0.504	-0.943	0.709	-1.274
60	83	0.330	-4.956	0.330	-4.956	0.471	-6.690		120	0.432	-1.055	0.432	-1.055	0.612	-1.424
	84	0.477	-0.161	0.477	-0.161	0.644	-0.219	95	120	0.514	-0.927	0.514	-0.927	0.724	-1.252
61	85	0.709	-0.162	0.709	-0.162	0.957	-0.221		121	0.421	-1.071	0.421	-1.071	0.598	-1.445
	86	0.366	-5.678	0.366	-5.678	0.521	-7.665	96	121	0.525	-0.908	0.525	-0.908	0.738	-1.226
62	86	0.239	-1.546	0.239	-1.546	0.350	-2.088		122	0.407	-1.087	0.407	-1.087	0.579	-1.467
	87	0.537	-0.763	0.537	-0.763	0.755	-1.030	97	122	0.531	-0.845	0.531	-0.845	0.746	-1.141
63	87	0.335	-1.165	0.335	-1.165	0.482	-1.573		123	0.345	-1.098	0.345	-1.098	0.494	-1.483
	88	0.597	-0.905	0.597	-0.905	0.834	-1.222	98	123	0.490	-0.852	0.490	-0.852	0.690	-1.150
64	88	0.416	-1.202	0.416	-1.202	0.590	-1.623		124	0.278	-1.068	0.278	-1.068	0.405	-1.442
	89	0.647	-0.893	0.647	-0.893	0.902	-1.206	99	124	0.437	-0.748	0.437	-0.748	0.620	-1.010
65	89	0.492	-1.188	0.492	-1.188	0.693	-1.603		125	0.199	-1.477	0.199	-1.477	0.296	-1.993
	90	0.639	-0.970	0.639	-0.970	0.892	-1.309	100	125	0.330	-4.956	0.330	-4.956	0.471	-6.690
66	90	0.510	-1.168	0.510	-1.168	0.717	-1.577		126	0.477	-0.184	0.477	-0.184	0.644	-0.250
	91	0.626	-0.993	0.626	-0.993	0.874	-1.341	101	126	0.067	-0.759	0.067	-0.759	0.091	-1.025
67	91	0.523	-1.149	0.523	-1.149	0.735	-1.551		127	0.157	-2.777	0.157	-2.777	0.232	-3.749
	92	0.613	-1.013	0.613	-1.013	0.857	-1.367	102	127	0.102	-1.232	0.102	-1.232	0.165	-1.663
68	92	0.536	-1.129	0.536	-1.129	0.752	-1.525		128	0.102	-1.232	0.102	-1.232	0.165	-1.663
	93	0.600	-1.032	0.600	-1.032	0.839	-1.394	103	128	0.209	-0.699	0.209	-0.699	0.312	-0.944
69	93	0.549	-1.110	0.549	-1.110	0.770	-1.498		129	0.143	-0.840	0.143	-0.840	0.222	-1.134
	94	0.587	-1.052	0.587	-1.052	0.822	-1.420	104	129	0.247	-0.724	0.247	-0.724	0.362	-0.977
70	94	0.562	-1.091	0.562	-1.091	0.787	-1.472		130	0.179	-0.856	0.179	-0.856	0.271	-1.156
	95	0.574	-1.071	0.574	-1.071	0.805	-1.446	105	130	0.270	-0.724	0.270	-0.724	0.394	-0.977
71	95	0.574	-1.071	0.574	-1.071	0.805	-1.446		131	0.212	-0.850	0.212	-0.850	0.316	-1.148
	96	0.562	-1.091	0.562	-1.091	0.787	-1.472	106	131	0.268	-0.757	0.268	-0.757	0.390	-1.022
72	96	0.587	-1.052	0.587	-1.052	0.822	-1.420		132	0.219	-0.842	0.219	-0.842	0.325	-1.136
	97	0.549	-1.110	0.549	-1.110	0.770	-1.498	107	132	0.263	-0.767	0.263	-0.767	0.384	-1.036
73	97	0.600	-1.032	0.600	-1.032	0.839	-1.394		133	0.224	-0.833	0.224	-0.833	0.332	-1.125
	98	0.536	-1.129	0.536	-1.129	0.752	-1.525	108	133	0.224	-0.833	0.224	-0.833	0.332	-1.125
74	98	0.613	-1.013	0.613	-1.013	0.857	-1.367		134	0.258	-0.775	0.258	-0.775	0.377	-1.047
	99	0.523	-1.149	0.523	-1.149	0.735	-1.551	109	134	0.229	-0.825	0.229	-0.825	0.338	-1.114
75	99	0.626	-0.993	0.626	-0.993	0.874	-1.341		135	0.253	-0.784	0.253	-0.784	0.371	-1.058
	100	0.510	-1.168	0.510	-1.168	0.717	-1.577	110	135	0.234	-0.817	0.234	-0.817	0.345	-1.103
76	100	0.639	-0.970	0.639	-0.970	0.892	-1.309		136	0.248	-0.792	0.248	-0.792	0.364	-1.069
	101	0.492	-1.188	0.492	-1.188	0.693	-1.603	111	136	0.243	-0.809	0.243	-0.809	0.351	-1.092
77	101	0.647	-0.893	0.647	-0.893	0.902	-1.206		137	0.243	-0.800	0.243	-0.800	0.358	-1.080
	102	0.416	-1.202	0.416	-1.202	0.590	-1.623	112	137	0.239	-0.809	0.239	-0.809	0.351	-1.092
78	102	0.597	-0.905	0.597	-0.905	0.834	-1.222		138	0.248	-0.792	0.248	-0.792	0.364	-1.069
	103	0.335	-1.165	0.335	-1.165	0.482	-1.573	113	138	0.248	-0.792	0.248	-0.792	0.364	-1.069
79	103	0.537	-0.763	0.537	-0.763	0.755	-1.030		139	0.234	-0.817	0.234	-0.817	0.345	-1.103
	104	0.239	-1.546	0.239	-1.546	0.350	-2.088	114	139	0.253	-0.784	0.253	-0.784	0.371	-1.058
80	104	0.366	-5.678	0.366	-5.678	0.521	-7.665		140	0.229	-0.825	0.229	-0.825	0.338	-1.114
								114	140	0.258	-0.775	0.258	-0.775	0.377	-1.047
									141	0.224	-0.833	0.224	-0.833	0.332	-1.125

115	141	0.263	-0.767	0.263	-0.767	0.384	-1.036		30	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	142	0.219	-0.842	0.219	-0.842	0.325	-1.136	150	10	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666
116	142	0.268	-0.757	0.268	-0.757	0.390	-1.022		31	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	143	0.212	-0.850	0.212	-0.850	0.316	-1.148	151	11	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666
117	143	0.270	-0.724	0.270	-0.724	0.394	-0.977		32	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	144	0.179	-0.856	0.179	-0.856	0.271	-1.156	152	12	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666
118	144	0.247	-0.724	0.247	-0.724	0.362	-0.977		33	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	145	0.143	-0.840	0.143	-0.840	0.222	-1.134	153	13	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666
119	145	0.209	-0.699	0.209	-0.699	0.312	-0.944		34	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	146	0.102	-1.232	0.102	-1.232	0.165	-1.663	154	14	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666
120	146	0.157	-2.777	0.157	-2.777	0.232	-3.749		35	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	147	0.067	-0.759	0.067	-0.759	0.091	-1.024	155	15	-0.083	-4.197	-0.083	-4.197	-0.076	-5.666
121	148	0.065	-1.277	0.065	-1.277	0.091	-1.724		36	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	149	0.351	-0.312	0.351	-0.312	0.487	-0.421	156	16	-0.082	-4.197	-0.082	-4.197	-0.074	-5.666
122	149	-0.025	-0.821	-0.025	-0.821	-0.007	-1.108		37	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
	150	0.045	-0.611	0.045	-0.611	0.090	-0.825	157	17	-0.081	-4.182	-0.081	-4.182	-0.073	-5.645
123	150	-0.020	-0.600	-0.020	-0.600	0.003	-0.810		38	-0.031	-2.653	-0.031	-2.653	-0.021	-3.582
	151	-0.016	-0.611	-0.016	-0.611	0.008	-0.825	158	18	-0.079	-3.987	-0.079	-3.987	-0.070	-5.383
124	151	-0.015	-0.602	-0.015	-0.602	0.009	-0.812		39	-0.033	-2.529	-0.033	-2.529	-0.024	-3.415
	152	-0.012	-0.612	-0.012	-0.612	0.012	-0.826	159	19	-0.068	-3.793	-0.068	-3.793	-0.055	-5.121
125	152	-0.012	-0.601	-0.012	-0.601	0.013	-0.812		40	-0.038	-2.406	-0.038	-2.406	-0.031	-3.248
	153	-0.012	-0.611	-0.012	-0.611	0.012	-0.825	160	20	-0.074	-4.085	-0.074	-4.085	-0.067	-5.514
126	153	-0.012	-0.604	-0.012	-0.604	0.013	-0.815		41	-0.040	-2.851	-0.040	-2.851	-0.035	-3.849
	154	-0.012	-0.610	-0.012	-0.610	0.012	-0.824	161	21	0.109	-27.848	0.109	-27.848	0.214	-37.595
127	154	-0.012	-0.604	-0.012	-0.604	0.013	-0.816		42	1.934	-13.267	1.934	-13.267	2.640	-17.911
	155	-0.013	-0.610	-0.013	-0.610	0.012	-0.823	162	22	0.142	-18.275	0.142	-18.275	0.228	-24.671
128	155	-0.013	-0.605	-0.013	-0.605	0.012	-0.817		43	15.713	-0.670	15.713	-0.670	21.212	-0.915
	156	-0.013	-0.609	-0.013	-0.609	0.012	-0.822	163	23	-0.036	-2.580	-0.036	-2.580	-0.030	-3.483
129	156	-0.013	-0.606	-0.013	-0.606	0.012	-0.818		44	1.139	-0.664	1.139	-0.664	1.538	-0.897
	157	-0.013	-0.608	-0.013	-0.608	0.012	-0.821	164	24	-0.029	-2.448	-0.029	-2.448	-0.018	-3.305
130	157	-0.013	-0.607	-0.013	-0.607	0.012	-0.819		45	1.241	-0.429	1.241	-0.429	1.675	-0.581
	158	-0.013	-0.607	-0.013	-0.607	0.012	-0.820	165	25	-0.036	-2.576	-0.036	-2.576	-0.028	-3.478
131	158	-0.013	-0.607	-0.013	-0.607	0.012	-0.820		46	1.320	-0.453	1.320	-0.453	1.782	-0.613
	159	-0.013	-0.607	-0.013	-0.607	0.012	-0.819	166	26	-0.038	-2.705	-0.038	-2.705	-0.030	-3.652
132	159	-0.013	-0.608	-0.013	-0.608	0.012	-0.821		47	1.399	-0.476	1.399	-0.476	1.888	-0.643
	160	-0.013	-0.606	-0.013	-0.606	0.012	-0.818	167	27	-0.038	-2.715	-0.038	-2.715	-0.031	-3.665
133	160	-0.013	-0.609	-0.013	-0.609	0.012	-0.822		48	1.405	-0.478	1.405	-0.478	1.897	-0.646
	161	-0.013	-0.605	-0.013	-0.605	0.012	-0.817	168	28	-0.039	-2.715	-0.039	-2.715	-0.032	-3.665
134	161	-0.013	-0.610	-0.013	-0.610	0.012	-0.823		49	1.405	-0.478	1.405	-0.478	1.897	-0.646
	162	-0.012	-0.604	-0.012	-0.604	0.013	-0.816	169	29	-0.040	-2.715	-0.040	-2.715	-0.032	-3.665
135	162	-0.012	-0.610	-0.012	-0.610	0.012	-0.824		50	1.405	-0.478	1.405	-0.478	1.897	-0.646
	163	-0.012	-0.604	-0.012	-0.604	0.013	-0.815	170	30	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665
136	163	-0.012	-0.611	-0.012	-0.611	0.012	-0.825		51	1.405	-0.478	1.405	-0.478	1.897	-0.646
	164	-0.012	-0.601	-0.012	-0.601	0.013	-0.812	171	31	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665
137	164	-0.012	-0.612	-0.012	-0.612	0.012	-0.826		52	1.405	-0.478	1.405	-0.478	1.897	-0.646
	165	-0.015	-0.602	-0.015	-0.602	0.009	-0.812	172	32	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665
138	165	-0.016	-0.611	-0.016	-0.611	0.008	-0.825		53	1.405	-0.478	1.405	-0.478	1.897	-0.646
	166	-0.020	-0.600	-0.020	-0.600	0.003	-0.810	173	33	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665
139	166	0.045	-0.611	0.045	-0.611	0.090	-0.825		54	1.405	-0.478	1.405	-0.478	1.897	-0.646
	167	-0.025	-0.821	-0.025	-0.821	-0.007	-1.108	174	34	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665
140	167	0.351	-0.312	0.351	-0.312	0.487	-0.421		55	1.405	-0.478	1.405	-0.478	1.897	-0.646
	168	0.065	-1.277	0.065	-1.277	0.091	-1.724	175	35	-0.040	-2.715	-0.040	-2.715	-0.032	-3.665
141	1	0.109	-27.848	0.109	-27.848	0.214	-37.595		56	1.405	-0.478	1.405	-0.478	1.897	-0.646
	22	1.934	-13.267	1.934	-13.267	2.640	-17.911	176	36	-0.039	-2.715	-0.039	-2.715	-0.032	-3.665
142	2	-0.074	-4.085	-0.074	-4.085	-0.067	-5.514		57	1.405	-0.478	1.405	-0.478	1.897	-0.646
	23	-0.040	-2.851	-0.040	-2.851	-0.035	-3.849	177	37	-0.038	-2.715	-0.038	-2.715	-0.031	-3.665
143	3	-0.068	-3.793	-0.068	-3.793	-0.055	-5.121		58	1.405	-0.478	1.405	-0.478	1.897	-0.646
	24	-0.038	-2.406	-0.038	-2.406	-0.031	-3.248	178	38	-0.038	-2.705	-0.038	-2.705	-0.030	-3.652
144	4	-0.079	-3.987	-0.079	-3.987	-0.070	-5.383		59	1.399	-0.476	1.399	-0.476	1.888	-0.643
	25	-0.033	-2.529	-0.033	-2.529	-0.024	-3.415	179	39	-0.036	-2.576	-0.036	-2.576	-0.028	-3.478
145	5	-0.081	-4.182	-0.081	-4.182	-0.073	-5.645		60	1.320	-0.453	1.320	-0.453	1.782	-0.613
	26	-0.031	-2.653	-0.031	-2.653	-0.021	-3.582	180	40	-0.029	-2.448	-0.029	-2.448	-0.018	-3.305
146	6	-0.082	-4.197	-0.082	-4.197	-0.074	-5.666		61	1.241	-0.429	1.241	-0.429	1.675	-0.581
	27	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595	181	41	-0.036	-2.580	-0.036	-2.580	-0.030	-3.483
147	7	-0.083	-4.197	-0.083	-4.197	-0.076	-5.666		62	1.139	-0.664	1.139	-0.664	1.538	-0.897
	28	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595	182	42	0.142	-18.275	0.142	-18.275	0.228	-24.671
148	8	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666		63	15.712	-0.670	15.712	-0.670	21.212	-0.915
	29	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595	183	43	11.998	-6.304	11.998	-6.304	16.197	-8.511
149	9	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666		64	21.772	-0.096	21.772	-0.096	29.392	-0.155

184	44	1.121	-0.432	1.121	-0.432	1.513	-0.584		99	3.010	0.045	3.010	0.045	4.063	0.041
	65	2.432	0.027	2.432	0.027	3.283	0.023	219	79	2.767	0.036	2.767	0.036	3.735	0.034
185	45	1.206	-0.473	1.206	-0.473	1.628	-0.640		100	3.010	0.044	3.010	0.044	4.063	0.041
	66	2.512	0.008	2.512	0.008	3.391	-0.004	220	80	2.756	0.036	2.756	0.036	3.720	0.034
186	46	1.281	-0.502	1.281	-0.502	1.730	-0.679		101	2.998	0.044	2.998	0.044	4.048	0.040
	67	2.655	0.028	2.655	0.028	3.585	0.023	221	81	2.616	0.036	2.616	0.036	3.531	0.035
187	47	1.356	-0.531	1.356	-0.531	1.830	-0.718		102	2.851	0.043	2.851	0.043	3.849	0.040
	68	2.799	0.029	2.799	0.029	3.779	0.025	222	82	2.476	0.035	2.476	0.035	3.343	0.033
188	48	1.362	-0.533	1.362	-0.533	1.838	-0.721		103	2.704	0.043	2.704	0.043	3.650	0.039
	69	2.810	0.030	2.810	0.030	3.794	0.026	223	83	2.571	0.033	2.571	0.033	3.471	0.032
189	49	1.362	-0.533	1.362	-0.533	1.838	-0.721		104	3.014	0.041	3.014	0.041	4.069	0.037
	70	2.810	0.030	2.810	0.030	3.794	0.026	224	84	19.082	-1.691	19.082	-1.691	25.761	-2.303
190	50	1.362	-0.533	1.362	-0.533	1.838	-0.721		105	18.662	-0.044	18.662	-0.044	25.194	-0.087
	71	2.810	0.031	2.810	0.031	3.794	0.027	225	85	18.662	-0.044	18.662	-0.044	25.194	-0.087
191	51	1.362	-0.533	1.362	-0.533	1.838	-0.721		106	19.417	-1.691	19.417	-1.691	26.213	-2.303
	72	2.810	0.031	2.810	0.031	3.794	0.027	226	86	3.014	0.041	3.014	0.041	4.069	0.037
192	52	1.362	-0.533	1.362	-0.533	1.838	-0.721		107	2.578	0.033	2.578	0.033	3.480	0.032
	73	2.810	0.031	2.810	0.031	3.794	0.028	227	87	2.704	0.043	2.704	0.043	3.650	0.039
193	53	1.362	-0.533	1.362	-0.533	1.838	-0.721		108	2.476	0.035	2.476	0.035	3.343	0.033
	74	2.810	0.031	2.810	0.031	3.794	0.028	228	88	2.851	0.043	2.851	0.043	3.849	0.040
194	54	1.362	-0.533	1.362	-0.533	1.838	-0.721		109	2.616	0.036	2.616	0.036	3.531	0.035
	75	2.810	0.031	2.810	0.031	3.794	0.028	229	89	2.998	0.044	2.998	0.044	4.048	0.040
195	55	1.362	-0.533	1.362	-0.533	1.838	-0.721		110	2.756	0.036	2.756	0.036	3.720	0.034
	76	2.810	0.031	2.810	0.031	3.794	0.027	230	90	3.010	0.044	3.010	0.044	4.063	0.041
196	56	1.362	-0.533	1.362	-0.533	1.838	-0.721		111	2.767	0.036	2.767	0.036	3.735	0.034
	77	2.810	0.031	2.810	0.031	3.794	0.027	231	91	3.010	0.045	3.010	0.045	4.063	0.041
197	57	1.362	-0.533	1.362	-0.533	1.838	-0.721		112	2.767	0.036	2.767	0.036	3.735	0.035
	78	2.810	0.030	2.810	0.030	3.794	0.026	232	92	3.010	0.045	3.010	0.045	4.063	0.042
198	58	1.362	-0.533	1.362	-0.533	1.838	-0.721		113	2.767	0.037	2.767	0.037	3.735	0.035
	79	2.810	0.030	2.810	0.030	3.794	0.026	233	93	3.010	0.045	3.010	0.045	4.063	0.042
199	59	1.356	-0.531	1.356	-0.531	1.830	-0.718		114	2.767	0.037	2.767	0.037	3.735	0.035
	80	2.799	0.029	2.799	0.029	3.779	0.025	234	94	3.010	0.046	3.010	0.046	4.063	0.043
200	60	1.281	-0.502	1.281	-0.502	1.730	-0.679		115	2.767	0.037	2.767	0.037	3.735	0.035
	81	2.655	0.028	2.655	0.028	3.585	0.023	235	95	3.010	0.046	3.010	0.046	4.063	0.043
201	61	1.206	-0.473	1.206	-0.473	1.628	-0.640		116	2.767	0.037	2.767	0.037	3.735	0.036
	82	2.512	0.008	2.512	0.008	3.391	-0.004	236	96	3.010	0.046	3.010	0.046	4.063	0.043
202	62	1.121	-0.432	1.121	-0.432	1.513	-0.584		117	2.767	0.037	2.767	0.037	3.735	0.035
	83	2.432	0.027	2.432	0.027	3.283	0.023	237	97	3.010	0.045	3.010	0.045	4.063	0.042
203	63	11.998	-6.303	11.998	-6.303	16.197	-8.511		118	2.767	0.037	2.767	0.037	3.735	0.035
	84	21.772	-0.096	21.772	-0.096	29.392	-0.155	238	98	3.010	0.045	3.010	0.045	4.063	0.042
204	64	19.082	-1.691	19.082	-1.691	25.761	-2.303		119	2.767	0.037	2.767	0.037	3.735	0.035
	85	18.662	-0.044	18.662	-0.044	25.194	-0.087	239	99	3.010	0.045	3.010	0.045	4.063	0.041
205	65	2.571	0.033	2.571	0.033	3.471	0.032		120	2.767	0.036	2.767	0.036	3.735	0.035
	86	3.014	0.041	3.014	0.041	4.069	0.037	240	100	3.010	0.044	3.010	0.044	4.063	0.041
206	66	2.476	0.035	2.476	0.035	3.343	0.033		121	2.767	0.036	2.767	0.036	3.735	0.034
	87	2.704	0.043	2.704	0.043	3.650	0.039	241	101	2.998	0.044	2.998	0.044	4.048	0.040
207	67	2.616	0.036	2.616	0.036	3.531	0.035		122	2.756	0.036	2.756	0.036	3.720	0.034
	88	2.851	0.043	2.851	0.043	3.849	0.040	242	102	2.851	0.043	2.851	0.043	3.849	0.040
208	68	2.756	0.036	2.756	0.036	3.720	0.034		123	2.616	0.036	2.616	0.036	3.531	0.035
	89	2.998	0.044	2.998	0.044	4.048	0.040	243	103	2.704	0.043	2.704	0.043	3.650	0.039
209	69	2.767	0.036	2.767	0.036	3.735	0.034		124	2.476	0.035	2.476	0.035	3.343	0.033
	90	3.010	0.044	3.010	0.044	4.063	0.041	244	104	3.014	0.041	3.014	0.041	4.069	0.037
210	70	2.767	0.036	2.767	0.036	3.735	0.035		125	2.578	0.033	2.578	0.033	3.480	0.032
	91	3.010	0.045	3.010	0.045	4.063	0.041	245	105	18.662	-0.044	18.662	-0.044	25.194	-0.087
211	71	2.767	0.037	2.767	0.037	3.735	0.035		126	19.417	-1.691	19.417	-1.691	26.213	-2.303
	92	3.010	0.045	3.010	0.045	4.063	0.042	246	106	22.257	-0.096	22.257	-0.096	30.046	-0.155
212	72	2.767	0.037	2.767	0.037	3.735	0.035		127	11.998	-6.304	11.998	-6.304	16.197	-8.511
	93	3.010	0.045	3.010	0.045	4.063	0.042	247	107	2.429	0.027	2.429	0.027	3.279	0.023
213	73	2.767	0.037	2.767	0.037	3.735	0.035		128	1.121	-0.432	1.121	-0.432	1.513	-0.584
	94	3.010	0.046	3.010	0.046	4.063	0.043	248	108	2.512	0.008	2.512	0.008	3.391	-0.003
214	74	2.767	0.037	2.767	0.037	3.735	0.036		129	1.206	-0.473	1.206	-0.473	1.628	-0.640
	95	3.010	0.046	3.010	0.046	4.063	0.043	249	109	2.655	0.028	2.655	0.028	3.585	0.023
215	75	2.767	0.037	2.767	0.037	3.735	0.035		130	1.281	-0.502	1.281	-0.502	1.730	-0.679
	96	3.010	0.046	3.010	0.046	4.063	0.043	250	110	2.799	0.029	2.799	0.029	3.779	0.025
216	76	2.767	0.037	2.767	0.037	3.735	0.035		131	1.356	-0.531	1.356	-0.531	1.830	-0.718
	97	3.010	0.045	3.010	0.045	4.063	0.042	251	111	2.810	0.030	2.810	0.030	3.794	0.026
217	77	2.767	0.037	2.767	0.037	3.735	0.035		132	1.362	-0.533	1.362	-0.533	1.838	-0.721
	98	3.010	0.045	3.010	0.045	4.063	0.042	252	112	2.810	0.030	2.810	0.030	3.794	0.026
218	78	2.767	0.036	2.767	0.036	3.735	0.035		133	1.362	-0.533	1.362	-0.533	1.838	-0.721

253	113	2.810	0.031	2.810	0.031	3.794	0.027	168	0.142	-18.247	0.142	-18.247	0.228	-24.634	
	134	1.362	-0.533	1.362	-0.533	1.838	-0.721	288	148	1.934	-13.257	1.934	-13.257	2.640	-17.897
254	114	2.810	0.031	2.810	0.031	3.794	0.027	169	0.109	-27.848	0.109	-27.848	0.214	-37.595	
	135	1.362	-0.533	1.362	-0.533	1.838	-0.721	289	149	-0.040	-2.851	-0.040	-2.851	-0.035	-3.849
255	115	2.810	0.031	2.810	0.031	3.794	0.028	170	-0.074	-4.089	-0.074	-4.089	-0.067	-5.520	
	136	1.362	-0.533	1.362	-0.533	1.838	-0.721	290	150	-0.038	-2.406	-0.038	-2.406	-0.031	-3.248
256	116	2.810	0.031	2.810	0.031	3.794	0.028	171	-0.069	-3.793	-0.069	-3.793	-0.056	-5.121	
	137	1.362	-0.533	1.362	-0.533	1.838	-0.721	291	151	-0.033	-2.529	-0.033	-2.529	-0.024	-3.415
257	117	2.810	0.031	2.810	0.031	3.794	0.028	172	-0.079	-3.987	-0.079	-3.987	-0.070	-5.383	
	138	1.362	-0.533	1.362	-0.533	1.838	-0.721	292	152	-0.031	-2.653	-0.031	-2.653	-0.021	-3.582
258	118	2.810	0.031	2.810	0.031	3.794	0.027	173	-0.081	-4.182	-0.081	-4.182	-0.073	-5.645	
	139	1.362	-0.533	1.362	-0.533	1.838	-0.721	293	153	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
259	119	2.810	0.031	2.810	0.031	3.794	0.027	174	-0.082	-4.197	-0.082	-4.197	-0.074	-5.666	
	140	1.362	-0.533	1.362	-0.533	1.838	-0.721	294	154	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
260	120	2.810	0.030	2.810	0.030	3.794	0.026	175	-0.083	-4.197	-0.083	-4.197	-0.076	-5.666	
	141	1.362	-0.533	1.362	-0.533	1.838	-0.721	295	155	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
261	121	2.810	0.030	2.810	0.030	3.794	0.026	176	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666	
	142	1.362	-0.533	1.362	-0.533	1.838	-0.721	296	156	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
262	122	2.799	0.029	2.799	0.029	3.779	0.025	177	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666	
	143	1.356	-0.531	1.356	-0.531	1.830	-0.718	297	157	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
263	123	2.655	0.028	2.655	0.028	3.585	0.023	178	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666	
	144	1.281	-0.502	1.281	-0.502	1.730	-0.679	298	158	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
264	124	2.512	0.008	2.512	0.008	3.391	-0.003	179	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666	
	145	1.206	-0.473	1.206	-0.473	1.628	-0.640	299	159	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
265	125	2.429	0.027	2.429	0.027	3.279	0.023	180	-0.085	-4.197	-0.085	-4.197	-0.078	-5.666	
	146	1.121	-0.432	1.121	-0.432	1.513	-0.584	300	160	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
266	126	22.256	-0.096	22.256	-0.096	30.046	-0.155	181	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666	
	147	11.998	-6.303	11.998	-6.303	16.197	-8.511	301	161	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
267	127	15.713	-0.670	15.713	-0.670	21.212	-0.915	182	-0.084	-4.197	-0.084	-4.197	-0.077	-5.666	
	148	0.142	-18.248	0.142	-18.248	0.228	-24.634	302	162	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
268	128	1.139	-0.664	1.139	-0.664	1.538	-0.897	183	-0.083	-4.197	-0.083	-4.197	-0.076	-5.666	
	149	-0.036	-2.580	-0.036	-2.580	-0.030	-3.483	303	163	-0.031	-2.663	-0.031	-2.663	-0.021	-3.595
269	129	1.241	-0.429	1.241	-0.429	1.675	-0.581	184	-0.082	-4.197	-0.082	-4.197	-0.074	-5.666	
	150	-0.029	-2.448	-0.029	-2.448	-0.018	-3.305	304	164	-0.031	-2.653	-0.031	-2.653	-0.021	-3.582
270	130	1.320	-0.453	1.320	-0.453	1.782	-0.613	185	-0.081	-4.182	-0.081	-4.182	-0.073	-5.645	
	151	-0.036	-2.576	-0.036	-2.576	-0.028	-3.478	305	165	-0.033	-2.529	-0.033	-2.529	-0.024	-3.415
271	131	1.399	-0.476	1.399	-0.476	1.888	-0.643	186	-0.079	-3.987	-0.079	-3.987	-0.070	-5.383	
	152	-0.038	-2.705	-0.038	-2.705	-0.030	-3.652	306	166	-0.038	-2.406	-0.038	-2.406	-0.031	-3.248
272	132	1.405	-0.478	1.405	-0.478	1.897	-0.646	187	-0.069	-3.793	-0.069	-3.793	-0.056	-5.121	
	153	-0.038	-2.715	-0.038	-2.715	-0.031	-3.665	307	167	-0.040	-2.851	-0.040	-2.851	-0.035	-3.849
273	133	1.405	-0.478	1.405	-0.478	1.897	-0.646	188	-0.074	-4.089	-0.074	-4.089	-0.067	-5.520	
	154	-0.039	-2.715	-0.039	-2.715	-0.032	-3.665	308	168	1.934	-13.257	1.934	-13.257	2.640	-17.897
274	134	1.405	-0.478	1.405	-0.478	1.897	-0.646	189	0.109	-27.848	0.109	-27.848	0.214	-37.595	
	155	-0.040	-2.715	-0.040	-2.715	-0.032	-3.665								
275	135	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	156	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665								
276	136	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	157	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665								
277	137	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	158	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665								
278	138	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	159	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665								
279	139	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	160	-0.040	-2.715	-0.040	-2.715	-0.033	-3.665								
280	140	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	161	-0.040	-2.715	-0.040	-2.715	-0.032	-3.665								
281	141	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	162	-0.039	-2.715	-0.039	-2.715	-0.032	-3.665								
282	142	1.405	-0.478	1.405	-0.478	1.897	-0.646								
	163	-0.038	-2.715	-0.038	-2.715	-0.031	-3.665								
283	143	1.399	-0.476	1.399	-0.476	1.888	-0.643								
	164	-0.038	-2.705	-0.038	-2.705	-0.030	-3.652								
284	144	1.320	-0.453	1.320	-0.453	1.782	-0.613								
	165	-0.036	-2.576	-0.036	-2.576	-0.028	-3.478								
285	145	1.241	-0.429	1.241	-0.429	1.675	-0.581								
	166	-0.029	-2.448	-0.029	-2.448	-0.018	-3.305								
286	146	1.139	-0.664	1.139	-0.664	1.538	-0.897								
	167	-0.036	-2.580	-0.036	-2.580	-0.030	-3.483								
287	147	15.712	-0.670	15.712	-0.670	21.212	-0.915								

Mu+/-, Mk+/-, Md+/-: flectores unitarios y de estados límite de servicio y último (mT/

#### CALCULO A FLEXION DE LA LOSA

=====

El presente listado desarrolla el cálculo a rotura por flexión de la losa, pero no realiza la comprobación a rotura por cortante de la misma.

La armadura de la losa se dispondrá en dos direcciones ortogonales.

Armadura longitudinal (superior e inferior): armadura paralela o casi paralela a los e  
Armadura transversal (superior e inferior): armadura perpendicular a la armadura long

Armadura transversal: cuantías calculadas a partir de la suma de esfuerzos locales y g  
Armadura longitudinal: cuantías calculadas a partir de un 25% de las cuantías de la a

Esfuerzos globales considerados: superestructura, sobrecarga, carro, descensos de apoy  
Esfuerzos locales considerados: superestructura, sobrecarga y carro.

Angulo que forman las barras de armado longitudinal con el eje X (g): 0,0

El eje X es el eje de abcisas del sistema global de coordenadas (X,Y) que se emplea pa  
de ubicación en planta de los ejes de las vigas y los contornos de la losa.

En el primer y último tramo debe disponerse una armadura de zuncho.

Cálculo de las cuantías correspondientes a la armadura transversal en la losa.

=====

Vano	Punto	Viga1	Viga2	Mdsup	Assup	Mdinf	Asinf
1	1	1	2	52.298	116.377	52.298	141.792
1	2	1	2	-14.973	19.242	8.031	16.651
1	3	1	2	-11.693	14.527	6.687	13.347
1	4	1	2	-14.459	18.479	7.889	16.288
1	5	1	2	-15.342	19.796	8.656	18.305
1	6	1	2	-14.459	18.479	7.889	16.288
1	7	1	2	-11.693	14.527	6.687	13.347
1	8	1	2	-14.973	19.242	8.031	16.651
1	9	1	2	52.298	116.376	52.298	141.791

Punto: Punto donde estudiar la losa. Puntos equiespaciados entre ejes de apoyos.  
 Viga1,Viga2 : vigas que definen el tramo donde estudiar la losa.  
 Mdsup (mT/ml): flector de cálculo para la armadura superior transversal de la losa.  
 Mdinf (mT/ml): flector de cálculo para la armadura inferior transversal de la losa.  
 Assup (cm2/ml): cuantía de armadura superior transversal a disponer en la losa.  
 Asinf (cm2/ml): cuantía de armadura inferior transversal a disponer en la losa.  
 Se suele disponer en los puntos extremos de la losa una armadura de zuncho, dado que allí habitualmente se obtienen elevados valores de cuantía de cálculo.

Amadura superior a disponer en la losa.

=====

Vano	Punto	C.Mec.(T/m)	n_t	Fi_t	n_l	Fi_l	Peso (Kg/m2)
1	1	516.310	5	1000	5	32	30858.445
1	2	85.369	5	25	5	12	23.706
1	3	64.451	5	20	5	10	15.413
1	4	81.983	5	25	5	12	23.706
1	5	87.824	5	25	5	12	23.706
1	6	81.983	5	25	5	12	23.706
1	7	64.451	5	20	5	10	15.413
1	8	85.368	5	25	5	12	23.706
1	9	516.304	5	1000	5	32	30858.445

Amadura inferior a disponer en la losa.

=====

Vano	Punto	C.Mec.(T/m)	n_t	Fi_t	n_l	Fi_l	Peso (Kg/m2)
1	1	629.064	5	1000	5	32	30858.445
1	2	73.874	5	25	5	12	23.706
1	3	59.213	5	20	5	10	15.413
1	4	72.264	5	25	5	12	23.706
1	5	81.212	5	25	5	12	23.706
1	6	72.264	5	25	5	12	23.706
1	7	59.213	5	20	5	10	15.413
1	8	73.874	5	25	5	12	23.706
1	9	629.058	5	1000	5	32	30858.445

C.Mec.: capacidad mecánica (T/m) de la armadura transversal  
 n\_t: número de posiciones por metro lineal correspondientes a la amadura transversal.  
 Fi\_t: diámetro de las posiciones correspondientes a la amadura transversal.  
 n\_l: número de posiciones por metro lineal correspondientes a la amadura longitudinal.  
 Fi\_l: diámetro de las posiciones correspondientes a la amadura longitudinal.

LISTADO DE CALCULO EN TRANSPORTE

=====

Cálculo de la armadura de refuerzo

=====

Vano	Viga	lvuelo	Md	Mu	As
1	1	0.000	-0.000	-5.867	0.000
1	1	1.517	-0.000	-158.530	0.000
1	1	3.033	-0.000	-172.821	0.000
1	1	4.550	-0.000	-151.018	0.000
1	1	6.067	-0.000	-136.994	0.000
1	1	7.583	-0.000	-127.219	0.000
1	1	9.100	-0.000	-120.428	0.000
1	1	10.617	-0.000	-120.428	0.000
1	1	12.133	-0.000	-120.428	0.000
1	1	13.650	-0.000	-120.428	0.000
1	2	0.000	-0.000	-0.000	0.000
1	2	1.517	-0.000	-32.095	0.000
1	2	3.033	-0.000	-30.493	0.000
1	2	4.550	-0.000	-30.493	0.000
1	2	6.067	-0.000	-30.493	0.000
1	2	7.583	-0.000	-30.493	0.000
1	2	9.100	-0.000	-30.493	0.000
1	2	10.617	-0.000	-30.493	0.000
1	2	12.133	-0.000	-30.493	0.000
1	2	13.650	-0.000	-30.493	0.000

Mu: Momento último correspondiente a la sección sin armadura de refuerzo (mT).  
 lvuelo (m): longitud de vuelo  
 As (cm2): Cuantía de refuerzo en fibra superior (Rec. mec. 5 cm)  
 Md: Momento de cálculo (mT)

CALCULO A FISURACION DE LAS VIGAS

=====

Máxima abertura de fisura (mm): 0,0000  
 Recubrimiento geométrico de hormigón c(m): 0,0000  
 Coeficiente de impacto :0,0000

Punto : Ordinal del punto de la directriz de la viga.  
 s(m) : Distancia del punto al inicio de la directriz de la viga.  
 N°Barras: Número de barras de la armadura pasiva dispuestas en una fila.  
 Fi(mm) : Diámetro de las barras de la armadura pasiva.  
 Sep.(m) : Separación entre las barras de la armadura pasiva.  
 Y(m) : Distancia del centro de las barras de la armadura pasiva a la fibra inferior de la sección de la viga.  
 Nk(T) : Axil para la combinación frecuente de acciones.  
 Mk(mT) : Flector para la combinación frecuente de acciones.  
 Mfis(mT) : Flector para el que la fibra más traccionada de hormigón alcanza el valor fctm con el axil Nk.  
 Ts(Kg/cm2) : Tensión de la armadura pasiva para la combinación frecuente de acciones.  
 Tsr(Kg/cm2): Tensión de la armadura pasiva en el instante en que se fisura el hormigón  
 wk (mm) : Abertura característica de fisura.

El cálculo a fisuración se resuelve en cada fila de la tabla para el supuesto de que e voladizo en transporte sea desde el inicio de la viga hasta el punto de ordinal "Punto

Vano 1 Viga 1  
 -----

Armadura pasiva en la cara superior

-----

Punto	s(m)	N°Barras	Fi (mm)	Sep. (m)	Y(m)
1	0.000	1	0.000	0.000	2.200
2	0.500	1	0.000	0.000	2.200
3	1.771	1	0.000	0.000	2.200
4	3.043	1	0.000	0.000	2.200
5	4.314	1	0.000	0.000	2.200
6	5.586	1	0.000	0.000	2.200
7	6.857	1	0.000	0.000	2.200
8	8.129	1	0.000	0.000	2.200

9	9.400	1	0.000	0.000	2.200
10	10.671	1	0.000	0.000	2.200
11	11.943	1	0.000	0.000	2.200
12	13.214	1	0.000	0.000	2.200

Abertura característica de fisura en fibra superior

Punto	s (m)	Cumple	Nk (T)	Mk (mT)	Mfis (mT)	Ts (Kg/cm2)	Tsr (Kg/cm2)	wk (mm)
1	0.000	Sí	0.00	0.00	-245.35	La sección no se fisura		
2	0.500	Sí	727.66	-452.02	-580.67	La sección no se fisura		
3	1.771	Sí	845.81	-525.41	-634.98	La sección no se fisura		
4	3.043	Sí	869.84	-545.70	-645.43	La sección no se fisura		
5	4.314	Sí	1104.84	-744.05	-753.07	La sección no se fisura		
6	5.586	Sí	1401.61	-979.80	-886.55	2065.86	754.73	-1.#IND0
7	6.857	Sí	1401.61	-979.80	-886.55	2065.86	754.73	-1.#IND0
8	8.129	Sí	1699.05	-1201.34	-1018.27	3254.89	600.60	-1.#IND0
9	9.400	Sí	1699.05	-1201.34	-1018.27	3254.89	600.60	-1.#IND0
10	10.671	Sí	1699.05	-1201.34	-1018.27	3254.89	600.60	-1.#IND0
11	11.943	Sí	1699.05	-1201.34	-1018.27	3254.89	600.60	-1.#IND0
12	13.214	Sí	1699.05	-1201.34	-1018.27	3254.89	600.60	-1.#IND0

Vano 1 Viga 2

Armadura pasiva en la cara superior

Punto	s (m)	N°Barras	Fi (mm)	Sep. (m)	Y (m)
1	0.000	1	0.000	0.000	2.200
2	0.500	1	0.000	0.000	2.200
3	1.771	1	0.000	0.000	2.200
4	3.043	1	0.000	0.000	2.200
5	4.314	1	0.000	0.000	2.200
6	5.586	1	0.000	0.000	2.200
7	6.857	1	0.000	0.000	2.200
8	8.129	1	0.000	0.000	2.200
9	9.400	1	0.000	0.000	2.200
10	10.671	1	0.000	0.000	2.200
11	11.943	1	0.000	0.000	2.200
12	13.214	1	0.000	0.000	2.200

Abertura característica de fisura en fibra superior

Punto	s (m)	Cumple	Nk (T)	Mk (mT)	Mfis (mT)	Ts (Kg/cm2)	Tsr (Kg/cm2)	wk (mm)
1	0.000	Sí	0.00	0.00	-243.61	La sección no se fisura		
2	0.500	Sí	664.39	-528.26	-548.31	La sección no se fisura		
3	1.771	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
4	3.043	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
5	4.314	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
6	5.586	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
7	6.857	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
8	8.129	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
9	9.400	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
10	10.671	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
11	11.943	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
12	13.214	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0

**Trams de 30m:**

PROYECTO DE TABLERO DE VIGAS  
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Listado generado el día 06-07-2020 a las 15:48:34.

Nombre del proyecto : 20200611 tablero\_30

Normativa utilizada (España): Instrucción IAP-2011/IAPF, EHE-2008

MEMORIA DEL PROYECTO  
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Definición en planta  
 =====

Contorno izquierdo del tablero  
 -----

Punto	x	y
1	-0.000	9.300
2	49.500	9.300

Contorno derecho del tablero  
 -----

Punto	x	y
1	0.000	0.000
2	49.500	0.000

Ejes de apoyos  
 -----

Vano 1  
 -----

Eje 1			
Punto	x	y	
1	10.000	0.000	
2	10.000	9.300	
Eje 2			
Punto	x	y	
1	39.500	0.000	
2	39.500	9.300	

Ejes de las vigas  
 -----

Vano 1  
 -----

Viga 1  
 -----

Apoyo 1	
x1 =	10.000
y1 =	6.900
Apoyo 2	
x2 =	39.500
y2 =	6.900

Viga 2  
 -----

Apoyo 1	
x1 =	10.000
y1 =	2.400
Apoyo 2	
x2 =	39.500
y2 =	2.400

Descripción de los apoyos  
 -----

Vano 1  
 -----

Viga 1  
 -----

Longitud de culata : 0.500 m  
 Número de apoyos por extremo : 1

Viga 2  
 -----

Longitud de culata : 0.500 m  
 Número de apoyos por extremo : 1

Sección de las vigas  
 =====

Forma de la sección  
 -----

Vano 1  
 -----

Viga 1  
 -----

Forma : Artesa Tipo 1  
 Tipo : AR-ALV-220-307

Viga 2  
 -----

Forma : Artesa Tipo 1  
 Tipo : AR-ALV-220-307

Tipos de sección  
 -----

Sección tipo artesa

Tipo : AR-ALV-220-307

Parámetros :

A :	133.200 cm
B :	147.200 cm
C :	194.800 cm
D :	56.350 cm
E :	220.000 cm
F :	30.000 cm
G :	15.000 cm
H :	10.000 cm
I :	10.000 cm
J :	10.000 cm
K :	28.000 cm
L :	2.000 cm
M :	5.000 cm
N :	5.000 cm
O :	5.000 cm

Materiales  
 =====

Hormigón de las vigas :  
 -----

Nombre : HP-50

Tipo : Hormigón.

Módulo de Young E (T/m2) :	3357390.00
Resistencia característica fck(T/m2) :	5102.00
Coefic. de minoración para situación persistente :	1.500
Coefic. de minoración para situación accidental :	1.300
Deformación máxima de compresión :	0.00350



Deformación de cambio de tramo en la ley parábola-rectángulo : 0.00200

Hormigón de la losa :

Nombre : HA-30

Tipo : Hormigón.

Módulo de Young E (T/m2) : 2916000.00  
Resistencia característica fck(T/m2) : 3061.20  
Coefic. de minoración para situación persistente : 1.500  
Coefic. de minoración para situación accidental : 1.300  
Deformación máxima de compresión : 0.00350  
Deformación de cambio de tramo en la ley parábola-rectángulo : 0.00200

Acero de la armadura pasiva de la viga :

Nombre : B500S

Tipo : Acero de dureza natural.

Módulo de Young E (T/m2) : 20408160.00  
Resistencia característica fyk(T/m2) : 51020.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.01000  
Deformación máxima de tracción : -0.01000

Acero de la armadura pasiva de la losa :

Nombre : B500S

Tipo : Acero de dureza natural.

Módulo de Young E (T/m2) : 20408160.00  
Resistencia característica fyk(T/m2) : 51020.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.01000  
Deformación máxima de tracción : -0.01000

Acero de la armadura activa de la viga :

Nombre : Y1860S7

Tipo : Acero para pretensar.

Módulo de Young E (T/m2) : 19387760.00  
Resistencia característica fyk(T/m2) : 173660.00  
Coefic. de minoración para situación persistente : 1.150  
Coefic. de minoración para situación accidental : 1.000  
Deformación máxima de compresión : 0.03500  
Deformación máxima adicional a la inicial : -0.01000  
Deformación máxima de tracción : -0.03500

Espesor de la losa

Espesor constante de 0.250 m  
Se ha optado por no incluir la prelosa en la sección resistente final viga + losa.  
Espesor de la losa considerado para el cálculo de esfuerzos locales: 0.250 m

Definición del pretensado

Vano 1

Viga 1

Fila 1

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 3.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 2

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 3

Distancia cdg-fibra inferior : 0.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 8  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 5.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 4

Distancia cdg-fibra inferior : 0.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 6  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 5

Distancia cdg-fibra inferior : 2.100 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 4  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Viga 2

Fila 1

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 16  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 15.167 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 2

Distancia cdg-fibra inferior : 0.050 m  
Area de acero de cada cordón : 1.400 cm2  
Numero de cordones : 14  
Resistencia última del acero : 19000.000 Kp/cm2  
Longitud de entubamiento : 0.000 m  
Tensión de tesado : 13833.674 Kp/cm2

Fila 3

-----  
 Distancia cdg-fibra inferior : 0.100 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 16  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 4

-----  
 Distancia cdg-fibra inferior : 0.100 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 0.000 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 5

-----  
 Distancia cdg-fibra inferior : 0.150 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 16  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 6

-----  
 Distancia cdg-fibra inferior : 0.150 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 0.000 m  
 Tensión de tesado : 13833.674 Kp/cm2

Fila 7

-----  
 Distancia cdg-fibra inferior : 0.200 m  
 Area de acero de cada cordón : 1.400 cm2  
 Numero de cordones : 14  
 Resistencia última del acero : 19000.000 Kp/cm2  
 Longitud de entubamiento : 15.167 m  
 Tensión de tesado : 13833.674 Kp/cm2

Definición de la armadura pasiva de las vigas

Vano 1

Viga 1

Fila 1

-----  
 Distancia cdg-fibra inferior : 0.050 cm  
 Diámetro de las barras : 12 mm  
 Número de barras : 12  
 Longitud de recorte : 0.050 m

Viga 2

Fila 1

-----  
 Distancia cdg-fibra inferior : 0.050 cm  
 Diámetro de las barras : 12 mm  
 Número de barras : 12  
 Longitud de recorte : 0.050 m

Definición de la armadura pasiva de la losa

Vano 1

-----  
 Armadura longitudinal superior : Fi 12 a 0.200 m  
 Armadura longitudinal inferior : Fi 12 a 0.200 m  
 Armadura transversal superior : Fi 16 a 0.200 m  
 Armadura transversal inferior : Fi 16 a 0.200 m

Recubrimiento mecánico superior : 0.050 m  
 Recubrimiento mecánico inferior : 0.050 m

Calendario

-----  
 Día en que se hormigona la viga : 0  
 Día en que se transfiere el pretensado : 5  
 Día en que se hormigona la losa : 30  
 Número de días entre hormigonado y fraguado de la losa : 1  
 Día en que se aplica la carga permanente sobre la losa : 90

Acciones sobre el puente

Peso Propio

-----  
 Densidad del hormigón (T/m3): 2,50

Superestructura

-----  
 Peso del pavimento con el espesor de proyecto (T/m2): 0,184  
 El programa incluye en el cálculo el aumento en un 50% del valor del peso de pavimento de proyecto, tal como se establece en la norma IAP.

Acera izquierda :

peso (T/m) : 0,400  
 anchura (m) : 0,650  
 distancia del centro de gravedad al borde del tablero (m) : 0,325

Acera derecha :

peso (T/m) : 0,400  
 anchura (m) : 0,650  
 distancia del centro de gravedad al borde del tablero (m) : 0,325

Tráfico en plataforma

-----  
 Anchura de los carriles virtuales:

Anchura de la plataforma (m)	Anchura del carril virtual (m)
0.000	0.000
3.000	3.000
5.399	3.000
5.400	2.700
6.000	3.000
1000.000	3.000

Nota: Para valores intermedios de la anchura de plataforma se interpola linealmente

Cargas de tráfico en plataforma:

Situación	Carga por rueda del vehículo pesado (t)	Sobrecarga uniforme (t/m2)
-----	-----	-----

Carril 1	15.291	0.917
Carril 2	10.194	0.255
Carril 3	5.097	0.255
Resto de carriles	0.000	0.255
Área remanente	0.000	0.255

Posición de las ruedas de los vehículos pesados:

Carga 1:	Distancia longitudinal de la carga :	0.000m
	Distancia transversal de la carga :	-1.000m
Carga 2:	Distancia longitudinal de la carga :	0.000m
	Distancia transversal de la carga :	1.000m
Carga 3:	Distancia longitudinal de la carga :	1.200m
	Distancia transversal de la carga :	-1.000m
Carga 4:	Distancia longitudinal de la carga :	1.200m
	Distancia transversal de la carga :	1.000m

Distancia de avance de los vehículos pesados : 1.000m

Tráfico en aceras

Ancho de la acera izquierda (m):	0,000
Ancho de la acera derecha (m):	0,000
Carga en acera izquierda (t/m2):	0,255
Carga en acera derecha (t/m2):	0,255

Gradiente térmico

Coefficiente de dilatación térmica (E-5) (1/°C):	1,00
Diferencia de temp. positiva entre cara sup. e inf.(°C) :	15,000
Diferencia de temp. positiva entre cara inf. y sup.(°C) :	-8,000

Humedad

Humedad relativa (%): 60,00

Coefficientes de seguridad

Coefficientes parciales de seguridad

Acción	Est. Límite Servicio		Estado Límite Ultimo	
	Coef.Fav.	Coef.Desf.	Coef.Fav.	Coef.Desf.
PP	1.00	1.00	1.00	1.35
PL	1.00	1.00	1.00	1.35
SE	1.00	1.00	1.00	1.35
TF	0.00	1.00	0.00	1.35
TA	0.00	1.00	0.00	1.35
GT	0.00	1.00	0.00	1.50
DA	0.00	1.00	0.00	1.20
TI	0.95	1.05	1.00	1.00
TP	1.00	1.00	1.00	1.35
RT	0.00	1.00	0.00	1.35
FL	0.00	1.00	0.00	1.35

PP : Peso propio de la viga.  
 PL : Peso propio de la losa.  
 SE : Superestructura.  
 TF : Tráfico en plataforma.

TA : Tráfico en aceras.  
 GT : Gradiente térmico.  
 DA : Descenso de apoyos.  
 TI : Acción instantánea del pretensado.  
 TP : Pérdidas diferidas del pretensado.  
 RT : Retracción de los hormigones de viga y losa.  
 FL : Fluencia de los hormigones de viga y losa.

Coefficientes de combinación

Acción	Psi0	Psi1	Psi2
Vehículos pesados	0.750	0.750	0.000
Sobrecarga uniforme	0.400	0.400	0.000
Carga en aceras	0.400	0.400	0.000
Acción térmica	0.600	0.600	0.500

Coefficientes de retracción y fluencia a tiempo infinito:

Resistencia característica del hormigón de la viga (Kg/cm2): 510,20  
 Resistencia característica del hormigón de la losa (Kg/cm2): 306,12  
 Humedad relativa (%): 60,0  
 Día en que se produce el tesado de las vigas: 5,0

Vano 1.Viga 1

Espesor ficticio de la sección transversal de la viga (mm): 209,4  
 Espesor ficticio de la sección transversal de la losa (mm): 284,5  
 Coef. de retracción de la viga entre el fraguado de la losa y tiempo infinito: 0,00  
 Coef. de retracción de la losa a tiempo infinito: 0,00038073  
 Coef. de fluencia de la viga entre el fraguado de la losa y tiempo infinito:  
 - Por acción del tesado de la viga: 1,207  
 - Por peso propio de la losa: 1,204  
 - Por superestructura: 1,148  
 Coef. de fluencia de la losa a tiempo infinito:  
 - Por superestructura: 1,782

Vano 1.Viga 2

Espesor ficticio de la sección transversal de la viga (mm): 209,4  
 Espesor ficticio de la sección transversal de la losa (mm): 284,5  
 Coef. de retracción de la viga entre el fraguado de la losa y tiempo infinito: 0,00  
 Coef. de retracción de la losa a tiempo infinito: 0,00038073  
 Coef. de fluencia de la viga entre el fraguado de la losa y tiempo infinito:  
 - Por acción del tesado de la viga: 1,207  
 - Por peso propio de la losa: 1,204  
 - Por superestructura: 1,148  
 Coef. de fluencia de la losa a tiempo infinito:  
 - Por superestructura: 1,782

LISTADO DE CARACTERISTICAS GEOMETRICAS

Sección bruta : No incluye la armadura activa ni la pasiva.  
 Sección neta : Se añade a la sección bruta la armadura pasiva, que se homogeneiza respecto del hormigón. No incluye la armadura activa. Se incluyen, sin embargo, los agujeros de las vainas de pretensado.  
 Sección homogeneizada : Se añade a la sección neta la armadura activa, que se homogeneiza respecto del hormigón.  
 A : área de la sección.  
 Ix : momento de inercia respecto del eje horizontal que pasa por el centro de gravedad.  
 Iy : momento de inercia respecto del eje vertical que pasa por el centro de gravedad.  
 Vs : Distancia del centro de gravedad a la fibra superior de la sección.  
 Vi : Distancia del centro de gravedad a la fibra inferior de la sección.

Secciones completas

=====

Las secciones siguientes NO incluyen la reducción del ancho de losa asociada al coeficiente de ancho eficaz.

Vano 1 Viga 1

-----  
Sección completa bruta de la viga  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.24245	0.75283	0.87440	1.305	-0.895
0.000	1.24245	0.75283	0.87440	1.305	-0.895
0.089	1.24245	0.75283	0.87440	1.305	-0.895
2.490	1.24245	0.75283	0.87440	1.305	-0.895
2.950	1.24245	0.75283	0.87440	1.305	-0.895
3.089	1.24245	0.75283	0.87440	1.305	-0.895
4.490	1.24245	0.75283	0.87440	1.305	-0.895
5.089	1.24245	0.75283	0.87440	1.305	-0.895
5.900	1.24245	0.75283	0.87440	1.305	-0.895
8.850	1.24245	0.75283	0.87440	1.305	-0.895
11.800	1.24245	0.75283	0.87440	1.305	-0.895
14.750	1.24245	0.75283	0.87440	1.305	-0.895
17.700	1.24245	0.75283	0.87440	1.305	-0.895
20.650	1.24245	0.75283	0.87440	1.305	-0.895
23.600	1.24245	0.75283	0.87440	1.305	-0.895
24.411	1.24245	0.75283	0.87440	1.305	-0.895
25.010	1.24245	0.75283	0.87440	1.305	-0.895
26.411	1.24245	0.75283	0.87440	1.305	-0.895
26.550	1.24245	0.75283	0.87440	1.305	-0.895
27.010	1.24245	0.75283	0.87440	1.305	-0.895
29.411	1.24245	0.75283	0.87440	1.305	-0.895
29.500	1.24245	0.75283	0.87440	1.305	-0.895
30.000	1.24245	0.75283	0.87440	1.305	-0.895

-----  
Sección completa bruta de la viga + losa  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.089	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
3.089	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.089	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
24.411	2.01848	1.76954	2.26233	0.995	-1.455
25.010	2.01848	1.76954	2.26233	0.995	-1.455
26.411	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
27.010	2.01848	1.76954	2.26233	0.995	-1.455
29.411	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

-----  
Sección completa neta de la viga  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.23909	0.75008	0.87277	1.304	-0.896
0.000	1.24598	0.75558	0.87427	1.309	-0.891
0.089	1.24598	0.75558	0.87427	1.309	-0.891
2.490	1.24598	0.75558	0.87427	1.309	-0.891
2.950	1.24402	0.75419	0.87379	1.307	-0.893
3.089	1.24402	0.75419	0.87379	1.307	-0.893
4.490	1.24402	0.75419	0.87379	1.307	-0.893
5.089	1.24290	0.75349	0.87348	1.306	-0.894
5.900	1.24290	0.75349	0.87348	1.306	-0.894
8.850	1.24290	0.75349	0.87348	1.306	-0.894
11.800	1.24290	0.75349	0.87348	1.306	-0.894
14.750	1.24290	0.75349	0.87348	1.306	-0.894
17.700	1.24290	0.75349	0.87348	1.306	-0.894
20.650	1.24290	0.75349	0.87348	1.306	-0.894
23.600	1.24290	0.75349	0.87348	1.306	-0.894
24.411	1.24290	0.75349	0.87348	1.306	-0.894
25.010	1.24402	0.75419	0.87379	1.307	-0.893
26.411	1.24402	0.75419	0.87379	1.307	-0.893
26.550	1.24402	0.75419	0.87379	1.307	-0.893
27.010	1.24598	0.75558	0.87427	1.309	-0.891
29.411	1.24598	0.75558	0.87427	1.309	-0.891
29.500	1.24598	0.75558	0.87427	1.309	-0.891
30.000	1.23909	0.75008	0.87277	1.304	-0.896

-----  
Sección completa neta de la viga + losa  
-----

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.04222	1.78574	2.31171	0.981	-1.469
0.000	2.04911	1.80055	2.31321	0.986	-1.464
0.089	2.04911	1.80055	2.31321	0.986	-1.464
2.490	2.04911	1.80055	2.31321	0.986	-1.464
2.950	2.04715	1.79663	2.31273	0.985	-1.465
3.089	2.04715	1.79663	2.31273	0.985	-1.465
4.490	2.04715	1.79663	2.31273	0.985	-1.465
5.089	2.04603	1.79454	2.31242	0.984	-1.466
5.900	2.04603	1.79454	2.31242	0.984	-1.466
8.850	2.04603	1.79454	2.31242	0.984	-1.466
11.800	2.04603	1.79454	2.31242	0.984	-1.466
14.750	2.04603	1.79454	2.31242	0.984	-1.466
17.700	2.04603	1.79454	2.31242	0.984	-1.466
20.650	2.04603	1.79454	2.31242	0.984	-1.466
23.600	2.04603	1.79454	2.31242	0.984	-1.466
24.411	2.04603	1.79454	2.31242	0.984	-1.466
25.010	2.04715	1.79663	2.31273	0.985	-1.465
26.411	2.04715	1.79663	2.31273	0.985	-1.465
26.550	2.04715	1.79663	2.31273	0.985	-1.465
27.010	2.04911	1.80055	2.31321	0.986	-1.464
29.411	2.04911	1.80055	2.31321	0.986	-1.464
29.500	2.04911	1.80055	2.31321	0.986	-1.464
30.000	2.04222	1.78574	2.31171	0.981	-1.469

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Sección completa homogeneizada de la viga  
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Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.25849	0.76588	0.88215	1.311	-0.889
0.000	1.26539	0.77129	0.88365	1.316	-0.884
0.089	1.26539	0.77129	0.88365	1.316	-0.884
2.490	1.26539	0.77129	0.88365	1.316	-0.884
2.950	1.27475	0.77775	0.88595	1.322	-0.878
3.089	1.27475	0.77775	0.88595	1.322	-0.878
4.490	1.27475	0.77775	0.88595	1.322	-0.878
5.089	1.28009	0.78097	0.88743	1.325	-0.875
5.900	1.28009	0.78097	0.88743	1.325	-0.875

8.850	1.28009	0.78097	0.88743	1.325	-0.875
11.800	1.28009	0.78097	0.88743	1.325	-0.875
14.750	1.28009	0.78097	0.88743	1.325	-0.875
17.700	1.28009	0.78097	0.88743	1.325	-0.875
20.650	1.28009	0.78097	0.88743	1.325	-0.875
23.600	1.28009	0.78097	0.88743	1.325	-0.875
24.411	1.28009	0.78097	0.88743	1.325	-0.875
25.010	1.27475	0.77775	0.88595	1.322	-0.878
26.411	1.27475	0.77775	0.88595	1.322	-0.878
26.550	1.27475	0.77775	0.88595	1.322	-0.878
27.010	1.26539	0.77129	0.88365	1.316	-0.884
29.411	1.26539	0.77129	0.88365	1.316	-0.884
29.500	1.26539	0.77129	0.88365	1.316	-0.884
30.000	1.25849	0.76588	0.88215	1.311	-0.889

Sección completa homogeneizada de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.06162	1.81870	2.32109	0.991	-1.459
0.000	2.06852	1.83331	2.32259	0.996	-1.454
0.089	2.06852	1.83331	2.32259	0.996	-1.454
2.490	2.06852	1.83331	2.32259	0.996	-1.454
2.950	2.07788	1.85168	2.32489	1.002	-1.448
3.089	2.07788	1.85168	2.32489	1.002	-1.448
4.490	2.07788	1.85168	2.32489	1.002	-1.448
5.089	2.08322	1.86137	2.32637	1.006	-1.444
5.900	2.08322	1.86137	2.32637	1.006	-1.444
8.850	2.08322	1.86137	2.32637	1.006	-1.444
11.800	2.08322	1.86137	2.32637	1.006	-1.444
14.750	2.08322	1.86137	2.32637	1.006	-1.444
17.700	2.08322	1.86137	2.32637	1.006	-1.444
20.650	2.08322	1.86137	2.32637	1.006	-1.444
23.600	2.08322	1.86137	2.32637	1.006	-1.444
24.411	2.08322	1.86137	2.32637	1.006	-1.444
25.010	2.07788	1.85168	2.32489	1.002	-1.448
26.411	2.07788	1.85168	2.32489	1.002	-1.448
26.550	2.07788	1.85168	2.32489	1.002	-1.448
27.010	2.06852	1.83331	2.32259	0.996	-1.454
29.411	2.06852	1.83331	2.32259	0.996	-1.454
29.500	2.06852	1.83331	2.32259	0.996	-1.454
30.000	2.06162	1.81870	2.32109	0.991	-1.459

Vano 1 Viga 2

Sección completa bruta de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.24245	0.75283	0.87440	1.305	-0.895
0.000	1.24245	0.75283	0.87440	1.305	-0.895
0.047	1.24245	0.75283	0.87440	1.305	-0.895
2.950	1.24245	0.75283	0.87440	1.305	-0.895
5.900	1.24245	0.75283	0.87440	1.305	-0.895
8.850	1.24245	0.75283	0.87440	1.305	-0.895
11.800	1.24245	0.75283	0.87440	1.305	-0.895
14.287	1.24245	0.75283	0.87440	1.305	-0.895
14.657	1.24245	0.75283	0.87440	1.305	-0.895
14.750	1.24245	0.75283	0.87440	1.305	-0.895
14.843	1.24245	0.75283	0.87440	1.305	-0.895
15.213	1.24245	0.75283	0.87440	1.305	-0.895
17.700	1.24245	0.75283	0.87440	1.305	-0.895
20.650	1.24245	0.75283	0.87440	1.305	-0.895
23.600	1.24245	0.75283	0.87440	1.305	-0.895
26.550	1.24245	0.75283	0.87440	1.305	-0.895
29.453	1.24245	0.75283	0.87440	1.305	-0.895

29.500	1.24245	0.75283	0.87440	1.305	-0.895
30.000	1.24245	0.75283	0.87440	1.305	-0.895

Sección completa bruta de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.287	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
14.843	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
29.453	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección completa neta de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.23657	0.74908	0.87293	1.301	-0.899
0.000	1.24346	0.75462	0.87443	1.306	-0.894
0.047	1.24346	0.75462	0.87443	1.306	-0.894
2.950	1.24346	0.75462	0.87443	1.306	-0.894
5.900	1.24346	0.75462	0.87443	1.306	-0.894
8.850	1.24346	0.75462	0.87443	1.306	-0.894
11.800	1.24346	0.75462	0.87443	1.306	-0.894
14.287	1.24346	0.75462	0.87443	1.306	-0.894
14.657	1.24346	0.75462	0.87443	1.306	-0.894
14.750	1.23478	0.74939	0.87228	1.301	-0.899
14.843	1.24346	0.75462	0.87443	1.306	-0.894
15.213	1.24346	0.75462	0.87443	1.306	-0.894
17.700	1.24346	0.75462	0.87443	1.306	-0.894
20.650	1.24346	0.75462	0.87443	1.306	-0.894
23.600	1.24346	0.75462	0.87443	1.306	-0.894
26.550	1.24346	0.75462	0.87443	1.306	-0.894
29.453	1.24346	0.75462	0.87443	1.306	-0.894
29.500	1.24346	0.75462	0.87443	1.306	-0.894
30.000	1.23657	0.74908	0.87293	1.301	-0.899

Sección completa neta de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
2.950	2.04659	1.79530	2.31337	0.984	-1.466
5.900	2.04659	1.79530	2.31337	0.984	-1.466
8.850	2.04659	1.79530	2.31337	0.984	-1.466
11.800	2.04659	1.79530	2.31337	0.984	-1.466
14.287	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
14.750	2.03791	1.77954	2.31122	0.978	-1.472
14.843	2.04659	1.79530	2.31337	0.984	-1.466

15.213	2.04659	1.79530	2.31337	0.984	-1.466
17.700	2.04659	1.79530	2.31337	0.984	-1.466
20.650	2.04659	1.79530	2.31337	0.984	-1.466
23.600	2.04659	1.79530	2.31337	0.984	-1.466
26.550	2.04659	1.79530	2.31337	0.984	-1.466
29.453	2.04659	1.79530	2.31337	0.984	-1.466
29.500	2.04659	1.79530	2.31337	0.984	-1.466
30.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección completa homogeneizada de la viga

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	1.27053	0.77023	0.88140	1.322	-0.878
0.000	1.27742	0.77551	0.88290	1.327	-0.873
0.047	1.27742	0.77551	0.88290	1.327	-0.873
2.950	1.27742	0.77551	0.88290	1.327	-0.873
5.900	1.27742	0.77551	0.88290	1.327	-0.873
8.850	1.27742	0.77551	0.88290	1.327	-0.873
11.800	1.27742	0.77551	0.88290	1.327	-0.873
14.287	1.27742	0.77551	0.88290	1.327	-0.873
14.657	1.27742	0.77551	0.88290	1.327	-0.873
14.750	1.31886	0.79822	0.89316	1.351	-0.849
14.843	1.27742	0.77551	0.88290	1.327	-0.873
15.213	1.27742	0.77551	0.88290	1.327	-0.873
17.700	1.27742	0.77551	0.88290	1.327	-0.873
20.650	1.27742	0.77551	0.88290	1.327	-0.873
23.600	1.27742	0.77551	0.88290	1.327	-0.873
26.550	1.27742	0.77551	0.88290	1.327	-0.873
29.453	1.27742	0.77551	0.88290	1.327	-0.873
29.500	1.27742	0.77551	0.88290	1.327	-0.873
30.000	1.27053	0.77023	0.88140	1.322	-0.878

Sección completa homogeneizada de la viga + losa

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
2.950	2.08055	1.85770	2.32184	1.006	-1.444
5.900	2.08055	1.85770	2.32184	1.006	-1.444
8.850	2.08055	1.85770	2.32184	1.006	-1.444
11.800	2.08055	1.85770	2.32184	1.006	-1.444
14.287	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
14.750	2.12199	1.92878	2.33210	1.032	-1.418
14.843	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.08055	1.85770	2.32184	1.006	-1.444
17.700	2.08055	1.85770	2.32184	1.006	-1.444
20.650	2.08055	1.85770	2.32184	1.006	-1.444
23.600	2.08055	1.85770	2.32184	1.006	-1.444
26.550	2.08055	1.85770	2.32184	1.006	-1.444
29.453	2.08055	1.85770	2.32184	1.006	-1.444
29.500	2.08055	1.85770	2.32184	1.006	-1.444
30.000	2.07366	1.84330	2.32034	1.001	-1.449

Secciones eficaces

Las secciones siguientes SI incluyen la reducción del ancho de losa asociada al coeficiente de ancho eficaz.

Vano 1 Viga 1

Sección eficaz bruta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.089	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
3.089	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.089	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
24.411	2.01848	1.76954	2.26233	0.995	-1.455
25.010	2.01848	1.76954	2.26233	0.995	-1.455
26.411	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
27.010	2.01848	1.76954	2.26233	0.995	-1.455
29.411	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz bruta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.089	2.01848	1.76954	2.26233	0.995	-1.455
2.490	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
3.089	2.01848	1.76954	2.26233	0.995	-1.455
4.490	2.01848	1.76954	2.26233	0.995	-1.455
5.089	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
24.411	2.01848	1.76954	2.26233	0.995	-1.455
25.010	2.01848	1.76954	2.26233	0.995	-1.455
26.411	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
27.010	2.01848	1.76954	2.26233	0.995	-1.455
29.411	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz neta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.04222	1.78574	2.31171	0.981	-1.469
0.000	2.04911	1.80055	2.31321	0.986	-1.464
0.089	2.04911	1.80055	2.31321	0.986	-1.464
2.490	2.04911	1.80055	2.31321	0.986	-1.464
2.950	2.04715	1.79663	2.31273	0.985	-1.465
3.089	2.04715	1.79663	2.31273	0.985	-1.465
4.490	2.04715	1.79663	2.31273	0.985	-1.465

5.089	2.04603	1.79454	2.31242	0.984	-1.466
5.900	2.04603	1.79454	2.31242	0.984	-1.466
8.850	2.04603	1.79454	2.31242	0.984	-1.466
11.800	2.04603	1.79454	2.31242	0.984	-1.466
14.750	2.04603	1.79454	2.31242	0.984	-1.466
17.700	2.04603	1.79454	2.31242	0.984	-1.466
20.650	2.04603	1.79454	2.31242	0.984	-1.466
23.600	2.04603	1.79454	2.31242	0.984	-1.466
24.411	2.04603	1.79454	2.31242	0.984	-1.466
25.010	2.04715	1.79663	2.31273	0.985	-1.465
26.411	2.04715	1.79663	2.31273	0.985	-1.465
26.550	2.04715	1.79663	2.31273	0.985	-1.465
27.010	2.04911	1.80055	2.31321	0.986	-1.464
29.411	2.04911	1.80055	2.31321	0.986	-1.464
29.500	2.04911	1.80055	2.31321	0.986	-1.464
30.000	2.04222	1.78574	2.31171	0.981	-1.469

Sección eficaz neta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.04222	1.78574	2.31171	0.981	-1.469
0.000	2.04911	1.80055	2.31321	0.986	-1.464
0.089	2.04911	1.80055	2.31321	0.986	-1.464
2.490	2.04911	1.80055	2.31321	0.986	-1.464
2.950	2.04715	1.79663	2.31273	0.985	-1.465
3.089	2.04715	1.79663	2.31273	0.985	-1.465
4.490	2.04715	1.79663	2.31273	0.985	-1.465
5.089	2.04603	1.79454	2.31242	0.984	-1.466
5.900	2.04603	1.79454	2.31242	0.984	-1.466
8.850	2.04603	1.79454	2.31242	0.984	-1.466
11.800	2.04603	1.79454	2.31242	0.984	-1.466
14.750	2.04603	1.79454	2.31242	0.984	-1.466
17.700	2.04603	1.79454	2.31242	0.984	-1.466
20.650	2.04603	1.79454	2.31242	0.984	-1.466
23.600	2.04603	1.79454	2.31242	0.984	-1.466
24.411	2.04603	1.79454	2.31242	0.984	-1.466
25.010	2.04715	1.79663	2.31273	0.985	-1.465
26.411	2.04715	1.79663	2.31273	0.985	-1.465
26.550	2.04715	1.79663	2.31273	0.985	-1.465
27.010	2.04911	1.80055	2.31321	0.986	-1.464
29.411	2.04911	1.80055	2.31321	0.986	-1.464
29.500	2.04911	1.80055	2.31321	0.986	-1.464
30.000	2.04222	1.78574	2.31171	0.981	-1.469

Sección eficaz homogeneizada viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.06162	1.81870	2.32109	0.991	-1.459
0.000	2.06852	1.83331	2.32259	0.996	-1.454
0.089	2.06852	1.83331	2.32259	0.996	-1.454
2.490	2.06852	1.83331	2.32259	0.996	-1.454
2.950	2.07788	1.85168	2.32489	1.002	-1.448
3.089	2.07788	1.85168	2.32489	1.002	-1.448
4.490	2.07788	1.85168	2.32489	1.002	-1.448
5.089	2.08322	1.86137	2.32637	1.006	-1.444
5.900	2.08322	1.86137	2.32637	1.006	-1.444
8.850	2.08322	1.86137	2.32637	1.006	-1.444
11.800	2.08322	1.86137	2.32637	1.006	-1.444
14.750	2.08322	1.86137	2.32637	1.006	-1.444
17.700	2.08322	1.86137	2.32637	1.006	-1.444
20.650	2.08322	1.86137	2.32637	1.006	-1.444
23.600	2.08322	1.86137	2.32637	1.006	-1.444
24.411	2.08322	1.86137	2.32637	1.006	-1.444
25.010	2.07788	1.85168	2.32489	1.002	-1.448
26.411	2.07788	1.85168	2.32489	1.002	-1.448

26.550	2.07788	1.85168	2.32489	1.002	-1.448
27.010	2.06852	1.83331	2.32259	0.996	-1.454
29.411	2.06852	1.83331	2.32259	0.996	-1.454
29.500	2.06852	1.83331	2.32259	0.996	-1.454
30.000	2.06162	1.81870	2.32109	0.991	-1.459

Sección eficaz homogeneizada viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.06162	1.81870	2.32109	0.991	-1.459
0.000	2.06852	1.83331	2.32259	0.996	-1.454
0.089	2.06852	1.83331	2.32259	0.996	-1.454
2.490	2.06852	1.83331	2.32259	0.996	-1.454
2.950	2.07788	1.85168	2.32489	1.002	-1.448
3.089	2.07788	1.85168	2.32489	1.002	-1.448
4.490	2.07788	1.85168	2.32489	1.002	-1.448
5.089	2.08322	1.86137	2.32637	1.006	-1.444
5.900	2.08322	1.86137	2.32637	1.006	-1.444
8.850	2.08322	1.86137	2.32637	1.006	-1.444
11.800	2.08322	1.86137	2.32637	1.006	-1.444
14.750	2.08322	1.86137	2.32637	1.006	-1.444
17.700	2.08322	1.86137	2.32637	1.006	-1.444
20.650	2.08322	1.86137	2.32637	1.006	-1.444
23.600	2.08322	1.86137	2.32637	1.006	-1.444
24.411	2.08322	1.86137	2.32637	1.006	-1.444
25.010	2.07788	1.85168	2.32489	1.002	-1.448
26.411	2.07788	1.85168	2.32489	1.002	-1.448
26.550	2.07788	1.85168	2.32489	1.002	-1.448
27.010	2.06852	1.83331	2.32259	0.996	-1.454
29.411	2.06852	1.83331	2.32259	0.996	-1.454
29.500	2.06852	1.83331	2.32259	0.996	-1.454
30.000	2.06162	1.81870	2.32109	0.991	-1.459

Vano 1 Viga 2

Sección eficaz bruta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455
0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.287	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
14.843	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
29.453	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz bruta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.01848	1.76954	2.26233	0.995	-1.455

0.000	2.01848	1.76954	2.26233	0.995	-1.455
0.047	2.01848	1.76954	2.26233	0.995	-1.455
2.950	2.01848	1.76954	2.26233	0.995	-1.455
5.900	2.01848	1.76954	2.26233	0.995	-1.455
8.850	2.01848	1.76954	2.26233	0.995	-1.455
11.800	2.01848	1.76954	2.26233	0.995	-1.455
14.287	2.01848	1.76954	2.26233	0.995	-1.455
14.657	2.01848	1.76954	2.26233	0.995	-1.455
14.750	2.01848	1.76954	2.26233	0.995	-1.455
14.843	2.01848	1.76954	2.26233	0.995	-1.455
15.213	2.01848	1.76954	2.26233	0.995	-1.455
17.700	2.01848	1.76954	2.26233	0.995	-1.455
20.650	2.01848	1.76954	2.26233	0.995	-1.455
23.600	2.01848	1.76954	2.26233	0.995	-1.455
26.550	2.01848	1.76954	2.26233	0.995	-1.455
29.453	2.01848	1.76954	2.26233	0.995	-1.455
29.500	2.01848	1.76954	2.26233	0.995	-1.455
30.000	2.01848	1.76954	2.26233	0.995	-1.455

Sección eficaz neta viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
2.950	2.04659	1.79530	2.31337	0.984	-1.466
5.900	2.04659	1.79530	2.31337	0.984	-1.466
8.850	2.04659	1.79530	2.31337	0.984	-1.466
11.800	2.04659	1.79530	2.31337	0.984	-1.466
14.287	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
14.750	2.03791	1.77954	2.31122	0.978	-1.472
14.843	2.04659	1.79530	2.31337	0.984	-1.466
15.213	2.04659	1.79530	2.31337	0.984	-1.466
17.700	2.04659	1.79530	2.31337	0.984	-1.466
20.650	2.04659	1.79530	2.31337	0.984	-1.466
23.600	2.04659	1.79530	2.31337	0.984	-1.466
26.550	2.04659	1.79530	2.31337	0.984	-1.466
29.453	2.04659	1.79530	2.31337	0.984	-1.466
29.500	2.04659	1.79530	2.31337	0.984	-1.466
30.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección eficaz neta viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.03970	1.78044	2.31187	0.979	-1.471
0.000	2.04659	1.79530	2.31337	0.984	-1.466
0.047	2.04659	1.79530	2.31337	0.984	-1.466
2.950	2.04659	1.79530	2.31337	0.984	-1.466
5.900	2.04659	1.79530	2.31337	0.984	-1.466
8.850	2.04659	1.79530	2.31337	0.984	-1.466
11.800	2.04659	1.79530	2.31337	0.984	-1.466
14.287	2.04659	1.79530	2.31337	0.984	-1.466
14.657	2.04659	1.79530	2.31337	0.984	-1.466
14.750	2.03791	1.77954	2.31122	0.978	-1.472
14.843	2.04659	1.79530	2.31337	0.984	-1.466
15.213	2.04659	1.79530	2.31337	0.984	-1.466
17.700	2.04659	1.79530	2.31337	0.984	-1.466
20.650	2.04659	1.79530	2.31337	0.984	-1.466
23.600	2.04659	1.79530	2.31337	0.984	-1.466
26.550	2.04659	1.79530	2.31337	0.984	-1.466
29.453	2.04659	1.79530	2.31337	0.984	-1.466
29.500	2.04659	1.79530	2.31337	0.984	-1.466
30.000	2.03970	1.78044	2.31187	0.979	-1.471

Sección eficaz homogeneizada viga+losa para estado límite de servicio

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
2.950	2.08055	1.85770	2.32184	1.006	-1.444
5.900	2.08055	1.85770	2.32184	1.006	-1.444
8.850	2.08055	1.85770	2.32184	1.006	-1.444
11.800	2.08055	1.85770	2.32184	1.006	-1.444
14.287	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
14.750	2.12199	1.92878	2.33210	1.032	-1.418
14.843	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.08055	1.85770	2.32184	1.006	-1.444
17.700	2.08055	1.85770	2.32184	1.006	-1.444
20.650	2.08055	1.85770	2.32184	1.006	-1.444
23.600	2.08055	1.85770	2.32184	1.006	-1.444
26.550	2.08055	1.85770	2.32184	1.006	-1.444
29.453	2.08055	1.85770	2.32184	1.006	-1.444
29.500	2.08055	1.85770	2.32184	1.006	-1.444
30.000	2.07366	1.84330	2.32034	1.001	-1.449

Sección eficaz homogeneizada viga+losa para estado límite último

Distancia (m)	A (m2)	Ix (m4)	Iy (m4)	Vs (m)	Vi (m)
-0.500	2.07366	1.84330	2.32034	1.001	-1.449
0.000	2.08055	1.85770	2.32184	1.006	-1.444
0.047	2.08055	1.85770	2.32184	1.006	-1.444
2.950	2.08055	1.85770	2.32184	1.006	-1.444
5.900	2.08055	1.85770	2.32184	1.006	-1.444
8.850	2.08055	1.85770	2.32184	1.006	-1.444
11.800	2.08055	1.85770	2.32184	1.006	-1.444
14.287	2.08055	1.85770	2.32184	1.006	-1.444
14.657	2.08055	1.85770	2.32184	1.006	-1.444
14.750	2.12199	1.92878	2.33210	1.032	-1.418
14.843	2.08055	1.85770	2.32184	1.006	-1.444
15.213	2.08055	1.85770	2.32184	1.006	-1.444
17.700	2.08055	1.85770	2.32184	1.006	-1.444
20.650	2.08055	1.85770	2.32184	1.006	-1.444
23.600	2.08055	1.85770	2.32184	1.006	-1.444
26.550	2.08055	1.85770	2.32184	1.006	-1.444
29.453	2.08055	1.85770	2.32184	1.006	-1.444
29.500	2.08055	1.85770	2.32184	1.006	-1.444
30.000	2.07366	1.84330	2.32034	1.001	-1.449

LISTADO DE ESFUERZOS

Vano 1 Viga 1

Esfuerzos por pretensado instantáneo.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	-217.797	-217.797	0.000	0.000	443.629	443.629
0.089	-217.797	-217.797	0.000	0.000	443.629	443.629
2.490	-217.797	-217.797	0.000	0.000	443.629	443.629
2.950	-396.191	-396.191	0.000	0.000	654.843	654.843
3.089	-436.789	-436.789	0.000	0.000	702.882	702.882
4.490	-436.789	-436.789	0.000	0.000	702.882	702.882
5.089	-554.641	-554.641	0.000	0.000	851.157	851.157



5.900	-554.641	-554.641	0.000	0.000	851.157	851.157	8.850	101.002	101.002	0.000	0.000	-75.433	-75.433
8.850	-554.641	-554.641	0.000	0.000	851.157	851.157	11.800	97.487	97.487	0.000	0.000	-73.205	-73.205
11.800	-554.641	-554.641	0.000	0.000	851.157	851.157	14.750	96.270	96.270	0.000	0.000	-72.434	-72.434
14.750	-554.641	-554.641	0.000	0.000	851.157	851.157	17.700	97.487	97.487	0.000	0.000	-73.205	-73.205
17.700	-554.641	-554.641	0.000	0.000	851.157	851.157	20.650	101.002	101.002	0.000	0.000	-75.433	-75.433
20.650	-554.641	-554.641	0.000	0.000	851.157	851.157	23.600	106.815	106.815	0.000	0.000	-79.118	-79.118
23.600	-554.641	-554.641	0.000	0.000	851.157	851.157	24.411	108.688	108.688	0.000	0.000	-80.305	-80.305
24.411	-554.641	-554.641	0.000	0.000	851.157	851.157	25.010	80.380	80.380	0.000	0.000	-61.001	-61.001
25.010	-436.789	-436.789	0.000	0.000	702.882	702.882	26.411	83.717	83.717	0.000	0.000	-63.080	-63.080
26.411	-436.789	-436.789	0.000	0.000	702.882	702.882	26.550	73.275	73.275	0.000	0.000	-56.194	-56.194
26.550	-396.191	-396.191	0.000	0.000	654.844	654.844	27.010	39.483	39.483	0.000	0.000	-33.774	-33.774
27.010	-217.797	-217.797	0.000	0.000	443.629	443.629	29.411	43.765	43.765	0.000	0.000	-36.339	-36.339
29.411	-217.797	-217.797	0.000	0.000	443.629	443.629	29.500	43.929	43.929	0.000	0.000	-36.437	-36.437
29.500	-217.797	-217.797	0.000	0.000	443.629	443.629	30.000	0.000	0.000	0.000	0.000	0.000	0.000
30.000	0.000	0.000	0.000	0.000	0.000	0.000							

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

Esfuerzos por pérdidas de pretensado en fase 1.

Esfuerzos por peso propio de la viga.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	10.325	10.325	0.000	0.000	-17.220	-17.220
0.089	10.260	10.260	0.000	0.000	-17.181	-17.181
2.490	8.615	8.615	0.000	0.000	-16.201	-16.201
2.950	19.714	19.714	0.000	0.000	-29.334	-29.334
3.089	22.906	22.906	0.000	0.000	-33.132	-33.132
4.490	21.765	21.765	0.000	0.000	-32.222	-32.222
5.089	31.118	31.118	0.000	0.000	-44.013	-44.013
5.900	30.528	30.528	0.000	0.000	-43.501	-43.501
8.850	28.654	28.654	0.000	0.000	-41.876	-41.876
11.800	27.530	27.530	0.000	0.000	-40.900	-40.900
14.750	27.156	27.156	0.000	0.000	-40.575	-40.575
17.700	27.530	27.530	0.000	0.000	-40.900	-40.900
20.650	28.654	28.654	0.000	0.000	-41.876	-41.876
23.600	30.528	30.528	0.000	0.000	-43.501	-43.501
24.411	31.118	31.118	0.000	0.000	-44.013	-44.013
25.010	21.765	21.765	0.000	0.000	-32.222	-32.222
26.411	22.906	22.906	0.000	0.000	-33.132	-33.132
26.550	19.714	19.714	0.000	0.000	-29.334	-29.334
27.010	8.615	8.615	0.000	0.000	-16.201	-16.201
29.411	10.260	10.260	0.000	0.000	-17.181	-17.181
29.500	10.325	10.325	0.000	0.000	-17.220	-17.220
30.000	0.000	0.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).  
N+,N- : Axil máximo positivo y mínimo negativo(T).

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	-0.000	-0.000
0.000	-0.388	-0.388	45.039	45.039
0.089	3.597	3.597	44.763	44.763
2.490	102.129	102.129	37.305	37.305
2.950	117.163	117.163	36.031	36.031
3.089	123.909	123.909	35.445	35.445
4.490	170.526	170.526	31.092	31.092
5.089	188.586	188.586	29.233	29.233
5.900	208.592	208.592	27.023	27.023
8.850	273.899	273.899	18.016	18.016
11.800	313.082	313.082	9.008	9.008
14.750	326.144	326.144	-0.000	-0.000
17.700	313.082	313.082	-9.008	-9.008
20.650	273.898	273.898	-18.016	-18.016
23.600	208.592	208.592	-27.023	-27.023
24.411	188.586	188.586	-29.233	-29.233
25.010	170.526	170.526	-31.092	-31.092
26.411	123.909	123.909	-35.445	-35.445
26.550	117.163	117.163	-36.031	-36.031
27.010	102.129	102.129	-37.305	-37.305
29.411	3.596	3.596	-44.763	-44.763
29.500	-0.388	-0.388	-45.039	-45.039
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por pérdidas de pretensado en fase 2.

Esfuerzos por peso propio de la losa.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	43.929	43.929	0.000	0.000	-36.437	-36.437
0.089	43.765	43.765	0.000	0.000	-36.339	-36.339
2.490	39.483	39.483	0.000	0.000	-33.774	-33.774
2.950	73.275	73.275	0.000	0.000	-56.194	-56.194
3.089	83.717	83.717	0.000	0.000	-63.080	-63.080
4.490	80.380	80.380	0.000	0.000	-61.001	-61.001
5.089	108.688	108.688	0.000	0.000	-80.305	-80.305
5.900	106.815	106.815	0.000	0.000	-79.118	-79.118

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	-0.433	-0.433	50.232	50.232
0.089	4.011	4.011	49.924	49.924
2.490	113.904	113.904	41.606	41.606
2.950	130.671	130.671	40.185	40.185
3.089	138.195	138.195	39.531	39.531
4.490	190.187	190.187	34.677	34.677
5.089	210.329	210.329	32.603	32.603
5.900	232.642	232.642	30.139	30.139
8.850	305.478	305.478	20.093	20.093
11.800	349.179	349.179	10.046	10.046

14.750	363.746	363.746	-0.000	-0.000
17.700	349.179	349.179	-10.046	-10.046
20.650	305.477	305.477	-20.093	-20.093
23.600	232.642	232.642	-30.139	-30.139
24.411	210.329	210.329	-32.603	-32.603
25.010	190.187	190.187	-34.677	-34.677
26.411	138.195	138.195	-39.531	-39.531
26.550	130.671	130.671	-40.185	-40.185
27.010	113.904	113.904	-41.606	-41.606
29.411	4.011	4.011	-49.924	-49.924
29.500	-0.433	-0.433	-50.232	-50.232
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por superestructura.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	8.646	-8.652	25.455	12.928
0.089	10.152	-7.139	25.299	12.853
2.490	50.899	33.779	21.088	10.829
2.950	58.705	41.618	20.281	10.442
3.089	61.059	43.982	20.037	10.325
4.490	83.559	61.933	17.598	9.123
5.089	92.190	67.857	16.561	8.602
5.900	103.884	75.883	15.156	7.897
8.850	137.747	99.465	10.074	5.303
11.800	158.764	114.449	5.026	2.666
14.750	167.225	120.443	0.012	-0.012
17.700	158.764	114.449	-2.666	-5.026
20.650	137.747	99.466	-5.303	-10.074
23.600	103.884	75.883	-7.897	-15.156
24.411	92.190	67.857	-8.602	-16.561
25.010	83.559	61.933	-9.123	-17.598
26.411	61.059	43.982	-10.325	-20.037
26.550	58.705	41.618	-10.442	-20.281
27.010	50.899	33.779	-10.829	-21.088
29.411	10.152	-7.139	-12.853	-25.299
29.500	8.646	-8.651	-12.928	-25.455
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre las aceras

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000
0.089	0.000	0.000	0.000	0.000
2.490	0.000	0.000	0.000	0.000
2.950	0.000	0.000	0.000	0.000
3.089	0.000	0.000	0.000	0.000
4.490	0.000	0.000	0.000	0.000
5.089	0.000	0.000	0.000	0.000
5.900	0.000	0.000	0.000	0.000
8.850	0.000	0.000	0.000	0.000
11.800	0.000	0.000	0.000	0.000
14.750	0.000	0.000	0.000	0.000
17.700	0.000	0.000	0.000	0.000
20.650	0.000	0.000	0.000	0.000

23.600	0.000	0.000	0.000	0.000
24.411	0.000	0.000	0.000	0.000
25.010	0.000	0.000	0.000	0.000
26.411	0.000	0.000	0.000	0.000
26.550	0.000	0.000	0.000	0.000
27.010	0.000	0.000	0.000	0.000
29.411	0.000	0.000	0.000	0.000
29.500	0.000	0.000	0.000	0.000
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre la plataforma

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	121.728	-118.362	132.557	-15.764
0.089	129.069	-116.338	132.176	-15.799
2.490	327.702	-61.560	121.872	-16.756
2.950	365.753	-51.067	119.898	-16.940
3.089	377.231	-47.901	119.303	-16.995
4.490	487.832	-33.330	112.044	-20.938
5.089	533.397	-32.649	108.545	-23.021
5.900	595.135	-31.727	103.805	-25.842
8.850	771.239	-28.732	88.051	-36.343
11.800	877.578	-26.697	73.783	-47.423
14.750	919.809	-26.872	59.521	-59.521
17.700	877.580	-26.697	47.424	-73.783
20.650	771.242	-28.732	36.343	-88.050
23.600	595.138	-31.727	25.843	-103.805
24.411	533.399	-32.649	23.021	-108.545
25.010	487.833	-33.330	20.939	-112.044
26.411	377.232	-47.902	16.996	-119.303
26.550	365.755	-51.067	16.940	-119.898
27.010	327.703	-61.561	16.757	-121.872
29.411	129.070	-116.341	15.799	-132.176
29.500	121.728	-118.366	15.764	-132.556
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por gradiente térmico

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.083	-0.156	0.013	-0.007
0.089	0.082	-0.154	0.013	-0.007
2.490	0.056	-0.105	0.016	-0.009
2.950	0.051	-0.096	0.017	-0.009
3.089	0.050	-0.093	0.017	-0.009
4.490	0.050	-0.094	0.019	-0.010
5.089	0.051	-0.096	0.020	-0.011
5.900	0.052	-0.098	0.021	-0.011
8.850	0.097	-0.119	0.020	-0.011
11.800	0.186	-0.277	0.015	-0.008
14.750	0.207	-0.388	0.008	-0.008
17.700	0.186	-0.277	0.008	-0.015
20.650	0.097	-0.119	0.011	-0.020
23.600	0.052	-0.098	0.011	-0.021
24.411	0.051	-0.096	0.011	-0.020
25.010	0.050	-0.094	0.010	-0.019



s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo (mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo (T).  
N+,N- : Axil máximo positivo y mínimo negativo (T).

Esfuerzos por pérdidas de pretensado en fase 2.

s (m)	M+	M-	Q+	Q-	N+	N-
-0.500	0.000	0.000	0.000	0.000	0.000	0.000
0.000	94.343	94.343	0.000	0.000	-64.121	-64.121
0.047	94.080	94.080	0.000	0.000	-63.942	-63.942
2.950	85.822	85.822	0.000	0.000	-58.333	-58.333
5.900	79.174	79.174	0.000	0.000	-53.817	-53.817
8.850	74.406	74.406	0.000	0.000	-50.578	-50.578
11.800	71.523	71.523	0.000	0.000	-48.620	-48.620
14.287	70.562	70.562	0.000	0.000	-47.968	-47.968
14.657	94.942	94.942	0.000	0.000	-64.539	-64.539
14.750	94.901	94.901	0.000	0.000	-64.511	-64.511
14.843	94.942	94.942	0.000	0.000	-64.539	-64.539
15.213	70.562	70.562	0.000	0.000	-47.968	-47.968
17.700	71.523	71.523	0.000	0.000	-48.620	-48.620
20.650	74.406	74.406	0.000	0.000	-50.578	-50.578
23.600	79.174	79.174	0.000	0.000	-53.817	-53.817
26.550	85.822	85.822	0.000	0.000	-58.333	-58.333
29.453	94.080	94.080	0.000	0.000	-63.942	-63.942
29.500	94.343	94.343	0.000	0.000	-64.121	-64.121
30.000	0.000	0.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo (mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo (T).  
N+,N- : Axil máximo positivo y mínimo negativo (T).

Esfuerzos por peso propio de la viga.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	-0.000	-0.000
0.000	-0.388	-0.388	45.039	45.039
0.047	3.476	3.476	44.772	44.772
2.950	117.163	117.163	36.031	36.031
5.900	208.592	208.592	27.023	27.023
8.850	273.899	273.899	18.016	18.016
11.800	313.083	313.083	9.008	9.008
14.287	326.101	326.101	0.518	0.518
14.657	326.106	326.106	0.487	0.487
14.750	326.144	326.144	0.000	0.000
14.843	326.106	326.106	-0.487	-0.487
15.213	326.101	326.101	-0.518	-0.518
17.700	313.083	313.083	-9.008	-9.008
20.650	273.899	273.899	-18.016	-18.016
23.600	208.592	208.592	-27.023	-27.023
26.550	117.163	117.163	-36.031	-36.031
29.453	3.476	3.476	-44.772	-44.772
29.500	-0.388	-0.388	-45.039	-45.039
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo (mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo (T).

Esfuerzos por peso propio de la losa.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000
0.047	0.000	0.000	0.000	0.000
2.950	0.000	0.000	0.000	0.000
5.900	0.000	0.000	0.000	0.000
8.850	0.000	0.000	0.000	0.000
11.800	0.000	0.000	0.000	0.000
14.287	0.000	0.000	0.000	0.000
14.657	0.000	0.000	0.000	0.000
14.750	0.000	0.000	0.000	0.000

-0.500	0.000	0.000	0.000	0.000
0.000	-0.433	-0.433	50.232	50.232
0.047	3.877	3.877	49.934	49.934
2.950	130.671	130.671	40.185	40.185
5.900	232.642	232.642	30.139	30.139
8.850	305.478	305.478	20.093	20.093
11.800	349.179	349.179	10.046	10.046
14.287	363.698	363.698	0.577	0.577
14.657	363.704	363.704	0.543	0.543
14.750	363.746	363.746	-0.000	-0.000
14.843	363.704	363.704	-0.543	-0.543
15.213	363.698	363.698	-0.577	-0.577
17.700	349.179	349.179	-10.046	-10.046
20.650	305.477	305.477	-20.093	-20.093
23.600	232.642	232.642	-30.139	-30.139
26.550	130.671	130.671	-40.185	-40.185
29.453	3.877	3.877	-49.934	-49.934
29.500	-0.433	-0.433	-50.232	-50.232
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo (mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo (T).

Esfuerzos por superestructura.

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	8.707	-8.701	25.447	12.916
0.047	9.499	-7.904	25.365	12.876
2.950	58.704	41.541	20.274	10.431
5.900	103.749	75.831	15.150	7.888
8.850	137.547	99.322	10.067	5.295
11.800	158.498	114.168	5.021	2.660
14.287	165.587	119.107	0.799	0.407
14.657	166.642	119.842	0.171	0.072
14.750	166.908	120.027	0.013	-0.012
14.843	166.642	119.842	-0.072	-0.171
15.213	165.587	119.107	-0.407	-0.799
17.700	158.498	114.168	-2.660	-5.021
20.650	137.548	99.323	-5.295	-10.067
23.600	103.751	75.833	-7.888	-15.150
26.550	58.707	41.544	-10.431	-20.273
29.453	9.502	-7.901	-12.876	-25.365
29.500	8.710	-8.698	-12.915	-25.447
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo (mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo (T).

Esfuerzos por tráfico sobre las aceras

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000
0.047	0.000	0.000	0.000	0.000
2.950	0.000	0.000	0.000	0.000
5.900	0.000	0.000	0.000	0.000
8.850	0.000	0.000	0.000	0.000
11.800	0.000	0.000	0.000	0.000
14.287	0.000	0.000	0.000	0.000
14.657	0.000	0.000	0.000	0.000
14.750	0.000	0.000	0.000	0.000

14.843	0.000	0.000	0.000	0.000
15.213	0.000	0.000	0.000	0.000
17.700	0.000	0.000	0.000	0.000
20.650	0.000	0.000	0.000	0.000
23.600	0.000	0.000	0.000	0.000
26.550	0.000	0.000	0.000	0.000
29.453	0.000	0.000	0.000	0.000
29.500	0.000	0.000	0.000	0.000
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por tráfico sobre la plataforma

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	122.103	-118.623	132.526	-15.838
0.047	125.963	-117.553	132.326	-15.856
2.950	365.599	-51.159	119.868	-16.967
5.900	594.448	-31.918	103.772	-25.835
8.850	770.172	-28.982	88.037	-36.326
11.800	876.473	-26.814	73.797	-47.397
14.287	912.515	-27.267	61.770	-57.622
14.657	917.879	-27.334	59.980	-59.144
14.750	919.232	-27.351	59.528	-59.528
14.843	917.881	-27.334	59.145	-59.979
15.213	912.516	-27.267	57.623	-61.769
17.700	876.466	-26.814	47.398	-73.797
20.650	770.175	-28.979	36.327	-88.036
23.600	594.462	-31.913	25.835	-103.771
26.550	365.614	-51.151	16.967	-119.867
29.453	125.978	-117.549	15.856	-132.325
29.500	122.118	-118.619	15.838	-132.526
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.  
M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por gradiente térmico

s (m)	M+	M-	Q+	Q-
-0.500	0.000	0.000	0.000	0.000
0.000	0.158	-0.084	0.007	-0.013
0.047	0.157	-0.084	0.007	-0.014
2.950	0.097	-0.052	0.009	-0.017
5.900	0.099	-0.053	0.011	-0.021
8.850	0.120	-0.097	0.010	-0.018
11.800	0.280	-0.188	0.005	-0.010
14.287	0.394	-0.216	0.002	-0.002
14.657	0.411	-0.220	0.001	-0.001
14.750	0.415	-0.221	0.001	-0.001
14.843	0.411	-0.220	0.001	-0.001
15.213	0.394	-0.216	0.003	-0.002
17.700	0.280	-0.189	0.010	-0.005
20.650	0.120	-0.097	0.019	-0.010
23.600	0.099	-0.053	0.021	-0.011
26.550	0.097	-0.052	0.018	-0.009
29.453	0.158	-0.085	0.014	-0.007
29.500	0.159	-0.085	0.014	-0.007
30.000	0.000	0.000	0.000	0.000

s(m) : distancia al inicio de la viga.

M+,M- : Momento flector máximo positivo y mínimo negativo(mT).  
Q+,Q- : Cortante máximo positivo y mínimo negativo(T).

Esfuerzos por retracción conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	45.187	64.841	-45.187	0.450
0.000	45.232	65.103	-45.232	0.449
0.047	45.232	65.103	-45.232	0.449
2.950	45.232	65.103	-45.232	0.449
5.900	45.232	65.103	-45.232	0.449
8.850	45.232	65.103	-45.232	0.449
11.800	45.232	65.103	-45.232	0.449
14.287	45.232	65.103	-45.232	0.449
14.657	45.232	65.103	-45.232	0.449
14.750	45.374	66.291	-45.374	0.446
14.843	45.232	65.103	-45.232	0.449
15.213	45.232	65.103	-45.232	0.449
17.700	45.232	65.103	-45.232	0.449
20.650	45.232	65.103	-45.232	0.449
23.600	45.232	65.103	-45.232	0.449
26.550	45.232	65.103	-45.232	0.449
29.453	45.232	65.103	-45.232	0.449
29.500	45.232	65.103	-45.232	0.449
30.000	45.187	64.841	-45.187	0.450

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

Esfuerzos por fluencia conjunta en la viga y la losa.

s (m)	Nv	Mv	Nl	Ml
-0.500	5.076	7.368	-5.076	-0.033
0.000	57.326	84.563	-57.326	-1.483
0.047	56.449	83.285	-56.449	-1.478
2.950	4.786	8.100	-4.786	-1.163
5.900	-36.059	-51.343	36.059	-0.914
8.850	-65.217	-93.778	65.217	-0.737
11.800	-82.692	-119.209	82.692	-0.631
14.287	-87.956	-126.869	87.956	-0.599
14.657	-88.388	-127.499	88.388	-0.597
14.750	-72.021	-104.890	72.021	-1.040
14.843	-88.388	-127.499	88.388	-0.597
15.213	-87.956	-126.869	87.956	-0.599
17.700	-82.692	-119.209	82.692	-0.631
20.650	-65.217	-93.778	65.217	-0.737
23.600	-36.059	-51.343	36.059	-0.914
26.550	4.786	8.100	-4.786	-1.163
29.453	56.448	83.285	-56.448	-1.478
29.500	57.326	84.563	-57.326	-1.483
30.000	5.076	7.368	-5.076	-0.033

s (m) : distancia al inicio de la viga.  
Nv (T) : Axil actuante sobre la sección de la viga.  
Mv (mT) : momento flector actuante sobre la sección de la viga.  
Nl (T) : Axil actuante sobre la sección de la losa.  
Ml (mT) : momento flector actuante sobre la sección de la losa.

CALCULO DE TENSIONES

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Cálculo de tensiones en las viga

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Vano 1 Viga 1

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Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	0.000	0.000	-0.000	-0
			0.000	-2.009	-2.214	64.727	58
			0.089	-1.329	-1.534	64.270	58
			2.490	15.483	15.278	52.977	46
			2.950	4.748	3.152	91.578	81
			3.089	2.883	0.969	99.945	89
			4.490	10.808	8.894	94.683	83
			5.089	5.755	2.992	120.055	106
			5.900	9.150	6.387	117.814	104
			8.850	20.233	17.470	110.501	97
			11.800	26.883	24.120	106.112	92
			14.750	29.099	26.336	104.649	91
			17.700	26.883	24.120	106.112	92
			20.650	20.233	17.470	110.501	97
			23.600	9.150	6.387	117.814	104
			24.411	5.755	2.992	120.055	106
			25.010	10.808	8.894	94.683	83
			26.411	2.883	0.969	99.945	89
			26.550	4.748	3.152	91.579	81
			27.010	15.483	15.278	52.977	46
29.411	-1.329	-1.534	64.270	58			
29.500	-2.009	-2.214	64.727	58			
30.000	0.000	0.000	0.000	0			
T2	30	-	-0.500	0.000	0.000	-0.000	-0
			0.000	-1.682	-2.288	64.776	56
			0.089	-0.252	-0.849	63.810	55
			2.490	35.107	34.713	39.921	31
			2.950	28.011	25.365	76.829	62
			3.089	27.670	24.461	84.347	68
			4.490	44.310	41.224	73.216	57
			5.089	43.292	38.686	96.500	76
			5.900	50.413	45.868	91.760	71
			8.850	73.666	69.311	76.289	56
			11.800	87.618	83.378	67.006	47
			14.750	92.268	88.066	63.912	44
			17.700	87.618	83.378	67.006	47

T3	90	-	-0.500	0.323	-0.324	0.714	-0
			0.000	-1.359	-2.611	65.491	55
			0.089	0.133	-1.112	64.404	54
			2.490	37.171	36.093	37.248	27
			2.950	30.394	27.058	73.577	57
			3.089	30.149	26.249	80.909	63
			4.490	47.690	43.758	68.392	50
			5.089	47.012	41.469	91.262	68
			5.900	54.598	48.989	85.913	63
			8.850	79.200	73.423	68.644	45
			11.800	93.999	88.109	58.211	34
			14.750	99.000	93.037	54.647	31
			17.700	93.999	88.109	58.211	34
			20.650	79.200	73.423	68.644	45
			23.600	54.598	48.989	85.913	63
			24.411	47.012	41.469	91.262	68
			25.010	47.690	43.758	68.392	50
			26.411	30.149	26.249	80.909	63
			26.550	30.394	27.058	73.577	57
			27.010	37.171	36.093	37.248	27
			29.411	0.133	-1.112	64.404	54
			29.500	-1.359	-2.611	65.491	55
			30.000	0.323	-0.324	0.714	-0
T4	-	Característica	-0.500	4.038	-3.848	11.106	-9
			0.000	2.356	-6.135	75.882	46
			0.089	4.193	-4.578	74.568	44
			2.490	50.564	35.024	42.974	2
			2.950	45.550	26.444	78.680	29
			3.089	45.843	25.773	85.845	34
			4.490	68.250	43.948	72.546	13
			5.089	69.470	41.709	95.365	28
			5.900	79.648	49.302	89.979	18
			8.850	111.571	73.746	72.371	-13
			11.800	130.715	88.228	61.504	-32
			14.750	137.444	93.071	57.832	-39
			17.700	130.715	88.228	61.504	-32
			20.650	111.572	73.746	72.371	-13
			23.600	79.649	49.302	89.979	18
			24.411	69.471	41.709	95.365	28
			25.010	68.250	43.948	72.546	13
			26.411	45.844	25.773	85.845	34
26.550	45.550	26.444	78.680	29			
27.010	50.564	35.024	42.974	2			
29.411	4.193	-4.578	74.568	44			
29.500	2.356	-6.135	75.882	46			
30.000	4.038	-3.848	11.106	-9			
T2	-	Frecuente	-0.500	2.387	-2.332	6.767	-6
			0.000	0.705	-4.619	71.543	49
			0.089	2.420	-3.089	70.326	48
			2.490	45.482	35.416	40.541	11
			2.950	39.844	26.615	76.528	40
			3.089	39.946	25.877	83.769	45
			4.490	60.535	43.741	70.854	27
			5.089	61.019	41.487	93.724	43
			5.900	70.192	49.057	88.393	35
			8.850	99.291	73.518	71.011	9
			11.800	116.773	88.099	60.344	-6
			14.750	122.848	92.988	56.737	-12
			17.700	116.773	88.099	60.344	-6

		20.650	99.291	73.517	71.011	9	
		23.600	70.193	49.057	88.393	35	
		24.411	61.020	41.487	93.724	43	
		25.010	60.535	43.741	70.854	27	
		26.411	39.946	25.877	83.769	45	
		26.550	39.844	26.615	76.528	40	
		27.010	45.482	35.416	40.541	11	
		29.411	2.420	-3.089	70.326	48	
		29.500	0.705	-4.619	71.543	49	
		30.000	2.387	-2.332	6.767	-6	
-	Casi-permanente	-0.500	0.330	-0.323	0.721	-0	
		0.000	-1.352	-2.611	65.497	55	
		0.089	0.140	-1.112	64.410	54	
		2.490	37.177	36.094	37.255	27	
		2.950	30.400	27.058	73.583	57	
		3.089	30.155	26.250	80.915	63	
		4.490	47.690	43.751	68.389	50	
		5.089	47.012	41.464	91.261	68	
		5.900	54.597	48.987	85.914	63	
		8.850	79.199	73.418	68.650	45	
		11.800	93.997	88.087	58.218	34	
		14.750	98.998	93.000	54.655	31	
		17.700	93.997	88.087	58.218	34	
		20.650	79.199	73.418	68.650	45	
		23.600	54.597	48.987	85.914	63	
		24.411	47.012	41.464	91.261	68	
		25.010	47.690	43.751	68.389	50	
		26.411	30.155	26.250	80.915	63	
		26.550	30.400	27.058	73.583	57	
		27.010	37.177	36.094	37.255	27	
		29.411	0.140	-1.112	64.410	54	
		29.500	-1.352	-2.610	65.497	55	
		30.000	0.330	-0.323	0.721	-0	
T5	-	Característica	-0.500	20.386	-3.848	11.106	-14
			0.000	19.259	-6.135	75.882	36
			0.089	20.550	-4.578	74.568	34
			2.490	65.222	22.579	42.974	-6
			2.950	60.505	18.912	78.680	17
			3.089	60.891	18.320	85.845	21
			4.490	83.262	29.965	72.546	0
			5.089	84.710	29.252	95.365	12
			5.900	94.868	33.356	89.979	2
			8.850	126.732	48.270	72.371	-28
			11.800	145.840	57.042	61.504	-46
			14.750	152.557	59.992	57.832	-53
			17.700	145.840	57.042	61.504	-46
			20.650	126.733	48.270	72.371	-28
			23.600	94.869	33.356	89.979	2
			24.411	84.710	29.252	95.365	12
			25.010	83.262	29.965	72.546	0
			26.411	60.891	18.320	85.845	21
			26.550	60.505	18.912	78.680	17
			27.010	65.222	22.579	42.974	-6
			29.411	20.550	-4.578	74.568	34
			29.500	19.259	-6.135	75.882	36
			30.000	20.386	-3.848	11.106	-14
	-	Frecuente	-0.500	18.735	-2.332	6.767	-10
			0.000	17.608	-4.619	71.543	40
			0.089	18.777	-3.089	70.326	38
			2.490	60.140	22.971	40.541	2
			2.950	54.798	19.084	76.528	27
			3.089	54.994	18.425	83.769	31
			4.490	75.547	29.758	70.854	14
			5.089	76.259	29.030	93.724	27
			5.900	85.412	33.111	88.393	19
			8.850	114.452	48.042	71.011	-6
			11.800	131.898	56.913	60.344	-21
			14.750	137.961	59.910	56.737	-27
			17.700	131.898	56.913	60.344	-21

		20.650	114.452	48.042	71.011	-6	
		23.600	85.413	33.111	88.393	19	
		24.411	76.259	29.030	93.724	27	
		25.010	75.547	29.758	70.854	14	
		26.411	54.994	18.425	83.769	31	
		26.550	54.798	19.084	76.528	27	
		27.010	60.140	22.971	40.541	2	
		29.411	18.776	-3.089	70.326	38	
		29.500	17.607	-4.619	71.543	40	
		30.000	18.734	-2.332	6.767	-10	
-	Casi-permanente	-0.500	16.678	-0.323	0.721	-5	
		0.000	15.551	-2.611	65.497	45	
		0.089	16.497	-1.112	64.410	44	
		2.490	51.835	23.648	37.255	18	
		2.950	45.354	19.527	73.583	45	
		3.089	45.202	18.797	80.915	50	
		4.490	62.702	29.768	68.389	37	
		5.089	62.251	29.007	91.261	52	
		5.900	69.818	33.041	85.914	47	
		8.850	94.360	47.942	68.650	30	
		11.800	109.123	56.901	58.218	20	
		14.750	114.111	59.921	54.655	16	
		17.700	109.123	56.901	58.218	20	
		20.650	94.360	47.942	68.650	30	
		23.600	69.818	33.041	85.914	47	
		24.411	62.251	29.007	91.261	52	
		25.010	62.702	29.768	68.389	37	
		26.411	45.202	18.797	80.915	50	
		26.550	45.354	19.527	73.583	45	
		27.010	51.835	23.648	37.255	18	
		29.411	16.497	-1.112	64.410	44	
		29.500	15.551	-2.610	65.497	45	
		30.000	16.678	-0.323	0.721	-5	
Env	-	Característica	-0.500	20.386	-3.848	11.106	-14
			0.000	19.259	-6.135	75.882	36
			0.089	20.550	-4.578	74.568	34
			2.490	65.222	15.278	52.977	-6
			2.950	60.505	3.152	91.578	17
			3.089	60.891	0.969	99.945	21
			4.490	83.262	8.894	94.683	0
			5.089	84.710	2.992	120.055	12
			5.900	94.868	6.387	117.814	2
			8.850	126.732	17.470	110.501	-28
			11.800	145.840	24.120	106.112	-46
			14.750	152.557	26.336	104.649	-53
			17.700	145.840	24.120	106.112	-46
			20.650	126.733	17.470	110.501	-28
			23.600	94.869	6.387	117.814	2
			24.411	84.710	2.992	120.055	12
			25.010	83.262	8.894	94.683	0
			26.411	60.891	0.969	99.945	21
			26.550	60.505	3.152	91.579	17
			27.010	65.222	15.278	52.977	-6
			29.411	20.550	-4.578	74.568	34
			29.500	19.259	-6.135	75.882	36
			30.000	20.386	-3.848	11.106	-14
	-	Frecuente	-0.500	18.735	-2.332	6.767	-10
			0.000	17.608	-4.619	71.543	40
			0.089	18.777	-3.089	70.326	38
			2.490	60.140	15.278	52.977	2
			2.950	54.798	3.152	91.578	27
			3.089	54.994	0.969	99.945	31
			4.490	75.547	8.894	94.683	14
			5.089	76.259	2.992	120.055	27
			5.900	85.412	6.387	117.814	19
			8.850	114.452	17.470	110.501	-6
			11.800	131.898	24.120	106.112	-21
			14.750	137.961	26.336	104.649	-27
			17.700	131.898	24.120	106.112	-21

20.650	114.452	17.470	110.501	-6		
23.600	85.413	6.387	117.814	19		
24.411	76.259	2.992	120.055	27		
25.010	75.547	8.894	94.683	14		
26.411	54.994	0.969	99.945	31		
26.550	54.798	3.152	91.579	27		
27.010	60.140	15.278	52.977	2		
29.411	18.776	-3.089	70.326	38		
29.500	17.607	-4.619	71.543	40		
30.000	18.734	-2.332	6.767	-10		
-	Casi-permanente	-0.500	16.678	-0.324	0.721	-5
0.000		15.551	-2.611	65.497	45	
0.089		16.497	-1.534	64.410	44	
2.490		51.835	15.278	52.977	18	
2.950		45.354	3.152	91.578	45	
3.089		45.202	0.969	99.945	50	
4.490		62.702	8.894	94.683	37	
5.089		62.251	2.992	120.055	52	
5.900		69.818	6.387	117.814	47	
8.850		94.360	17.470	110.501	30	
11.800		109.123	24.120	106.112	20	
14.750		114.111	26.336	104.649	16	
17.700		109.123	24.120	106.112	20	
20.650		94.360	17.470	110.501	30	
23.600		69.818	6.387	117.814	47	
24.411		62.251	2.992	120.055	52	
25.010		62.702	8.894	94.683	37	
26.411		45.202	0.969	99.945	50	
26.550		45.354	3.152	91.579	45	
27.010		51.835	15.278	52.977	18	
29.411		16.497	-1.534	64.410	44	
29.500		15.551	-2.611	65.497	45	
30.000		16.678	-0.324	0.721	-5	

Vano 1 Viga 2

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K1 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K2 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K3 = 1.000000$

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K4 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K5 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K6 = 1.000000$

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	0.000	0.000	-0.000	-0
			0.000	-39.090	-43.197	131.715	119
			0.047	-38.428	-42.536	131.280	118
			2.950	-18.972	-23.080	118.485	105
			5.900	-3.325	-7.433	108.195	95
			8.850	7.852	3.744	100.845	88

T2 30

T3 90

T4 - Característica

11.800	14.557	10.450	96.435	83
14.287	16.785	12.678	94.970	82
14.657	13.676	9.241	105.464	91
14.750	13.057	8.622	107.468	93
14.843	13.676	9.241	105.464	91
15.213	16.785	12.678	94.970	82
17.700	14.557	10.450	96.435	83
20.650	7.852	3.744	100.845	88
23.600	-3.325	-7.433	108.195	95
26.550	-18.972	-23.080	118.485	105
29.453	-38.428	-42.536	131.280	118
29.500	-39.090	-43.197	131.715	119
30.000	0.000	0.000	0.000	0
-0.500	0.000	0.000	-0.000	-0
0.000	-37.149	-43.271	131.764	113
0.047	-35.755	-41.873	130.844	112
2.950	5.244	-0.717	103.778	85
5.900	38.217	32.381	82.012	64
8.850	61.769	56.023	66.464	48
11.800	75.900	70.208	57.136	39
14.287	80.595	74.921	54.037	36
14.657	77.940	71.484	64.531	44
14.750	76.667	70.175	68.769	49
14.843	77.940	71.484	64.531	44
15.213	80.595	74.921	54.037	36
17.700	75.900	70.208	57.136	39
20.650	61.769	56.023	66.464	48
23.600	38.217	32.381	82.012	64
26.550	5.244	-0.717	103.778	85
29.453	-35.755	-41.873	130.844	112
29.500	-37.149	-43.271	131.764	113
30.000	0.000	0.000	0.000	0
-0.500	0.326	-0.326	0.705	-0
0.000	-36.823	-43.597	132.469	112
0.047	-35.396	-42.166	131.487	111
2.950	7.628	0.977	100.553	81
5.900	42.409	35.503	76.153	56
8.850	67.314	60.125	58.804	38
11.800	82.296	74.915	48.322	27
14.287	87.288	79.817	44.828	23
14.657	84.678	76.409	55.263	31
14.750	83.390	75.086	59.990	37
14.843	84.678	76.409	55.263	31
15.213	87.288	79.817	44.827	23
17.700	82.296	74.915	48.322	27
20.650	67.314	60.125	58.804	38
23.600	42.409	35.503	76.153	56
26.550	7.629	0.977	100.553	81
29.453	-35.396	-42.166	131.486	111
29.500	-36.823	-43.597	132.469	112
30.000	0.326	-0.325	0.705	-0
-0.500	4.051	-3.895	10.910	-9
0.000	-33.098	-47.166	142.674	103
0.047	-31.490	-45.704	141.574	102
2.950	22.784	0.339	105.612	53
5.900	67.457	35.814	80.247	10
8.850	99.706	60.456	62.574	-20
11.800	119.095	75.041	51.631	-39
14.287	125.617	79.910	48.028	-45
14.657	123.234	76.497	58.447	-38
14.750	121.831	75.155	63.038	-29
14.843	123.234	76.497	58.447	-38
15.213	125.616	79.910	48.028	-45
17.700	119.094	75.041	51.631	-39
20.650	99.706	60.456	62.574	-20
23.600	67.458	35.814	80.247	10
26.550	22.785	0.340	105.611	53
29.453	-31.490	-45.704	141.573	102
29.500	-33.097	-47.166	142.673	103



		30.000	4.052	-3.895	10.909	-9			15.213	126.330	51.734	46.925	-31
-	Frecuente	-0.500	2.393	-2.359	6.648	-6			17.700	120.399	48.573	50.467	-25
		0.000	-34.756	-45.631	138.412	107			20.650	102.723	39.632	61.191	-10
		0.047	-33.212	-44.183	137.363	105			23.600	73.348	24.575	78.645	15
		2.950	17.081	0.523	103.476	63			26.550	34.238	0.524	103.475	49
		5.900	58.008	35.565	78.645	27			29.453	0.947	-44.183	137.362	86
		8.850	87.422	60.220	61.191	1			29.500	-0.306	-45.631	138.412	87
		11.800	105.122	74.912	50.467	-14			30.000	18.766	-2.359	6.648	-10
		14.287	111.060	79.807	46.925	-19		-	-0.500	16.711	-0.325	0.708	-5
		14.657	108.590	76.398	57.354	-11		Casi-permanente	0.000	-2.361	-43.597	132.472	93
		14.750	107.231	75.064	61.991	-4			0.047	-1.225	-42.166	131.490	92
		14.843	108.590	76.398	57.354	-11			2.950	24.795	0.978	100.556	67
		15.213	111.060	79.807	46.925	-19			5.900	57.748	24.513	76.157	43
		17.700	105.121	74.912	50.467	-14			8.850	82.614	39.538	58.815	26
		20.650	87.421	60.220	61.191	1			11.800	97.571	48.565	48.335	15
		23.600	58.008	35.566	78.645	27			14.287	102.554	51.725	44.841	12
		26.550	17.082	0.524	103.475	63			14.657	100.139	48.370	55.276	17
		29.453	-33.212	-44.183	137.362	105			14.750	98.891	52.598	60.003	23
		29.500	-34.755	-45.631	138.412	107			14.843	100.139	48.370	55.276	17
		30.000	2.394	-2.359	6.648	-6			15.213	102.554	51.725	44.841	12
-	Casi-permanente	-0.500	0.339	-0.325	0.708	-0			17.700	97.571	48.565	48.335	15
		0.000	-36.810	-43.597	132.472	112			20.650	82.614	39.538	58.815	26
		0.047	-35.384	-42.166	131.490	111			23.600	57.748	24.513	76.157	43
		2.950	7.639	0.978	100.556	81			26.550	24.796	0.978	100.556	67
		5.900	42.408	35.504	76.157	56			29.453	-1.225	-42.166	131.490	92
		8.850	67.313	60.126	58.815	38			29.500	-2.361	-43.597	132.472	93
		11.800	82.293	74.905	48.335	27			30.000	16.711	-0.325	0.708	-5
		14.287	87.284	79.798	44.841	23	Env	-	-0.500	20.423	-3.895	10.910	-14
		14.657	84.673	76.389	55.276	31		Característica	0.000	1.351	-47.166	142.674	84
		14.750	83.385	75.067	60.003	37			0.047	2.668	-45.704	141.574	82
		14.843	84.673	76.389	55.276	31			2.950	39.940	-23.080	118.485	39
		15.213	87.284	79.798	44.841	23			5.900	82.797	-7.433	108.195	-1
		17.700	82.293	74.905	48.335	27			8.850	115.007	3.744	100.845	-32
		20.650	67.313	60.126	58.815	38			11.800	134.373	10.450	96.435	-51
		23.600	42.408	35.504	76.157	56			14.287	140.887	12.678	94.970	-57
		26.550	7.639	0.978	100.556	81			14.657	138.699	9.241	105.464	-52
		29.453	-35.384	-42.166	131.490	111			14.750	137.337	8.622	107.468	-43
		29.500	-36.810	-43.597	132.472	112			14.843	138.700	9.241	105.464	-52
		30.000	0.339	-0.325	0.708	-0			15.213	140.887	12.678	94.970	-57
T5	-	-0.500	20.423	-3.895	10.910	-14			17.700	134.372	10.450	96.435	-51
		0.000	1.351	-47.166	142.674	84			20.650	115.007	3.744	100.845	-32
		0.047	2.668	-45.704	141.574	82			23.600	82.797	-7.433	108.195	-1
		2.950	39.940	0.339	105.612	39			26.550	39.941	-23.080	118.485	39
		5.900	82.797	24.823	80.247	-1			29.453	2.669	-45.704	141.573	82
		8.850	115.007	39.868	62.574	-32			29.500	1.352	-47.166	142.673	84
		11.800	134.373	48.702	51.631	-51			30.000	20.424	-3.895	10.909	-14
		14.287	140.887	51.837	48.028	-57			-0.500	18.766	-2.359	6.648	-10
		14.657	138.699	48.478	58.447	-52		-	0.000	-0.307	-45.631	138.412	87
		14.750	137.337	52.687	63.038	-43		Frecuente	0.047	0.947	-44.183	137.363	86
		14.843	138.700	48.478	58.447	-52			2.950	34.238	-23.080	118.485	49
		15.213	140.887	51.837	48.028	-57			5.900	73.347	-7.433	108.195	15
		17.700	134.372	48.702	51.631	-51			8.850	102.723	3.744	100.845	-10
		20.650	115.007	39.868	62.574	-32			11.800	120.400	10.450	96.435	-25
		23.600	82.797	24.823	80.247	-1			14.287	126.330	12.678	94.970	-31
		26.550	39.941	0.340	105.611	39			14.657	124.056	9.241	105.464	-25
		29.453	2.669	-45.704	141.573	82			14.750	122.737	8.622	107.468	-17
		29.500	1.352	-47.166	142.673	84			14.843	124.056	9.241	105.464	-25
		30.000	20.424	-3.895	10.909	-14			15.213	126.330	12.678	94.970	-31
-	Frecuente	-0.500	18.766	-2.359	6.648	-10			17.700	120.399	10.450	96.435	-25
		0.000	-0.307	-45.631	138.412	87			20.650	102.723	3.744	100.845	-10
		0.047	0.947	-44.183	137.363	86			23.600	73.348	-7.433	108.195	15
		2.950	34.238	0.523	103.476	49			26.550	34.238	-23.080	118.485	49
		5.900	73.347	24.574	78.645	15			29.453	0.947	-44.183	137.362	86
		8.850	102.723	39.632	61.191	-10			29.500	-0.306	-45.631	138.412	87
		11.800	120.400	48.573	50.467	-25			30.000	18.766	-2.359	6.648	-10
		14.287	126.330	51.734	46.925	-31		-	-0.500	16.711	-0.326	0.708	-5
		14.657	124.056	48.379	57.354	-25		Casi-permanente	0.000	-2.361	-43.597	132.472	93
		14.750	122.737	52.596	61.991	-17			0.047	-1.225	-42.536	131.490	92
		14.843	124.056	48.379	57.354	-25			2.950	24.795	-23.080	118.485	67

5.900	57.748	-7.433	108.195	43
8.850	82.614	3.744	100.845	26
11.800	97.571	10.450	96.435	15
14.287	102.554	12.678	94.970	12
14.657	100.139	9.241	105.464	17
14.750	98.891	8.622	107.468	23
14.843	100.139	9.241	105.464	17
15.213	102.554	12.678	94.970	12
17.700	97.571	10.450	96.435	15
20.650	82.614	3.744	100.845	26
23.600	57.748	-7.433	108.195	43
26.550	24.796	-23.080	118.485	67
29.453	-1.225	-42.536	131.490	92
29.500	-2.361	-43.597	132.472	93
30.000	16.711	-0.325	0.708	-5

T1 : Al transferir el pretensado.  
T2 : Al hormigonar la losa.  
T3 : Al disponer la superestructura.  
T4 : Al abrir al tráfico.  
T5 : A tiempo infinito.  
Env : Envoltente de tensiones.

Día : número de días transcurridos entre el hormigonado de la viga y el instante considerado.  
s(m): distancia al inicio de la viga.  
Tsup + (kg/cm2): máxima tensión positiva en la fibra superior de la viga.  
Tsup - (kg/cm2): máxima tensión negativa en la fibra superior de la viga.  
Tinf + (kg/cm2): máxima tensión positiva en la fibra inferior de la viga.  
Tinf - (kg/cm2): máxima tensión negativa en la fibra inferior de la viga.  
Tsup- y Tinf+ corresponden a la situación de transferencia de pretensado.

Cálculo de tensiones en la losa  
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Vano 1 Viga 1  
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Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	0.000	0.000	0.000	0
			0.000	0.000	0.000	0.000	0
			0.089	0.000	0.000	0.000	0
			2.490	0.000	0.000	0.000	0

T2 30 -

T3 90 -

T4 - Característica

2.950	0.000	0.000	0.000	0
3.089	0.000	0.000	0.000	0
4.490	0.000	0.000	0.000	0
5.089	0.000	0.000	0.000	0
5.900	0.000	0.000	0.000	0
8.850	0.000	0.000	0.000	0
11.800	0.000	0.000	0.000	0
14.750	0.000	0.000	0.000	0
17.700	0.000	0.000	0.000	0
20.650	0.000	0.000	0.000	0
23.600	0.000	0.000	0.000	0
24.411	0.000	0.000	0.000	0
25.010	0.000	0.000	0.000	0
26.411	0.000	0.000	0.000	0
26.550	0.000	0.000	0.000	0
27.010	0.000	0.000	0.000	0
29.411	0.000	0.000	0.000	0
29.500	0.000	0.000	0.000	0
30.000	0.000	0.000	0.000	0
-0.500	0.000	0.000	0.000	0
0.000	0.000	0.000	0.000	0
0.089	0.000	0.000	0.000	0
2.490	0.000	0.000	0.000	0
2.950	0.000	0.000	0.000	0
3.089	0.000	0.000	0.000	0
4.490	0.000	0.000	0.000	0
5.089	0.000	0.000	0.000	0
5.900	0.000	0.000	0.000	0
8.850	0.000	0.000	0.000	0
11.800	0.000	0.000	0.000	0
14.750	0.000	0.000	0.000	0
17.700	0.000	0.000	0.000	0
20.650	0.000	0.000	0.000	0
23.600	0.000	0.000	0.000	0
24.411	0.000	0.000	0.000	0
25.010	0.000	0.000	0.000	0
26.411	0.000	0.000	0.000	0
26.550	0.000	0.000	0.000	0
27.010	0.000	0.000	0.000	0
29.411	0.000	0.000	0.000	0
29.500	0.000	0.000	0.000	0
30.000	0.000	0.000	0.000	0
-0.500	0.383	-0.384	0.281	-0
0.000	0.383	-0.384	0.281	-0
0.089	0.455	-0.313	0.335	-0
2.490	2.396	1.599	1.793	1
2.950	2.758	1.958	2.070	1
3.089	2.870	2.068	2.154	1
4.490	3.916	2.927	2.936	2
5.089	4.307	3.208	3.231	2
5.900	4.846	3.596	3.634	2
8.850	6.413	4.731	4.807	3
11.800	7.394	5.444	5.542	4
14.750	7.798	5.722	5.847	4
17.700	7.394	5.444	5.542	4
20.650	6.413	4.731	4.807	3
23.600	4.846	3.596	3.634	2
24.411	4.307	3.208	3.231	2
25.010	3.916	2.927	2.936	2
26.411	2.870	2.068	2.154	1
26.550	2.758	1.958	2.070	1
27.010	2.396	1.599	1.793	1
29.411	0.455	-0.313	0.335	-0
29.500	0.383	-0.384	0.281	-0
30.000	0.383	-0.384	0.281	-0
-0.500	4.865	-4.818	3.507	-3
0.000	4.865	-4.818	3.507	-3
0.089	5.328	-4.668	3.861	-3
2.490	17.855	0.000	13.425	0

2.950	20.181	0.861	15.233	0
3.089	20.902	1.121	15.785	1
4.490	27.493	2.700	20.792	2
5.089	30.035	3.036	22.737	2
5.900	33.546	3.497	25.391	2
8.850	43.526	4.676	32.922	3
11.800	49.521	5.235	37.431	4
14.750	51.918	5.441	39.237	4
17.700	49.521	5.235	37.432	4
20.650	43.527	4.676	32.923	3
23.600	33.546	3.497	25.392	2
24.411	30.035	3.036	22.737	2
25.010	27.493	2.700	20.793	2
26.411	20.902	1.121	15.785	1
26.550	20.181	0.861	15.233	0
27.010	17.855	0.000	13.425	0
29.411	5.328	-4.668	3.861	-3
29.500	4.865	-4.818	3.507	-3
30.000	4.865	-4.818	3.507	-3
-0.500	2.880	-2.923	2.073	-2
0.000	2.880	-2.923	2.073	-2
0.089	3.205	-2.809	2.321	-1
2.490	11.998	0.619	9.011	0
2.950	13.633	1.239	10.277	1
3.089	14.139	1.427	10.663	1
4.490	18.658	2.668	14.092	2
5.089	20.364	2.983	15.397	2
5.900	22.720	3.417	17.179	2
8.850	29.447	4.589	22.256	3
11.800	33.522	5.224	25.322	4
14.750	35.163	5.469	26.559	4
17.700	33.522	5.224	25.323	4
20.650	29.448	4.589	22.256	3
23.600	22.721	3.417	17.179	2
24.411	20.364	2.983	15.397	2
25.010	18.659	2.668	14.092	2
26.411	14.139	1.427	10.663	1
26.550	13.633	1.239	10.277	1
27.010	11.998	0.619	9.011	0
29.411	3.204	-2.809	2.320	-1
29.500	2.879	-2.923	2.073	-2
30.000	2.879	-2.923	2.073	-2
-0.500	0.390	-0.383	0.287	-0
0.000	0.390	-0.383	0.287	-0
0.089	0.461	-0.313	0.341	-0
2.490	2.402	1.599	1.798	1
2.950	2.763	1.958	2.074	1
3.089	2.875	2.068	2.159	1
4.490	3.916	2.921	2.935	2
5.089	4.307	3.204	3.231	2
5.900	4.846	3.594	3.634	2
8.850	6.413	4.726	4.806	3
11.800	7.394	5.424	5.541	4
14.750	7.796	5.688	5.845	4
17.700	7.394	5.424	5.541	4
20.650	6.413	4.726	4.806	3
23.600	4.846	3.594	3.634	2
24.411	4.307	3.204	3.231	2
25.010	3.916	2.921	2.936	2
26.411	2.875	2.068	2.159	1
26.550	2.763	1.958	2.075	1
27.010	2.402	1.599	1.798	1
29.411	0.461	-0.313	0.341	-0
29.500	0.390	-0.383	0.287	-0
30.000	0.390	-0.383	0.287	-0
-0.500	4.865	-8.196	3.507	-8
0.000	5.407	-9.160	4.481	-8
0.089	5.867	-8.854	4.951	-7
2.490	20.613	-2.447	17.536	-4

T5

- Frecuente

- Casi-permanente

- Característica

2.950	21.488	-0.941	19.389	-3
3.089	22.349	-0.478	20.096	-3
4.490	30.784	1.031	26.492	-2
5.089	33.004	1.887	28.846	-1
5.900	37.500	2.310	32.242	-1
8.850	50.153	3.369	41.793	-0
11.800	57.748	3.856	47.514	-0
14.750	60.674	4.037	49.721	-0
17.700	57.749	3.856	47.514	-0
20.650	50.154	3.369	41.794	-0
23.600	37.501	2.310	32.242	-1
24.411	33.005	1.887	28.846	-1
25.010	30.785	1.031	26.493	-2
26.411	22.349	-0.478	20.096	-3
26.550	21.489	-0.941	19.389	-3
27.010	20.613	-2.447	17.536	-4
29.411	5.867	-8.854	4.951	-7
29.500	5.407	-9.160	4.481	-8
30.000	4.865	-8.196	3.507	-8
-0.500	2.880	-6.301	2.073	-7
0.000	3.422	-7.266	3.047	-6
0.089	3.744	-6.995	3.411	-6
2.490	14.756	-1.828	13.123	-4
2.950	14.940	-0.563	14.432	-3
3.089	15.586	-0.172	14.974	-3
4.490	21.950	0.998	19.792	-2
5.089	23.333	1.834	21.506	-1
5.900	26.675	2.230	24.029	-1
8.850	36.074	3.283	31.127	-0
11.800	41.749	3.846	35.405	-0
14.750	43.918	4.065	37.044	-0
17.700	41.749	3.846	35.405	-0
20.650	36.075	3.283	31.128	-0
23.600	26.675	2.230	24.030	-1
24.411	23.334	1.834	21.506	-1
25.010	21.950	0.998	19.792	-2
26.411	15.586	-0.172	14.974	-3
26.550	14.940	-0.563	14.432	-3
27.010	14.756	-1.827	13.123	-4
29.411	3.743	-6.995	3.410	-6
29.500	3.422	-7.266	3.046	-6
30.000	2.879	-6.301	2.073	-7
-0.500	0.390	-3.762	0.287	-5
0.000	0.932	-4.726	1.260	-4
0.089	1.000	-4.499	1.431	-4
2.490	5.159	-0.848	5.910	-3
2.950	4.071	0.156	6.230	-3
3.089	4.322	0.469	6.470	-2
4.490	7.207	1.251	8.635	-2
5.089	7.276	2.055	9.340	-1
5.900	8.801	2.407	10.485	-1
8.850	13.040	3.420	13.677	-0
11.800	15.621	4.046	15.624	-0
14.750	16.552	4.284	16.329	-0
17.700	15.621	4.046	15.624	-0
20.650	13.040	3.420	13.677	-0
23.600	8.801	2.407	10.485	-1
24.411	7.276	2.055	9.340	-1
25.010	7.207	1.251	8.635	-2
26.411	4.322	0.469	6.470	-2
26.550	4.071	0.156	6.230	-3
27.010	5.159	-0.848	5.910	-3
29.411	1.000	-4.499	1.431	-4
29.500	0.932	-4.726	1.260	-4
30.000	0.390	-3.762	0.287	-5
-0.500	4.865	-8.196	3.507	-8
0.000	5.407	-9.160	4.481	-8
0.089	5.867	-8.854	4.951	-7
2.490	20.613	-2.447	17.536	-4

- Frecuente

- Casi-permanente

Env - Característica

		2.950	21.488	-0.941	19.389	-3
		3.089	22.349	-0.478	20.096	-3
		4.490	30.784	0.000	26.492	-2
		5.089	33.004	0.000	28.846	-1
		5.900	37.500	0.000	32.242	-1
		8.850	50.153	0.000	41.793	-0
		11.800	57.748	0.000	47.514	-0
		14.750	60.674	0.000	49.721	-0
		17.700	57.749	0.000	47.514	-0
		20.650	50.154	0.000	41.794	-0
		23.600	37.501	0.000	32.242	-1
		24.411	33.005	0.000	28.846	-1
		25.010	30.785	0.000	26.493	-2
		26.411	22.349	-0.478	20.096	-3
		26.550	21.489	-0.941	19.389	-3
		27.010	20.613	-2.447	17.536	-4
		29.411	5.867	-8.854	4.951	-7
		29.500	5.407	-9.160	4.481	-8
		30.000	4.865	-8.196	3.507	-8
-	Frecuente	-0.500	2.880	-6.301	2.073	-7
		0.000	3.422	-7.266	3.047	-6
		0.089	3.744	-6.995	3.411	-6
		2.490	14.756	-1.828	13.123	-4
		2.950	14.940	-0.563	14.432	-3
		3.089	15.586	-0.172	14.974	-3
		4.490	21.950	0.000	19.792	-2
		5.089	23.333	0.000	21.506	-1
		5.900	26.675	0.000	24.029	-1
		8.850	36.074	0.000	31.127	-0
		11.800	41.749	0.000	35.405	-0
		14.750	43.918	0.000	37.044	-0
		17.700	41.749	0.000	35.405	-0
		20.650	36.075	0.000	31.128	-0
		23.600	26.675	0.000	24.030	-1
		24.411	23.334	0.000	21.506	-1
		25.010	21.950	0.000	19.792	-2
		26.411	15.586	-0.172	14.974	-3
		26.550	14.940	-0.563	14.432	-3
		27.010	14.756	-1.827	13.123	-4
		29.411	3.743	-6.995	3.410	-6
		29.500	3.422	-7.266	3.046	-6
		30.000	2.879	-6.301	2.073	-7
-	Casi-permanente	-0.500	0.390	-3.762	0.287	-5
		0.000	0.932	-4.726	1.260	-4
		0.089	1.000	-4.499	1.431	-4
		2.490	5.159	-0.848	5.910	-3
		2.950	4.071	0.000	6.230	-3
		3.089	4.322	0.000	6.470	-2
		4.490	7.207	0.000	8.635	-2
		5.089	7.276	0.000	9.340	-1
		5.900	8.801	0.000	10.485	-1
		8.850	13.040	0.000	13.677	-0
		11.800	15.621	0.000	15.624	-0
		14.750	16.552	0.000	16.329	-0
		17.700	15.621	0.000	15.624	-0
		20.650	13.040	0.000	13.677	-0
		23.600	8.801	0.000	10.485	-1
		24.411	7.276	0.000	9.340	-1
		25.010	7.207	0.000	8.635	-2
		26.411	4.322	0.000	6.470	-2
		26.550	4.071	0.000	6.230	-3
		27.010	5.159	-0.848	5.910	-3
		29.411	1.000	-4.499	1.431	-4
		29.500	0.932	-4.726	1.260	-4
		30.000	0.390	-3.762	0.287	-5

Vano 1 Viga 2

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

Instante	Día	Situación	s (m)	Tsup +	Tsup -	Tinf +	
T1	5	-	-0.500	0.000	0.000	0.000	0
			0.000	0.000	0.000	0.000	0
			0.047	0.000	0.000	0.000	0
			2.950	0.000	0.000	0.000	0
			5.900	0.000	0.000	0.000	0
			8.850	0.000	0.000	0.000	0
			11.800	0.000	0.000	0.000	0
			14.287	0.000	0.000	0.000	0
			14.657	0.000	0.000	0.000	0
			14.750	0.000	0.000	0.000	0
			14.843	0.000	0.000	0.000	0
			15.213	0.000	0.000	0.000	0
			17.700	0.000	0.000	0.000	0
			20.650	0.000	0.000	0.000	0
			23.600	0.000	0.000	0.000	0
			26.550	0.000	0.000	0.000	0
			29.453	0.000	0.000	0.000	0
			29.500	0.000	0.000	0.000	0
			30.000	0.000	0.000	0.000	0
T2	30	-	-0.500	0.000	0.000	0.000	0
			0.000	0.000	0.000	0.000	0
			0.047	0.000	0.000	0.000	0
			2.950	0.000	0.000	0.000	0
			5.900	0.000	0.000	0.000	0
			8.850	0.000	0.000	0.000	0
			11.800	0.000	0.000	0.000	0
			14.287	0.000	0.000	0.000	0
			14.657	0.000	0.000	0.000	0
			14.750	0.000	0.000	0.000	0
			14.843	0.000	0.000	0.000	0
			15.213	0.000	0.000	0.000	0
			17.700	0.000	0.000	0.000	0
			20.650	0.000	0.000	0.000	0
			23.600	0.000	0.000	0.000	0
			26.550	0.000	0.000	0.000	0
			29.453	0.000	0.000	0.000	0
			29.500	0.000	0.000	0.000	0
			30.000	0.000	0.000	0.000	0
T3	90	-	-0.500	0.385	-0.384	0.283	-0
			0.000	0.385	-0.384	0.283	-0
			0.047	0.423	-0.347	0.312	-0
			2.950	2.757	1.957	2.071	1
			5.900	4.853	3.597	3.641	2

			8.850	6.424	4.724	4.816	3				29.500	0.397	-0.384	0.294	-0	
			11.800	7.408	5.423	5.555	4				30.000	0.397	-0.384	0.294	-0	
			14.287	7.749	5.645	5.814	4	T5	-	Característica	-0.500	4.862	-8.207	3.518	-8	
			14.657	7.800	5.678	5.852	4				0.000	6.623	-13.752	4.176	-9	
			14.750	7.718	5.617	5.839	4				0.047	6.860	-13.594	4.360	-9	
			14.843	7.800	5.678	5.852	4				2.950	21.765	-3.185	17.816	-3	
			15.213	7.749	5.645	5.814	4				5.900	36.207	2.094	30.840	-1	
			17.700	7.408	5.423	5.555	4				8.850	48.918	3.182	40.436	-0	
			20.650	6.424	4.724	4.816	3				11.800	56.595	3.675	46.228	-0	
			23.600	4.854	3.597	3.641	2				14.287	59.172	3.858	48.183	0	
			26.550	2.757	1.957	2.071	1				14.657	59.979	4.342	48.620	0	
			29.453	0.423	-0.347	0.312	-0				14.750	57.150	4.254	48.086	0	
			29.500	0.385	-0.384	0.283	-0				14.843	59.979	4.342	48.620	0	
			30.000	0.385	-0.384	0.283	-0				15.213	59.172	3.858	48.183	0	
T4	-	Característica	-0.500	4.862	-4.844	3.518	-3				17.700	56.594	3.675	46.227	-0	
			0.000	4.862	-4.844	3.518	-3				20.650	48.918	3.182	40.436	-0	
			0.047	5.104	-4.765	3.704	-3				23.600	36.207	2.094	30.840	-1	
			2.950	20.163	0.840	15.234	0				26.550	21.766	-3.184	17.816	-3	
			5.900	33.558	3.494	25.396	2				29.453	6.861	-13.593	4.361	-9	
			8.850	43.560	4.672	32.950	3				29.500	6.624	-13.752	4.177	-9	
			11.800	49.615	5.218	37.517	4				30.000	4.863	-8.207	3.519	-8	
			14.287	51.705	5.419	39.103	4			-	Frecuente	-0.500	2.877	-6.302	2.078	-7
			14.657	52.016	5.449	39.339	4				0.000	4.637	-11.847	2.737	-7	
			14.750	51.455	5.382	39.226	4				0.047	4.803	-11.707	2.865	-7	
			14.843	52.016	5.449	39.339	4				2.950	15.226	-2.795	12.863	-3	
			15.213	51.705	5.419	39.103	4				5.900	25.385	2.011	22.632	-1	
			17.700	49.614	5.218	37.516	4				8.850	34.834	3.090	29.767	-0	
			20.650	43.560	4.672	32.949	3				11.800	40.566	3.665	34.092	-0	
			23.600	33.558	3.495	25.397	2				14.287	42.475	3.867	35.540	0	
			26.550	20.164	0.841	15.234	0				14.657	43.183	4.354	35.902	0	
			29.453	5.105	-4.765	3.705	-3				14.750	40.536	4.270	35.405	0	
			29.500	4.863	-4.844	3.519	-3				14.843	43.183	4.354	35.902	0	
			30.000	4.863	-4.844	3.519	-3				15.213	42.475	3.867	35.540	0	
		-	Frecuente	-0.500	2.877	-2.938	2.078	-2			17.700	40.565	3.665	34.091	-0	
				0.000	2.877	-2.938	2.078	-2			20.650	34.834	3.090	29.767	-0	
				0.047	3.047	-2.878	2.208	-2			23.600	25.385	2.012	22.633	-1	
				2.950	13.624	1.229	10.281	1			26.550	15.227	-2.795	12.863	-3	
				5.900	22.736	3.412	17.189	2			29.453	4.804	-11.707	2.865	-7	
				8.850	29.477	4.580	22.281	3			29.500	4.638	-11.846	2.737	-7	
				11.800	33.585	5.208	25.380	4			30.000	2.877	-6.301	2.079	-7	
				14.287	35.008	5.428	26.460	4			-0.500	0.397	-3.748	0.294	-5	
				14.657	35.220	5.461	26.621	4		-	Casi-permanente	0.000	2.158	-9.293	0.952	-6
				14.750	34.841	5.398	26.546	4			0.047	2.190	-9.176	0.979	-5	
				14.843	35.220	5.461	26.621	4			2.950	4.368	-2.068	4.662	-2	
				15.213	35.008	5.428	26.460	4			5.900	7.503	2.198	9.084	-1	
				17.700	33.585	5.208	25.380	4			8.850	11.781	3.234	12.302	-0	
				20.650	29.476	4.580	22.280	3			11.800	14.386	3.869	14.264	-0	
				23.600	22.736	3.412	17.189	2			14.287	15.213	4.066	14.890	0	
				26.550	13.625	1.230	10.281	1			14.657	15.759	4.553	15.129	0	
				29.453	3.048	-2.878	2.209	-2			14.750	13.411	4.470	14.695	0	
				29.500	2.877	-2.938	2.079	-2			14.843	15.759	4.553	15.129	0	
				30.000	2.877	-2.938	2.079	-2			15.213	15.213	4.066	14.890	0	
		-	Casi-permanente	-0.500	0.397	-0.384	0.294	-0			17.700	14.386	3.869	14.264	-0	
				0.000	0.397	-0.384	0.294	-0			20.650	11.781	3.234	12.302	-0	
				0.047	0.435	-0.347	0.323	-0			23.600	7.503	2.198	9.084	-1	
				2.950	2.767	1.957	2.080	1			26.550	4.368	-2.068	4.662	-2	
				5.900	4.854	3.598	3.640	2			29.453	2.191	-9.176	0.979	-5	
				8.850	6.424	4.724	4.815	3			29.500	2.158	-9.292	0.953	-6	
				11.800	7.406	5.413	5.553	4			30.000	0.397	-3.747	0.294	-5	
				14.287	7.746	5.627	5.810	4	Env	-	Característica	-0.500	4.862	-8.207	3.518	-8
				14.657	7.797	5.659	5.848	4			0.000	6.623	-13.752	4.176	-9	
				14.750	7.715	5.598	5.835	4			0.047	6.860	-13.594	4.360	-9	
				14.843	7.797	5.659	5.848	4			2.950	21.765	-3.185	17.816	-3	
				15.213	7.746	5.627	5.810	4			5.900	36.207	0.000	30.840	-1	
				17.700	7.406	5.413	5.553	4			8.850	48.918	0.000	40.436	-0	
				20.650	6.424	4.724	4.815	3			11.800	56.595	0.000	46.228	-0	
				23.600	4.854	3.599	3.641	2			14.287	59.172	0.000	48.183	0	
				26.550	2.767	1.957	2.080	1			14.657	59.979	0.000	48.620	0	
				29.453	0.435	-0.347	0.323	-0			14.750	57.150	0.000	48.086	0	

		14.843	59.979	0.000	48.620	0
		15.213	59.172	0.000	48.183	0
		17.700	56.594	0.000	46.227	-0
		20.650	48.918	0.000	40.436	-0
		23.600	36.207	0.000	30.840	-1
		26.550	21.766	-3.184	17.816	-3
		29.453	6.861	-13.593	4.361	-9
		29.500	6.624	-13.752	4.177	-9
		30.000	4.863	-8.207	3.519	-8
-	Frecuente	-0.500	2.877	-6.302	2.078	-7
		0.000	4.637	-11.847	2.737	-7
		0.047	4.803	-11.707	2.865	-7
		2.950	15.226	-2.795	12.863	-3
		5.900	25.385	0.000	22.632	-1
		8.850	34.834	0.000	29.767	-0
		11.800	40.566	0.000	34.092	-0
		14.287	42.475	0.000	35.540	0
		14.657	43.183	0.000	35.902	0
		14.750	40.536	0.000	35.405	0
		14.843	43.183	0.000	35.902	0
		15.213	42.475	0.000	35.540	0
		17.700	40.565	0.000	34.091	-0
		20.650	34.834	0.000	29.767	-0
		23.600	25.385	0.000	22.633	-1
		26.550	15.227	-2.795	12.863	-3
		29.453	4.804	-11.707	2.865	-7
		29.500	4.638	-11.846	2.737	-7
		30.000	2.877	-6.301	2.079	-7
-	Casi-permanente	-0.500	0.397	-3.748	0.294	-5
		0.000	2.158	-9.293	0.952	-6
		0.047	2.190	-9.176	0.979	-5
		2.950	4.368	-2.068	4.662	-2
		5.900	7.503	0.000	9.084	-1
		8.850	11.781	0.000	12.302	-0
		11.800	14.386	0.000	14.264	-0
		14.287	15.213	0.000	14.890	0
		14.657	15.759	0.000	15.129	0
		14.750	13.411	0.000	14.695	0
		14.843	15.759	0.000	15.129	0
		15.213	15.213	0.000	14.890	0
		17.700	14.386	0.000	14.264	-0
		20.650	11.781	0.000	12.302	-0
		23.600	7.503	0.000	9.084	-1
		26.550	4.368	-2.068	4.662	-2
		29.453	2.191	-9.176	0.979	-5
		29.500	2.158	-9.292	0.953	-6
		30.000	0.397	-3.747	0.294	-5

T1 : Al transferir el pretensado.  
T2 : Al hormigonar la losa.  
T3 : Al disponer la superestructura.  
T4 : Al abrir al tráfico.  
T5 : A tiempo infinito.  
Env : Envolverte de tensiones.

Día : número de días transcurridos entre el hormigonado de la viga y el instante considerado.

s(m) : distancia al inicio de la viga.

Tsup + (kg/cm2): máxima tensión positiva en la fibra superior de la losa.

Tsup - (kg/cm2): máxima tensión negativa en la fibra superior de la losa.

Tinf + (kg/cm2): máxima tensión positiva en la fibra inferior de la losa.

Tinf - (kg/cm2): máxima tensión negativa en la fibra inferior de la losa.

Tsup- y Tinf+ corresponden a la situación de transferencia de pretensado.

CALCULO A ROTURA POR FLEXION

Cálculo a rotura por flexión en la viga aislada.

Esfuerzos decalados (apartado 44.2.3.4.2 de la EHE).

Vano 1 Viga 1

Cálculo realizado para flector positivo.

Coefficientes de anchura eficaz empleados

Coefficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K1 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K2 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K3 = 1.000000

Coefficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga : K4 = 1.000000

- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga : K5 = 1.000000

- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga : K6 = 1.000000

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	0.000	0.000	-		
0.000	0.000	0.000	-		
1.182	979.724	307.891	3.182	1.797	-10.003
1.195	986.555	309.245	3.190	1.809	-10.003
2.490	986.603	449.671	2.194	1.809	-10.003
2.950	1140.485	501.292	2.275	2.095	-10.003
4.195	1541.789	608.581	2.533	3.422	-10.003
4.490	1541.789	629.089	2.451	3.422	-10.003
5.900	1760.193	717.750	2.452	3.500	-6.750
6.195	1802.937	736.405	2.448	3.500	-6.225
8.850	1802.937	855.408	2.108	3.500	-6.225
11.800	1802.937	918.470	1.963	3.500	-6.225
14.750	1802.937	931.351	1.936	3.500	-6.225
17.700	1802.937	918.470	1.963	3.500	-6.225
20.650	1802.937	855.408	2.108	3.500	-6.225
23.305	1802.937	736.405	2.448	3.500	-6.225
23.600	1760.193	717.749	2.452	3.500	-6.750
25.010	1541.789	629.089	2.451	3.422	-10.003
25.305	1541.789	608.581	2.533	3.422	-10.003
26.550	1140.484	501.291	2.275	2.095	-10.003
27.010	986.603	449.671	2.194	1.809	-10.003
28.305	986.603	309.279	3.190	1.809	-10.003
28.318	979.724	307.891	3.182	1.797	-10.003
29.500	0.000	0.000	-		
30.000	0.000	0.000	-		

Vano 1 Viga 2

Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K1 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K2 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K3 = 1.000000$

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K4 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K5 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K6 = 1.000000$

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	0.000	0.000	-		
0.000	0.000	0.000	-		
1.220	1796.887	318.579	5.640	3.500	-7.101
2.950	1797.421	492.739	3.648	3.500	-7.101
5.900	1797.421	716.209	2.510	3.500	-7.101
8.850	1797.421	854.484	2.104	3.500	-7.101
11.587	1797.421	919.380	1.955	3.500	-7.101
11.800	1797.421	922.560	1.948	3.500	-7.101
14.657	1797.421	931.352	1.930	3.500	-7.101
14.750	1847.262	931.352	1.983	3.500	-6.425
14.843	1797.421	931.352	1.930	3.500	-7.101
17.700	1797.421	922.560	1.948	3.500	-7.101
17.913	1797.421	919.380	1.955	3.500	-7.101
20.650	1797.421	854.484	2.104	3.500	-7.101
23.600	1797.421	716.209	2.510	3.500	-7.101
26.550	1797.421	492.739	3.648	3.500	-7.101
28.278	1797.421	318.895	5.636	3.500	-7.101
29.500	0.000	0.000	-		
30.000	0.000	0.000	-		

- s (m) : distancia al inicio de la viga.
- Mu (mT) : momento flector último de signo positivo en la sección de la viga.
- Md (mT) : momento flector de cálculo de signo positivo en la sección de la viga.
- K : coeficiente de seguridad a rotura (Mu/Md).
- esup (o/oo) : deformación en la fibra superior de la viga.
- einf (o/oo) : deformación en la fibra inferior de la viga.

Cálculo a rotura por flexión en la viga + losa.

Esfuerzos decalados (apartado 44.2.3.4.2 de la EHE).

Vano 1 Viga 1

Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K1 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K2 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K3 = 1.000000$

Coeficientes de anchura eficaz en los extremos de la viga

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K4 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K5 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K6 = 1.000000$

s (m)	Mu (mT)	Md (mT)	K	esup	einf
-0.500	2.541	87.239	0.02913	0.159	-10.212
0.000	445.823	156.835	2.84262	0.481	-10.002
1.182	1140.996	805.006	1.41738	0.813	-10.002
1.195	1148.345	808.126	1.42100	0.815	-10.002
2.490	1148.061	1115.751	1.02896	0.813	-10.002
2.950	1329.998	1217.552	1.09235	0.880	-10.002
4.195	1827.772	1477.786	1.23683	1.063	-10.002
4.490	1827.985	1537.333	1.18906	1.062	-10.002
5.900	2136.953	1813.877	1.17811	1.172	-10.002
6.195	2203.514	1855.309	1.18768	1.197	-10.002
8.850	2201.168	2194.794	1.00290	1.184	-10.002
11.800	2199.970	2370.472	0.92807	1.175	-10.002
14.750	2198.647	2398.927	0.91651	1.171	-10.002
17.700	2199.970	2370.473	0.92807	1.175	-10.002
20.650	2201.168	2194.798	1.00290	1.184	-10.002
23.305	2203.514	1855.314	1.18768	1.197	-10.002
23.600	2136.953	1813.882	1.17811	1.172	-10.002
25.010	1827.985	1537.338	1.18906	1.062	-10.002
25.305	1827.772	1477.790	1.23683	1.063	-10.002
26.550	1329.997	1217.554	1.09235	0.880	-10.002
27.010	1148.061	1115.753	1.02896	0.813	-10.002
28.305	1148.427	808.206	1.42096	0.815	-10.002
28.318	1140.996	805.008	1.41737	0.813	-10.002
29.500	445.821	156.836	2.84259	0.481	-10.002
30.000	2.541	87.241	0.02913	0.159	-10.212

Vano 1 Viga 2

Cálculo realizado para flector positivo.

Coeficientes de anchura eficaz empleados

Coeficientes de anchura eficaz en centro de vano

- Coeficiente a emplear para la parte izquierda de la losa que se encuentre sobre la viga :  $K1 = 1.000000$
- Coeficiente a emplear para la parte derecha de la losa que se encuentre sobre la viga :  $K2 = 1.000000$
- Coeficiente a emplear para la parte intermedia de la losa que se encuentre sobre la viga :  $K3 = 1.000000$





s(m): Distancia del punto al primer eje de apoyos.  
 Vtra+(T): cortante máximo positivo por tráfico en aceras.  
 Vtra-(T): cortante máximo negativo por tráfico en aceras.  
 Vtrp+(T): cortante máximo positivo por tráfico en plataforma.  
 Vtrp-(T): cortante máximo negativo por tráfico en plataforma.  
 Vgt+(T): cortante máximo positivo por gradiente térmico.  
 Vgt-(T): cortante máximo negativo por gradiente térmico.

Listado de cortantes efectivos de cálculo

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Valores obtenidos con coeficientes de seguridad correspondientes al estado límite último.

s(m): Distancia del punto al primer eje de apoyos.  
 Vrd1+(T): cortante efectivo máximo positivo tras transferir el pretensado.  
 Vrd2+(T): cortante efectivo máximo positivo tras hormigonar la losa.  
 Vrd3+(T): cortante efectivo máximo positivo tras disponer la superestructura.  
 Vrd4+(T): cortante efectivo máximo positivo tras abrir al tráfico.  
 Vrd5+(T): cortante efectivo máximo positivo a tiempo infinito.  
 Vrd1-(T): cortante efectivo máximo negativo tras transferir el pretensado.  
 Vrd2-(T): cortante efectivo máximo negativo tras hormigonar la losa.  
 Vrd3-(T): cortante efectivo máximo negativo tras disponer la superestructura.  
 Vrd4-(T): cortante efectivo máximo negativo tras abrir al tráfico.  
 Vrd5-(T): cortante efectivo máximo negativo a tiempo infinito.  
 Vrd+ (T): cortante efectivo máximo positivo total.  
 Vrd- (T): cortante efectivo máximo negativo total.

Vano 1 Viga 1

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Punto	s(m)	Vrd1+	Vrd2+	Vrd3+	Vrd4+	Vrd5+	Vrd+
1	-0.500	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
2	0.000	-1.553	-3.285	-3.285	-3.285	-3.285	-1.553
3	0.000	60.802	128.615	162.979	341.932	341.932	341.932
4	7.375	30.401	64.308	81.321	209.822	209.822	209.822
5	14.750	-0.000	-0.000	0.039	80.392	80.392	80.392
6	22.125	-22.519	-47.635	-54.250	-15.968	-15.968	-15.968
7	29.500	-45.039	-95.271	-108.198	-86.910	-86.910	-45.039
8	29.500	2.097	4.435	4.435	4.435	4.435	4.435
9	30.000	0.000	0.000	0.000	0.000	0.000	0.000

Punto	s(m)	Vrd1-	Vrd2-	Vrd3-	Vrd4-	Vrd5-	Vrd-
1	-0.500	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
2	0.000	-1.553	-3.285	-3.285	-3.285	-3.285	-3.285
3	0.000	45.039	95.271	108.198	86.911	86.911	45.039
4	7.375	22.519	47.635	54.250	15.969	15.969	15.969
5	14.750	-0.000	-0.000	-0.039	-80.392	-80.392	-80.392
6	22.125	-30.401	-64.308	-81.321	-209.822	-209.822	-209.822
7	29.500	-60.803	-128.615	-162.979	-341.932	-341.932	-341.932
8	29.500	1.553	3.285	3.285	3.285	3.285	1.553
9	30.000	0.000	0.000	0.000	0.000	0.000	0.000

Vano 1 Viga 2

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Punto	s(m)	Vrd1+	Vrd2+	Vrd3+	Vrd4+	Vrd5+	Vrd+
1	-0.500	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
2	0.000	-1.553	-3.285	-3.285	-3.285	-3.285	-1.553
3	0.000	60.803	128.615	162.969	341.882	341.882	341.882
4	7.375	30.401	64.308	81.313	209.770	209.770	209.770
5	14.750	0.000	-0.000	0.040	80.404	80.404	80.404
6	22.125	-22.519	-47.635	-54.241	-15.971	-15.971	-15.971
7	29.500	-45.039	-95.271	-108.186	-86.792	-86.792	-45.039
8	29.500	2.097	4.435	4.435	4.435	4.435	4.435
9	30.000	0.000	0.000	0.000	0.000	0.000	0.000

Punto	s(m)	Vrd1-	Vrd2-	Vrd3-	Vrd4-	Vrd5-	Vrd-
1	-0.500	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
2	0.000	-1.553	-3.285	-3.285	-3.285	-3.285	-3.285
3	0.000	45.039	95.271	108.186	86.793	86.793	45.039
4	7.375	22.519	47.635	54.241	15.972	15.972	15.972
5	14.750	0.000	-0.000	-0.040	-80.403	-80.403	-80.403
6	22.125	-30.401	-64.308	-81.313	-209.769	-209.769	-209.769
7	29.500	-60.803	-128.615	-162.969	-341.881	-341.881	-341.881
8	29.500	1.553	3.285	3.285	3.285	3.285	1.553
9	30.000	0.000	0.000	0.000	0.000	0.000	0.000

Comprobación de rotura por cortante por compresión

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Vano 1 Viga 1

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Punto	s(m)	Vrd	Vu1	Vrd/Vu1
1	-0.500	0.000	736.113	0.000
2	0.000	3.285	763.238	0.004
3	0.000	341.932	763.238	0.448
4	7.375	209.822	818.179	0.256
5	14.750	80.392	818.928	0.098
6	22.125	209.822	818.179	0.256
7	29.500	341.932	763.238	0.448
8	29.500	4.435	763.238	0.006
9	30.000	0.000	736.113	0.000

Vano 1 Viga 2

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Punto	s(m)	Vrd	Vu1	Vrd/Vu1
1	-0.500	0.000	725.311	0.000
2	0.000	3.285	764.420	0.004
3	0.000	341.882	764.420	0.447
4	7.375	209.770	798.510	0.263
5	14.750	80.404	794.998	0.101
6	22.125	209.769	798.510	0.263
7	29.500	341.881	764.421	0.447
8	29.500	4.435	764.421	0.006
9	30.000	0.000	725.311	0.000

s(m): Distancia del punto al primer eje de apoyos.  
 Vrd(T): cortante efectivo máximo total.  
 Vu1(T): cortante de agotamiento por compresión oblicua del alma.

Comprobación de rotura por cortante por tracción

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Vano 1 Viga 1

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Punto	s(m)	Vrd	Vcu	Vsu	As
1	-0.500	0.000	38.094	0.000	0.000
2	0.000	3.285	48.686	0.000	0.000
3	0.000	341.932	48.686	293.246	33.178
4	7.375	209.822	77.612	132.211	15.023
5	14.750	80.392	77.986	2.406	0.273
6	22.125	209.822	77.612	132.211	15.023
7	29.500	341.932	48.686	293.246	33.178
8	29.500	4.435	48.686	0.000	0.000
9	30.000	0.000	38.094	0.000	0.000

Vano 1 Viga 2

Punto	s(m)	Vrd	Vcu	Vsu	As
1	-0.500	0.000	37.629	0.000	0.000
2	0.000	3.285	54.552	0.000	0.000
3	0.000	341.882	54.552	287.330	33.022
4	7.375	209.770	71.597	138.173	15.880
5	14.750	80.404	73.012	7.392	0.858
6	22.125	209.769	71.597	138.172	15.880
7	29.500	341.881	54.552	287.329	33.022
8	29.500	4.435	54.552	0.000	0.000
9	30.000	0.000	37.629	0.000	0.000

s(m): Distancia del punto al primer eje de apoyos.

Vrd(T): cortante efectivo máximo total.

Vcu(T): contribución del hormigón a la resistencia a esfuerzo cortante.

Vsu(T): contribución de la armadura transversal del alma a la resistencia a cortante.

As(cm2/m): área de la armadura transversal de cálculo por viga (no incluye la arm. mín

LISTADO DE FUERZAS DE PRETENSADO

Coeficientes de seguridad empleados : unitarios.

Fuerza de pretensado a lo largo de cada cable en cada instante

Vano 1 Viga 1

Punto	s (m)	Cable	P1 (T)	P2 (T)	P3 (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	258.784	248.005	226.377
		3	0.000	0.000	0.000
		4	110.907	106.332	97.086
		5	73.938	72.073	66.506
3	0.089	1	0.000	0.000	0.000
		2	258.784	248.045	226.494
		3	0.000	0.000	0.000
		4	110.907	106.348	97.134
		5	73.938	72.056	66.480
4	2.490	1	0.000	0.000	0.000
		2	258.784	249.048	229.516
		3	0.000	0.000	0.000
		4	110.907	106.753	98.373
		5	73.938	71.639	65.821
5	2.950	1	237.282	225.964	205.292
		2	258.957	246.393	223.144
		3	0.000	0.000	0.000
		4	110.981	105.651	95.716
		5	73.988	71.879	66.007
6	3.089	1	258.957	246.169	222.653
		2	258.957	246.169	222.653
		3	0.000	0.000	0.000
		4	110.981	105.558	95.510
		5	73.988	71.882	65.998
7	4.490	1	258.957	246.635	224.052
		2	258.957	246.635	224.052
		3	0.000	0.000	0.000
		4	110.981	105.745	96.084
		5	73.988	71.687	65.688

8	5.089	1	259.048	245.093	220.388
		2	259.048	245.093	220.388
		3	148.027	140.138	126.070
		4	111.020	105.104	94.553
		5	74.014	71.776	65.720
9	5.900	1	259.048	245.327	221.112
		2	259.048	245.327	221.112
		3	148.027	140.264	126.466
		4	111.020	105.198	94.850
		5	74.014	71.677	65.561
10	8.850	1	259.048	245.991	223.128
		2	259.048	245.991	223.128
		3	148.027	140.620	127.568
		4	111.020	105.465	95.676
		5	74.014	71.396	65.115
11	11.800	1	259.048	246.389	224.344
		2	259.048	246.389	224.344
		3	148.027	140.834	128.233
		4	111.020	105.626	96.175
		5	74.014	71.228	64.846
12	14.750	1	259.048	246.521	224.761
		2	259.048	246.521	224.761
		3	148.027	140.905	128.461
		4	111.020	105.679	96.346
		5	74.014	71.172	64.755
13	17.700	1	259.048	246.389	224.344
		2	259.048	246.389	224.344
		3	148.027	140.834	128.233
		4	111.020	105.626	96.175
		5	74.014	71.228	64.846
14	20.650	1	259.048	245.991	223.128
		2	259.048	245.991	223.128
		3	148.027	140.620	127.568
		4	111.020	105.465	95.676
		5	74.014	71.396	65.115
15	23.600	1	259.048	245.327	221.112
		2	259.048	245.327	221.112
		3	148.027	140.264	126.466
		4	111.020	105.198	94.850
		5	74.014	71.677	65.561
16	24.411	1	259.048	245.093	220.388
		2	259.048	245.093	220.388
		3	148.027	140.138	126.070
		4	111.020	105.104	94.553
		5	74.014	71.776	65.720
17	25.010	1	258.957	246.635	224.052
		2	258.957	246.635	224.052
		3	0.000	0.000	0.000
		4	110.981	105.745	96.084
		5	73.988	71.687	65.688
18	26.411	1	258.957	246.169	222.653
		2	258.957	246.169	222.653
		3	0.000	0.000	0.000
		4	110.981	105.558	95.510
		5	73.988	71.882	65.998
19	26.550	1	237.280	225.962	205.290
		2	258.957	246.393	223.144
		3	0.000	0.000	0.000
		4	110.981	105.651	95.716
		5	73.988	71.879	66.007
20	27.010	1	0.000	0.000	0.000
		2	258.784	249.048	229.516
		3	0.000	0.000	0.000
		4	110.907	106.753	98.373
		5	73.938	71.639	65.821
21	29.411	1	0.000	0.000	0.000
		2	258.784	248.045	226.494
		3	0.000	0.000	0.000
		4	110.907	106.348	97.134

22	29.500	5	73.938	72.056	66.480
		1	0.000	0.000	0.000
		2	258.784	248.005	226.377
		3	0.000	0.000	0.000
		4	110.907	106.332	97.086
23	30.000	5	73.938	72.073	66.506
		1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000

P1 : fuerza de pretensado después de tesar.

P2 : fuerza de pretensado después de hormigonar la losa.

P3 : fuerza de pretensado a tiempo infinito.

Vano 1 Viga 2

Punto	s (m)	Cable	P1 (T)	P2 (T)	P3 (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	238.827	226.244	204.688
		3	0.000	0.000	0.000
		4	238.827	226.487	205.103
		5	0.000	0.000	0.000
		6	238.827	226.730	205.517
		7	0.000	0.000	0.000
3	0.047	1	0.000	0.000	0.000
		2	238.827	226.262	204.741
		3	0.000	0.000	0.000
		4	238.827	226.504	205.153
		5	0.000	0.000	0.000
		6	238.827	226.746	205.566
		7	0.000	0.000	0.000
4	2.950	1	0.000	0.000	0.000
		2	238.827	227.320	207.859
		3	0.000	0.000	0.000
		4	238.827	227.498	208.136
		5	0.000	0.000	0.000
		6	238.827	227.676	208.413
		7	0.000	0.000	0.000
5	5.900	1	0.000	0.000	0.000
		2	238.827	228.157	210.332
		3	0.000	0.000	0.000
		4	238.827	228.284	210.500
		5	0.000	0.000	0.000
		6	238.827	228.411	210.669
		7	0.000	0.000	0.000
6	8.850	1	0.000	0.000	0.000
		2	238.827	228.755	212.102
		3	0.000	0.000	0.000
		4	238.827	228.846	212.194
		5	0.000	0.000	0.000
		6	238.827	228.936	212.285
		7	0.000	0.000	0.000
7	11.800	1	0.000	0.000	0.000
		2	238.827	229.114	213.169
		3	0.000	0.000	0.000
		4	238.827	229.183	213.215
		5	0.000	0.000	0.000
		6	238.827	229.252	213.260

8	14.287	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	229.227	213.501
		3	0.000	0.000	0.000
		4	238.827	229.289	213.532
		5	0.000	0.000	0.000
		6	238.827	229.351	213.563
9	14.657	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	229.232	213.528
		3	0.000	0.000	0.000
		4	238.827	229.294	213.558
		5	0.000	0.000	0.000
		6	238.827	229.356	213.588
10	14.750	7	0.000	0.000	0.000
		1	50.218	39.025	22.219
		2	240.573	228.596	209.536
		3	50.218	39.176	22.421
		4	240.573	228.728	209.712
		5	50.218	39.327	22.623
		6	240.573	228.860	209.889
11	14.843	7	43.941	34.543	19.972
		1	0.000	0.000	0.000
		2	238.827	229.232	213.528
		3	0.000	0.000	0.000
		4	238.827	229.294	213.558
		5	0.000	0.000	0.000
		6	238.827	229.356	213.588
12	15.213	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	229.227	213.501
		3	0.000	0.000	0.000
		4	238.827	229.289	213.532
		5	0.000	0.000	0.000
		6	238.827	229.351	213.563
13	17.700	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	229.114	213.169
		3	0.000	0.000	0.000
		4	238.827	229.183	213.215
		5	0.000	0.000	0.000
		6	238.827	229.252	213.260
14	20.650	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	228.755	212.102
		3	0.000	0.000	0.000
		4	238.827	228.846	212.194
		5	0.000	0.000	0.000
		6	238.827	228.936	212.285
15	23.600	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	228.157	210.332
		3	0.000	0.000	0.000
		4	238.827	228.284	210.500
		5	0.000	0.000	0.000
		6	238.827	228.411	210.669
16	26.550	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	227.320	207.859
		3	0.000	0.000	0.000
		4	238.827	227.498	208.136
		5	0.000	0.000	0.000
		6	238.827	227.676	208.413
17	29.453	7	0.000	0.000	0.000
		1	0.000	0.000	0.000
		2	238.827	226.262	204.741
		3	0.000	0.000	0.000
		4	238.827	226.504	205.153
		5	0.000	0.000	0.000

		6	238.827	226.746	205.566
		7	0.000	0.000	0.000
18	29.500	1	0.000	0.000	0.000
		2	238.827	226.244	204.688
		3	0.000	0.000	0.000
		4	238.827	226.487	205.103
		5	0.000	0.000	0.000
		6	238.827	226.730	205.517
		7	0.000	0.000	0.000
19	30.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000

P1 : fuerza de pretensado después de tesar.

P2 : fuerza de pretensado después de hormigonar la losa.

P3 : fuerza de pretensado a tiempo infinito.

Pérdidas de pretensado entre tesado y hormigonado de losa

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Vano 1 Viga 1

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Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	-0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	2.986	4.304	3.489
		3	0.000	0.000	0.000
		4	1.280	1.800	1.495
		5	0.853	0.016	0.997
3	0.089	1	0.000	0.000	0.000
		2	2.986	4.264	3.489
		3	0.000	0.000	0.000
		4	1.280	1.784	1.495
		5	0.853	0.032	0.997
4	2.490	1	0.000	0.000	0.000
		2	2.986	3.260	3.489
		3	0.000	0.000	0.000
		4	1.280	1.380	1.495
		5	0.853	0.450	0.997
5	2.950	1	2.986	6.078	2.254
		2	2.986	6.078	3.500
		3	0.000	0.000	0.000
		4	1.280	2.551	1.500
		5	0.853	0.256	1.000
6	3.089	1	2.986	6.301	3.500
		2	2.986	6.301	3.500
		3	0.000	0.000	0.000
		4	1.280	2.644	1.500
		5	0.853	0.252	1.000
7	4.490	1	2.986	5.836	3.500
		2	2.986	5.836	3.500
		3	0.000	0.000	0.000
		4	1.280	2.456	1.500
		5	0.853	0.448	1.000
8	5.089	1	2.986	7.464	3.506
		2	2.986	7.464	3.506
		3	1.706	4.180	2.003
		4	1.280	3.135	1.502
		5	0.853	0.383	1.002

9	5.900	1	2.986	7.229	3.506
		2	2.986	7.229	3.506
		3	1.706	4.054	2.003
		4	1.280	3.040	1.502
		5	0.853	0.482	1.002
10	8.850	1	2.986	6.566	3.506
		2	2.986	6.566	3.506
		3	1.706	3.697	2.003
		4	1.280	2.773	1.502
		5	0.853	0.763	1.002
11	11.800	1	2.986	6.168	3.506
		2	2.986	6.168	3.506
		3	1.706	3.484	2.003
		4	1.280	2.613	1.502
		5	0.853	0.931	1.002
12	14.750	1	2.986	6.035	3.506
		2	2.986	6.035	3.506
		3	1.706	3.413	2.003
		4	1.280	2.559	1.502
		5	0.853	0.987	1.002
13	17.700	1	2.986	6.168	3.506
		2	2.986	6.168	3.506
		3	1.706	3.484	2.003
		4	1.280	2.613	1.502
		5	0.853	0.931	1.002
14	20.650	1	2.986	6.566	3.506
		2	2.986	6.566	3.506
		3	1.706	3.697	2.003
		4	1.280	2.773	1.502
		5	0.853	0.763	1.002
15	23.600	1	2.986	7.229	3.506
		2	2.986	7.229	3.506
		3	1.706	4.054	2.003
		4	1.280	3.040	1.502
		5	0.853	0.482	1.002
16	24.411	1	2.986	7.464	3.506
		2	2.986	7.464	3.506
		3	1.706	4.180	2.003
		4	1.280	3.135	1.502
		5	0.853	0.383	1.002
17	25.010	1	2.986	5.836	3.500
		2	2.986	5.836	3.500
		3	0.000	0.000	0.000
		4	1.280	2.456	1.500
		5	0.853	0.448	1.000
18	26.411	1	2.986	6.301	3.500
		2	2.986	6.301	3.500
		3	0.000	0.000	0.000
		4	1.280	2.644	1.500
		5	0.853	0.252	1.000
19	26.550	1	2.986	6.078	2.254
		2	2.986	6.078	3.500
		3	0.000	0.000	0.000
		4	1.280	2.551	1.500
		5	0.853	0.256	1.000
20	27.010	1	0.000	0.000	0.000
		2	2.986	3.260	3.489
		3	0.000	0.000	0.000
		4	1.280	1.380	1.495
		5	0.853	0.450	0.997
21	29.411	1	0.000	0.000	0.000
		2	2.986	4.264	3.489
		3	0.000	0.000	0.000
		4	1.280	1.784	1.495
		5	0.853	0.032	0.997
22	29.500	1	0.000	0.000	0.000
		2	2.986	4.304	3.489
		3	0.000	0.000	0.000
		4	1.280	1.800	1.495

23	30.000	5	0.853	0.016	0.997
		1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	-0.000	0.000

Prt : pérdida de pretensado por retracción del hormigón.  
Pfl : pérdida de pretensado por fluencia del hormigón.  
Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Vano 1 Viga 2

Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	2.680	7.806	2.098
		3	0.000	0.000	0.000
		4	2.680	7.563	2.098
		5	0.000	0.000	0.000
		6	2.680	7.320	2.098
		7	0.000	0.000	0.000
3	0.047	1	0.000	0.000	0.000
		2	2.680	7.787	2.098
		3	0.000	0.000	0.000
		4	2.680	7.545	2.098
		5	0.000	0.000	0.000
		6	2.680	7.303	2.098
		7	0.000	0.000	0.000
4	2.950	1	0.000	0.000	0.000
		2	2.680	6.729	2.098
		3	0.000	0.000	0.000
		4	2.680	6.552	2.098
		5	0.000	0.000	0.000
		6	2.680	6.374	2.098
		7	0.000	0.000	0.000
5	5.900	1	0.000	0.000	0.000
		2	2.680	5.892	2.098
		3	0.000	0.000	0.000
		4	2.680	5.765	2.098
		5	0.000	0.000	0.000
		6	2.680	5.638	2.098
		7	0.000	0.000	0.000
6	8.850	1	0.000	0.000	0.000
		2	2.680	5.294	2.098
		3	0.000	0.000	0.000
		4	2.680	5.204	2.098
		5	0.000	0.000	0.000
		6	2.680	5.113	2.098
		7	0.000	0.000	0.000
7	11.800	1	0.000	0.000	0.000
		2	2.680	4.936	2.098
		3	0.000	0.000	0.000
		4	2.680	4.867	2.098
		5	0.000	0.000	0.000
		6	2.680	4.798	2.098
		7	0.000	0.000	0.000
8	14.287	1	0.000	0.000	0.000
		2	2.680	4.823	2.098
		3	0.000	0.000	0.000
		4	2.680	4.761	2.098

		5	0.000	0.000	0.000
		6	2.680	4.698	2.098
		7	0.000	0.000	0.000
9	14.657	1	0.000	0.000	0.000
		2	2.680	4.817	2.098
		3	0.000	0.000	0.000
		4	2.680	4.755	2.098
		5	0.000	0.000	0.000
		6	2.680	4.694	2.098
		7	0.000	0.000	0.000
10	14.750	1	3.062	8.131	0.000
		2	2.680	7.115	2.183
		3	3.062	7.980	0.000
		4	2.680	6.983	2.183
		5	3.062	7.829	0.000
		6	2.680	6.850	2.183
		7	2.680	6.718	0.000
11	14.843	1	0.000	0.000	0.000
		2	2.680	4.817	2.098
		3	0.000	0.000	0.000
		4	2.680	4.755	2.098
		5	0.000	0.000	0.000
		6	2.680	4.694	2.098
		7	0.000	0.000	0.000
12	15.213	1	0.000	0.000	0.000
		2	2.680	4.823	2.098
		3	0.000	0.000	0.000
		4	2.680	4.761	2.098
		5	0.000	0.000	0.000
		6	2.680	4.698	2.098
		7	0.000	0.000	0.000
13	17.700	1	0.000	0.000	0.000
		2	2.680	4.936	2.098
		3	0.000	0.000	0.000
		4	2.680	4.867	2.098
		5	0.000	0.000	0.000
		6	2.680	4.798	2.098
		7	0.000	0.000	0.000
14	20.650	1	0.000	0.000	0.000
		2	2.680	5.294	2.098
		3	0.000	0.000	0.000
		4	2.680	5.204	2.098
		5	0.000	0.000	0.000
		6	2.680	5.113	2.098
		7	0.000	0.000	0.000
15	23.600	1	0.000	0.000	0.000
		2	2.680	5.892	2.098
		3	0.000	0.000	0.000
		4	2.680	5.765	2.098
		5	0.000	0.000	0.000
		6	2.680	5.638	2.098
		7	0.000	0.000	0.000
16	26.550	1	0.000	0.000	0.000
		2	2.680	6.729	2.098
		3	0.000	0.000	0.000
		4	2.680	6.552	2.098
		5	0.000	0.000	0.000
		6	2.680	6.374	2.098
		7	0.000	0.000	0.000
17	29.453	1	0.000	0.000	0.000
		2	2.680	7.787	2.098
		3	0.000	0.000	0.000
		4	2.680	7.545	2.098
		5	0.000	0.000	0.000
		6	2.680	7.303	2.098
		7	0.000	0.000	0.000
18	29.500	1	0.000	0.000	0.000
		2	2.680	7.806	2.098
		3	0.000	0.000	0.000

		4	2.680	7.563	2.098
		5	0.000	0.000	0.000
		6	2.680	7.320	2.098
		7	0.000	0.000	0.000
19	30.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000

Prt : pérdida de pretensado por retracción del hormigón.  
Pfl : pérdida de pretensado por fluencia del hormigón.  
Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Pérdidas de pretensado entre hormigonado de losa y tiempo infinito  
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Vano 1 Viga 1  
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Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	-0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	8.213	6.198	7.216
		3	0.000	0.000	0.000
		4	3.557	2.597	3.093
		5	3.360	0.145	2.062
3	0.089	1	0.000	0.000	0.000
		2	8.213	6.121	7.216
		3	0.000	0.000	0.000
		4	3.557	2.565	3.093
		5	3.360	0.154	2.062
4	2.490	1	0.000	0.000	0.000
		2	8.213	4.102	7.216
		3	0.000	0.000	0.000
		4	3.557	1.730	3.093
		5	3.360	0.395	2.062
5	2.950	1	8.223	7.788	4.662
		2	8.223	7.788	7.238
		3	0.000	0.000	0.000
		4	3.561	3.272	3.102
		5	3.360	0.444	2.068
6	3.089	1	8.223	8.056	7.238
		2	8.223	8.056	7.238
		3	0.000	0.000	0.000
		4	3.561	3.385	3.102
		5	3.360	0.456	2.068
7	4.490	1	8.223	7.122	7.238
		2	8.223	7.122	7.238
		3	0.000	0.000	0.000
		4	3.561	2.999	3.102
		5	3.360	0.570	2.068
8	5.089	1	8.227	9.227	7.250
		2	8.227	9.227	7.250
		3	4.750	5.175	4.143
		4	3.563	3.881	3.107
		5	3.360	0.624	2.071
9	5.900	1	8.227	8.738	7.250
		2	8.227	8.738	7.250
		3	4.750	4.905	4.143
		4	3.563	3.679	3.107
		5	3.360	0.684	2.071

10	8.850	1	8.227	7.386	7.250
		2	8.227	7.386	7.250
		3	4.750	4.159	4.143
		4	3.563	3.119	3.107
		5	3.360	0.849	2.071
11	11.800	1	8.227	6.567	7.250
		2	8.227	6.567	7.250
		3	4.750	3.708	4.143
		4	3.563	2.781	3.107
		5	3.360	0.950	2.071
12	14.750	1	8.227	6.284	7.250
		2	8.227	6.284	7.250
		3	4.750	3.551	4.143
		4	3.563	2.663	3.107
		5	3.360	0.985	2.071
13	17.700	1	8.227	6.567	7.250
		2	8.227	6.567	7.250
		3	4.750	3.708	4.143
		4	3.563	2.781	3.107
		5	3.360	0.950	2.071
14	20.650	1	8.227	7.386	7.250
		2	8.227	7.386	7.250
		3	4.750	4.159	4.143
		4	3.563	3.119	3.107
		5	3.360	0.849	2.071
15	23.600	1	8.227	8.738	7.250
		2	8.227	8.738	7.250
		3	4.750	4.905	4.143
		4	3.563	3.679	3.107
		5	3.360	0.684	2.071
16	24.411	1	8.227	9.227	7.250
		2	8.227	9.227	7.250
		3	4.750	5.175	4.143
		4	3.563	3.881	3.107
		5	3.360	0.624	2.071
17	25.010	1	8.223	7.122	7.238
		2	8.223	7.122	7.238
		3	0.000	0.000	0.000
		4	3.561	2.999	3.102
		5	3.360	0.570	2.068
18	26.411	1	8.223	8.056	7.238
		2	8.223	8.056	7.238
		3	0.000	0.000	0.000
		4	3.561	3.385	3.102
		5	3.360	0.456	2.068
19	26.550	1	8.223	7.787	4.662
		2	8.223	7.787	7.238
		3	0.000	0.000	0.000
		4	3.561	3.272	3.102
		5	3.360	0.444	2.068
20	27.010	1	0.000	0.000	0.000
		2	8.213	4.102	7.216
		3	0.000	0.000	0.000
		4	3.557	1.730	3.093
		5	3.360	0.395	2.062
21	29.411	1	0.000	0.000	0.000
		2	8.213	6.121	7.216
		3	0.000	0.000	0.000
		4	3.557	2.565	3.093
		5	3.360	0.154	2.062
22	29.500	1	0.000	0.000	0.000
		2	8.213	6.198	7.216
		3	0.000	0.000	0.000
		4	3.557	2.597	3.093
		5	3.360	0.145	2.062
23	30.000	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000

5 0.000 -0.000 0.000

Prt : pérdida de pretensado por retracción del hormigón.  
 Pfl : pérdida de pretensado por fluencia del hormigón.  
 Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Vano 1 Viga 2

Punto	s (m)	Cable	Prt (T)	Pfl (T)	Prl (T)
1	-0.500	1	0.000	0.000	0.000
		2	0.000	0.000	0.000
		3	0.000	0.000	0.000
		4	0.000	0.000	0.000
		5	0.000	0.000	0.000
		6	0.000	0.000	0.000
		7	0.000	0.000	0.000
2	0.000	1	0.000	0.000	0.000
		2	7.122	10.249	4.186
		3	0.000	0.000	0.000
		4	7.197	10.002	4.186
		5	0.000	0.000	0.000
		6	7.272	9.755	4.186
		7	0.000	0.000	0.000
3	0.047	1	0.000	0.000	0.000
		2	7.122	10.214	4.186
		3	0.000	0.000	0.000
		4	7.197	9.968	4.186
		5	0.000	0.000	0.000
		6	7.272	9.723	4.186
		7	0.000	0.000	0.000
4	2.950	1	0.000	0.000	0.000
		2	7.122	8.153	4.186
		3	0.000	0.000	0.000
		4	7.197	7.979	4.186
		5	0.000	0.000	0.000
		6	7.272	7.806	4.186
		7	0.000	0.000	0.000
5	5.900	1	0.000	0.000	0.000
		2	7.122	6.518	4.186
		3	0.000	0.000	0.000
		4	7.197	6.401	4.186
		5	0.000	0.000	0.000
		6	7.272	6.284	4.186
		7	0.000	0.000	0.000
6	8.850	1	0.000	0.000	0.000
		2	7.122	5.345	4.186
		3	0.000	0.000	0.000
		4	7.197	5.270	4.186
		5	0.000	0.000	0.000
		6	7.272	5.194	4.186
		7	0.000	0.000	0.000
7	11.800	1	0.000	0.000	0.000
		2	7.122	4.637	4.186
		3	0.000	0.000	0.000
		4	7.197	4.585	4.186
		5	0.000	0.000	0.000
		6	7.272	4.534	4.186
		7	0.000	0.000	0.000
8	14.287	1	0.000	0.000	0.000
		2	7.122	4.418	4.186
		3	0.000	0.000	0.000
		4	7.197	4.374	4.186
		5	0.000	0.000	0.000
		6	7.272	4.331	4.186
		7	0.000	0.000	0.000
9	14.657	1	0.000	0.000	0.000
		2	7.122	4.396	4.186

		3	0.000	0.000	0.000
		4	7.197	4.354	4.186
		5	0.000	0.000	0.000
		6	7.272	4.311	4.186
		7	0.000	0.000	0.000
10	14.750	1	8.169	8.636	0.000
		2	7.148	7.556	4.356
		3	8.254	8.500	0.000
		4	7.222	7.438	4.356
		5	8.339	8.365	0.000
		6	7.297	7.319	4.356
		7	7.371	7.201	0.000
11	14.843	1	0.000	0.000	0.000
		2	7.122	4.396	4.186
		3	0.000	0.000	0.000
		4	7.197	4.354	4.186
		5	0.000	0.000	0.000
		6	7.272	4.311	4.186
		7	0.000	0.000	0.000
12	15.213	1	0.000	0.000	0.000
		2	7.122	4.418	4.186
		3	0.000	0.000	0.000
		4	7.197	4.374	4.186
		5	0.000	0.000	0.000
		6	7.272	4.331	4.186
		7	0.000	0.000	0.000
13	17.700	1	0.000	0.000	0.000
		2	7.122	4.637	4.186
		3	0.000	0.000	0.000
		4	7.197	4.585	4.186
		5	0.000	0.000	0.000
		6	7.272	4.534	4.186
		7	0.000	0.000	0.000
14	20.650	1	0.000	0.000	0.000
		2	7.122	5.345	4.186
		3	0.000	0.000	0.000
		4	7.197	5.270	4.186
		5	0.000	0.000	0.000
		6	7.272	5.194	4.186
		7	0.000	0.000	0.000
15	23.600	1	0.000	0.000	0.000
		2	7.122	6.518	4.186
		3	0.000	0.000	0.000
		4	7.197	6.401	4.186
		5	0.000	0.000	0.000
		6	7.272	6.284	4.186
		7	0.000	0.000	0.000
16	26.550	1	0.000	0.000	0.000
		2	7.122	8.153	4.186
		3	0.000	0.000	0.000
		4	7.197	7.979	4.186
		5	0.000	0.000	0.000
		6	7.272	7.806	4.186
		7	0.000	0.000	0.000
17	29.453	1	0.000	0.000	0.000
		2	7.122	10.214	4.186
		3	0.000	0.000	0.000
		4	7.197	9.968	4.186
		5	0.000	0.000	0.000
		6	7.272	9.723	4.186
		7	0.000	0.000	0.000
18	29.500	1	0.000	0.000	0.000
		2	7.122	10.249	4.186
		3	0.000	0.000	0.000
		4	7.197	10.002	4.186
		5	0.000	0.000	0.000
		6	7.272	9.755	4.186
		7	0.000	0.000	0.000
19	30.000	1	0.000	0.000	0.000

2	0.000	0.000	0.000
3	0.000	0.000	0.000
4	0.000	0.000	0.000
5	0.000	0.000	0.000
6	0.000	0.000	0.000
7	0.000	0.000	0.000

Prt : pérdida de pretensado por retracción del hormigón.  
Pfl : pérdida de pretensado por fluencia del hormigón.  
Prl : pérdida de pretensado por relajación del acero de la armadura activa.

Pérdidas de pretensado totales (T)

Vano 1 Viga 1

Punto	s (m)	P0 (T)	DP1a (T)	DP1b (T)	DP1 (T)	DP2 (T)
1	-0.500	898.380	7.491	890.889	898.380	0.000
2	0.000	898.380	7.491	447.259	454.751	53.661
3	0.089	898.380	7.491	447.259	454.751	53.522
4	2.490	898.380	7.491	447.259	454.751	49.919
5	2.950	898.380	7.491	209.681	217.173	91.049
6	3.089	898.380	7.491	188.007	195.498	96.069
7	4.490	898.380	7.491	188.007	195.498	93.005
8	5.089	898.380	7.491	39.732	47.223	124.037
9	5.900	898.380	7.491	39.732	47.223	122.055
10	8.850	898.380	7.491	39.732	47.223	116.541
11	11.800	898.380	7.491	39.732	47.223	113.214
12	14.750	898.380	7.491	39.732	47.223	112.074
13	17.700	898.380	7.491	39.732	47.223	113.214
14	20.650	898.380	7.491	39.732	47.223	116.541
15	23.600	898.380	7.491	39.732	47.223	122.055
16	24.411	898.380	7.491	39.732	47.223	124.037
17	25.010	898.380	7.491	188.007	195.498	93.005
18	26.411	898.380	7.491	188.007	195.498	96.069
19	26.550	898.380	7.491	209.683	217.174	91.049
20	27.010	898.380	7.491	447.259	454.751	49.919
21	29.411	898.380	7.491	447.259	454.751	53.522
22	29.500	898.380	7.491	447.259	454.751	53.661
23	30.000	898.380	7.491	890.889	898.380	0.000

Vano 1 Viga 2

Punto	s (m)	P0 (T)	DP1a (T)	DP1b (T)	DP1 (T)	DP2 (T)
1	-0.500	2031.120	16.937	2014.183	2031.120	0.000
2	0.000	2031.120	16.937	1297.703	1314.640	101.173
3	0.047	2031.120	16.937	1297.703	1314.640	101.020
4	2.950	2031.120	16.937	1297.703	1314.640	92.072
5	5.900	2031.120	16.937	1297.703	1314.640	84.979
6	8.850	2031.120	16.937	1297.703	1314.640	79.899
7	11.800	2031.120	16.937	1297.703	1314.640	76.836
8	14.287	2031.120	16.937	1297.703	1314.640	75.884
9	14.657	2031.120	16.937	1297.703	1314.640	75.806
10	14.750	2031.120	16.937	1097.868	1114.806	199.943
11	14.843	2031.120	16.937	1297.703	1314.640	75.806
12	15.213	2031.120	16.937	1297.703	1314.640	75.884
13	17.700	2031.120	16.937	1297.703	1314.640	76.836
14	20.650	2031.120	16.937	1297.703	1314.640	79.899
15	23.600	2031.120	16.937	1297.703	1314.640	84.979
16	26.550	2031.120	16.937	1297.703	1314.640	92.072
17	29.453	2031.120	16.937	1297.703	1314.640	101.020
18	29.500	2031.120	16.937	1297.703	1314.640	101.173
19	30.000	2031.120	16.937	2014.183	2031.120	0.000

Pérdidas de pretensado totales (%)

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Vano 1 Viga 1

Punto	s (m)	DP1 (%)	DP2 (%)	DP3 (%)
1	-0.500	100.000	0.000	100.000
2	0.000	50.619	5.973	56.592
3	0.089	50.619	5.958	56.577
4	2.490	50.619	5.557	56.175
5	2.950	24.174	10.135	34.309
6	3.089	21.761	10.694	32.455
7	4.490	21.761	10.353	32.114
8	5.089	5.256	13.807	19.063
9	5.900	5.256	13.586	18.843
10	8.850	5.256	12.972	18.229
11	11.800	5.256	12.602	17.858
12	14.750	5.256	12.475	17.732
13	17.700	5.256	12.602	17.858
14	20.650	5.256	12.972	18.229
15	23.600	5.256	13.586	18.843
16	24.411	5.256	13.807	19.063
17	25.010	21.761	10.353	32.114
18	26.411	21.761	10.694	32.455
19	26.550	24.174	10.135	34.309
20	27.010	50.619	5.557	56.175
21	29.411	50.619	5.958	56.577
22	29.500	50.619	5.973	56.592
23	30.000	100.000	0.000	100.000

P0: Fuerza de tesado  
DP1a: Pérdidas de pretensado por penetración de cuñas.  
DP1b: Pérdidas de pretensado por acortamiento elástico.  
DP1: Pérdidas totales instantáneas de pretensado.  
DP2: Pérdidas totales diferidas de pretensado.  
DP3: Pérdidas totales de pretensado.

Vano 1 Viga 2

Punto	s (m)	DP1 (%)	DP2 (%)	DP3 (%)
1	-0.500	100.000	0.000	100.000
2	0.000	64.725	4.981	69.706
3	0.047	64.725	4.974	69.698
4	2.950	64.725	4.533	69.258
5	5.900	64.725	4.184	68.909
6	8.850	64.725	3.934	68.659
7	11.800	64.725	3.783	68.508
8	14.287	64.725	3.736	68.461
9	14.657	64.725	3.732	68.457
10	14.750	54.886	9.844	64.730
11	14.843	64.725	3.732	68.457
12	15.213	64.725	3.736	68.461
13	17.700	64.725	3.783	68.508
14	20.650	64.725	3.934	68.659
15	23.600	64.725	4.184	68.909
16	26.550	64.725	4.533	69.258
17	29.453	64.725	4.974	69.698
18	29.500	64.725	4.981	69.706
19	30.000	100.000	0.000	100.000

P0: Fuerza de tesado  
DP1a: Pérdidas de pretensado por penetración de cuñas.  
DP1b: Pérdidas de pretensado por acortamiento elástico.  
DP1: Pérdidas totales instantáneas de pretensado.  
DP2: Pérdidas totales diferidas de pretensado.  
DP3: Pérdidas totales de pretensado.



LISTADO DE DESPIECES EN LA VIGA

Vano 1 Viga 1

1) Armadura transversal en el alma

A: DATOS

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Xi (m)	0.10	2.51	3.34	5.38	7.42	9.47	11.51
cotg(teta)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
sep. máx.(cm)	45.00	45.00	45.00	45.00	45.00	45.00	60.00
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Xi (m) : distancia de cada punto en estudio al extremo inicial de la viga.  
cotg(teta) : cotangente del ángulo entre las bielas de compresión de hormigón y el eje  
sep. máx. : separación máxima entre estribos, de acuerdo con el art. 44.2.3.4.1 de la  
Diámetro (mm) : Diámetro de los estribos a disponer.

B: RESULTADOS PARA LA VIGA AISLADA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	127.74	106.76	99.46	81.67	63.87	46.08	28.28
Vu1 (T)	707.48	735.23	762.08	789.74	795.65	795.65	795.65
Vu2(sin arm.)	56.05	70.20	83.63	102.29	107.29	107.29	107.29
Vcu (T)	56.05	70.20	83.63	102.29	107.29	107.29	107.29
Vsu (T)	71.69	36.56	15.83	0.00	0.00	0.00	0.00

Vrd (T) : Cortante de cálculo.  
Vu1 (T) : Esfuerzo cortante de agotamiento por compresión oblicua en el alma.  
Vu2 sin armadura (T) : Esfuerzo cortante de agotamiento por tracción en el alma en pie  
Vcu (T) : Contribución del hormigón a la resistencia a esfuerzo cortante.  
Vsu (T) : Contribución de la armadura transversal a la resistencia a esfuerzo cortante

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	4.62	2.00	0.00	0.00	0.00	0.00
Apret(cm2/m)	30.95	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	30.95	4.62	4.14	4.14	4.14	4.14	4.14

Amin (cm2/ml) : Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
Acort(cm2/ml) : Cuantía por cortante.  
Apret(cm2/ml) : Cuantía por la introducción del pretensado.  
Atotal : Cuantía total.

C: RESULTADOS PARA LA VIGA + LOSA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	340.24	299.63	284.88	247.27	209.93	173.11	137.28
Td (T)	63.90	62.53	64.47	67.48	65.74	62.60	59.95
Vu1 (T)	767.67	784.83	799.42	814.14	818.19	818.54	818.78
Tu1 (T)	976.05	976.05	976.05	976.05	976.05	976.05	976.05
Vu2(sin arm.)	50.90	59.76	67.05	78.33	82.53	82.70	82.82
Vcu (T)	50.90	59.76	67.05	75.59	77.62	77.79	77.91

Vsu (T)	289.34	239.87	217.83	171.68	132.31	95.31	59.37
Td-Vrd	0.46	0.41	0.38	0.34	0.30	0.25	0.21

Vrd (T) : Cortante de cálculo.  
Td (T) : Torsor de cálculo.  
Vu1 (T) : Esfuerzo cortante de agotamiento por compresión oblicua en el alma.  
Tu1 (T) : Esfuerzo torsor que pueden resistir las bielas comprimidas de hormigón.  
Vu2 sin armadura (T) : Esfuerzo cortante de agotamiento por tracción en el alma en pie  
Vcu (T) : Contribución del hormigón a la resistencia a esfuerzo cortante.  
Vsu (T) : Contribución de la armadura transversal a la resistencia a esfuerzo cortante  
Td-Vrd: comprobación de la torsión combinada con cortante (art. 45.3.2.2 de la EHE)

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	27.16	24.67	19.51	15.03	10.83	6.75
Ators(cm2/m)	1.84	1.80	1.86	1.94	1.89	1.80	1.73
Apret(cm2/m)	30.95	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	32.79	31.06	26.52	21.45	16.93	12.63	8.47

Amin (cm2/ml) : Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
Acort(cm2/ml) : Cuantía por cortante.  
Ators(cm2/ml) : Cuantía por torsión.  
Apret(cm2/ml) : Cuantía por la introducción del pretensado.  
Atotal : Cuantía total.

Despieces :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L teor. (m)	0.55	4.50	2.04	2.04	2.04	2.04	2.04
L real (m)	0.63	4.50	2.09	2.10	2.16	2.16	1.61
Nº estribos	7	45	19	15	12	9	5
sep. (cm)	9.00	10.00	11.00	14.00	18.00	24.00	37.00

L teor. (m) : Longitud de cada uno de los tramos de definición del despiece.  
L real (m) : Longitud final para la definición del despiece, de acuerdo con la separ  
Nº estribos : Número de estribos dispuestos en cada uno de los tramos de definición d  
sep. (cm) : Separación real entre los estribos dispuestos en cada tramo.

Armadura longitudinal :

Longitud mínima necesaria (desde el borde del neopreno, m) :4,132

2) Armadura de refuerzo de rasante viga-losa

A: DATOS

Armadura de refuerzo :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Nº estribos	3	3	2	2	2	2	2
Arm.saliente	sí	sí	sí	sí	sí	sí	sí

Diámetro (mm) : Diámetro de los estribos de refuerzo a disponer.  
Nº estribos : Número de estribos de refuerzo a disponer.

Ancho de la losa en contacto con la viga (m) :0,807  
Coeficiente  $\beta$  de tipo de superficie (tabla 47.2.2.2 EHE) :0,200  
Coeficiente  $\mu$  de tipo de superficie (tabla 47.2.2.2 EHE) :0,600

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.63	4.50	2.09	2.10	2.16	2.16	1.61
N° estribos	7	45	19	15	12	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura total resultante :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2	31.42	150.80	65.97	53.41	43.98	34.56	21.99
cm2/m	49.87	33.51	31.57	25.43	20.36	16.00	13.66

Tensión rasante de cálculo (tmd, T/m2) :79,875  
Longitud de redistribución plástica (ar, m) :15,250  
Sección de barra necesarias para coser la junta (cm2) :399,256  
Sección de barra dispuestas para coser la junta (cm2) :402,124  
Armadura mínima para considerar la colaboración de armadura (cm2/ml) :8,070

### 3) Armadura de rasante en el ala superior

A: DATOS

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	3	15	7	7	8	8	6

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
N° estribos : Número de estribos a disponer en las alas.

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.63	4.50	2.09	2.10	2.16	2.16	1.61
N° estribos	7	45	19	15	12	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	20.00	30.00	29.00	29.00	26.00	26.00	26.00
cm2 neces.	0.52	3.74	1.74	1.74	1.79	1.79	1.34
cm2 disp.	2.36	11.78	5.50	5.50	6.28	6.28	4.71

Longitud de redistribución plástica (m) :15,250  
Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :0,114  
Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :0,114  
Sección de barra necesarias en la longitud de redistribución plástica (cm2) :0,428  
Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :42,411

### 4) Armadura transversal de rasante en el ala inferior

A: DATOS

Armadura en ala inferior:

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	26	18	7	7	8	8	6

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
N° estribos : Número de estribos a disponer en las alas.

Porcentaje de los cordones ubicados en cada ala (%) :40,000

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.63	4.50	2.09	2.10	2.16	2.16	1.61
N° estribos	7	45	19	15	12	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	2.00	25.00	29.00	29.00	26.00	26.00	26.00
cm2 neces.	20.08	13.50	1.94	2.04	2.05	1.95	1.39
cm2 disp.	40.84	28.27	11.00	11.00	12.57	12.57	9.42

Longitud de redistribución plástica (m) :15,250  
Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :-1,000  
Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (su1, T/m)  
Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :-1,000  
Sección de barra necesarias en la longitud de redistribución plástica (cm2) :29,844  
Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :125,664

### 5) Armadura de refuerzo

- Armadura longitudinal:

A: DATOS

Diámetro (mm) :6,000

B: RESULTADOS PARA LA VIGA AISLADA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	19.94	0.00	0.00	0.00	0.00	0.00	0.00

C: RESULTADOS PARA LA VIGA + LOSA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	40.50	18.87	16.16	0.00	0.00	0.00	0.00

Longitud mínima necesaria (desde el borde del neopreno, m) :4,132  
Longitud horizontal dispuesta de armadura (m) :7,190  
Longitud de anclaje (desde el borde del neopreno, m) :0,152  
Número de barras por extremo :144  
longitud vertical (patillas, m) :0,000

- Armadura vertical:

Cuantía necesaria (cm2): 30,951  
Número de barras de la posición principal: 0  
Diámetro de las barras de la posición principal (mm): 0,000

Número de barras de la posición secundaria: 0  
 Diámetro de las barras de la posición principal (mm): 0,000

Vano 1 Viga 2  
 =====

1) Armadura transversal en el alma  
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A: DATOS

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Xi (m)	0.10	2.47	3.33	5.38	7.43	9.47	11.52
cotg(teta)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
sep. máx.(cm)	45.00	45.00	45.00	45.00	45.00	45.00	60.00
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Xi (m) : distancia de cada punto en estudio al extremo inicial de la viga.  
 cotg(teta): cotangente del ángulo entre las bielas de compresión de hormigón y el eje  
 sep. máx. : separación máxima entre estribos, de acuerdo con el art. 44.2.3.4.1 de la  
 Diámetro (mm): Diámetro de los estribos a disponer.

B: RESULTADOS PARA LA VIGA AISLADA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	127.74	107.09	99.57	81.72	63.87	46.02	28.18
Vu1 (T)	726.35	758.28	764.77	764.77	764.77	764.77	764.77
Vu2(sin arm.)	70.76	91.51	94.76	94.76	94.76	94.76	94.76
Vcu (T)	70.76	86.72	89.97	94.76	94.76	94.76	94.76
Vsu (T)	56.98	20.36	9.60	0.00	0.00	0.00	0.00

Vrd (T): Cortante de cálculo.  
 Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.  
 Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie  
 Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.  
 Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	2.62	1.23	0.00	0.00	0.00	0.00
Apret(cm2/m)	26.05	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	26.05	4.14	4.14	4.14	4.14	4.14	4.14

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
 Acort(cm2/ml): Cuantía por cortante.  
 Apret(cm2/ml): Cuantía por la introducción del pretensado.  
 Atotal : Cuantía total.

C: RESULTADOS PARA LA VIGA + LOSA

Comprobaciones :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Vrd (T)	340.19	300.21	285.06	247.34	209.89	172.98	137.07
Td (T)	64.07	62.66	64.73	67.62	65.89	62.78	60.12
Vu1 (T)	772.17	793.24	797.62	798.12	798.52	798.84	799.05
Tu1 (T)	976.05	976.05	976.05	976.05	976.05	976.05	976.05
Vu2(sin arm.)	58.43	72.91	75.10	75.35	75.55	75.71	75.81
Vcu (T)	58.43	68.96	71.15	71.40	71.60	71.76	71.87
Vsu (T)	281.77	231.25	213.91	175.93	138.29	101.22	65.20
Td-Vrd	0.46	0.40	0.39	0.35	0.30	0.26	0.21

Vrd (T): Cortante de cálculo.  
 Td (T): Torsor de cálculo.  
 Vu1 (T): Esfuerzo cortante de agotamiento por compresión oblicua en el alma.  
 Tu1 (T): Esfuerzo torsor que pueden resistir las bielas comprimidas de hormigón.  
 Vu2 sin armadura (T): Esfuerzo cortante de agotamiento por tracción en el alma en pie  
 Vcu (T): Contribución del hormigón a la resistencia a esfuerzo cortante.  
 Vsu (T): Contribución de la armadura transversal a la resistencia a esfuerzo cortante  
 Td-Vrd: comprobación de la torsión combinada con cortante (art. 45.3.2.2 de la EHE)

Cuantías :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
Amin (cm2/m)	4.14	4.14	4.14	4.14	4.14	4.14	4.14
Acort(cm2/m)	0.00	26.58	24.58	20.22	15.89	11.63	7.49
Ators(cm2/m)	1.85	1.81	1.87	1.95	1.90	1.81	1.73
Apret(cm2/m)	26.05	2.10	0.00	0.00	0.00	0.00	0.00
Atotal	30.48	30.48	26.45	22.17	17.79	13.44	9.23

Amin (cm2/ml): Cuantía mínima de cortante (art. 44.2.3.4.1 de la EHE)  
 Acort(cm2/ml): Cuantía por cortante.  
 Ators(cm2/ml): Cuantía por torsión.  
 Apret(cm2/ml): Cuantía por la introducción del pretensado.  
 Atotal : Cuantía total.

Despieces :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L teor. (m)	0.55	4.47	2.05	2.05	2.05	2.05	2.05
L real (m)	0.60	4.50	2.09	2.10	2.21	2.07	1.68
Nº estribos	6	45	19	15	13	9	5
sep. (cm)	10.00	10.00	11.00	14.00	17.00	23.00	34.00

L teor. (m) : Longitud de cada uno de los tramos de definición del despiece.  
 L real (m) : Longitud final para la definición del despiece, de acuerdo con la separ  
 Nº estribos : Número de estribos dispuestos en cada uno de los tramos de definición d  
 sep. (cm) : Separación real entre los estribos dispuestos en cada tramo.

Armadura longitudinal :

Longitud mínima necesaria (desde el borde del neopreno, m) :1,076

2) Armadura de refuerzo de rasante viga-losa  
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A: DATOS

Armadura de refuerzo :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Nº estribos	2	2	2	2	1	1	1
Arm.saliente	sí	sí	sí	sí	sí	sí	sí

Diámetro (mm): Diámetro de los estribos de refuerzo a disponer.  
 Nº estribos : Número de estribos de refuerzo a disponer.

Ancho de la losa en contacto con la viga (m) :0,807  
 Coeficiente β de tipo de superficie (tabla 47.2.2.2 EHE) :0,200  
 Coeficiente μ de tipo de superficie (tabla 47.2.2.2 EHE) :0,600

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
-------	---------	---------	---------	---------	---------	---------	---------

L real (m)	0.60	4.50	2.09	2.10	2.21	2.07	1.68
N° estribos	6	45	19	15	13	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura total resultante :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2	25.13	147.65	65.97	53.41	43.98	31.42	18.85
cm2/m	41.89	32.81	31.57	25.43	19.90	15.18	11.22

Tensión rasante de cálculo (tmd, T/m2) :76,758  
Longitud de redistribución plástica (ar, m) :15,250  
Sección de barra necesarias para coser la junta (cm2) :383,573  
Sección de barra dispuestas para coser la junta (cm2) :386,416  
Armadura mínima para considerar la colaboración de armadura (cm2/ml) :8,070

### 3) Armadura de rasante en el ala superior

A: DATOS

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	2	15	7	7	8	7	6

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
N° estribos : Número de estribos a disponer en las alas.

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.60	4.50	2.09	2.10	2.21	2.07	1.68
N° estribos	6	45	19	15	13	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala superior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	29.00	30.00	29.00	29.00	27.00	29.00	28.00
cm2 neces.	0.50	3.74	1.74	1.74	1.84	1.72	1.40
cm2 disp.	1.57	11.78	5.50	5.50	6.28	5.50	4.71

Longitud de redistribución plástica (m) :15,250  
Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :0,003  
Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (sul, T/m)  
Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :0,003  
Sección de barra necesarias en la longitud de redistribución plástica (cm2) :0,013  
Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :40,841

### 4) Armadura transversal de rasante en el ala inferior

A: DATOS

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
-------	---------	---------	---------	---------	---------	---------	---------

diámetro (mm)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
N° estribos	21	18	7	7	8	7	6

Diámetro (mm): Diámetro de los estribos a disponer en las alas.  
N° estribos : Número de estribos a disponer en las alas.

Porcentaje de los cordones ubicados en cada ala (%) :40,000

B: RESULTADOS

Armadura transversal en el alma :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
L real (m)	0.60	4.50	2.09	2.10	2.21	2.07	1.68
N° estribos	6	45	19	15	13	9	5

L real (m) : Longitud final para la definición del despiece  
N° estribos : Número de estribos dispuestos en cada uno de los tramos de definición

Armadura en ala inferior :

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
sep. (cm)	2.00	25.00	29.00	29.00	27.00	29.00	28.00
cm2 neces.	16.19	13.51	1.95	2.05	2.10	1.87	1.46
cm2 disp.	32.99	28.27	11.00	11.00	12.57	11.00	9.42

Longitud de redistribución plástica (m) :15,250  
Esfuerzo rasante medio por unidad de longitud (sd, T/ml) :-1,000  
Esfuerzo rasante de agotamiento por compresión oblicua en el plano vertical (sul, T/m)  
Esfuerzo rasante de agotamiento por tracción (su2, T/ml) :-1,000  
Sección de barra necesarias en la longitud de redistribución plástica (cm2) :25,958  
Sección de barra dispuestas en la longitud de redistribución plástica (cm2) :116,239

### 5) Armadura de refuerzo

- Armadura longitudinal:

A: DATOS

Diámetro (mm) :6,000

B: RESULTADOS PARA LA VIGA AISLADA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	21.84	0.00	0.00	0.00	0.00	0.00	0.00

C: RESULTADOS PARA LA VIGA + LOSA

Valor	Tramo 1	Tramo 2	Tramo 3	Tramo 4	Tramo 5	Tramo 6	Tramo 7
cm2 neces.	41.61	0.00	0.00	0.00	0.00	0.00	0.00

Longitud mínima necesaria (desde el borde del neopreno, m) :1,076  
Longitud horizontal dispuesta de armadura (m) :1,576  
Longitud de anclaje (desde el borde del neopreno, m) :0,152  
Número de barras por extremo :148  
longitud vertical (patillas, m) :0,000

- Armadura vertical:

Cuantía necesaria (cm2): 26,054  
Número de barras de la posición principal: 0  
Diámetro de las barras de la posición principal (mm): 0,000  
Número de barras de la posición secundaria: 0  
Diámetro de las barras de la posición principal (mm): 0,000

LISTADO DE REACCIONES

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Vano 1

Las reacciones correspondientes a las acciones han sido obtenidas con coeficientes de seguridad unitarios.

Las reacciones correspondientes a las combinaciones características, frecuentes y casi permanentes han sido obtenidas con los coeficientes de seguridad del estado límite de servicio.

Las reacciones correspondientes a las combinaciones persistentes han sido obtenidas con los coeficientes de seguridad del estado límite último.

Unidades utilizadas : t

Viga 1

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Apoyo inicial :

PP : Peso propio de la viga.  
Rz+ = 46.592 Rz- = 46.592

PL : Peso de la losa.  
Rz+ = 51.964 Rz- = 51.964

SE : Superestructura.  
Rz+ = 22.191 Rz- = 16.763

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 144.109 Rz- = -15.710

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 46.592 Rz- = 46.592

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 98.556 Rz- = 98.556

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 120.746 Rz- = 115.319

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 264.855 Rz- = 99.609

C5 : Combinación característica a tiempo infinito.  
Rz+ = 264.855 Rz- = 99.609

C6 : Combinación característica. Envolvente global.  
Rz+ = 264.855 Rz- = 46.592

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 209.605 Rz- = 106.374

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 209.605 Rz- = 106.374

F6 : Combinación frecuente. Envolvente global.

Rz+ = 209.605 Rz- = 46.592

P4 : Combinación casi permanente tras abrir al tráfico.  
Rz+ = 120.746 Rz- = 115.319

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 120.746 Rz- = 115.319

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 120.746 Rz- = 46.592

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 62.899 Rz- = 46.592

D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 133.050 Rz- = 98.556

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 163.008 Rz- = 115.319

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 357.554 Rz- = 94.110

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 357.554 Rz- = 94.110

D6 : Combinación persistente. Envolvente global.  
Rz+ = 357.554 Rz- = 46.592

Apoyo final :

PP : Peso propio de la viga.  
Rz+ = 46.592 Rz- = 46.592

PL : Peso de la losa.  
Rz+ = 51.964 Rz- = 51.964

SE : Superestructura.  
Rz+ = 22.191 Rz- = 16.763

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 144.109 Rz- = -15.710

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 46.592 Rz- = 46.592

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 98.556 Rz- = 98.556

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 120.746 Rz- = 115.319

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 264.855 Rz- = 99.609

C5 : Combinación característica a tiempo infinito.  
Rz+ = 264.855 Rz- = 99.609

C6 : Combinación característica. Envolvente global.  
Rz+ = 264.855 Rz- = 46.592

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 209.605 Rz- = 106.374

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 209.605 Rz- = 106.374

F6 : Combinación frecuente. Envolvente global.  
Rz+ = 209.605 Rz- = 46.592

P4 : Combinación casi permanente tras abrir al tráfico.  
Rz+ = 120.746 Rz- = 115.319

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 120.746 Rz- = 115.319

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 120.746 Rz- = 46.592

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 62.899 Rz- = 46.592

D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 133.050 Rz- = 98.556

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 163.008 Rz- = 115.319

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 357.554 Rz- = 94.110

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 357.554 Rz- = 94.110

D6 : Combinación persistente. Envolvente global.  
Rz+ = 357.554 Rz- = 46.592

Viga 2

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Apoyo inicial :

PP : Peso propio de la viga.  
Rz+ = 46.592 Rz- = 46.592

PL : Peso de la losa.  
Rz+ = 51.964 Rz- = 51.964

SE : Superestructura.  
Rz+ = 22.177 Rz- = 16.749

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.  
Rz+ = 144.082 Rz- = -15.753

GT : Gradiente térmico.  
Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.  
Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.  
Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.  
Rz+ = 46.592 Rz- = 46.592

C2 : Combinación característica tras hormigonar la losa.  
Rz+ = 98.556 Rz- = 98.556

C3 : Combinación característica tras disponer la superestructura.  
Rz+ = 120.733 Rz- = 115.305

C4 : Combinación característica tras abrir al tráfico.  
Rz+ = 264.815 Rz- = 99.552

C5 : Combinación característica a tiempo infinito.  
Rz+ = 264.815 Rz- = 99.552

C6 : Combinación característica. Envolvente global.  
Rz+ = 264.815 Rz- = 46.592

F4 : Combinación frecuente tras abrir al tráfico.  
Rz+ = 209.577 Rz- = 106.335

F5 : Combinación frecuente a tiempo infinito.  
Rz+ = 209.577 Rz- = 106.335

F6 : Combinación frecuente. Envolvente global.  
Rz+ = 209.577 Rz- = 46.592

P4 : Combinación casi permanente tras abrir al tráfico.  
Rz+ = 120.733 Rz- = 115.305

P5 : Combinación casi permanente a tiempo infinito.  
Rz+ = 120.733 Rz- = 115.305

P6 : Combinación casi permanente. Envolvente global.  
Rz+ = 120.733 Rz- = 46.592

D1 : Combinación persistente tras transferir el pretensado.  
Rz+ = 62.899 Rz- = 46.592

D2 : Combinación persistente tras hormigonar la losa.  
Rz+ = 133.050 Rz- = 98.556

D3 : Combinación persistente tras disponer la superestructura.  
Rz+ = 162.990 Rz- = 115.305

D4 : Combinación persistente tras abrir al tráfico.  
Rz+ = 357.500 Rz- = 94.038

D5 : Combinación persistente a tiempo infinito.  
Rz+ = 357.500 Rz- = 94.038

D6 : Combinación persistente. Envolvente global.  
Rz+ = 357.500 Rz- = 46.592

Apoyo final :

PP : Peso propio de la viga.  
Rz+ = 46.592 Rz- = 46.592

PL : Peso de la losa.  
Rz+ = 51.964 Rz- = 51.964

SE : Superestructura.  
Rz+ = 22.177 Rz- = 16.749

TRA : Tráfico en aceras.  
Rz+ = 0.000 Rz- = 0.000

TRP : Tráfico en plataforma.

Rz+ = 144.082 Rz- = -15.753

GT : Gradiente térmico.

Rz+ = 0.000 Rz- = -0.000

DA : Descenso de apoyo instantáneo.

Rz+ = 0.000 Rz- = 0.000

DP : Incremento de descenso de apoyo.

Rz+ = 0.000 Rz- = 0.000

C1 : Combinación característica tras transferir el pretensado.

Rz+ = 46.592 Rz- = 46.592

C2 : Combinación característica tras hormigonar la losa.

Rz+ = 98.556 Rz- = 98.556

C3 : Combinación característica tras disponer la superestructura.

Rz+ = 120.733 Rz- = 115.305

C4 : Combinación característica tras abrir al tráfico.

Rz+ = 264.815 Rz- = 99.552

C5 : Combinación característica a tiempo infinito.

Rz+ = 264.815 Rz- = 99.552

C6 : Combinación característica. Envolvente global.

Rz+ = 264.815 Rz- = 46.592

F4 : Combinación frecuente tras abrir al tráfico.

Rz+ = 209.577 Rz- = 106.335

F5 : Combinación frecuente a tiempo infinito.

Rz+ = 209.577 Rz- = 106.335

F6 : Combinación frecuente. Envolvente global.

Rz+ = 209.577 Rz- = 46.592

P4 : Combinación casi permanente tras abrir al tráfico.

Rz+ = 120.733 Rz- = 115.305

P5 : Combinación casi permanente a tiempo infinito.

Rz+ = 120.733 Rz- = 115.305

P6 : Combinación casi permanente. Envolvente global.

Rz+ = 120.733 Rz- = 46.592

D1 : Combinación persistente tras transferir el pretensado.

Rz+ = 62.899 Rz- = 46.592

D2 : Combinación persistente tras hormigonar la losa.

Rz+ = 133.050 Rz- = 98.556

D3 : Combinación persistente tras disponer la superestructura.

Rz+ = 162.990 Rz- = 115.305

D4 : Combinación persistente tras abrir al tráfico.

Rz+ = 357.500 Rz- = 94.038

D5 : Combinación persistente a tiempo infinito.

Rz+ = 357.500 Rz- = 94.038

D6 : Combinación persistente. Envolvente global.

Rz+ = 357.500 Rz- = 46.592

CALCULO DE LA LOSA

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Listado de esfuerzos locales. Vano 1

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El presente listado define la envolvente de momentos flectores en la losa, pero no incluye el valor de la envolvente de los esfuerzos de cortante.

El presente cálculo NO incluye los esfuerzos obtenidos por paseo de las cargas puntuales del carro, sobrecarga de tráfico o acción de la superestructura en el voladizo de la losa existente junto a las vigas extremas del tablero.

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas puntuales del carro.

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-
1	22	0.047	-1.337	0.047	-1.337	0.063	-1.805
	23	0.528	-0.123	0.528	-0.123	0.713	-0.166
2	23	0.039	-0.438	0.039	-0.438	0.052	-0.591
	24	0.160	-0.084	0.160	-0.084	0.216	-0.114
3	24	0.055	-0.060	0.055	-0.060	0.075	-0.080
	25	0.042	-0.083	0.042	-0.083	0.057	-0.112
4	25	0.053	-0.066	0.053	-0.066	0.071	-0.089
	26	0.043	-0.081	0.043	-0.081	0.057	-0.110
5	26	0.051	-0.067	0.051	-0.067	0.069	-0.090
	27	0.043	-0.080	0.043	-0.080	0.058	-0.108
6	27	0.049	-0.068	0.049	-0.068	0.067	-0.091
	28	0.044	-0.079	0.044	-0.079	0.059	-0.107
7	28	0.048	-0.069	0.048	-0.069	0.065	-0.093
	29	0.044	-0.078	0.044	-0.078	0.060	-0.105
8	29	0.048	-0.070	0.048	-0.070	0.064	-0.095
	30	0.045	-0.076	0.045	-0.076	0.060	-0.103
9	30	0.047	-0.071	0.047	-0.071	0.063	-0.096
	31	0.045	-0.075	0.045	-0.075	0.061	-0.101
10	31	0.046	-0.073	0.046	-0.073	0.063	-0.098
	32	0.046	-0.074	0.046	-0.074	0.062	-0.100
11	32	0.046	-0.074	0.046	-0.074	0.062	-0.100
	33	0.046	-0.073	0.046	-0.073	0.063	-0.098
12	33	0.045	-0.075	0.045	-0.075	0.061	-0.101
	34	0.047	-0.071	0.047	-0.071	0.063	-0.096
13	34	0.045	-0.076	0.045	-0.076	0.060	-0.103
	35	0.048	-0.070	0.048	-0.070	0.064	-0.095
14	35	0.044	-0.078	0.044	-0.078	0.060	-0.105
	36	0.048	-0.069	0.048	-0.069	0.065	-0.093
15	36	0.044	-0.079	0.044	-0.079	0.059	-0.107
	37	0.049	-0.068	0.049	-0.068	0.067	-0.091
16	37	0.043	-0.080	0.043	-0.080	0.058	-0.108
	38	0.051	-0.067	0.051	-0.067	0.069	-0.090
17	38	0.043	-0.081	0.043	-0.081	0.057	-0.110
	39	0.053	-0.066	0.053	-0.066	0.071	-0.089
18	39	0.042	-0.083	0.042	-0.083	0.057	-0.112
	40	0.055	-0.060	0.055	-0.060	0.075	-0.080
19	40	0.160	-0.084	0.160	-0.084	0.216	-0.114
	41	0.039	-0.438	0.039	-0.438	0.052	-0.591
20	41	0.528	-0.123	0.528	-0.123	0.713	-0.166
	42	0.047	-1.337	0.047	-1.337	0.063	-1.805
21	43	0.021	-0.663	0.021	-0.663	0.028	-0.895
	44	0.255	-2.865	0.255	-2.865	0.345	-3.867
22	44	0.203	-0.947	0.203	-0.947	0.274	-1.279
	45	0.472	-0.171	0.472	-0.171	0.637	-0.231
23	45	0.355	-0.370	0.355	-0.370	0.479	-0.499
	46	0.465	-0.242	0.465	-0.242	0.628	-0.327
24	46	0.363	-0.350	0.363	-0.350	0.490	-0.473
	47	0.458	-0.226	0.458	-0.226	0.618	-0.306
25	47	0.370	-0.330	0.370	-0.330	0.500	-0.446
	48	0.450	-0.212	0.450	-0.212	0.608	-0.286
26	48	0.377	-0.311	0.377	-0.311	0.509	-0.420
	49	0.443	-0.197	0.443	-0.197	0.598	-0.266
27	49	0.385	-0.291	0.385	-0.291	0.519	-0.393
	50	0.436	-0.183	0.436	-0.183	0.588	-0.247

28	50	0.392	-0.272	0.392	-0.272	0.529	-0.367	87	1.110	-0.465	1.110	-0.465	1.499	-0.628	
	51	0.428	-0.179	0.428	-0.179	0.578	-0.242	63	87	0.750	-0.907	0.750	-0.907	1.013	-1.225
29	51	0.399	-0.252	0.399	-0.252	0.539	-0.340		88	1.090	-0.638	1.090	-0.638	1.472	-0.862
	52	0.421	-0.197	0.421	-0.197	0.569	-0.266	64	88	0.774	-0.862	0.774	-0.862	1.045	-1.163
30	52	0.407	-0.232	0.407	-0.232	0.549	-0.314		89	1.068	-0.608	1.068	-0.608	1.441	-0.821
	53	0.414	-0.215	0.414	-0.215	0.559	-0.290	65	89	0.796	-0.816	0.796	-0.816	1.075	-1.102
31	53	0.414	-0.215	0.414	-0.215	0.559	-0.290		90	1.045	-0.574	1.045	-0.574	1.411	-0.775
	54	0.407	-0.232	0.407	-0.232	0.549	-0.314	66	90	0.819	-0.771	0.819	-0.771	1.106	-1.040
32	54	0.421	-0.197	0.421	-0.197	0.569	-0.266		91	1.022	-0.540	1.022	-0.540	1.380	-0.730
	55	0.399	-0.252	0.399	-0.252	0.539	-0.340	67	91	0.842	-0.725	0.842	-0.725	1.136	-0.979
33	55	0.428	-0.179	0.428	-0.179	0.578	-0.242		92	1.000	-0.506	1.000	-0.506	1.350	-0.684
	56	0.392	-0.272	0.392	-0.272	0.529	-0.367	68	92	0.864	-0.680	0.864	-0.680	1.167	-0.917
34	56	0.436	-0.183	0.436	-0.183	0.588	-0.247		93	0.977	-0.472	0.977	-0.472	1.319	-0.638
	57	0.385	-0.291	0.385	-0.291	0.519	-0.393	69	93	0.887	-0.634	0.887	-0.634	1.197	-0.856
35	57	0.443	-0.197	0.443	-0.197	0.598	-0.266		94	0.955	-0.498	0.955	-0.498	1.289	-0.672
	58	0.377	-0.311	0.377	-0.311	0.509	-0.420	70	94	0.909	-0.589	0.909	-0.589	1.228	-0.795
36	58	0.450	-0.212	0.450	-0.212	0.608	-0.286		95	0.932	-0.543	0.932	-0.543	1.258	-0.733
	59	0.370	-0.330	0.370	-0.330	0.500	-0.446	71	95	0.932	-0.543	0.932	-0.543	1.258	-0.733
37	59	0.458	-0.226	0.458	-0.226	0.618	-0.306		96	0.909	-0.589	0.909	-0.589	1.228	-0.795
	60	0.363	-0.350	0.363	-0.350	0.490	-0.473	72	96	0.955	-0.498	0.955	-0.498	1.289	-0.672
38	60	0.465	-0.242	0.465	-0.242	0.628	-0.327		97	0.887	-0.634	0.887	-0.634	1.197	-0.856
	61	0.355	-0.370	0.355	-0.370	0.479	-0.499	73	97	0.977	-0.472	0.977	-0.472	1.319	-0.638
39	61	0.472	-0.171	0.472	-0.171	0.637	-0.231		98	0.864	-0.680	0.864	-0.680	1.167	-0.917
	62	0.203	-0.947	0.203	-0.947	0.274	-1.279	74	98	1.000	-0.506	1.000	-0.506	1.350	-0.684
40	62	0.255	-2.865	0.255	-2.865	0.345	-3.867		99	0.842	-0.725	0.842	-0.725	1.136	-0.979
	63	0.021	-0.663	0.021	-0.663	0.028	-0.895	75	99	1.022	-0.540	1.022	-0.540	1.380	-0.730
41	64	0.313	-0.254	0.313	-0.254	0.423	-0.343		100	0.819	-0.771	0.819	-0.771	1.106	-1.040
	65	0.436	-4.703	0.436	-4.703	0.588	-6.349	76	100	1.045	-0.574	1.045	-0.574	1.411	-0.775
42	65	0.403	-1.147	0.403	-1.147	0.544	-1.548		101	0.796	-0.816	0.796	-0.816	1.075	-1.102
	66	0.932	-0.318	0.932	-0.318	1.259	-0.429	77	101	1.068	-0.608	1.068	-0.608	1.441	-0.821
43	66	0.630	-0.768	0.630	-0.768	0.851	-1.037		102	0.774	-0.862	0.774	-0.862	1.045	-1.163
	67	0.915	-0.529	0.915	-0.529	1.235	-0.715	78	102	1.090	-0.638	1.090	-0.638	1.472	-0.862
44	67	0.650	-0.730	0.650	-0.730	0.877	-0.986		103	0.750	-0.907	0.750	-0.907	1.013	-1.225
	68	0.896	-0.502	0.896	-0.502	1.209	-0.678	79	103	1.110	-0.465	1.110	-0.465	1.499	-0.628
45	68	0.669	-0.692	0.669	-0.692	0.903	-0.935		104	0.478	-1.177	0.478	-1.177	0.645	-1.589
	69	0.876	-0.473	0.876	-0.473	1.183	-0.639	80	104	0.457	-5.137	0.457	-5.137	0.617	-6.936
46	69	0.687	-0.654	0.687	-0.654	0.928	-0.884		105	0.439	-0.085	0.439	-0.085	0.593	-0.114
	70	0.857	-0.444	0.857	-0.444	1.157	-0.600	81	106	0.313	-0.286	0.313	-0.286	0.423	-0.386
47	70	0.706	-0.617	0.706	-0.617	0.954	-0.832		107	0.436	-4.703	0.436	-4.703	0.588	-6.349
	71	0.838	-0.415	0.838	-0.415	1.132	-0.560	82	107	0.403	-1.147	0.403	-1.147	0.544	-1.548
48	71	0.725	-0.579	0.725	-0.579	0.979	-0.781		108	0.932	-0.318	0.932	-0.318	1.259	-0.429
	72	0.819	-0.390	0.819	-0.390	1.106	-0.526	83	108	0.630	-0.768	0.630	-0.768	0.851	-1.037
49	72	0.744	-0.541	0.744	-0.541	1.004	-0.730		109	0.915	-0.529	0.915	-0.529	1.235	-0.715
	73	0.801	-0.428	0.801	-0.428	1.081	-0.577	84	109	0.650	-0.730	0.650	-0.730	0.877	-0.986
50	73	0.763	-0.503	0.763	-0.503	1.030	-0.679		110	0.896	-0.502	0.896	-0.502	1.209	-0.678
	74	0.782	-0.465	0.782	-0.465	1.055	-0.628	85	110	0.669	-0.692	0.669	-0.692	0.903	-0.935
51	74	0.782	-0.465	0.782	-0.465	1.055	-0.628		111	0.876	-0.473	0.876	-0.473	1.183	-0.639
	75	0.763	-0.503	0.763	-0.503	1.030	-0.679	86	111	0.687	-0.654	0.687	-0.654	0.928	-0.884
52	75	0.801	-0.428	0.801	-0.428	1.081	-0.577		112	0.857	-0.444	0.857	-0.444	1.157	-0.600
	76	0.744	-0.541	0.744	-0.541	1.004	-0.730	87	112	0.706	-0.617	0.706	-0.617	0.954	-0.832
53	76	0.820	-0.390	0.820	-0.390	1.106	-0.526		113	0.838	-0.415	0.838	-0.415	1.132	-0.560
	77	0.725	-0.579	0.725	-0.579	0.979	-0.781	88	113	0.725	-0.579	0.725	-0.579	0.979	-0.781
54	77	0.838	-0.415	0.838	-0.415	1.132	-0.560		114	0.820	-0.390	0.820	-0.390	1.106	-0.526
	78	0.706	-0.617	0.706	-0.617	0.954	-0.832	89	114	0.744	-0.541	0.744	-0.541	1.004	-0.730
55	78	0.857	-0.444	0.857	-0.444	1.157	-0.600		115	0.801	-0.428	0.801	-0.428	1.081	-0.577
	79	0.687	-0.654	0.687	-0.654	0.928	-0.884	90	115	0.763	-0.503	0.763	-0.503	1.030	-0.679
56	79	0.876	-0.473	0.876	-0.473	1.183	-0.639		116	0.782	-0.465	0.782	-0.465	1.055	-0.628
	80	0.669	-0.692	0.669	-0.692	0.903	-0.935	91	116	0.782	-0.465	0.782	-0.465	1.055	-0.628
57	80	0.896	-0.502	0.896	-0.502	1.209	-0.678		117	0.763	-0.503	0.763	-0.503	1.030	-0.679
	81	0.650	-0.730	0.650	-0.730	0.877	-0.986	92	117	0.801	-0.428	0.801	-0.428	1.081	-0.577
58	81	0.915	-0.529	0.915	-0.529	1.235	-0.715		118	0.744	-0.541	0.744	-0.541	1.004	-0.730
	82	0.630	-0.768	0.630	-0.768	0.851	-1.037	93	118	0.820	-0.390	0.820	-0.390	1.106	-0.526
59	82	0.932	-0.318	0.932	-0.318	1.259	-0.429		119	0.725	-0.579	0.725	-0.579	0.979	-0.781
	83	0.403	-1.147	0.403	-1.147	0.544	-1.548	94	119	0.838	-0.415	0.838	-0.415	1.132	-0.560
60	83	0.436	-4.703	0.436	-4.703	0.588	-6.349		120	0.706	-0.617	0.706	-0.617	0.954	-0.832
	84	0.313	-0.254	0.313	-0.254	0.423	-0.342	95	120	0.857	-0.444	0.857	-0.444	1.157	-0.600
61	85	0.439	-0.085	0.439	-0.085	0.593	-0.114		121	0.687	-0.654	0.687	-0.654	0.928	-0.884
	86	0.457	-5.137	0.457	-5.137	0.617	-6.936	96	121	0.876	-0.473	0.876	-0.473	1.183	-0.639
62	86	0.478	-1.177	0.478	-1.177	0.645	-1.589		122	0.669	-0.692	0.669	-0.692	0.903	-0.935



97	122	0.896	-0.502	0.896	-0.502	1.209	-0.678		159	0.046	-0.073	0.046	-0.073	0.063	-0.098
	123	0.650	-0.730	0.650	-0.730	0.877	-0.986	132	159	0.045	-0.075	0.045	-0.075	0.061	-0.101
98	123	0.915	-0.529	0.915	-0.529	1.235	-0.715		160	0.047	-0.071	0.047	-0.071	0.063	-0.096
	124	0.630	-0.768	0.630	-0.768	0.851	-1.037	133	160	0.045	-0.076	0.045	-0.076	0.060	-0.103
99	124	0.932	-0.318	0.932	-0.318	1.259	-0.429		161	0.048	-0.070	0.048	-0.070	0.064	-0.095
	125	0.403	-1.147	0.403	-1.147	0.544	-1.548	134	161	0.044	-0.078	0.044	-0.078	0.060	-0.105
100	125	0.436	-4.703	0.436	-4.703	0.588	-6.349		162	0.048	-0.069	0.048	-0.069	0.065	-0.093
	126	0.313	-0.286	0.313	-0.286	0.423	-0.386	135	162	0.044	-0.079	0.044	-0.079	0.059	-0.107
101	127	0.021	-0.663	0.021	-0.663	0.028	-0.895		163	0.049	-0.068	0.049	-0.068	0.067	-0.091
	128	0.255	-2.865	0.255	-2.865	0.345	-3.867	136	163	0.043	-0.080	0.043	-0.080	0.058	-0.108
102	128	0.203	-0.947	0.203	-0.947	0.274	-1.279		164	0.051	-0.067	0.051	-0.067	0.069	-0.090
	129	0.472	-0.171	0.472	-0.171	0.637	-0.231	137	164	0.043	-0.081	0.043	-0.081	0.057	-0.110
103	129	0.355	-0.370	0.355	-0.370	0.479	-0.499		165	0.053	-0.066	0.053	-0.066	0.071	-0.089
	130	0.465	-0.242	0.465	-0.242	0.628	-0.327	138	165	0.042	-0.083	0.042	-0.083	0.057	-0.112
104	130	0.363	-0.350	0.363	-0.350	0.490	-0.473		166	0.055	-0.060	0.055	-0.060	0.075	-0.080
	131	0.458	-0.226	0.458	-0.226	0.618	-0.306	139	166	0.160	-0.084	0.160	-0.084	0.216	-0.114
105	131	0.370	-0.330	0.370	-0.330	0.500	-0.446		167	0.039	-0.438	0.039	-0.438	0.052	-0.591
	132	0.450	-0.212	0.450	-0.212	0.608	-0.286	140	167	0.528	-0.123	0.528	-0.123	0.713	-0.166
106	132	0.377	-0.311	0.377	-0.311	0.509	-0.420		168	0.047	-1.337	0.047	-1.337	0.063	-1.805
	133	0.443	-0.197	0.443	-0.197	0.598	-0.266	141	1	0.208	-21.537	0.208	-21.537	0.281	-29.075
107	133	0.385	-0.291	0.385	-0.291	0.519	-0.393		22	2.437	-9.173	2.437	-9.173	3.290	-12.383
	134	0.436	-0.183	0.436	-0.183	0.588	-0.247	142	2	0.006	-5.059	0.006	-5.059	0.008	-6.829
108	134	0.392	-0.272	0.392	-0.272	0.529	-0.367		23	0.024	-3.570	0.024	-3.570	0.033	-4.820
	135	0.428	-0.179	0.428	-0.179	0.578	-0.242	143	3	0.007	-4.035	0.007	-4.035	0.010	-5.447
109	135	0.399	-0.252	0.399	-0.252	0.539	-0.340		24	0.056	-2.575	0.056	-2.575	0.076	-3.477
	136	0.421	-0.197	0.421	-0.197	0.569	-0.266	144	4	0.008	-4.033	0.008	-4.033	0.011	-5.445
110	136	0.407	-0.232	0.407	-0.232	0.549	-0.314		25	0.057	-2.574	0.057	-2.574	0.076	-3.475
	137	0.414	-0.215	0.414	-0.215	0.559	-0.290	145	5	0.024	-4.033	0.024	-4.033	0.033	-5.445
111	137	0.414	-0.215	0.414	-0.215	0.559	-0.290		26	0.057	-2.574	0.057	-2.574	0.076	-3.475
	138	0.407	-0.232	0.407	-0.232	0.549	-0.314	146	6	0.023	-4.033	0.023	-4.033	0.031	-5.445
112	138	0.421	-0.197	0.421	-0.197	0.569	-0.266		27	0.057	-2.574	0.057	-2.574	0.076	-3.475
	139	0.399	-0.252	0.399	-0.252	0.539	-0.340	147	7	0.022	-4.033	0.022	-4.033	0.030	-5.445
113	139	0.428	-0.179	0.428	-0.179	0.578	-0.242		28	0.057	-2.574	0.057	-2.574	0.076	-3.475
	140	0.392	-0.272	0.392	-0.272	0.529	-0.367	148	8	0.021	-4.033	0.021	-4.033	0.028	-5.445
114	140	0.436	-0.183	0.436	-0.183	0.588	-0.247		29	0.057	-2.574	0.057	-2.574	0.076	-3.475
	141	0.385	-0.291	0.385	-0.291	0.519	-0.393	149	9	0.019	-4.033	0.019	-4.033	0.026	-5.445
115	141	0.443	-0.197	0.443	-0.197	0.598	-0.266		30	0.057	-2.574	0.057	-2.574	0.076	-3.475
	142	0.377	-0.311	0.377	-0.311	0.509	-0.420	150	10	0.018	-4.033	0.018	-4.033	0.025	-5.445
116	142	0.450	-0.212	0.450	-0.212	0.608	-0.286		31	0.057	-2.574	0.057	-2.574	0.076	-3.475
	143	0.370	-0.330	0.370	-0.330	0.500	-0.446	151	11	0.017	-4.033	0.017	-4.033	0.023	-5.445
117	143	0.458	-0.226	0.458	-0.226	0.618	-0.306		32	0.057	-2.574	0.057	-2.574	0.076	-3.475
	144	0.363	-0.350	0.363	-0.350	0.490	-0.473	152	12	0.018	-4.033	0.018	-4.033	0.025	-5.445
118	144	0.465	-0.242	0.465	-0.242	0.628	-0.327		33	0.057	-2.574	0.057	-2.574	0.076	-3.475
	145	0.355	-0.370	0.355	-0.370	0.479	-0.499	153	13	0.019	-4.033	0.019	-4.033	0.026	-5.445
119	145	0.472	-0.171	0.472	-0.171	0.637	-0.231		34	0.057	-2.574	0.057	-2.574	0.076	-3.475
	146	0.203	-0.947	0.203	-0.947	0.274	-1.279	154	14	0.021	-4.033	0.021	-4.033	0.028	-5.445
120	146	0.255	-2.865	0.255	-2.865	0.345	-3.867		35	0.057	-2.574	0.057	-2.574	0.076	-3.475
	147	0.021	-0.663	0.021	-0.663	0.028	-0.895	155	15	0.022	-4.033	0.022	-4.033	0.030	-5.445
121	148	0.047	-1.337	0.047	-1.337	0.063	-1.805		36	0.057	-2.574	0.057	-2.574	0.076	-3.475
	149	0.528	-0.123	0.528	-0.123	0.713	-0.166	156	16	0.023	-4.033	0.023	-4.033	0.031	-5.445
122	149	0.039	-0.438	0.039	-0.438	0.052	-0.591		37	0.057	-2.574	0.057	-2.574	0.076	-3.475
	150	0.160	-0.084	0.160	-0.084	0.216	-0.114	157	17	0.024	-4.033	0.024	-4.033	0.033	-5.445
123	150	0.055	-0.060	0.055	-0.060	0.075	-0.080		38	0.057	-2.574	0.057	-2.574	0.076	-3.475
	151	0.042	-0.083	0.042	-0.083	0.057	-0.112	158	18	0.008	-4.033	0.008	-4.033	0.011	-5.445
124	151	0.053	-0.066	0.053	-0.066	0.071	-0.089		39	0.057	-2.574	0.057	-2.574	0.076	-3.475
	152	0.043	-0.081	0.043	-0.081	0.057	-0.110	159	19	0.007	-4.035	0.007	-4.035	0.010	-5.447
125	152	0.051	-0.067	0.051	-0.067	0.069	-0.090		40	0.056	-2.575	0.056	-2.575	0.076	-3.477
	153	0.043	-0.080	0.043	-0.080	0.058	-0.108	160	20	0.006	-5.059	0.006	-5.059	0.008	-6.829
126	153	0.049	-0.068	0.049	-0.068	0.067	-0.091		41	0.024	-3.570	0.024	-3.570	0.033	-4.820
	154	0.044	-0.079	0.044	-0.079	0.059	-0.107	161	21	0.208	-21.537	0.208	-21.537	0.281	-29.075
127	154	0.048	-0.069	0.048	-0.069	0.065	-0.093		42	2.437	-9.173	2.437	-9.173	3.290	-12.383
	155	0.044	-0.078	0.044	-0.078	0.060	-0.105	162	22	0.153	-13.792	0.153	-13.792	0.207	-18.619
128	155	0.048	-0.070	0.048	-0.070	0.064	-0.095		43	13.118	-0.514	13.118	-0.514	17.709	-0.694
	156	0.045	-0.076	0.045	-0.076	0.060	-0.103	163	23	0.004	-3.256	0.004	-3.256	0.005	-4.395
129	156	0.047	-0.071	0.047	-0.071	0.063	-0.096		44	1.605	-0.815	1.605	-0.815	2.167	-1.100
	157	0.045	-0.075	0.045	-0.075	0.061	-0.101	164	24	0.025	-2.668	0.025	-2.668	0.034	-3.602
130	157	0.046	-0.073	0.046	-0.073	0.063	-0.098		45	1.658	-0.487	1.658	-0.487	2.239	-0.658
	158	0.046	-0.074	0.046	-0.074	0.062	-0.100	165	25	0.025	-2.667	0.025	-2.667	0.034	-3.600
131	158	0.046	-0.074	0.046	-0.074	0.062	-0.100		46	1.658	-0.487	1.658	-0.487	2.239	-0.658

166	26	0.025	-2.667	0.025	-2.667	0.034	-3.600		81	2.995	-0.005	2.995	-0.005	4.044	-0.006
	47	1.658	-0.487	1.658	-0.487	2.239	-0.658	201	61	1.577	-0.593	1.577	-0.593	2.129	-0.800
167	27	0.025	-2.667	0.025	-2.667	0.034	-3.600		82	2.996	-0.005	2.996	-0.005	4.045	-0.007
	48	1.658	-0.487	1.658	-0.487	2.239	-0.658	202	62	1.566	-0.579	1.566	-0.579	2.114	-0.782
168	28	0.025	-2.667	0.025	-2.667	0.034	-3.600		83	3.208	-0.006	3.208	-0.006	4.330	-0.007
	49	1.658	-0.487	1.658	-0.487	2.239	-0.658	203	63	10.110	-4.945	10.110	-4.945	13.649	-6.676
169	29	0.025	-2.667	0.025	-2.667	0.034	-3.600		84	17.072	-0.170	17.072	-0.170	23.048	-0.230
	50	1.658	-0.487	1.658	-0.487	2.239	-0.658	204	64	15.242	-1.684	15.242	-1.684	20.577	-2.274
170	30	0.025	-2.667	0.025	-2.667	0.034	-3.600		85	14.231	-0.395	14.231	-0.395	19.211	-0.533
	51	1.658	-0.487	1.658	-0.487	2.239	-0.658	205	65	3.304	-0.002	3.304	-0.002	4.461	-0.002
171	31	0.025	-2.667	0.025	-2.667	0.034	-3.600		86	3.871	-0.003	3.871	-0.003	5.226	-0.004
	52	1.658	-0.487	1.658	-0.487	2.239	-0.658	206	66	2.928	-0.002	2.928	-0.002	3.953	-0.002
172	32	0.025	-2.667	0.025	-2.667	0.034	-3.600		87	3.065	-0.003	3.065	-0.003	4.138	-0.005
	53	1.658	-0.487	1.658	-0.487	2.239	-0.658	207	67	2.927	-0.002	2.927	-0.002	3.952	-0.003
173	33	0.025	-2.667	0.025	-2.667	0.034	-3.600		88	3.064	-0.004	3.064	-0.004	4.136	-0.005
	54	1.658	-0.487	1.658	-0.487	2.239	-0.658	208	68	2.927	-0.004	2.927	-0.004	3.952	-0.006
174	34	0.025	-2.667	0.025	-2.667	0.034	-3.600		89	3.064	-0.010	3.064	-0.010	4.136	-0.013
	55	1.658	-0.487	1.658	-0.487	2.239	-0.658	209	69	2.927	-0.004	2.927	-0.004	3.952	-0.006
175	35	0.025	-2.667	0.025	-2.667	0.034	-3.600		90	3.064	-0.010	3.064	-0.010	4.136	-0.013
	56	1.658	-0.487	1.658	-0.487	2.239	-0.658	210	70	2.927	-0.004	2.927	-0.004	3.952	-0.005
176	36	0.025	-2.667	0.025	-2.667	0.034	-3.600		91	3.064	-0.009	3.064	-0.009	4.136	-0.012
	57	1.658	-0.487	1.658	-0.487	2.239	-0.658	211	71	2.927	-0.004	2.927	-0.004	3.952	-0.005
177	37	0.025	-2.667	0.025	-2.667	0.034	-3.600		92	3.064	-0.009	3.064	-0.009	4.136	-0.012
	58	1.658	-0.487	1.658	-0.487	2.239	-0.658	212	72	2.927	-0.004	2.927	-0.004	3.952	-0.005
178	38	0.025	-2.667	0.025	-2.667	0.034	-3.600		93	3.064	-0.008	3.064	-0.008	4.136	-0.011
	59	1.658	-0.487	1.658	-0.487	2.239	-0.658	213	73	2.927	-0.003	2.927	-0.003	3.952	-0.005
179	39	0.025	-2.667	0.025	-2.667	0.034	-3.600		94	3.064	-0.008	3.064	-0.008	4.136	-0.010
	60	1.658	-0.487	1.658	-0.487	2.239	-0.658	214	74	2.927	-0.003	2.927	-0.003	3.952	-0.004
180	40	0.025	-2.668	0.025	-2.668	0.034	-3.602		95	3.064	-0.007	3.064	-0.007	4.136	-0.010
	61	1.658	-0.487	1.658	-0.487	2.239	-0.658	215	75	2.927	-0.003	2.927	-0.003	3.952	-0.005
181	41	0.004	-3.256	0.004	-3.256	0.005	-4.395		96	3.064	-0.008	3.064	-0.008	4.136	-0.010
	62	1.605	-0.815	1.605	-0.815	2.167	-1.100	216	76	2.927	-0.004	2.927	-0.004	3.952	-0.005
182	42	0.153	-13.792	0.153	-13.792	0.207	-18.619		97	3.064	-0.008	3.064	-0.008	4.136	-0.011
	63	13.118	-0.514	13.118	-0.514	17.709	-0.694	217	77	2.927	-0.004	2.927	-0.004	3.952	-0.005
183	43	10.110	-4.945	10.110	-4.945	13.649	-6.676		98	3.064	-0.009	3.064	-0.009	4.136	-0.012
	64	17.072	-0.170	17.072	-0.170	23.048	-0.230	218	78	2.927	-0.004	2.927	-0.004	3.952	-0.005
184	44	1.566	-0.579	1.566	-0.579	2.114	-0.782		99	3.064	-0.009	3.064	-0.009	4.136	-0.012
	65	3.208	-0.006	3.208	-0.006	4.330	-0.007	219	79	2.927	-0.004	2.927	-0.004	3.952	-0.006
185	45	1.577	-0.593	1.577	-0.593	2.129	-0.800		100	3.064	-0.010	3.064	-0.010	4.136	-0.013
	66	2.996	-0.005	2.996	-0.005	4.045	-0.007	220	80	2.927	-0.004	2.927	-0.004	3.952	-0.006
186	46	1.577	-0.592	1.577	-0.592	2.130	-0.800		101	3.064	-0.010	3.064	-0.010	4.136	-0.013
	67	2.995	-0.005	2.995	-0.005	4.044	-0.006	221	81	2.927	-0.002	2.927	-0.002	3.952	-0.003
187	47	1.577	-0.592	1.577	-0.592	2.130	-0.800		102	3.064	-0.004	3.064	-0.004	4.136	-0.005
	68	2.995	-0.013	2.995	-0.013	4.044	-0.018	222	82	2.928	-0.002	2.928	-0.002	3.953	-0.002
188	48	1.577	-0.592	1.577	-0.592	2.130	-0.800		103	3.065	-0.003	3.065	-0.003	4.138	-0.005
	69	2.995	-0.013	2.995	-0.013	4.044	-0.017	223	83	3.304	-0.002	3.304	-0.002	4.461	-0.002
189	49	1.577	-0.592	1.577	-0.592	2.130	-0.800		104	3.871	-0.003	3.871	-0.003	5.226	-0.004
	70	2.995	-0.012	2.995	-0.012	4.044	-0.016	224	84	15.242	-1.684	15.242	-1.684	20.577	-2.274
190	50	1.577	-0.592	1.577	-0.592	2.130	-0.800		105	14.230	-0.395	14.230	-0.395	19.211	-0.533
	71	2.995	-0.011	2.995	-0.011	4.044	-0.015	225	85	14.231	-0.395	14.231	-0.395	19.211	-0.533
191	51	1.577	-0.592	1.577	-0.592	2.130	-0.800		106	15.556	-1.683	15.556	-1.683	21.000	-2.271
	72	2.995	-0.011	2.995	-0.011	4.044	-0.014	226	86	3.871	-0.003	3.871	-0.003	5.226	-0.004
192	52	1.577	-0.592	1.577	-0.592	2.130	-0.800		107	3.316	-0.002	3.316	-0.002	4.476	-0.002
	73	2.995	-0.010	2.995	-0.010	4.044	-0.014	227	87	3.065	-0.003	3.065	-0.003	4.138	-0.005
193	53	1.577	-0.592	1.577	-0.592	2.130	-0.800		108	2.928	-0.002	2.928	-0.002	3.953	-0.002
	74	2.995	-0.009	2.995	-0.009	4.044	-0.013	228	88	3.064	-0.004	3.064	-0.004	4.136	-0.005
194	54	1.577	-0.592	1.577	-0.592	2.130	-0.800		109	2.927	-0.002	2.927	-0.002	3.952	-0.003
	75	2.995	-0.010	2.995	-0.010	4.044	-0.014	229	89	3.064	-0.010	3.064	-0.010	4.136	-0.013
195	55	1.577	-0.592	1.577	-0.592	2.130	-0.800		110	2.927	-0.004	2.927	-0.004	3.952	-0.006
	76	2.995	-0.011	2.995	-0.011	4.044	-0.014	230	90	3.064	-0.010	3.064	-0.010	4.136	-0.013
196	56	1.577	-0.592	1.577	-0.592	2.130	-0.800		111	2.927	-0.004	2.927	-0.004	3.952	-0.006
	77	2.995	-0.011	2.995	-0.011	4.044	-0.015	231	91	3.064	-0.009	3.064	-0.009	4.136	-0.012
197	57	1.577	-0.592	1.577	-0.592	2.130	-0.800		112	2.927	-0.004	2.927	-0.004	3.952	-0.005
	78	2.995	-0.012	2.995	-0.012	4.044	-0.016	232	92	3.064	-0.009	3.064	-0.009	4.136	-0.012
198	58	1.577	-0.592	1.577	-0.592	2.130	-0.800		113	2.927	-0.004	2.927	-0.004	3.952	-0.005
	79	2.995	-0.013	2.995	-0.013	4.044	-0.017	233	93	3.064	-0.008	3.064	-0.008	4.136	-0.011
199	59	1.577	-0.592	1.577	-0.592	2.130	-0.800		114	2.927	-0.004	2.927	-0.004	3.952	-0.005
	80	2.995	-0.013	2.995	-0.013	4.044	-0.018	234	94	3.064	-0.008	3.064	-0.008	4.136	-0.010
200	60	1.577	-0.592	1.577	-0.592	2.130	-0.800		115	2.927	-0.003	2.927	-0.003	3.952	-0.005

235	95	3.064	-0.007	3.064	-0.007	4.136	-0.010		150	0.025	-2.668	0.025	-2.668	0.034	-3.602
	116	2.927	-0.003	2.927	-0.003	3.952	-0.004	270	130	1.658	-0.487	1.658	-0.487	2.239	-0.658
236	96	3.064	-0.008	3.064	-0.008	4.136	-0.010		151	0.025	-2.667	0.025	-2.667	0.034	-3.600
	117	2.927	-0.003	2.927	-0.003	3.952	-0.005	271	131	1.658	-0.487	1.658	-0.487	2.239	-0.658
237	97	3.064	-0.008	3.064	-0.008	4.136	-0.011		152	0.025	-2.667	0.025	-2.667	0.034	-3.600
	118	2.927	-0.004	2.927	-0.004	3.952	-0.005	272	132	1.658	-0.487	1.658	-0.487	2.239	-0.658
238	98	3.064	-0.009	3.064	-0.009	4.136	-0.012		153	0.025	-2.667	0.025	-2.667	0.034	-3.600
	119	2.927	-0.004	2.927	-0.004	3.952	-0.005	273	133	1.658	-0.487	1.658	-0.487	2.239	-0.658
239	99	3.064	-0.009	3.064	-0.009	4.136	-0.012		154	0.025	-2.667	0.025	-2.667	0.034	-3.600
	120	2.927	-0.004	2.927	-0.004	3.952	-0.005	274	134	1.658	-0.487	1.658	-0.487	2.239	-0.658
240	100	3.064	-0.010	3.064	-0.010	4.136	-0.013		155	0.025	-2.667	0.025	-2.667	0.034	-3.600
	121	2.927	-0.004	2.927	-0.004	3.952	-0.006	275	135	1.658	-0.487	1.658	-0.487	2.239	-0.658
241	101	3.064	-0.010	3.064	-0.010	4.136	-0.013		156	0.025	-2.667	0.025	-2.667	0.034	-3.600
	122	2.927	-0.004	2.927	-0.004	3.952	-0.006	276	136	1.658	-0.487	1.658	-0.487	2.239	-0.658
242	102	3.064	-0.004	3.064	-0.004	4.136	-0.005		157	0.025	-2.667	0.025	-2.667	0.034	-3.600
	123	2.927	-0.002	2.927	-0.002	3.952	-0.003	277	137	1.658	-0.487	1.658	-0.487	2.239	-0.658
243	103	3.065	-0.003	3.065	-0.003	4.138	-0.005		158	0.025	-2.667	0.025	-2.667	0.034	-3.600
	124	2.928	-0.002	2.928	-0.002	3.953	-0.002	278	138	1.658	-0.487	1.658	-0.487	2.239	-0.658
244	104	3.871	-0.003	3.871	-0.003	5.226	-0.004		159	0.025	-2.667	0.025	-2.667	0.034	-3.600
	125	3.316	-0.002	3.316	-0.002	4.476	-0.002	279	139	1.658	-0.487	1.658	-0.487	2.239	-0.658
245	105	14.231	-0.395	14.231	-0.395	19.211	-0.533		160	0.025	-2.667	0.025	-2.667	0.034	-3.600
	126	15.556	-1.683	15.556	-1.683	21.000	-2.271	280	140	1.658	-0.487	1.658	-0.487	2.239	-0.658
246	106	17.563	-0.170	17.563	-0.170	23.710	-0.230		161	0.025	-2.667	0.025	-2.667	0.034	-3.600
	127	10.110	-4.945	10.110	-4.945	13.649	-6.676	281	141	1.658	-0.487	1.658	-0.487	2.239	-0.658
247	107	3.202	-0.006	3.202	-0.006	4.323	-0.007		162	0.025	-2.667	0.025	-2.667	0.034	-3.600
	128	1.566	-0.579	1.566	-0.579	2.114	-0.782	282	142	1.658	-0.487	1.658	-0.487	2.239	-0.658
248	108	2.996	-0.005	2.996	-0.005	4.045	-0.007		163	0.025	-2.667	0.025	-2.667	0.034	-3.600
	129	1.577	-0.592	1.577	-0.592	2.129	-0.800	283	143	1.658	-0.487	1.658	-0.487	2.239	-0.658
249	109	2.995	-0.005	2.995	-0.005	4.044	-0.006		164	0.025	-2.667	0.025	-2.667	0.034	-3.600
	130	1.577	-0.592	1.577	-0.592	2.130	-0.800	284	144	1.658	-0.487	1.658	-0.487	2.239	-0.658
250	110	2.995	-0.013	2.995	-0.013	4.044	-0.018		165	0.025	-2.667	0.025	-2.667	0.034	-3.600
	131	1.577	-0.592	1.577	-0.592	2.130	-0.800	285	145	1.658	-0.487	1.658	-0.487	2.239	-0.658
251	111	2.995	-0.013	2.995	-0.013	4.044	-0.017		166	0.025	-2.668	0.025	-2.668	0.034	-3.602
	132	1.577	-0.592	1.577	-0.592	2.130	-0.800	286	146	1.605	-0.815	1.605	-0.815	2.167	-1.100
252	112	2.995	-0.012	2.995	-0.012	4.044	-0.016		167	0.004	-3.256	0.004	-3.256	0.005	-4.395
	133	1.577	-0.592	1.577	-0.592	2.130	-0.800	287	147	13.118	-0.514	13.118	-0.514	17.709	-0.694
253	113	2.995	-0.011	2.995	-0.011	4.044	-0.015		168	0.153	-13.792	0.153	-13.792	0.207	-18.619
	134	1.577	-0.592	1.577	-0.592	2.130	-0.800	288	148	2.437	-9.161	2.437	-9.161	3.290	-12.368
254	114	2.995	-0.011	2.995	-0.011	4.044	-0.014		169	0.208	-21.537	0.208	-21.537	0.281	-29.075
	135	1.577	-0.592	1.577	-0.592	2.130	-0.800	289	149	0.024	-3.570	0.024	-3.570	0.033	-4.820
255	115	2.995	-0.010	2.995	-0.010	4.044	-0.014		170	0.006	-5.065	0.006	-5.065	0.008	-6.838
	136	1.577	-0.592	1.577	-0.592	2.130	-0.800	290	150	0.056	-2.575	0.056	-2.575	0.076	-3.477
256	116	2.995	-0.009	2.995	-0.009	4.044	-0.013		171	0.007	-4.035	0.007	-4.035	0.010	-5.447
	137	1.577	-0.592	1.577	-0.592	2.130	-0.800	291	151	0.057	-2.574	0.057	-2.574	0.076	-3.475
257	117	2.995	-0.010	2.995	-0.010	4.044	-0.014		172	0.008	-4.033	0.008	-4.033	0.011	-5.445
	138	1.577	-0.592	1.577	-0.592	2.130	-0.800	292	152	0.057	-2.574	0.057	-2.574	0.076	-3.475
258	118	2.995	-0.011	2.995	-0.011	4.044	-0.014		173	0.024	-4.033	0.024	-4.033	0.033	-5.445
	139	1.577	-0.592	1.577	-0.592	2.130	-0.800	293	153	0.057	-2.574	0.057	-2.574	0.076	-3.475
259	119	2.995	-0.011	2.995	-0.011	4.044	-0.015		174	0.023	-4.033	0.023	-4.033	0.031	-5.445
	140	1.577	-0.592	1.577	-0.592	2.130	-0.800	294	154	0.057	-2.574	0.057	-2.574	0.076	-3.475
260	120	2.995	-0.012	2.995	-0.012	4.044	-0.016		175	0.022	-4.033	0.022	-4.033	0.030	-5.445
	141	1.577	-0.592	1.577	-0.592	2.130	-0.800	295	155	0.057	-2.574	0.057	-2.574	0.076	-3.475
261	121	2.995	-0.013	2.995	-0.013	4.044	-0.017		176	0.021	-4.033	0.021	-4.033	0.028	-5.445
	142	1.577	-0.592	1.577	-0.592	2.130	-0.800	296	156	0.057	-2.574	0.057	-2.574	0.076	-3.475
262	122	2.995	-0.013	2.995	-0.013	4.044	-0.018		177	0.019	-4.033	0.019	-4.033	0.026	-5.445
	143	1.577	-0.592	1.577	-0.592	2.130	-0.800	297	157	0.057	-2.574	0.057	-2.574	0.076	-3.475
263	123	2.995	-0.005	2.995	-0.005	4.044	-0.006		178	0.018	-4.033	0.018	-4.033	0.025	-5.445
	144	1.577	-0.592	1.577	-0.592	2.130	-0.800	298	158	0.057	-2.574	0.057	-2.574	0.076	-3.475
264	124	2.996	-0.005	2.996	-0.005	4.045	-0.007		179	0.017	-4.033	0.017	-4.033	0.023	-5.445
	145	1.577	-0.592	1.577	-0.592	2.129	-0.800	299	159	0.057	-2.574	0.057	-2.574	0.076	-3.475
265	125	3.202	-0.006	3.202	-0.006	4.323	-0.007		180	0.018	-4.033	0.018	-4.033	0.025	-5.445
	146	1.566	-0.579	1.566	-0.579	2.114	-0.782	300	160	0.057	-2.574	0.057	-2.574	0.076	-3.475
266	126	17.563	-0.170	17.563	-0.170	23.710	-0.230		181	0.019	-4.033	0.019	-4.033	0.026	-5.445
	147	10.110	-4.945	10.110	-4.945	13.649	-6.676	301	161	0.057	-2.574	0.057	-2.574	0.076	-3.475
267	127	13.118	-0.514	13.118	-0.514	17.709	-0.694		182	0.021	-4.033	0.021	-4.033	0.028	-5.445
	148	0.153	-13.792	0.153	-13.792	0.207	-18.619	302	162	0.057	-2.574	0.057	-2.574	0.076	-3.475
268	128	1.605	-0.815	1.605	-0.815	2.167	-1.100		183	0.022	-4.033	0.022	-4.033	0.030	-5.445
	149	0.004	-3.256	0.004	-3.256	0.005	-4.395	303	163	0.057	-2.574	0.057	-2.574	0.076	-3.475
269	129	1.658	-0.487	1.658	-0.487	2.239	-0.658		184	0.023	-4.033	0.023	-4.033	0.031	-5.445

304	164	0.057	-2.574	0.057	-2.574	0.076	-3.475
	185	0.024	-4.033	0.024	-4.033	0.033	-5.445
305	165	0.057	-2.574	0.057	-2.574	0.076	-3.475
	186	0.008	-4.033	0.008	-4.033	0.011	-5.445
306	166	0.056	-2.575	0.056	-2.575	0.076	-3.477
	187	0.007	-4.035	0.007	-4.035	0.010	-5.447
307	167	0.024	-3.570	0.024	-3.570	0.033	-4.820
	188	0.006	-5.065	0.006	-5.065	0.008	-6.838
308	168	2.437	-9.161	2.437	-9.161	3.290	-12.368
	189	0.208	-21.537	0.208	-21.537	0.281	-29.075

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas debidas a la superestructura.

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-
1	22	-0.004	-0.006	-0.004	-0.006	-0.004	-0.008
	23	-0.020	-0.029	-0.020	-0.029	-0.020	-0.040
2	23	-0.034	-0.051	-0.034	-0.051	-0.034	-0.069
	24	-0.037	-0.056	-0.037	-0.056	-0.037	-0.075
3	24	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	25	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
4	25	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	26	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
5	26	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	27	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
6	27	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	28	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
7	28	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	29	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
8	29	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	30	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
9	30	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	31	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
10	31	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	32	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
11	32	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	33	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
12	33	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	34	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
13	34	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	35	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
14	35	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	36	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
15	36	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	37	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
16	37	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	38	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
17	38	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	39	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
18	39	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	40	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
19	40	-0.037	-0.056	-0.037	-0.056	-0.037	-0.075
	41	-0.034	-0.051	-0.034	-0.051	-0.034	-0.069
20	41	-0.020	-0.029	-0.020	-0.029	-0.020	-0.040
	42	-0.004	-0.006	-0.004	-0.006	-0.004	-0.008
21	43	0.001	0.000	0.001	0.000	0.001	0.000
	44	-0.030	-0.045	-0.030	-0.045	-0.030	-0.061
22	44	-0.034	-0.051	-0.034	-0.051	-0.034	-0.069
	45	-0.037	-0.055	-0.037	-0.055	-0.037	-0.074
23	45	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	46	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
24	46	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	47	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
25	47	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	48	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
26	48	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	49	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
27	49	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073

	50	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
28	50	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	51	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
29	51	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	52	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
30	52	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	53	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
31	53	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	54	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
32	54	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	55	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
33	55	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	56	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
34	56	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	57	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
35	57	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	58	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
36	58	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	59	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
37	59	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	60	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
38	60	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	61	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
39	61	-0.037	-0.055	-0.037	-0.055	-0.037	-0.074
	62	-0.034	-0.051	-0.034	-0.051	-0.034	-0.069
40	62	-0.030	-0.045	-0.030	-0.045	-0.030	-0.061
	63	0.001	0.000	0.001	0.000	0.001	0.000
41	64	0.003	0.002	0.003	0.002	0.003	0.002
	65	-0.036	-0.053	-0.036	-0.053	-0.036	-0.072
42	65	-0.035	-0.053	-0.035	-0.053	-0.035	-0.072
	66	-0.036	-0.053	-0.036	-0.053	-0.036	-0.072
43	66	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	67	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
44	67	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	68	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
45	68	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	69	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
46	69	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	70	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
47	70	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	71	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
48	71	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	72	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
49	72	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	73	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
50	73	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	74	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
51	74	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	75	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
52	75	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	76	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
53	76	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	77	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
54	77	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	78	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
55	78	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	79	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
56	79	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	80	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
57	80	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	81	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
58	81	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
	82	-0.036	-0.054	-0.036	-0.054	-0.036	-0.073
59	82	-0.036	-0.053	-0.036	-0.053	-0.036	-0.072
	83	-0.035	-0.053	-0.035	-0.053	-0.035	-0.072
60	83	-0.036	-0.053	-0.036	-0.053	-0.036	-0.072
	84	0.003	0.002	0.003	0.002	0.003	0.002
61	85	0.003	0.002	0.003	0.002	0.004	0.002
	86	-0.037	-0.056	-0.037	-0.056	-0.037	-0.075







200	60	0.005	0.003	0.005	0.003	0.006	0.003		115	0.062	0.041	0.062	0.041	0.083	0.041
	81	0.062	0.041	0.062	0.041	0.083	0.041	235	95	0.081	0.054	0.081	0.054	0.109	0.054
201	61	0.005	0.003	0.005	0.003	0.006	0.003		116	0.062	0.041	0.062	0.041	0.083	0.041
	82	0.062	0.041	0.062	0.041	0.083	0.041	236	96	0.081	0.054	0.081	0.054	0.109	0.054
202	62	0.004	0.003	0.004	0.003	0.006	0.003		117	0.062	0.041	0.062	0.041	0.083	0.041
	83	0.058	0.038	0.058	0.038	0.078	0.038	237	97	0.081	0.054	0.081	0.054	0.109	0.054
203	63	0.005	0.003	0.005	0.003	0.007	0.003		118	0.062	0.041	0.062	0.041	0.083	0.041
	84	0.072	0.048	0.072	0.048	0.098	0.048	238	98	0.081	0.054	0.081	0.054	0.109	0.054
204	64	0.065	0.043	0.065	0.043	0.088	0.043		119	0.062	0.041	0.062	0.041	0.083	0.041
	85	0.086	0.058	0.086	0.058	0.117	0.058	239	99	0.081	0.054	0.081	0.054	0.109	0.054
205	65	0.058	0.039	0.058	0.039	0.079	0.039		120	0.062	0.041	0.062	0.041	0.083	0.041
	86	0.076	0.051	0.076	0.051	0.103	0.051	240	100	0.081	0.054	0.081	0.054	0.109	0.054
206	66	0.061	0.041	0.061	0.041	0.083	0.041		121	0.062	0.041	0.062	0.041	0.083	0.041
	87	0.080	0.054	0.080	0.054	0.108	0.054	241	101	0.081	0.054	0.081	0.054	0.109	0.054
207	67	0.062	0.041	0.062	0.041	0.083	0.041		122	0.062	0.041	0.062	0.041	0.083	0.041
	88	0.081	0.054	0.081	0.054	0.109	0.054	242	102	0.081	0.054	0.081	0.054	0.109	0.054
208	68	0.062	0.041	0.062	0.041	0.083	0.041		123	0.062	0.041	0.062	0.041	0.083	0.041
	89	0.081	0.054	0.081	0.054	0.109	0.054	243	103	0.080	0.054	0.080	0.054	0.108	0.054
209	69	0.062	0.041	0.062	0.041	0.083	0.041		124	0.061	0.041	0.061	0.041	0.083	0.041
	90	0.081	0.054	0.081	0.054	0.109	0.054	244	104	0.076	0.051	0.076	0.051	0.103	0.051
210	70	0.062	0.041	0.062	0.041	0.083	0.041		125	0.058	0.039	0.058	0.039	0.079	0.039
	91	0.081	0.054	0.081	0.054	0.109	0.054	245	105	0.086	0.058	0.086	0.058	0.117	0.058
211	71	0.062	0.041	0.062	0.041	0.083	0.041		126	0.065	0.043	0.065	0.043	0.088	0.043
	92	0.081	0.054	0.081	0.054	0.109	0.054	246	106	0.072	0.048	0.072	0.048	0.098	0.048
212	72	0.062	0.041	0.062	0.041	0.083	0.041		127	0.005	0.003	0.005	0.003	0.007	0.003
	93	0.081	0.054	0.081	0.054	0.109	0.054	247	107	0.058	0.038	0.058	0.038	0.078	0.038
213	73	0.062	0.041	0.062	0.041	0.083	0.041		128	0.004	0.003	0.004	0.003	0.006	0.003
	94	0.081	0.054	0.081	0.054	0.109	0.054	248	108	0.062	0.041	0.062	0.041	0.083	0.041
214	74	0.062	0.041	0.062	0.041	0.083	0.041		129	0.005	0.003	0.005	0.003	0.006	0.003
	95	0.081	0.054	0.081	0.054	0.109	0.054	249	109	0.062	0.041	0.062	0.041	0.083	0.041
215	75	0.062	0.041	0.062	0.041	0.083	0.041		130	0.005	0.003	0.005	0.003	0.006	0.003
	96	0.081	0.054	0.081	0.054	0.109	0.054	250	110	0.062	0.041	0.062	0.041	0.083	0.041
216	76	0.062	0.041	0.062	0.041	0.083	0.041		131	0.005	0.003	0.005	0.003	0.006	0.003
	97	0.081	0.054	0.081	0.054	0.109	0.054	251	111	0.062	0.041	0.062	0.041	0.083	0.041
217	77	0.062	0.041	0.062	0.041	0.083	0.041		132	0.005	0.003	0.005	0.003	0.006	0.003
	98	0.081	0.054	0.081	0.054	0.109	0.054	252	112	0.062	0.041	0.062	0.041	0.083	0.041
218	78	0.062	0.041	0.062	0.041	0.083	0.041		133	0.005	0.003	0.005	0.003	0.006	0.003
	99	0.081	0.054	0.081	0.054	0.109	0.054	253	113	0.062	0.041	0.062	0.041	0.083	0.041
219	79	0.062	0.041	0.062	0.041	0.083	0.041		134	0.005	0.003	0.005	0.003	0.006	0.003
	100	0.081	0.054	0.081	0.054	0.109	0.054	254	114	0.062	0.041	0.062	0.041	0.083	0.041
220	80	0.062	0.041	0.062	0.041	0.083	0.041		135	0.005	0.003	0.005	0.003	0.006	0.003
	101	0.081	0.054	0.081	0.054	0.109	0.054	255	115	0.062	0.041	0.062	0.041	0.083	0.041
221	81	0.062	0.041	0.062	0.041	0.083	0.041		136	0.005	0.003	0.005	0.003	0.006	0.003
	102	0.081	0.054	0.081	0.054	0.109	0.054	256	116	0.062	0.041	0.062	0.041	0.083	0.041
222	82	0.061	0.041	0.061	0.041	0.083	0.041		137	0.005	0.003	0.005	0.003	0.006	0.003
	103	0.080	0.054	0.080	0.054	0.108	0.054	257	117	0.062	0.041	0.062	0.041	0.083	0.041
223	83	0.058	0.039	0.058	0.039	0.079	0.039		138	0.005	0.003	0.005	0.003	0.006	0.003
	104	0.076	0.051	0.076	0.051	0.103	0.051	258	118	0.062	0.041	0.062	0.041	0.083	0.041
224	84	0.065	0.043	0.065	0.043	0.088	0.043		139	0.005	0.003	0.005	0.003	0.006	0.003
	105	0.086	0.058	0.086	0.058	0.117	0.058	259	119	0.062	0.041	0.062	0.041	0.083	0.041
225	85	0.086	0.058	0.086	0.058	0.117	0.058		140	0.005	0.003	0.005	0.003	0.006	0.003
	106	0.065	0.043	0.065	0.043	0.088	0.043	260	120	0.062	0.041	0.062	0.041	0.083	0.041
226	86	0.076	0.051	0.076	0.051	0.103	0.051		141	0.005	0.003	0.005	0.003	0.006	0.003
	107	0.058	0.039	0.058	0.039	0.079	0.039	261	121	0.062	0.041	0.062	0.041	0.083	0.041
227	87	0.080	0.054	0.080	0.054	0.108	0.054		142	0.005	0.003	0.005	0.003	0.006	0.003
	108	0.061	0.041	0.061	0.041	0.083	0.041	262	122	0.062	0.041	0.062	0.041	0.083	0.041
228	88	0.081	0.054	0.081	0.054	0.109	0.054		143	0.005	0.003	0.005	0.003	0.006	0.003
	109	0.062	0.041	0.062	0.041	0.083	0.041	263	123	0.062	0.041	0.062	0.041	0.083	0.041
229	89	0.081	0.054	0.081	0.054	0.109	0.054		144	0.005	0.003	0.005	0.003	0.006	0.003
	110	0.062	0.041	0.062	0.041	0.083	0.041	264	124	0.062	0.041	0.062	0.041	0.083	0.041
230	90	0.081	0.054	0.081	0.054	0.109	0.054		145	0.005	0.003	0.005	0.003	0.006	0.003
	111	0.062	0.041	0.062	0.041	0.083	0.041	265	125	0.058	0.038	0.058	0.038	0.078	0.038
231	91	0.081	0.054	0.081	0.054	0.109	0.054		146	0.004	0.003	0.004	0.003	0.006	0.003
	112	0.062	0.041	0.062	0.041	0.083	0.041	266	126	0.072	0.048	0.072	0.048	0.098	0.048
232	92	0.081	0.054	0.081	0.054	0.109	0.054		147	0.005	0.003	0.005	0.003	0.007	0.003
	113	0.062	0.041	0.062	0.041	0.083	0.041	267	127	0.019	0.013	0.019	0.013	0.026	0.013
233	93	0.081	0.054	0.081	0.054	0.109	0.054		148	-0.070	-0.105	-0.070	-0.105	-0.070	-0.142
	114	0.062	0.041	0.062	0.041	0.083	0.041	268	128	0.003	0.002	0.003	0.002	0.004	0.002
234	94	0.081	0.054	0.081	0.054	0.109	0.054		149	-0.056	-0.084	-0.056	-0.084	-0.056	-0.114







96	121	0.046	-0.226	0.046	-0.226	0.062	-0.306		158	0.030	-0.210	0.030	-0.210	0.040	-0.284
	122	0.046	-0.226	0.046	-0.226	0.062	-0.306	131	158	0.030	-0.210	0.030	-0.210	0.040	-0.284
97	122	0.046	-0.226	0.046	-0.226	0.062	-0.306		159	0.030	-0.210	0.030	-0.210	0.040	-0.284
	123	0.046	-0.226	0.046	-0.226	0.062	-0.306	132	159	0.030	-0.210	0.030	-0.210	0.040	-0.284
98	123	0.046	-0.226	0.046	-0.226	0.062	-0.306		160	0.030	-0.210	0.030	-0.210	0.040	-0.284
	124	0.045	-0.225	0.045	-0.225	0.061	-0.303	133	160	0.030	-0.210	0.030	-0.210	0.040	-0.284
99	124	0.044	-0.221	0.044	-0.221	0.060	-0.299		161	0.030	-0.210	0.030	-0.210	0.040	-0.284
	125	0.046	-0.222	0.046	-0.222	0.062	-0.300	134	161	0.030	-0.210	0.030	-0.210	0.040	-0.284
100	125	0.001	-0.178	0.001	-0.178	0.002	-0.241		162	0.030	-0.210	0.030	-0.210	0.040	-0.284
	126	0.029	-0.020	0.029	-0.020	0.038	-0.027	135	162	0.030	-0.210	0.030	-0.210	0.040	-0.284
101	127	0.019	-0.017	0.019	-0.017	0.026	-0.023		163	0.030	-0.210	0.030	-0.210	0.040	-0.284
	128	0.003	-0.153	0.003	-0.153	0.005	-0.207	136	163	0.030	-0.210	0.030	-0.210	0.040	-0.284
102	128	0.041	-0.212	0.041	-0.212	0.055	-0.286		164	0.030	-0.210	0.030	-0.210	0.040	-0.284
	129	0.037	-0.219	0.037	-0.219	0.050	-0.295	137	164	0.030	-0.210	0.030	-0.210	0.040	-0.284
103	129	0.042	-0.222	0.042	-0.222	0.056	-0.300		165	0.030	-0.210	0.030	-0.210	0.040	-0.284
	130	0.043	-0.223	0.043	-0.223	0.058	-0.301	138	165	0.030	-0.210	0.030	-0.210	0.040	-0.284
104	130	0.043	-0.223	0.043	-0.223	0.058	-0.302		166	0.029	-0.210	0.029	-0.210	0.039	-0.283
	131	0.043	-0.223	0.043	-0.223	0.058	-0.302	139	166	0.024	-0.210	0.024	-0.210	0.033	-0.283
105	131	0.043	-0.224	0.043	-0.224	0.058	-0.302		167	0.028	-0.197	0.028	-0.197	0.037	-0.266
	132	0.043	-0.224	0.043	-0.224	0.058	-0.302	140	167	0.020	-0.118	0.020	-0.118	0.028	-0.159
106	132	0.043	-0.224	0.043	-0.224	0.058	-0.302		168	0.020	-0.039	0.020	-0.039	0.027	-0.053
	133	0.043	-0.224	0.043	-0.224	0.058	-0.302	141	1	0.037	-0.684	0.037	-0.684	0.050	-0.924
107	133	0.043	-0.224	0.043	-0.224	0.058	-0.302		22	0.040	-0.346	0.040	-0.346	0.054	-0.467
	134	0.043	-0.224	0.043	-0.224	0.058	-0.302	142	2	0.003	-0.485	0.003	-0.485	0.004	-0.654
108	134	0.043	-0.224	0.043	-0.224	0.058	-0.302		23	0.006	-0.291	0.006	-0.291	0.008	-0.392
	135	0.043	-0.224	0.043	-0.224	0.058	-0.302	143	3	0.003	-0.522	0.003	-0.522	0.004	-0.705
109	135	0.043	-0.224	0.043	-0.224	0.058	-0.302		24	0.009	-0.307	0.009	-0.307	0.012	-0.414
	136	0.043	-0.224	0.043	-0.224	0.058	-0.302	144	4	0.005	-0.525	0.005	-0.525	0.007	-0.709
110	136	0.043	-0.224	0.043	-0.224	0.058	-0.302		25	0.009	-0.309	0.009	-0.309	0.013	-0.417
	137	0.043	-0.224	0.043	-0.224	0.058	-0.302	145	5	0.005	-0.525	0.005	-0.525	0.007	-0.709
111	137	0.043	-0.224	0.043	-0.224	0.058	-0.302		26	0.010	-0.309	0.010	-0.309	0.013	-0.417
	138	0.043	-0.224	0.043	-0.224	0.058	-0.302	146	6	0.005	-0.525	0.005	-0.525	0.007	-0.709
112	138	0.043	-0.224	0.043	-0.224	0.058	-0.302		27	0.010	-0.309	0.010	-0.309	0.013	-0.417
	139	0.043	-0.224	0.043	-0.224	0.058	-0.302	147	7	0.005	-0.525	0.005	-0.525	0.007	-0.709
113	139	0.043	-0.224	0.043	-0.224	0.058	-0.302		28	0.010	-0.309	0.010	-0.309	0.013	-0.417
	140	0.043	-0.224	0.043	-0.224	0.058	-0.302	148	8	0.005	-0.525	0.005	-0.525	0.007	-0.709
114	140	0.043	-0.224	0.043	-0.224	0.058	-0.302		29	0.010	-0.309	0.010	-0.309	0.013	-0.417
	141	0.043	-0.224	0.043	-0.224	0.058	-0.302	149	9	0.005	-0.525	0.005	-0.525	0.007	-0.709
115	141	0.043	-0.224	0.043	-0.224	0.058	-0.302		30	0.010	-0.309	0.010	-0.309	0.013	-0.417
	142	0.043	-0.224	0.043	-0.224	0.058	-0.302	150	10	0.005	-0.525	0.005	-0.525	0.007	-0.709
116	142	0.043	-0.224	0.043	-0.224	0.058	-0.302		31	0.010	-0.309	0.010	-0.309	0.013	-0.417
	143	0.043	-0.224	0.043	-0.224	0.058	-0.302	151	11	0.005	-0.525	0.005	-0.525	0.007	-0.709
117	143	0.043	-0.223	0.043	-0.223	0.058	-0.302		32	0.010	-0.309	0.010	-0.309	0.013	-0.417
	144	0.043	-0.223	0.043	-0.223	0.058	-0.302	152	12	0.005	-0.525	0.005	-0.525	0.007	-0.709
118	144	0.043	-0.223	0.043	-0.223	0.058	-0.301		33	0.010	-0.309	0.010	-0.309	0.013	-0.417
	145	0.042	-0.222	0.042	-0.222	0.056	-0.300	153	13	0.005	-0.525	0.005	-0.525	0.007	-0.709
119	145	0.037	-0.219	0.037	-0.219	0.050	-0.295		34	0.010	-0.309	0.010	-0.309	0.013	-0.417
	146	0.041	-0.212	0.041	-0.212	0.055	-0.286	154	14	0.005	-0.525	0.005	-0.525	0.007	-0.709
120	146	0.003	-0.153	0.003	-0.153	0.005	-0.207		35	0.010	-0.309	0.010	-0.309	0.013	-0.417
	147	0.019	-0.017	0.019	-0.017	0.026	-0.023	155	15	0.005	-0.525	0.005	-0.525	0.007	-0.709
121	148	0.020	-0.039	0.020	-0.039	0.027	-0.053		36	0.010	-0.309	0.010	-0.309	0.013	-0.417
	149	0.020	-0.118	0.020	-0.118	0.028	-0.159	156	16	0.005	-0.525	0.005	-0.525	0.007	-0.709
122	149	0.028	-0.197	0.028	-0.197	0.037	-0.266		37	0.010	-0.309	0.010	-0.309	0.013	-0.417
	150	0.024	-0.210	0.024	-0.210	0.033	-0.283	157	17	0.005	-0.525	0.005	-0.525	0.007	-0.709
123	150	0.029	-0.210	0.029	-0.210	0.039	-0.283		38	0.010	-0.309	0.010	-0.309	0.013	-0.417
	151	0.030	-0.210	0.030	-0.210	0.040	-0.284	158	18	0.005	-0.525	0.005	-0.525	0.007	-0.709
124	151	0.030	-0.210	0.030	-0.210	0.040	-0.284		39	0.009	-0.309	0.009	-0.309	0.013	-0.417
	152	0.030	-0.210	0.030	-0.210	0.040	-0.284	159	19	0.003	-0.522	0.003	-0.522	0.004	-0.705
125	152	0.030	-0.210	0.030	-0.210	0.040	-0.284		40	0.009	-0.307	0.009	-0.307	0.012	-0.414
	153	0.030	-0.210	0.030	-0.210	0.040	-0.284	160	20	0.003	-0.485	0.003	-0.485	0.004	-0.654
126	153	0.030	-0.210	0.030	-0.210	0.040	-0.284		41	0.006	-0.291	0.006	-0.291	0.008	-0.392
	154	0.030	-0.210	0.030	-0.210	0.040	-0.284	161	21	0.037	-0.684	0.037	-0.684	0.050	-0.924
127	154	0.030	-0.210	0.030	-0.210	0.040	-0.284		42	0.040	-0.346	0.040	-0.346	0.054	-0.467
	155	0.030	-0.210	0.030	-0.210	0.040	-0.284	162	22	0.045	-0.394	0.045	-0.394	0.061	-0.532
128	155	0.030	-0.210	0.030	-0.210	0.040	-0.284		43	0.158	-0.094	0.158	-0.094	0.214	-0.126
	156	0.030	-0.210	0.030	-0.210	0.040	-0.284	163	23	0.007	-0.287	0.007	-0.287	0.009	-0.387
129	156	0.030	-0.210	0.030	-0.210	0.040	-0.284		44	0.054	-0.045	0.054	-0.045	0.073	-0.060
	157	0.030	-0.210	0.030	-0.210	0.040	-0.284	164	24	0.009	-0.308	0.009	-0.308	0.012	-0.415
130	157	0.030	-0.210	0.030	-0.210	0.040	-0.284		45	0.066	-0.049	0.066	-0.049	0.089	-0.066



234	94	0.269	-0.002	0.269	-0.002	0.364	-0.003		149	0.007	-0.287	0.007	-0.287	0.009	-0.387
	115	0.206	-0.001	0.206	-0.001	0.278	-0.002	269	129	0.066	-0.049	0.066	-0.049	0.089	-0.066
235	95	0.269	-0.002	0.269	-0.002	0.364	-0.003		150	0.009	-0.308	0.009	-0.308	0.012	-0.415
	116	0.206	-0.001	0.206	-0.001	0.278	-0.002	270	130	0.066	-0.050	0.066	-0.050	0.089	-0.068
236	96	0.269	-0.002	0.269	-0.002	0.364	-0.003		151	0.010	-0.309	0.010	-0.309	0.014	-0.418
	117	0.206	-0.001	0.206	-0.001	0.278	-0.002	271	131	0.066	-0.050	0.066	-0.050	0.089	-0.068
237	97	0.269	-0.002	0.269	-0.002	0.364	-0.003		152	0.010	-0.309	0.010	-0.309	0.014	-0.418
	118	0.206	-0.001	0.206	-0.001	0.278	-0.002	272	132	0.066	-0.050	0.066	-0.050	0.089	-0.068
238	98	0.269	-0.002	0.269	-0.002	0.364	-0.003		153	0.010	-0.309	0.010	-0.309	0.014	-0.418
	119	0.206	-0.001	0.206	-0.001	0.278	-0.002	273	133	0.066	-0.050	0.066	-0.050	0.089	-0.068
239	99	0.269	-0.002	0.269	-0.002	0.364	-0.003		154	0.010	-0.309	0.010	-0.309	0.014	-0.418
	120	0.206	-0.001	0.206	-0.001	0.278	-0.002	274	134	0.066	-0.050	0.066	-0.050	0.089	-0.068
240	100	0.269	-0.002	0.269	-0.002	0.364	-0.003		155	0.010	-0.309	0.010	-0.309	0.014	-0.418
	121	0.206	-0.001	0.206	-0.001	0.278	-0.002	275	135	0.066	-0.050	0.066	-0.050	0.089	-0.068
241	101	0.269	-0.002	0.269	-0.002	0.364	-0.003		156	0.010	-0.309	0.010	-0.309	0.014	-0.418
	122	0.206	-0.001	0.206	-0.001	0.278	-0.002	276	136	0.066	-0.050	0.066	-0.050	0.089	-0.068
242	102	0.269	-0.002	0.269	-0.002	0.364	-0.002		157	0.010	-0.309	0.010	-0.309	0.014	-0.418
	123	0.206	-0.001	0.206	-0.001	0.278	-0.002	277	137	0.066	-0.050	0.066	-0.050	0.089	-0.068
243	103	0.268	-0.001	0.268	-0.001	0.361	-0.001		158	0.010	-0.309	0.010	-0.309	0.014	-0.418
	124	0.205	-0.001	0.205	-0.001	0.276	-0.001	278	138	0.066	-0.050	0.066	-0.050	0.089	-0.068
244	104	0.254	-0.001	0.254	-0.001	0.343	-0.001		159	0.010	-0.309	0.010	-0.309	0.014	-0.418
	125	0.195	-0.001	0.195	-0.001	0.263	-0.001	279	139	0.066	-0.050	0.066	-0.050	0.089	-0.068
245	105	0.293	-0.006	0.293	-0.006	0.396	-0.008		160	0.010	-0.309	0.010	-0.309	0.014	-0.418
	126	0.234	-0.018	0.234	-0.018	0.316	-0.025	280	140	0.066	-0.050	0.066	-0.050	0.089	-0.068
246	106	0.260	-0.019	0.260	-0.019	0.351	-0.026		161	0.010	-0.309	0.010	-0.309	0.014	-0.418
	127	0.126	-0.110	0.126	-0.110	0.171	-0.148	281	141	0.066	-0.050	0.066	-0.050	0.089	-0.068
247	107	0.192	-0.001	0.192	-0.001	0.260	-0.001		162	0.010	-0.309	0.010	-0.309	0.014	-0.418
	128	0.056	-0.041	0.056	-0.041	0.075	-0.055	282	142	0.066	-0.050	0.066	-0.050	0.089	-0.068
248	108	0.206	-0.001	0.206	-0.001	0.278	-0.002		163	0.010	-0.309	0.010	-0.309	0.014	-0.418
	129	0.062	-0.047	0.062	-0.047	0.084	-0.063	283	143	0.066	-0.050	0.066	-0.050	0.089	-0.068
249	109	0.207	-0.002	0.207	-0.002	0.279	-0.003		164	0.010	-0.309	0.010	-0.309	0.014	-0.418
	130	0.063	-0.047	0.063	-0.047	0.085	-0.063	284	144	0.066	-0.050	0.066	-0.050	0.089	-0.068
250	110	0.207	-0.002	0.207	-0.002	0.279	-0.003		165	0.010	-0.309	0.010	-0.309	0.014	-0.418
	131	0.063	-0.047	0.063	-0.047	0.085	-0.063	285	145	0.066	-0.049	0.066	-0.049	0.089	-0.066
251	111	0.207	-0.002	0.207	-0.002	0.279	-0.003		166	0.009	-0.308	0.009	-0.308	0.012	-0.415
	132	0.063	-0.047	0.063	-0.047	0.085	-0.063	286	146	0.054	-0.045	0.054	-0.045	0.073	-0.060
252	112	0.207	-0.002	0.207	-0.002	0.279	-0.003		167	0.007	-0.287	0.007	-0.287	0.009	-0.387
	133	0.063	-0.047	0.063	-0.047	0.085	-0.063	287	147	0.158	-0.094	0.158	-0.094	0.214	-0.126
253	113	0.207	-0.002	0.207	-0.002	0.279	-0.003		168	0.045	-0.394	0.045	-0.394	0.061	-0.532
	134	0.063	-0.047	0.063	-0.047	0.085	-0.063	288	148	0.040	-0.346	0.040	-0.346	0.054	-0.467
254	114	0.207	-0.002	0.207	-0.002	0.279	-0.003		169	0.037	-0.684	0.037	-0.684	0.050	-0.924
	135	0.063	-0.047	0.063	-0.047	0.085	-0.063	289	149	0.006	-0.291	0.006	-0.291	0.008	-0.392
255	115	0.207	-0.002	0.207	-0.002	0.279	-0.003		170	0.003	-0.485	0.003	-0.485	0.004	-0.654
	136	0.063	-0.047	0.063	-0.047	0.085	-0.063	290	150	0.009	-0.307	0.009	-0.307	0.012	-0.414
256	116	0.207	-0.002	0.207	-0.002	0.279	-0.003		171	0.003	-0.522	0.003	-0.522	0.004	-0.705
	137	0.063	-0.047	0.063	-0.047	0.085	-0.063	291	151	0.009	-0.309	0.009	-0.309	0.013	-0.417
257	117	0.207	-0.002	0.207	-0.002	0.279	-0.003		172	0.005	-0.525	0.005	-0.525	0.007	-0.709
	138	0.063	-0.047	0.063	-0.047	0.085	-0.063	292	152	0.010	-0.309	0.010	-0.309	0.013	-0.417
258	118	0.207	-0.002	0.207	-0.002	0.279	-0.003		173	0.005	-0.525	0.005	-0.525	0.007	-0.709
	139	0.063	-0.047	0.063	-0.047	0.085	-0.063	293	153	0.010	-0.309	0.010	-0.309	0.013	-0.417
259	119	0.207	-0.002	0.207	-0.002	0.279	-0.003		174	0.005	-0.525	0.005	-0.525	0.007	-0.709
	140	0.063	-0.047	0.063	-0.047	0.085	-0.063	294	154	0.010	-0.309	0.010	-0.309	0.013	-0.417
260	120	0.207	-0.002	0.207	-0.002	0.279	-0.003		175	0.005	-0.525	0.005	-0.525	0.007	-0.709
	141	0.063	-0.047	0.063	-0.047	0.085	-0.063	295	155	0.010	-0.309	0.010	-0.309	0.013	-0.417
261	121	0.207	-0.002	0.207	-0.002	0.279	-0.003		176	0.005	-0.525	0.005	-0.525	0.007	-0.709
	142	0.063	-0.047	0.063	-0.047	0.085	-0.063	296	156	0.010	-0.309	0.010	-0.309	0.013	-0.417
262	122	0.207	-0.002	0.207	-0.002	0.279	-0.003		177	0.005	-0.525	0.005	-0.525	0.007	-0.709
	143	0.063	-0.047	0.063	-0.047	0.085	-0.063	297	157	0.010	-0.309	0.010	-0.309	0.013	-0.417
263	123	0.207	-0.002	0.207	-0.002	0.279	-0.003		178	0.005	-0.525	0.005	-0.525	0.007	-0.709
	144	0.063	-0.047	0.063	-0.047	0.085	-0.063	298	158	0.010	-0.309	0.010	-0.309	0.013	-0.417
264	124	0.206	-0.001	0.206	-0.001	0.278	-0.002		179	0.005	-0.525	0.005	-0.525	0.007	-0.709
	145	0.062	-0.047	0.062	-0.047	0.084	-0.063	299	159	0.010	-0.309	0.010	-0.309	0.013	-0.417
265	125	0.192	-0.001	0.192	-0.001	0.260	-0.001		180	0.005	-0.525	0.005	-0.525	0.007	-0.709
	146	0.056	-0.041	0.056	-0.041	0.075	-0.055	300	160	0.010	-0.309	0.010	-0.309	0.013	-0.417
266	126	0.260	-0.019	0.260	-0.019	0.351	-0.026		181	0.005	-0.525	0.005	-0.525	0.007	-0.709
	147	0.126	-0.110	0.126	-0.110	0.171	-0.148	301	161	0.010	-0.309	0.010	-0.309	0.013	-0.417
267	127	0.158	-0.094	0.158	-0.094	0.214	-0.126		182	0.005	-0.525	0.005	-0.525	0.007	-0.709
	148	0.045	-0.394	0.045	-0.394	0.061	-0.532	302	162	0.010	-0.309	0.010	-0.309	0.013	-0.417
268	128	0.054	-0.045	0.054	-0.045	0.073	-0.060		183	0.005	-0.525	0.005	-0.525	0.007	-0.709

303	163	0.010	-0.309	0.010	-0.309	0.013	-0.417		49	0.450	-0.475	0.450	-0.475	0.620	-0.641
	184	0.005	-0.525	0.005	-0.525	0.007	-0.709	27	49	0.391	-0.569	0.391	-0.569	0.541	-0.768
304	164	0.010	-0.309	0.010	-0.309	0.013	-0.417		50	0.443	-0.460	0.443	-0.460	0.610	-0.622
	185	0.005	-0.525	0.005	-0.525	0.007	-0.709	28	50	0.399	-0.549	0.399	-0.549	0.551	-0.742
305	165	0.009	-0.309	0.009	-0.309	0.013	-0.417		51	0.435	-0.457	0.435	-0.457	0.600	-0.617
	186	0.005	-0.525	0.005	-0.525	0.007	-0.709	29	51	0.406	-0.530	0.406	-0.530	0.561	-0.715
306	166	0.009	-0.307	0.009	-0.307	0.012	-0.414		52	0.428	-0.475	0.428	-0.475	0.590	-0.641
	187	0.003	-0.522	0.003	-0.522	0.004	-0.705	30	52	0.413	-0.510	0.413	-0.510	0.571	-0.689
307	167	0.006	-0.291	0.006	-0.291	0.008	-0.392		53	0.421	-0.492	0.421	-0.492	0.581	-0.665
	188	0.003	-0.485	0.003	-0.485	0.004	-0.654	31	53	0.421	-0.492	0.421	-0.492	0.581	-0.665
308	168	0.040	-0.346	0.040	-0.346	0.054	-0.467		54	0.413	-0.510	0.413	-0.510	0.571	-0.689
	189	0.037	-0.684	0.037	-0.684	0.050	-0.924	32	54	0.428	-0.475	0.428	-0.475	0.590	-0.641

Los esfuerzos siguientes se refieren al cálculo de una banda de losa entre 2 vigas consecutivas sometida a la acción de las cargas debidas al carro, superestructura y so

Barra	Nodo	Mu+	Mu-	Mk+	Mk-	Md+	Md-								
1	22	0.063	-1.382	0.063	-1.382	0.087	-1.865		55	0.435	-0.457	0.435	-0.457	0.600	-0.617
	23	0.529	-0.270	0.529	-0.270	0.721	-0.365	36	56	0.399	-0.549	0.399	-0.549	0.551	-0.742
2	23	0.032	-0.686	0.032	-0.686	0.055	-0.926		57	0.443	-0.460	0.443	-0.460	0.610	-0.622
	24	0.147	-0.349	0.147	-0.349	0.212	-0.472	37	57	0.391	-0.569	0.391	-0.569	0.541	-0.768
3	24	0.048	-0.324	0.048	-0.324	0.078	-0.437		58	0.450	-0.475	0.450	-0.475	0.620	-0.641
	25	0.036	-0.347	0.036	-0.347	0.061	-0.468	38	58	0.384	-0.589	0.384	-0.589	0.531	-0.795
4	25	0.046	-0.330	0.046	-0.330	0.075	-0.446		59	0.457	-0.490	0.457	-0.490	0.630	-0.661
	26	0.036	-0.346	0.036	-0.346	0.062	-0.467	39	59	0.377	-0.608	0.377	-0.608	0.521	-0.821
5	26	0.045	-0.331	0.045	-0.331	0.073	-0.447		60	0.464	-0.504	0.464	-0.504	0.640	-0.681
	27	0.037	-0.345	0.037	-0.345	0.062	-0.466	40	60	0.370	-0.628	0.370	-0.628	0.512	-0.847
6	27	0.043	-0.332	0.043	-0.332	0.071	-0.449		61	0.471	-0.519	0.471	-0.519	0.649	-0.701
	28	0.037	-0.344	0.037	-0.344	0.063	-0.464	41	61	0.361	-0.646	0.361	-0.646	0.500	-0.872
7	28	0.042	-0.334	0.042	-0.334	0.069	-0.450		62	0.472	-0.445	0.472	-0.445	0.650	-0.600
	29	0.038	-0.342	0.038	-0.342	0.064	-0.462	42	62	0.210	-1.210	0.210	-1.210	0.295	-1.634
8	29	0.041	-0.335	0.041	-0.335	0.068	-0.452		63	0.229	-3.063	0.229	-3.063	0.319	-4.135
	30	0.039	-0.341	0.039	-0.341	0.065	-0.461	43	63	0.041	-0.680	0.041	-0.680	0.055	-0.918
9	30	0.041	-0.336	0.041	-0.336	0.068	-0.454		64	0.344	-0.272	0.344	-0.272	0.465	-0.368
	31	0.039	-0.340	0.039	-0.340	0.065	-0.459	44	64	0.402	-4.935	0.402	-4.935	0.555	-6.662
10	31	0.040	-0.337	0.040	-0.337	0.067	-0.455		65	0.413	-1.422	0.413	-1.422	0.570	-1.920
	32	0.040	-0.339	0.040	-0.339	0.066	-0.457	45	65	0.941	-0.592	0.941	-0.592	1.283	-0.800
11	32	0.040	-0.339	0.040	-0.339	0.066	-0.457		66	0.639	-1.047	0.639	-1.047	0.876	-1.413
	33	0.040	-0.337	0.040	-0.337	0.067	-0.455	46	66	0.924	-0.810	0.924	-0.810	1.260	-1.094
12	33	0.039	-0.340	0.039	-0.340	0.065	-0.459		67	0.659	-1.011	0.659	-1.011	0.903	-1.364
	34	0.041	-0.336	0.041	-0.336	0.068	-0.454	47	67	0.905	-0.783	0.905	-0.783	1.235	-1.057
13	34	0.039	-0.341	0.039	-0.341	0.065	-0.461		68	0.678	-0.973	0.678	-0.973	0.928	-1.313
	35	0.041	-0.335	0.041	-0.335	0.068	-0.452	48	68	0.886	-0.754	0.886	-0.754	1.209	-1.018
14	35	0.038	-0.342	0.038	-0.342	0.064	-0.462		69	0.697	-0.935	0.697	-0.935	0.954	-1.262
	36	0.042	-0.334	0.042	-0.334	0.069	-0.450	49	69	0.867	-0.725	0.867	-0.725	1.183	-0.979
15	36	0.037	-0.344	0.037	-0.344	0.063	-0.464		70	0.716	-0.897	0.716	-0.897	0.979	-1.211
	37	0.043	-0.332	0.043	-0.332	0.071	-0.449	50	70	0.848	-0.696	0.848	-0.696	1.158	-0.939
16	37	0.037	-0.345	0.037	-0.345	0.062	-0.466		71	0.735	-0.860	0.735	-0.860	1.005	-1.160
	38	0.045	-0.331	0.045	-0.331	0.073	-0.447	48	71	0.829	-0.670	0.829	-0.670	1.132	-0.905
17	38	0.036	-0.346	0.036	-0.346	0.062	-0.467		72	0.829	-0.670	0.829	-0.670	1.132	-0.905
	39	0.046	-0.330	0.046	-0.330	0.075	-0.446	49	72	0.754	-0.822	0.754	-0.822	1.030	-1.109
18	39	0.036	-0.347	0.036	-0.347	0.061	-0.468		73	0.810	-0.708	0.810	-0.708	1.107	-0.956
	40	0.048	-0.324	0.048	-0.324	0.078	-0.437	50	73	0.773	-0.784	0.773	-0.784	1.056	-1.058
19	40	0.147	-0.349	0.147	-0.349	0.212	-0.472		74	0.791	-0.746	0.791	-0.746	1.081	-1.007
	41	0.032	-0.686	0.032	-0.686	0.055	-0.926	51	74	0.791	-0.746	0.791	-0.746	1.081	-1.007
20	41	0.529	-0.270	0.529	-0.270	0.721	-0.365		75	0.773	-0.784	0.773	-0.784	1.056	-1.058
	42	0.063	-1.382	0.063	-1.382	0.087	-1.865	52	75	0.810	-0.708	0.810	-0.708	1.107	-0.956
21	43	0.041	-0.680	0.041	-0.680	0.055	-0.918		76	0.754	-0.822	0.754	-0.822	1.030	-1.109
	44	0.229	-3.063	0.229	-3.063	0.319	-4.135	53	76	0.829	-0.670	0.829	-0.670	1.132	-0.905
22	44	0.210	-1.210	0.210	-1.210	0.295	-1.634		77	0.735	-0.860	0.735	-0.860	1.005	-1.160
	45	0.472	-0.445	0.472	-0.445	0.650	-0.600	54	77	0.848	-0.696	0.848	-0.696	1.158	-0.939
23	45	0.361	-0.646	0.361	-0.646	0.500	-0.872		78	0.716	-0.897	0.716	-0.897	0.979	-1.211
	46	0.471	-0.519	0.471	-0.519	0.649	-0.701	55	78	0.867	-0.725	0.867	-0.725	1.183	-0.979
24	46	0.370	-0.628	0.370	-0.628	0.512	-0.847		79	0.697	-0.935	0.697	-0.935	0.954	-1.262
	47	0.464	-0.504	0.464	-0.504	0.640	-0.681	56	79	0.886	-0.754	0.886	-0.754	1.209	-1.018
25	47	0.377	-0.608	0.377	-0.608	0.521	-0.821		80	0.678	-0.973	0.678	-0.973	0.928	-1.313
	48	0.457	-0.490	0.457	-0.490	0.630	-0.661	57	80	0.905	-0.783	0.905	-0.783	1.235	-1.057
26	48	0.384	-0.589	0.384	-0.589	0.531	-0.795		81	0.659	-1.011	0.659	-1.011	0.903	-1.365
								58	81	0.924	-0.810	0.924	-0.810	1.260	-1.094
								59	82	0.639	-1.047	0.639	-1.047	0.876	-1.413
								60	82	0.941	-0.592	0.941	-0.592	1.283	-0.800
									83	0.413	-1.422	0.413	-1.422	0.570	-1.920
									83	0.402	-4.935	0.402	-4.935	0.555	-6.662
									84	0.344	-0.272	0.344	-0.272	0.465	-0.368

61	85	0.474	-0.106	0.474	-0.106	0.639	-0.143	121	0.697	-0.935	0.697	-0.935	0.954	-1.262	
	86	0.421	-5.379	0.421	-5.379	0.581	-7.261	96	121	0.886	-0.754	0.886	-0.754	1.209	-1.018
62	86	0.492	-1.461	0.492	-1.461	0.677	-1.972	122	0.678	-0.973	0.678	-0.973	0.928	-1.313	
	87	1.123	-0.741	1.123	-0.741	1.528	-1.000	97	122	0.905	-0.783	0.905	-0.783	1.235	-1.057
63	87	0.764	-1.189	0.764	-1.189	1.043	-1.606	123	0.659	-1.011	0.659	-1.011	0.903	-1.365	
	88	1.103	-0.923	1.103	-0.923	1.502	-1.246	98	123	0.924	-0.810	0.924	-0.810	1.260	-1.094
64	88	0.787	-1.146	0.787	-1.146	1.075	-1.547	124	0.639	-1.047	0.639	-1.047	0.876	-1.413	
	89	1.081	-0.893	1.081	-0.893	1.472	-1.205	99	124	0.941	-0.592	0.941	-0.592	1.283	-0.800
65	89	0.810	-1.101	0.810	-1.101	1.106	-1.486	125	0.413	-1.422	0.413	-1.422	0.570	-1.920	
	90	1.059	-0.859	1.059	-0.859	1.442	-1.159	100	125	0.402	-4.935	0.402	-4.935	0.555	-6.662
66	90	0.832	-1.055	0.832	-1.055	1.136	-1.424	126	0.344	-0.305	0.344	-0.305	0.465	-0.412	
	91	1.036	-0.825	1.036	-0.825	1.411	-1.114	101	127	0.041	-0.680	0.041	-0.680	0.055	-0.918
67	91	0.855	-1.010	0.855	-1.010	1.167	-1.363	128	0.229	-3.063	0.229	-3.063	0.319	-4.135	
	92	1.013	-0.791	1.013	-0.791	1.381	-1.068	102	128	0.210	-1.210	0.210	-1.210	0.295	-1.634
68	92	0.878	-0.964	0.878	-0.964	1.198	-1.302	129	0.472	-0.445	0.472	-0.445	0.650	-0.600	
	93	0.991	-0.757	0.991	-0.757	1.350	-1.022	103	129	0.361	-0.646	0.361	-0.646	0.500	-0.872
69	93	0.900	-0.919	0.900	-0.919	1.228	-1.240	130	0.471	-0.519	0.471	-0.519	0.649	-0.701	
	94	0.968	-0.782	0.968	-0.782	1.320	-1.056	104	130	0.370	-0.628	0.370	-0.628	0.512	-0.847
70	94	0.923	-0.873	0.923	-0.873	1.259	-1.179	131	0.464	-0.504	0.464	-0.504	0.640	-0.681	
	95	0.945	-0.828	0.945	-0.828	1.289	-1.117	105	131	0.377	-0.608	0.377	-0.608	0.521	-0.821
71	95	0.945	-0.828	0.945	-0.828	1.289	-1.117	132	0.457	-0.490	0.457	-0.490	0.630	-0.661	
	96	0.923	-0.873	0.923	-0.873	1.259	-1.179	106	132	0.384	-0.589	0.384	-0.589	0.531	-0.795
72	96	0.968	-0.782	0.968	-0.782	1.320	-1.056	133	0.450	-0.475	0.450	-0.475	0.620	-0.641	
	97	0.900	-0.919	0.900	-0.919	1.228	-1.240	107	133	0.391	-0.569	0.391	-0.569	0.541	-0.768
73	97	0.991	-0.757	0.991	-0.757	1.350	-1.022	134	0.443	-0.460	0.443	-0.460	0.610	-0.622	
	98	0.878	-0.964	0.878	-0.964	1.198	-1.302	108	134	0.399	-0.549	0.399	-0.549	0.551	-0.742
74	98	1.013	-0.791	1.013	-0.791	1.381	-1.068	135	0.435	-0.457	0.435	-0.457	0.600	-0.617	
	99	0.855	-1.010	0.855	-1.010	1.167	-1.363	109	135	0.406	-0.530	0.406	-0.530	0.561	-0.715
75	99	1.036	-0.825	1.036	-0.825	1.411	-1.114	136	0.428	-0.475	0.428	-0.475	0.590	-0.641	
	100	0.832	-1.055	0.832	-1.055	1.136	-1.424	110	136	0.413	-0.510	0.413	-0.510	0.571	-0.689
76	100	1.059	-0.859	1.059	-0.859	1.442	-1.159	137	0.421	-0.492	0.421	-0.492	0.581	-0.665	
	101	0.810	-1.101	0.810	-1.101	1.106	-1.486	111	137	0.421	-0.492	0.421	-0.492	0.581	-0.665
77	101	1.081	-0.893	1.081	-0.893	1.472	-1.205	138	0.413	-0.510	0.413	-0.510	0.571	-0.689	
	102	0.787	-1.146	0.787	-1.146	1.075	-1.547	112	138	0.428	-0.475	0.428	-0.475	0.590	-0.641
78	102	1.103	-0.923	1.103	-0.923	1.502	-1.246	139	0.406	-0.530	0.406	-0.530	0.561	-0.715	
	103	0.764	-1.189	0.764	-1.189	1.043	-1.606	113	139	0.435	-0.457	0.435	-0.457	0.600	-0.617
79	103	1.123	-0.741	1.123	-0.741	1.528	-1.000	140	0.399	-0.549	0.399	-0.549	0.551	-0.742	
	104	0.492	-1.461	0.492	-1.461	0.677	-1.972	114	140	0.443	-0.460	0.443	-0.460	0.610	-0.622
80	104	0.421	-5.379	0.421	-5.379	0.581	-7.261	141	0.391	-0.569	0.391	-0.569	0.541	-0.768	
	105	0.474	-0.106	0.474	-0.106	0.640	-0.143	115	141	0.450	-0.475	0.450	-0.475	0.620	-0.641
81	106	0.344	-0.305	0.344	-0.305	0.465	-0.412	142	0.384	-0.589	0.384	-0.589	0.531	-0.795	
	107	0.402	-4.935	0.402	-4.935	0.555	-6.662	116	142	0.457	-0.490	0.457	-0.490	0.630	-0.661
82	107	0.413	-1.422	0.413	-1.422	0.570	-1.920	143	0.377	-0.608	0.377	-0.608	0.521	-0.821	
	108	0.941	-0.592	0.941	-0.592	1.283	-0.800	117	143	0.464	-0.504	0.464	-0.504	0.640	-0.681
83	108	0.639	-1.047	0.639	-1.047	0.876	-1.413	144	0.370	-0.628	0.370	-0.628	0.512	-0.847	
	109	0.924	-0.810	0.924	-0.810	1.260	-1.094	118	144	0.471	-0.519	0.471	-0.519	0.649	-0.701
84	109	0.659	-1.011	0.659	-1.011	0.903	-1.364	145	0.361	-0.646	0.361	-0.646	0.500	-0.872	
	110	0.905	-0.783	0.905	-0.783	1.235	-1.057	119	145	0.472	-0.445	0.472	-0.445	0.650	-0.600
85	110	0.678	-0.973	0.678	-0.973	0.928	-1.313	146	0.210	-1.210	0.210	-1.210	0.295	-1.634	
	111	0.886	-0.754	0.886	-0.754	1.209	-1.018	120	146	0.229	-3.063	0.229	-3.063	0.319	-4.135
86	111	0.697	-0.935	0.697	-0.935	0.954	-1.262	147	0.041	-0.680	0.041	-0.680	0.055	-0.918	
	112	0.867	-0.725	0.867	-0.725	1.183	-0.979	121	148	0.063	-1.382	0.063	-1.382	0.087	-1.865
87	112	0.716	-0.897	0.716	-0.897	0.979	-1.211	149	0.529	-0.270	0.529	-0.270	0.721	-0.365	
	113	0.848	-0.696	0.848	-0.696	1.158	-0.939	122	149	0.032	-0.686	0.032	-0.686	0.055	-0.926
88	113	0.735	-0.860	0.735	-0.860	1.005	-1.160	150	0.147	-0.349	0.147	-0.349	0.212	-0.472	
	114	0.829	-0.670	0.829	-0.670	1.132	-0.905	123	150	0.048	-0.324	0.048	-0.324	0.078	-0.437
89	114	0.754	-0.822	0.754	-0.822	1.030	-1.109	151	0.036	-0.347	0.036	-0.347	0.061	-0.468	
	115	0.810	-0.708	0.810	-0.708	1.107	-0.956	124	151	0.046	-0.330	0.046	-0.330	0.075	-0.446
90	115	0.773	-0.784	0.773	-0.784	1.056	-1.058	152	0.036	-0.346	0.036	-0.346	0.062	-0.467	
	116	0.791	-0.746	0.791	-0.746	1.081	-1.007	125	152	0.045	-0.331	0.045	-0.331	0.073	-0.447
91	116	0.791	-0.746	0.791	-0.746	1.081	-1.007	153	0.037	-0.345	0.037	-0.345	0.062	-0.466	
	117	0.773	-0.784	0.773	-0.784	1.056	-1.058	126	153	0.043	-0.332	0.043	-0.332	0.071	-0.449
92	117	0.810	-0.708	0.810	-0.708	1.107	-0.956	154	0.037	-0.344	0.037	-0.344	0.063	-0.464	
	118	0.754	-0.822	0.754	-0.822	1.030	-1.109	127	154	0.042	-0.334	0.042	-0.334	0.069	-0.450
93	118	0.829	-0.670	0.829	-0.670	1.132	-0.905	155	0.038	-0.342	0.038	-0.342	0.064	-0.462	
	119	0.735	-0.860	0.735	-0.860	1.005	-1.160	128	155	0.041	-0.335	0.041	-0.335	0.068	-0.452
94	119	0.848	-0.696	0.848	-0.696	1.158	-0.939	156	0.039	-0.341	0.039	-0.341	0.065	-0.461	
	120	0.716	-0.897	0.716	-0.897	0.979	-1.211	129	156	0.041	-0.336	0.041	-0.336	0.068	-0.454
95	120	0.867	-0.725	0.867	-0.725	1.183	-0.979	157	0.039	-0.340	0.039	-0.340	0.065	-0.459	



130	157	0.040	-0.337	0.040	-0.337	0.067	-0.455		45	1.729	-0.533	1.729	-0.533	2.334	-0.721
	158	0.040	-0.339	0.040	-0.339	0.066	-0.457	165	25	-0.025	-3.066	-0.025	-3.066	-0.012	-4.140
131	158	0.040	-0.339	0.040	-0.339	0.066	-0.457		46	1.729	-0.534	1.729	-0.534	2.334	-0.722
	159	0.040	-0.337	0.040	-0.337	0.067	-0.455	166	26	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
132	159	0.039	-0.340	0.039	-0.340	0.065	-0.459		47	1.729	-0.534	1.729	-0.534	2.334	-0.723
	160	0.041	-0.336	0.041	-0.336	0.068	-0.454	167	27	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
133	160	0.039	-0.341	0.039	-0.341	0.065	-0.461		48	1.729	-0.534	1.729	-0.534	2.334	-0.723
	161	0.041	-0.335	0.041	-0.335	0.068	-0.452	168	28	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
134	161	0.038	-0.342	0.038	-0.342	0.064	-0.462		49	1.729	-0.534	1.729	-0.534	2.334	-0.723
	162	0.042	-0.334	0.042	-0.334	0.069	-0.450	169	29	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
135	162	0.037	-0.344	0.037	-0.344	0.063	-0.464		50	1.729	-0.534	1.729	-0.534	2.334	-0.723
	163	0.043	-0.332	0.043	-0.332	0.071	-0.449	170	30	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
136	163	0.037	-0.345	0.037	-0.345	0.062	-0.466		51	1.729	-0.534	1.729	-0.534	2.334	-0.723
	164	0.045	-0.331	0.045	-0.331	0.073	-0.447	171	31	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
137	164	0.036	-0.346	0.036	-0.346	0.062	-0.467		52	1.729	-0.534	1.729	-0.534	2.334	-0.723
	165	0.046	-0.330	0.046	-0.330	0.075	-0.446	172	32	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
138	165	0.036	-0.347	0.036	-0.347	0.061	-0.468		53	1.729	-0.534	1.729	-0.534	2.334	-0.723
	166	0.048	-0.324	0.048	-0.324	0.078	-0.437	173	33	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
139	166	0.147	-0.349	0.147	-0.349	0.212	-0.472		54	1.729	-0.534	1.729	-0.534	2.334	-0.723
	167	0.032	-0.686	0.032	-0.686	0.055	-0.926	174	34	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
140	167	0.529	-0.270	0.529	-0.270	0.721	-0.365		55	1.729	-0.534	1.729	-0.534	2.334	-0.723
	168	0.063	-1.382	0.063	-1.382	0.087	-1.865	175	35	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
141	1	0.115	-22.417	0.115	-22.417	0.201	-30.262		56	1.729	-0.534	1.729	-0.534	2.334	-0.723
	22	2.415	-9.611	2.415	-9.611	3.282	-12.975	176	36	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
142	2	-0.088	-5.688	-0.088	-5.688	-0.085	-7.679		57	1.729	-0.534	1.729	-0.534	2.334	-0.723
	23	-0.027	-3.947	-0.027	-3.947	-0.016	-5.328	177	37	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
143	3	-0.094	-4.713	-0.094	-4.713	-0.090	-6.363		58	1.729	-0.534	1.729	-0.534	2.334	-0.723
	24	0.005	-2.972	0.005	-2.972	0.028	-4.012	178	38	-0.024	-3.066	-0.024	-3.066	-0.012	-4.140
144	4	-0.091	-4.714	-0.091	-4.714	-0.086	-6.365		59	1.729	-0.534	1.729	-0.534	2.334	-0.723
	25	0.006	-2.973	0.006	-2.973	0.029	-4.013	179	39	-0.025	-3.066	-0.025	-3.066	-0.012	-4.140
145	5	-0.075	-4.714	-0.075	-4.714	-0.064	-6.365		60	1.729	-0.534	1.729	-0.534	2.334	-0.722
	26	0.006	-2.973	0.006	-2.973	0.029	-4.013	180	40	-0.026	-3.066	-0.026	-3.066	-0.014	-4.139
146	6	-0.076	-4.714	-0.076	-4.714	-0.066	-6.365		61	1.729	-0.533	1.729	-0.533	2.334	-0.721
	27	0.006	-2.973	0.006	-2.973	0.029	-4.013	181	41	-0.045	-3.627	-0.045	-3.627	-0.041	-4.896
147	7	-0.077	-4.714	-0.077	-4.714	-0.067	-6.365		62	1.662	-0.858	1.662	-0.858	2.244	-1.158
	28	0.006	-2.973	0.006	-2.973	0.029	-4.013	182	42	0.129	-14.291	0.129	-14.291	0.198	-19.293
148	8	-0.078	-4.714	-0.078	-4.714	-0.069	-6.365		63	13.295	-0.594	13.295	-0.594	17.949	-0.807
	29	0.006	-2.973	0.006	-2.973	0.029	-4.013	183	43	10.242	-5.051	10.242	-5.051	13.826	-6.821
149	9	-0.079	-4.714	-0.079	-4.714	-0.071	-6.365		64	17.405	-0.141	17.405	-0.141	23.497	-0.207
	30	0.006	-2.973	0.006	-2.973	0.029	-4.013	184	44	1.626	-0.617	1.626	-0.617	2.195	-0.834
150	10	-0.081	-4.714	-0.081	-4.714	-0.072	-6.365		65	3.458	0.032	3.458	0.032	4.668	0.029
	31	0.006	-2.973	0.006	-2.973	0.029	-4.013	185	45	1.644	-0.636	1.644	-0.636	2.220	-0.860
151	11	-0.082	-4.714	-0.082	-4.714	-0.074	-6.365		66	3.263	0.034	3.263	0.034	4.405	0.032
	32	0.006	-2.973	0.006	-2.973	0.029	-4.013	186	46	1.645	-0.636	1.645	-0.636	2.221	-0.860
152	12	-0.081	-4.714	-0.081	-4.714	-0.072	-6.365		67	3.264	0.034	3.264	0.034	4.406	0.032
	33	0.006	-2.973	0.006	-2.973	0.029	-4.013	187	47	1.645	-0.636	1.645	-0.636	2.221	-0.860
153	13	-0.079	-4.714	-0.079	-4.714	-0.071	-6.365		68	3.264	0.026	3.264	0.026	4.406	0.020
	34	0.006	-2.973	0.006	-2.973	0.029	-4.013	188	48	1.645	-0.636	1.645	-0.636	2.221	-0.860
154	14	-0.078	-4.714	-0.078	-4.714	-0.069	-6.365		69	3.264	0.026	3.264	0.026	4.406	0.021
	35	0.006	-2.973	0.006	-2.973	0.029	-4.013	189	49	1.645	-0.636	1.645	-0.636	2.221	-0.860
155	15	-0.077	-4.714	-0.077	-4.714	-0.067	-6.365		70	3.264	0.027	3.264	0.027	4.406	0.022
	36	0.006	-2.973	0.006	-2.973	0.029	-4.013	190	50	1.645	-0.636	1.645	-0.636	2.221	-0.860
156	16	-0.076	-4.714	-0.076	-4.714	-0.066	-6.365		71	3.264	0.027	3.264	0.027	4.406	0.023
	37	0.006	-2.973	0.006	-2.973	0.029	-4.013	191	51	1.645	-0.636	1.645	-0.636	2.221	-0.860
157	17	-0.075	-4.714	-0.075	-4.714	-0.064	-6.365		72	3.264	0.028	3.264	0.028	4.406	0.024
	38	0.006	-2.973	0.006	-2.973	0.029	-4.013	192	52	1.645	-0.636	1.645	-0.636	2.221	-0.860
158	18	-0.091	-4.714	-0.091	-4.714	-0.086	-6.364		73	3.264	0.029	3.264	0.029	4.406	0.025
	39	0.006	-2.973	0.006	-2.973	0.029	-4.013	193	53	1.645	-0.636	1.645	-0.636	2.221	-0.860
159	19	-0.094	-4.713	-0.094	-4.713	-0.090	-6.363		74	3.264	0.030	3.264	0.030	4.406	0.026
	40	0.005	-2.972	0.005	-2.972	0.028	-4.012	194	54	1.645	-0.636	1.645	-0.636	2.221	-0.860
160	20	-0.088	-5.688	-0.088	-5.688	-0.085	-7.679		75	3.264	0.029	3.264	0.029	4.406	0.025
	41	-0.027	-3.947	-0.027	-3.947	-0.016	-5.328	195	55	1.645	-0.636	1.645	-0.636	2.221	-0.860
161	21	0.115	-22.416	0.115	-22.416	0.201	-30.262		76	3.264	0.028	3.264	0.028	4.406	0.024
	42	2.415	-9.611	2.415	-9.611	3.282	-12.975	196	56	1.645	-0.636	1.645	-0.636	2.221	-0.860
162	22	0.129	-14.291	0.129	-14.291	0.198	-19.293		77	3.264	0.027	3.264	0.027	4.406	0.023
	43	13.295	-0.594	13.295	-0.594	17.949	-0.807	197	57	1.645	-0.636	1.645	-0.636	2.221	-0.860
163	23	-0.045	-3.627	-0.045	-3.627	-0.041	-4.896		78	3.264	0.027	3.264	0.027	4.406	0.022
	44	1.662	-0.858	1.662	-0.858	2.244	-1.158	198	58	1.645	-0.636	1.645	-0.636	2.221	-0.860
164	24	-0.026	-3.066	-0.026	-3.066	-0.014	-4.139		79	3.264	0.026	3.264	0.026	4.406	0.021

199	59	1.645	-0.636	1.645	-0.636	2.221	-0.860		114	3.195	0.036	3.195	0.036	4.313	0.035
	80	3.264	0.026	3.264	0.026	4.406	0.020	234	94	3.414	0.044	3.414	0.044	4.609	0.041
200	60	1.645	-0.636	1.645	-0.636	2.221	-0.860		115	3.195	0.036	3.195	0.036	4.313	0.035
	81	3.264	0.034	3.264	0.034	4.406	0.032	235	95	3.414	0.045	3.414	0.045	4.609	0.041
201	61	1.644	-0.636	1.644	-0.636	2.220	-0.860		116	3.195	0.037	3.195	0.037	4.313	0.035
	82	3.263	0.034	3.263	0.034	4.405	0.032	236	96	3.414	0.044	3.414	0.044	4.609	0.041
202	62	1.626	-0.617	1.626	-0.617	2.195	-0.834		117	3.195	0.036	3.195	0.036	4.313	0.035
	83	3.458	0.032	3.458	0.032	4.668	0.029	237	97	3.414	0.044	3.414	0.044	4.609	0.040
203	63	10.242	-5.051	10.242	-5.051	13.826	-6.821		118	3.195	0.036	3.195	0.036	4.313	0.035
	84	17.405	-0.141	17.405	-0.141	23.497	-0.207	238	98	3.414	0.043	3.414	0.043	4.609	0.040
204	64	15.541	-1.659	15.541	-1.659	20.981	-2.255		119	3.195	0.036	3.195	0.036	4.313	0.034
	85	14.610	-0.343	14.610	-0.343	19.724	-0.483	239	99	3.414	0.043	3.414	0.043	4.609	0.039
205	65	3.558	0.037	3.558	0.037	4.803	0.036		120	3.195	0.036	3.195	0.036	4.313	0.034
	86	4.201	0.047	4.201	0.047	5.672	0.046	240	100	3.414	0.042	3.414	0.042	4.609	0.038
206	66	3.194	0.039	3.194	0.039	4.312	0.038		121	3.195	0.036	3.195	0.036	4.313	0.034
	87	3.413	0.049	3.413	0.049	4.608	0.047	241	101	3.414	0.042	3.414	0.042	4.609	0.038
207	67	3.195	0.038	3.195	0.038	4.313	0.037		122	3.195	0.036	3.195	0.036	4.313	0.034
	88	3.414	0.048	3.414	0.048	4.609	0.046	242	102	3.414	0.048	3.414	0.048	4.609	0.046
208	68	3.195	0.036	3.195	0.036	4.313	0.034		123	3.195	0.038	3.195	0.038	4.313	0.037
	89	3.414	0.042	3.414	0.042	4.609	0.038	243	103	3.413	0.049	3.413	0.049	4.608	0.047
209	69	3.195	0.036	3.195	0.036	4.313	0.034		124	3.194	0.039	3.194	0.039	4.312	0.038
	90	3.414	0.042	3.414	0.042	4.609	0.038	244	104	4.201	0.047	4.201	0.047	5.672	0.046
210	70	3.195	0.036	3.195	0.036	4.313	0.034		125	3.569	0.037	3.569	0.037	4.818	0.036
	91	3.414	0.043	3.414	0.043	4.609	0.039	245	105	14.610	-0.343	14.610	-0.343	19.724	-0.483
211	71	3.195	0.036	3.195	0.036	4.313	0.034		126	15.854	-1.658	15.854	-1.658	21.404	-2.253
	92	3.414	0.043	3.414	0.043	4.609	0.040	246	106	17.895	-0.141	17.895	-0.141	24.159	-0.207
212	72	3.195	0.036	3.195	0.036	4.313	0.035		127	10.242	-5.051	10.242	-5.051	13.826	-6.821
	93	3.414	0.044	3.414	0.044	4.609	0.040	247	107	3.452	0.032	3.452	0.032	4.660	0.029
213	73	3.195	0.036	3.195	0.036	4.313	0.035		128	1.626	-0.617	1.626	-0.617	2.195	-0.834
	94	3.414	0.044	3.414	0.044	4.609	0.041	248	108	3.263	0.034	3.263	0.034	4.405	0.032
214	74	3.195	0.037	3.195	0.037	4.313	0.035		129	1.644	-0.636	1.644	-0.636	2.220	-0.860
	95	3.414	0.045	3.414	0.045	4.609	0.041	249	109	3.264	0.034	3.264	0.034	4.406	0.032
215	75	3.195	0.036	3.195	0.036	4.313	0.035		130	1.645	-0.636	1.645	-0.636	2.221	-0.860
	96	3.414	0.044	3.414	0.044	4.609	0.041	250	110	3.264	0.026	3.264	0.026	4.406	0.020
216	76	3.195	0.036	3.195	0.036	4.313	0.035		131	1.645	-0.636	1.645	-0.636	2.221	-0.860
	97	3.414	0.044	3.414	0.044	4.609	0.040	251	111	3.264	0.026	3.264	0.026	4.406	0.021
217	77	3.195	0.036	3.195	0.036	4.313	0.034		132	1.645	-0.636	1.645	-0.636	2.221	-0.860
	98	3.414	0.043	3.414	0.043	4.609	0.040	252	112	3.264	0.027	3.264	0.027	4.406	0.022
218	78	3.195	0.036	3.195	0.036	4.313	0.034		133	1.645	-0.636	1.645	-0.636	2.221	-0.860
	99	3.414	0.043	3.414	0.043	4.609	0.039	253	113	3.264	0.027	3.264	0.027	4.406	0.023
219	79	3.195	0.036	3.195	0.036	4.313	0.034		134	1.645	-0.636	1.645	-0.636	2.221	-0.860
	100	3.414	0.042	3.414	0.042	4.609	0.038	254	114	3.264	0.028	3.264	0.028	4.406	0.024
220	80	3.195	0.036	3.195	0.036	4.313	0.034		135	1.645	-0.636	1.645	-0.636	2.221	-0.860
	101	3.414	0.042	3.414	0.042	4.609	0.038	255	115	3.264	0.029	3.264	0.029	4.406	0.025
221	81	3.195	0.038	3.195	0.038	4.313	0.037		136	1.645	-0.636	1.645	-0.636	2.221	-0.860
	102	3.414	0.048	3.414	0.048	4.609	0.046	256	116	3.264	0.030	3.264	0.030	4.406	0.026
222	82	3.194	0.039	3.194	0.039	4.312	0.038		137	1.645	-0.636	1.645	-0.636	2.221	-0.860
	103	3.413	0.049	3.413	0.049	4.608	0.047	257	117	3.264	0.029	3.264	0.029	4.406	0.025
223	83	3.558	0.037	3.558	0.037	4.803	0.036		138	1.645	-0.636	1.645	-0.636	2.221	-0.860
	104	4.201	0.047	4.201	0.047	5.672	0.046	258	118	3.264	0.028	3.264	0.028	4.406	0.024
224	84	15.541	-1.659	15.541	-1.659	20.981	-2.255		139	1.645	-0.636	1.645	-0.636	2.221	-0.860
	105	14.610	-0.343	14.610	-0.343	19.724	-0.483	259	119	3.264	0.027	3.264	0.027	4.406	0.023
225	85	14.610	-0.343	14.610	-0.343	19.724	-0.483		140	1.645	-0.636	1.645	-0.636	2.221	-0.860
	106	15.855	-1.658	15.855	-1.658	21.404	-2.253	260	120	3.264	0.027	3.264	0.027	4.406	0.022
226	86	4.201	0.047	4.201	0.047	5.672	0.046		141	1.645	-0.636	1.645	-0.636	2.221	-0.860
	107	3.569	0.037	3.569	0.037	4.818	0.036	261	121	3.264	0.026	3.264	0.026	4.406	0.021
227	87	3.413	0.049	3.413	0.049	4.608	0.047		142	1.645	-0.636	1.645	-0.636	2.221	-0.860
	108	3.194	0.039	3.194	0.039	4.312	0.038	262	122	3.264	0.026	3.264	0.026	4.406	0.020
228	88	3.414	0.048	3.414	0.048	4.609	0.046		143	1.645	-0.636	1.645	-0.636	2.221	-0.860
	109	3.195	0.038	3.195	0.038	4.313	0.037	263	123	3.264	0.034	3.264	0.034	4.406	0.032
229	89	3.414	0.042	3.414	0.042	4.609	0.038		144	1.645	-0.636	1.645	-0.636	2.221	-0.860
	110	3.195	0.036	3.195	0.036	4.313	0.034	264	124	3.263	0.034	3.263	0.034	4.405	0.032
230	90	3.414	0.042	3.414	0.042	4.609	0.038		145	1.644	-0.636	1.644	-0.636	2.220	-0.860
	111	3.195	0.036	3.195	0.036	4.313	0.034	265	125	3.452	0.032	3.452	0.032	4.660	0.029
231	91	3.414	0.043	3.414	0.043	4.609	0.039		146	1.626	-0.617	1.626	-0.617	2.195	-0.834
	112	3.195	0.036	3.195	0.036	4.313	0.034	266	126	17.895	-0.141	17.895	-0.141	24.159	-0.207
232	92	3.414	0.043	3.414	0.043	4.609	0.040		147	10.242	-5.051	10.242	-5.051	13.826	-6.821
	113	3.195	0.036	3.195	0.036	4.313	0.034	267	127	13.295	-0.594	13.295	-0.594	17.949	-0.807
233	93	3.414	0.044	3.414	0.044	4.609	0.040		148	0.129	-14.291	0.129	-14.291	0.198	-19.293





1	1	338.654	5	1000	5	25	30846.145
1	2	85.913	5	25	5	12	23.706
1	3	70.756	5	25	5	12	23.706
1	4	73.537	5	25	5	12	23.706
1	5	76.878	5	25	5	12	23.706
1	6	73.537	5	25	5	12	23.706
1	7	70.756	5	25	5	12	23.706
1	8	85.913	5	25	5	12	23.706
1	9	338.649	5	1000	5	25	30846.145

Amadura inferior a disponer en la losa.

=====

Vano	Punto	C.Mec. (T/m)	n_t	Fi_t	n_l	Fi_l	Peso (Kg/m2)
1	1	451.408	5	1000	5	32	30858.445
1	2	77.422	5	25	5	12	23.706
1	3	67.114	5	20	5	10	15.413
1	4	68.489	5	20	5	10	15.413
1	5	69.967	5	25	5	12	23.706
1	6	68.489	5	20	5	10	15.413
1	7	67.114	5	20	5	10	15.413
1	8	77.421	5	25	5	12	23.706
1	9	451.404	5	1000	5	32	30858.445

C.Mec.: capacidad mecánica (T/m) de la armadura transversal

n\_t: número de posiciones por metro lineal correspondientes a la amadura transversal.

Fi\_t: diámetro de las posiciones correspondientes a la amadura transversal.

n\_l: número de posiciones por metro lineal correspondientes a la amadura longitudinal.

Fi\_l: diámetro de las posiciones correspondientes a la amadura longitudinal.

LISTADO DE CALCULO EN TRANSPORTE

=====

Cálculo de la armadura de refuerzo

=====

Vano	Viga	lvuelo	Md	Mu	As
1	1	0.000	-0.000	-5.854	0.000
1	1	1.017	-0.000	-108.295	0.000
1	1	2.033	-0.000	-171.664	0.000
1	1	3.050	-0.000	-171.394	0.000
1	1	4.067	-0.000	-162.257	0.000
1	1	5.083	-0.000	-155.379	0.000
1	1	6.100	-0.000	-152.357	0.000
1	1	7.117	-0.000	-150.369	0.000
1	1	8.133	-0.000	-150.369	0.000
1	1	9.150	-0.000	-150.369	0.000
1	2	0.000	-0.000	-0.000	0.000
1	2	1.017	-0.000	-30.964	0.000
1	2	2.033	-0.000	-30.493	0.000
1	2	3.050	-0.000	-30.493	0.000
1	2	4.067	-0.000	-30.493	0.000
1	2	5.083	-0.000	-30.493	0.000
1	2	6.100	-0.000	-30.493	0.000
1	2	7.117	-0.000	-30.493	0.000
1	2	8.133	-0.000	-30.493	0.000
1	2	9.150	-0.000	-30.493	0.000

Mu: Momento último correspondiente a la sección sin armadura de refuerzo (mT).

lvuelo (m): longitud de vuelo

As (cm2): Cuantía de refuerzo en fibra superior (Rec. mec. 5 cm)

Md: Momento de cálculo (mT)

CALCULO A FISURACION DE LAS VIGAS

=====

Máxima abertura de fisura (mm): 0,0000

Recubrimiento geométrico de hormigón c(m): 0,0000

Coefficiente de impacto :0,0000

Punto : Ordinal del punto de la directriz de la viga.

s(m) : Distancia del punto al inicio de la directriz de la viga.

N°Barras: Número de barras de la armadura pasiva dispuestas en una fila.

Fi(mm) : Diámetro de las barras de la armadura pasiva.

Sep.(m) : Separación entre las barras de la armadura pasiva.

Y(m) : Distancia del centro de las barras de la armadura pasiva a la fibra inferior de la sección de la viga.

Nk(T) : Axil para la combinación frecuente de acciones.

Mk(mT) : Flector para la combinación frecuente de acciones.

Mfis(mT) : Flector para el que la fibra más traccionada de hormigón alcanza el valor fctm con el axil Nk.

Ts(Kg/cm2) : Tensión de la armadura pasiva para la combinación frecuente de acciones.

Tsr(Kg/cm2): Tensión de la armadura pasiva en el instante en que se fisura el hormigón

wk (mm) : Abertura característica de fisura.

El cálculo a fisuración se resuelve en cada fila de la tabla para el supuesto de que e voladizo en transporte sea desde el inicio de la viga hasta el punto de ordinal "Punto

Vano 1 Viga 1  
-----

Armadura pasiva en la cara superior

-----

Punto	s(m)	N°Barras	Fi (mm)	Sep. (m)	Y(m)
1	0.000	1	0.000	0.000	2.200
2	0.500	1	0.000	0.000	2.200
3	1.343	1	0.000	0.000	2.200
4	2.186	1	0.000	0.000	2.200
5	3.029	1	0.000	0.000	2.200
6	3.871	1	0.000	0.000	2.200
7	4.714	1	0.000	0.000	2.200
8	5.557	1	0.000	0.000	2.200
9	6.400	1	0.000	0.000	2.200
10	7.243	1	0.000	0.000	2.200
11	8.086	1	0.000	0.000	2.200
12	8.929	1	0.000	0.000	2.200

Abertura característica de fisura en fibra superior

-----

Punto	s(m)	Cumple	Nk(T)	Mk(mT)	Mfis(mT)	Ts(Kg/cm2)	Tsr(Kg/cm2)	wk (mm)
1	0.000	Sí	0.00	0.00	-244.33	La sección no se fisura		
2	0.500	Sí	465.81	-228.69	-460.90	La sección no se fisura		
3	1.343	Sí	465.81	-228.69	-460.90	La sección no se fisura		
4	2.186	Sí	465.81	-228.69	-460.90	La sección no se fisura		
5	3.029	Sí	484.41	-244.39	-469.60	La sección no se fisura		
6	3.871	Sí	738.03	-458.63	-586.64	La sección no se fisura		
7	4.714	Sí	738.03	-458.63	-586.64	La sección no se fisura		
8	5.557	Sí	885.50	-575.84	-654.08	La sección no se fisura		
9	6.400	Sí	893.71	-582.37	-657.87	La sección no se fisura		
10	7.243	Sí	893.71	-582.37	-657.87	La sección no se fisura		
11	8.086	Sí	893.71	-582.37	-657.87	La sección no se fisura		
12	8.929	Sí	893.71	-582.37	-657.87	La sección no se fisura		

Vano 1 Viga 2  
-----

Armadura pasiva en la cara superior

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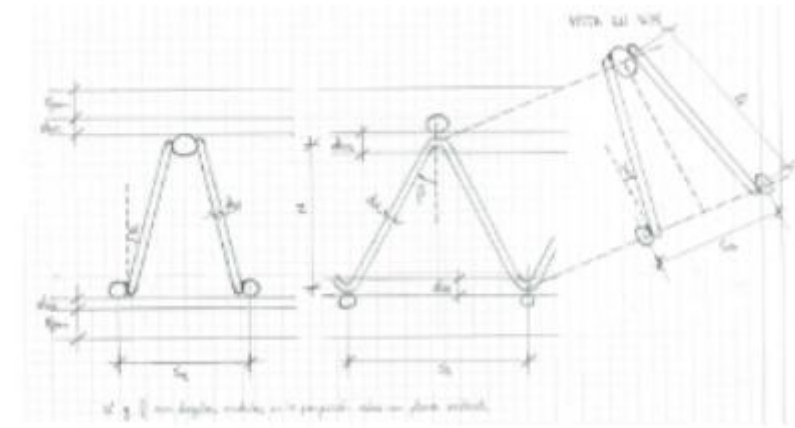
Punto	s (m)	N°Barras	Fi (mm)	Sep. (m)	Y (m)
1	0.000	1	0.000	0.000	2.200
2	0.500	1	0.000	0.000	2.200
3	1.343	1	0.000	0.000	2.200
4	2.186	1	0.000	0.000	2.200
5	3.029	1	0.000	0.000	2.200
6	3.871	1	0.000	0.000	2.200
7	4.714	1	0.000	0.000	2.200
8	5.557	1	0.000	0.000	2.200
9	6.400	1	0.000	0.000	2.200
10	7.243	1	0.000	0.000	2.200
11	8.086	1	0.000	0.000	2.200
12	8.929	1	0.000	0.000	2.200

Abertura característica de fisura en fibra superior

Punto	s (m)	Cumple	Nk (T)	Mk (mT)	Mfis (mT)	Ts (Kg/cm2)	Tsr (Kg/cm2)	wk (mm)
1	0.000	Sí	0.00	0.00	-243.61	La sección no se fisura		
2	0.500	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
3	1.343	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
4	2.186	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
5	3.029	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
6	3.871	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
7	4.714	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
8	5.557	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
9	6.400	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
10	7.243	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
11	8.086	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0
12	8.929	Sí	752.30	-598.16	-588.53	17586.62	12277.11	-1.#IND0



REJISRO DE HORMIGÓN ARMADO CON CERRAJES METÁLICOS			
Pretensas apoyadas en sus dos extremos			
ETAPAS DE DISEÑO DE HORMIGÓN ARMADO CON CERRAJES METÁLICOS			
DATOS DE LAS MATERIAS			
Límite elástico de proyecto de la armadura pasiva	$f_{yk}$	500	MPa
Resistencia de proyecto del hormigón a compresión	$f_{cd}$	30	MPa
Coefficiente de seguridad y minoración del límite elástico del acero	$\gamma_s$	1.25	-
Coefficiente de seguridad y minoración de la resistencia del hormigón	$\gamma_c$	1.5	-
Módulo de elasticidad del acero	$E_s$	210000	MPa
Límite elástico de cálculo del acero	$f_{yk}/\gamma_s$	400	MPa
Resistencia de cálculo del hormigón a compresión	$f_{cd}/\gamma_c$	20.00	MPa
Margenante correspondiente al límite elástico del acero	$\sigma_{sk}$	0.0007	-
DIMENSIONES GEOMÉTRICAS			
Largo total (pretensa + hormigón en situ)	$L_0$	2.150	m
Largo pretensa	$L_p$	2.070	m
Anchura pretensa	$b$	1.200	mm
Luz de cálculo de la pretensa	$L_c$	1.750	m
Recubrimiento geométrico	$d_{geom}$	0.035	m
Número de cables por pretensa	$n_c$	2.0	-
Área de barras cordeles inferiores	$A_{s1}$	30.0	mm <sup>2</sup>
Área de barras cordeles superiores	$A_{s2}$	30.0	mm <sup>2</sup>
Área de barras transversales inferiores	$A_{s3}$	3.0	mm <sup>2</sup>
Área de barras transversales superiores	$A_{s4}$	11.0	mm <sup>2</sup>
Área de diagonales cables	$A_{s5}$	3.0	mm <sup>2</sup>
Separación entre cordeles inferiores de una misma cable	$s_1$	0.150	m
Luz inferior (cables cables)	$s_2$	0.175	m
Luz efectiva cables	$s_3$	0.144	m
Ángulo "alpha"	$\alpha$	28.50	°
Ángulo "beta"	$\beta$	31.28	°
Longitud diagonal (en verdadera magnitud)	$s_4$	0.176	m
Ángulo "gamma"	$\gamma$	38.34	°
MÓDULOS Y EFECTOS			
Resistencia específica hormigón	$R_{yk}$	25.00	MPa
Carga de construcción	$S_k$	1.00	MPa
Momento de diseño por	$M_k$	2.08	kNm/m
Cantidad de diseño por	$S_k$	7.70	MPa
Momento de diseño por pretensa	$M_p$	1.38	kNm
Cantidad de diseño por pretensa	$S_p$	4.24	MPa
VERIFICACIÓN A PARTE DEL CORCÓN SUPERIOR COMPRESO			
Coefficiente para longitud de pandeo	$k$	1.00	-
Coefficiente de imperfección	$\alpha$	0.40	-
Coefficiente de minoración de resistencia	$\chi$	1.00	-
Área cables (comprido) (una única barra)	$A$	210.00	mm <sup>2</sup>
Área cables (comprido) (una única barra)	$I$	210.00	mm <sup>2</sup>
Longitud de pandeo	$L$	1.75	mm
Resistencia elástica	$N_k$	217.70	MPa
Factor adimensional	$\lambda$	0.000	-
Resistencia $\phi$	$\phi$	0.88	-
Resistencia $\lambda$	$\lambda$	0.737	-
Resistencia de cálculo a pandeo (una única barra)	$N_{k,ed}$	87.50	MPa
Factor de compresión de cálculo (una única barra)	$N_{k,ed}$	12.45	MPa
VERIFICACIÓN A PARTE DE LAS DIAGONALES			
Coefficiente para longitud de pandeo	$k$	1.00	-
Coefficiente de imperfección	$\alpha$	0.40	-
Coefficiente de minoración de resistencia	$\chi$	1.00	-
Área diagonales (una única barra)	$A$	30.00	mm <sup>2</sup>
Área diagonales (una única barra)	$I$	210.00	mm <sup>2</sup>
Longitud de pandeo	$L$	1.76.00	mm
Resistencia elástica	$N_k$	11.40	MPa
Factor adimensional	$\lambda$	1.307	-
Resistencia $\phi$	$\phi$	1.771	-
Resistencia $\lambda$	$\lambda$	0.702	-
Resistencia de cálculo a pandeo (una única barra)	$N_{k,ed}$	4.28	MPa
Factor de compresión de cálculo (una única barra)	$N_{k,ed}$	1.40	MPa



Nota: en este caso típicamente se toma un valor de 1.00  
 Nota: para secciones circulares macizas, aplica la curva de pandeo  $\chi$ , con  $\alpha=0.40$   
 Nota: ver Tabla 23.3 de EHE. En general el valor es 1.00. Para puentes de acero, debe tomarse 1.20.

Nota: en este caso tomar un valor de 1.00 cuando del lado superior ya que el hormigón de la pretensa aporta un cierto empotramiento.  
 Nota: para secciones circulares macizas, aplica la curva de pandeo  $\chi$ , con  $\alpha=0.40$   
 Nota: ver Tabla 23.3 de EHE. En general el valor es 1.00. Para puentes de acero, debe tomarse 1.20.

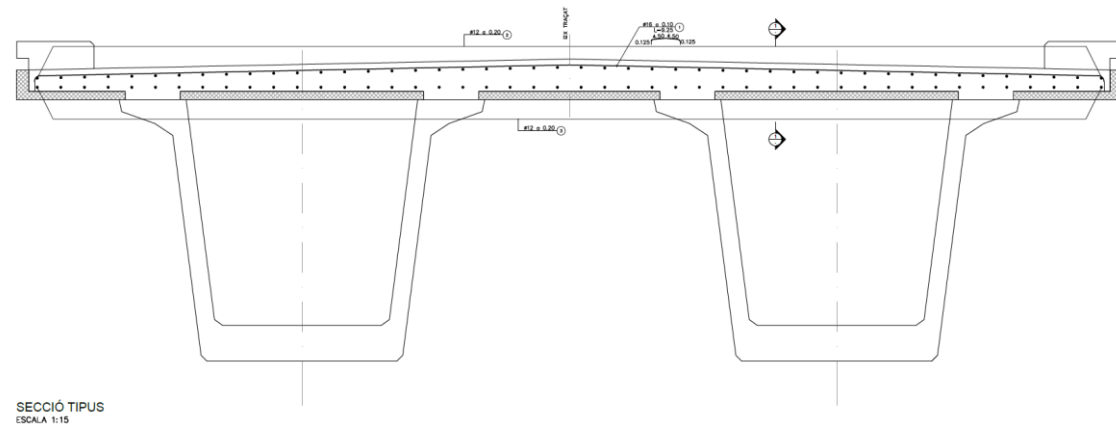
## IMPACTO EN SISTEMAS DE CONTENCIÓN DE VEHÍCULOS

Se presenta la verificación del armado transversal del tablero ante situación de impacto.

El tablero consiste en una losa de canto variable de 0.34m a 0.25m sobre dos vigas artesas de hormigón armado.

Las vigas artesas tienen un espesor de almas de 0.25m y un ala inferior de 0.30m.

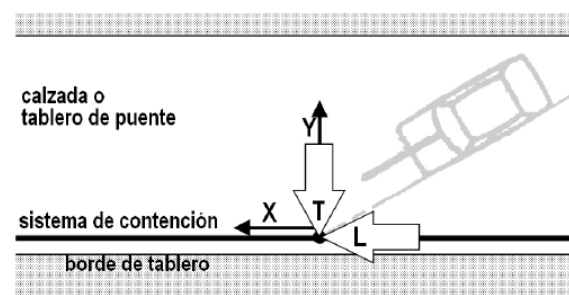
El tablero dispone de una armadura transversal de  $\Phi 16$  a 0.10m.



Los materiales utilizados se muestran a continuación.

- Hormigón armado HA-30
- Armadura pasiva B500S

Se considera las siguientes acciones aplicadas en la barrera de protección del puente (Contención H2).



	Máximos
Trayectoria (T/L)	
$F_{x_{carretera}}$ (KN)	118
$F_{y_{carretera}}$ (KN)	-160
$F_z$ (KN)	78
$M_{x_{carretera}}$ (KNm)	-71
$M_{y_{carretera}}$ (KNm)	-44

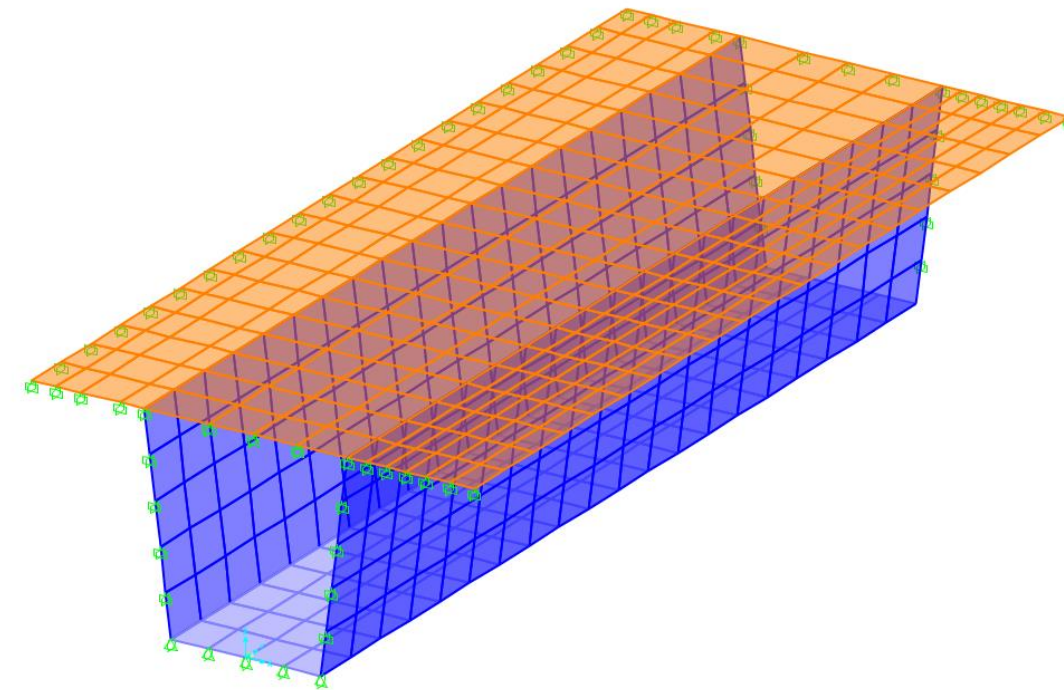
De acuerdo con la normativa IAP-11, se aplica simultáneamente con esta acción accidental una fuerza vertical debida a la presencia del vehículo de valor igual a  $0.75 Q = 0.75 \cdot 150 \text{ kN} = 112.5 \text{ kN}$ .

Para llevar a cabo este análisis se considera la combinación accidental de acciones (ELA).

- $G \cdot 1.0 + SC \cdot 1.0 + Q \cdot 1.5$

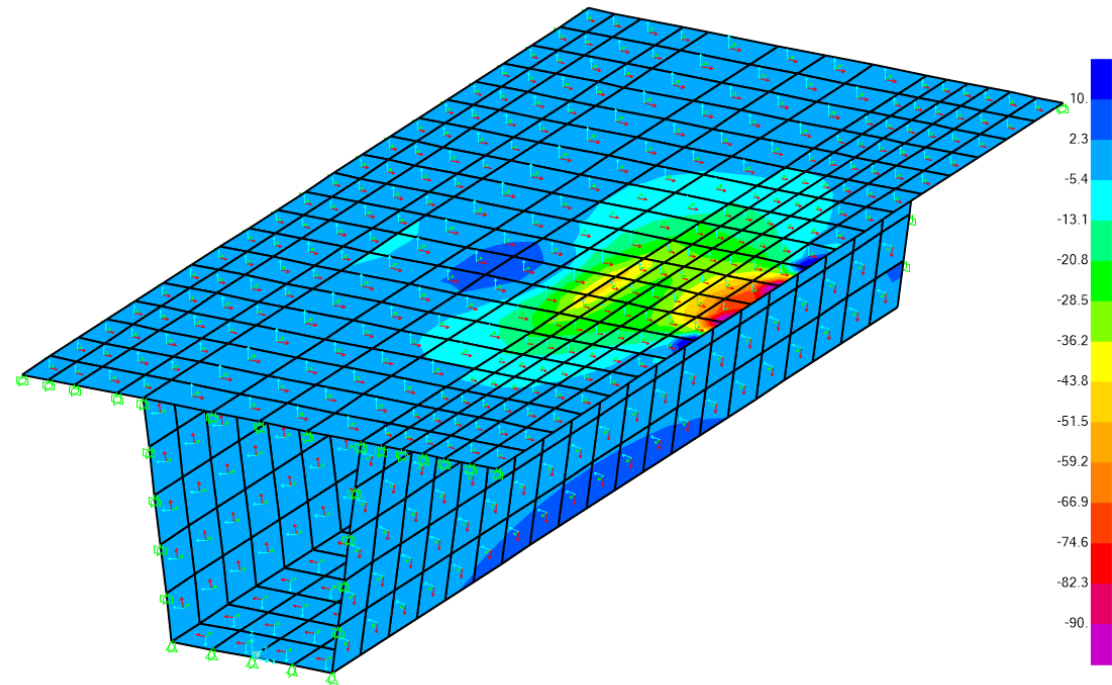
Se realiza un modelo tridimensional del tablero mediante elementos "shells" utilizando el programa SAP2000.

El modelo representa los primeros 10m del primer vano y la mitad del tablero. Está apoyado solo en un extremo y en los dos lados tiene los movimientos X, Y restringidos, así como sus respectivos giros.

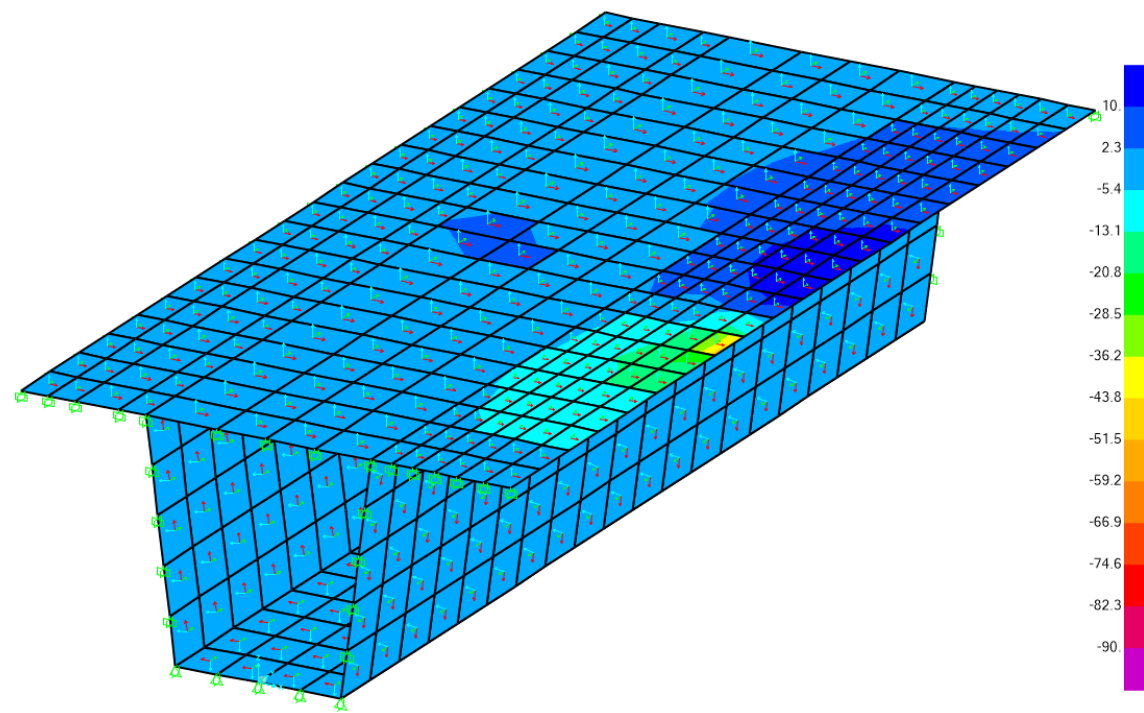




La siguiente figura muestra los esfuerzos obtenidos en el tablero.



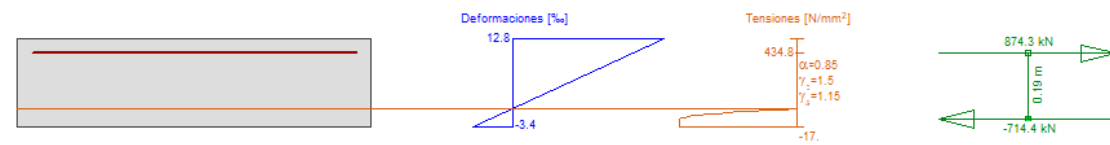
Flectores transversales



Se observa que el momento mínimo de diseño es  $M_{11} = -109 \text{ kNm}$  -15 kNm ( $M_{12} = -124 \text{ kNm/m}$ ).

A continuación, se verifica la sección mediante el software Fagus. La sección tiene un factor de seguridad de 1.18.

Eficiencia  $N_x$  constante;  $N_x = 160.0$ ;  $M_y = -124.0$ ;  $\text{eff}(M,N) = 0.85$  OK



**Cálculo capacidad última Sección (Viga): TABLERO0.25**

Solicitaciones / Factores de eficiencia:  $\text{eff}(M,N) = 0.85$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión			Sección completa $\text{eff}(M,N,V,T)$
			N [kN]	$M_y$ [kNm]	$M_z$ [kNm]	$\text{eff}(M,N)$	$V_y$ [kN]	$V_z$ [kN]	T [kNm]	
1	!ELU		+ 160.0	-124.0	0	0.85				

**Parámetros de análisis "ELU" Código: EHE-08. Instr. Hormigón Estruct.**

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm²]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]		$\alpha_{cc}$	$\gamma_c$	$\gamma_s$	$\theta$	$\phi$
!ELU	2/0	1	-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

**Deformaciones y tensiones extremas**

Nombre	Clase	$y_a$ [m]	$z_a$ [m]	$\epsilon$ [‰]	$\sigma_a$ [N/mm²]	$\gamma$ [°]
C1	H300	1.	0.	-3.4	-17.	1.76
C1	H300	0.	0.25	12.8	0.	1.76
R1	AEH500	0.96	0.21	10.	434.8	1.15

**Estado Último "ELU"**

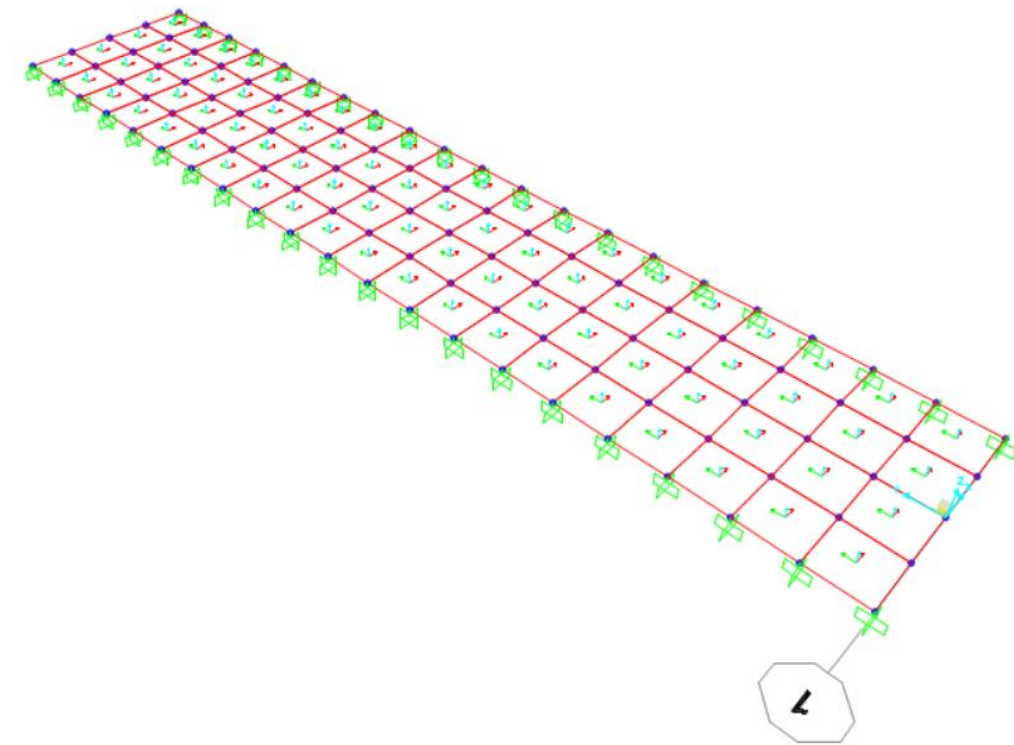
N [kN]	Esfuerzos		Deformación y curvatura			Valores rigidez		
	$M_y$ [kNm]	$M_z$ [kNm]	$\epsilon_x$ [‰]	$\chi_{y1}$ [km⁻¹]	$\chi_{z1}$ [km⁻¹]	$N/\epsilon_x$ [kN]	$M_y/\chi_{y1}$ [kNm²]	$M_z/\chi_{z1}$ [kNm²]
160.	-145.5	0.	4.7	-64.7	0.0	34047.58	2250.91	19169.44

Armadura G0  $\Sigma A_s = 2011. \text{mm}^2$ ,  $\rho = 0.8 \%$

Nombre	Material	BC	Tipo	$y_{1q}$ [m]	$z_{1q}$ [m]	$y_{2q}$ [m]	$z_{2q}$ [m]	$a_s/m'$ [mm²/m]	$n, \emptyset$	exist $A_s$ [mm²]
R1	R(AEH500)	2	L	0.04	0.21	0.96	0.21	2200.22		2011.00

Losa de semicontinuidad:

Se desarrolla un modelo de cálculo para la losa de semicontinuidad en el que se aplican las acciones que llegan desde ambos tableros y las cargas directas sobre la losa. Puede verse el modelo en la figura adjunta:

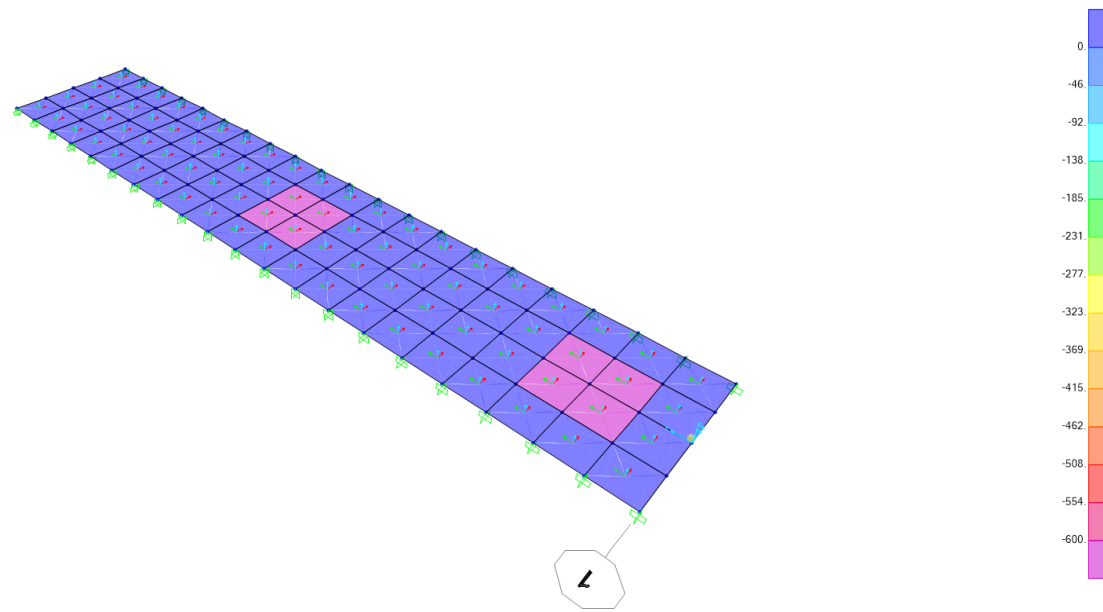


Las cargas consideradas son:

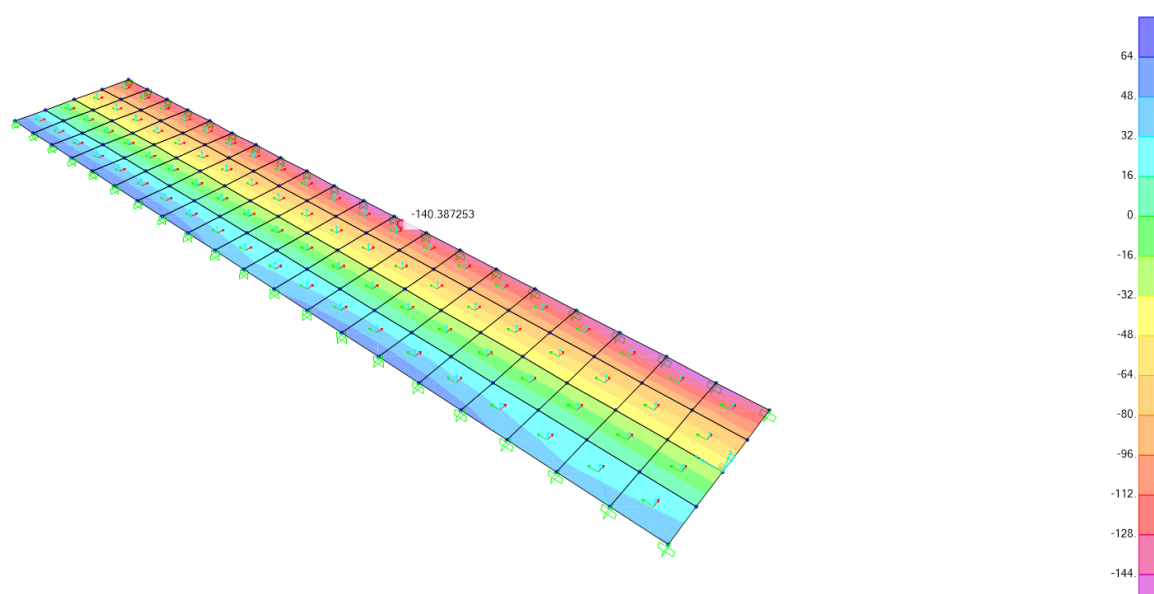
- Peso propio
- Pavimento
- Tren de cargas:  $q + Q$  (del carro solo las huellas que entran en la junta, según la figura adjunta)
- Giro impuesto por los tableros adyacentes.

Huellas del carro:





Se obtienen los siguiente flectores:



La armadura necesaria es:

Comprobación Dimensionamiento Diagrama de Flexión

Propuesta de armado Plano de agotamiento

Sección: LOSA\_CONT

Elemento estructural:  Viga  Losa  Muro

SECCIÓN DEFORMACIONES  $\cdot 10^{-3}$  TENSIONES MPa

Plano de deformación de agotamiento y  $M_u$

$x$  [m] 0.082  $\epsilon_s \cdot 10^{-3}$  3.5  $M_u$  [kN·m] 140.0  
 $1/i$  [km<sup>-1</sup>] 42.8  $\epsilon_i \cdot 10^{-3}$  -4.2

Deformación y tensión de armaduras

Profundidad (m)	Armadura (cm <sup>2</sup> )	Deformación $\cdot 10^{-3}$	Tensión [MPa]
0.050	6.1	1.4	-271.5
0.130	35.9	-2.1	413.0

$M_d$  [kN·m] 140

Se cubre con 2f16 a 0.10m (40.22cm<sup>2</sup>/m).

## Càlcul d'estreps

REACCIONES EN APARATOS DE APOYO:

45 m

VANO:

ACCIÓN	REACCIONES VERT		REACCIONES HOR. LONG		MOVIMIENTO LONG.		GIRO DE FLEXIÓN		REACCIONES HOR. TRANSV.		GIRO DE TORSIÓN	
	MÁX (kN)	MÍN (kN)	MÁX (kN)	MÍN (kN)	MÁX (mm)	MÍN (mm)	MÁX (%)	MÍN (%)	MÁX (kN)	MÍN (kN)	MÁX (%)	MÍN (%)
GViva	0	0	0	0	0	0	4.45	4.45	0	0	0	0
PRETENSADO	0	0	0	0	0	0	-9.202	-9.202	0	0	0	0
GVloca	0	0	0	0	7.6	7.6	4.537	4.537	0	0	0	0
GZ	0	0	0	0	14	14	0.819	0.819	0	0	0	0
PROLOGÍA	0	0	0	0	23.9	0	0.476	0	0	0	0	0
SC-g-g	1732	-214	0	0	4.6	0	2.882	0	0	0	0	0
TEMP. +	0	0	0	0	20.9	0	-15	0	0	0	0	0
TEMP. -	0	0	0	0	-13.2	0	0.538	0	0	0	0	0
FRENADO	0	0	0	0	0	0	0	0	0	0	0	0
VIENTO TRANSV	222.6	-222.6	0	0	0	0	0	0	57.2	-57.2	0	0
VIENTO TRANSV + SC	166.3	-166.3	0	0	0	0	0	0	136.3	-136.3	0	0
VIENTO LONG	0	0	14.5	-14.5	0	0	0	0	0	0	0	0
VIENTO LONG + SC	0	0	88.8	-88.8	0	0	0	0	0	0	0	0
SISMO LONG	188.4	-188.4	223.8	-223.8	0	0	0.12	-0.12	71.5	-71.5	0	0
SISMO TRANSV	322.9	-322.9	63.5	-63.5	0	0	0.12	-0.12	238.2	-238.2	0	0
SISMO VERT	393.5	-393.5	72	-72	0	0	0.25	-0.25	72	-72	0	0

COMBINACIONES

	Fvert	Torsor	F long	Ftransv
MÁXIMA REACCIÓN VERTICAL	3664	748	160	164
MÍNIMA REACCIÓN VERTICAL	-766	0	112	114
MÁXIMA DISTORSIÓN	3464	0	172	0
MÁXIMO GIRO	3664	5127	160	164
SISMO LONG	377	848	448	143
SISMO TRANSV	646	1453	139	476
SISMO VERT	787	1771	144	144

	Flong	Fvert	Mt
G1	0	0	2943.6
G2	0	0	660
MÁXIMA REACCIÓN VERTICAL	150	164	3664
MÍNIMA REACCIÓN VERTICAL	112	114	-766
MÁXIMA DISTORSIÓN	172	0	3464
MÁXIMO GIRO	150	164	3664
SISMO LONG	448	143	377
SISMO TRANSV	139	476	646
SISMO VERT	144	144	787

**VERIFICACION ESTADOS DE FUENTE**

**ENTRADA DE DATOS:**

- 1.- GEOMETRIA:**
- L0= 3.30 m
  - L1= 1.30 m
  - L2= 3.30 m
  - L3= 1.00 m
  - L4= 3.30 m
  - L5= 1.00 m
  - L6= 1.00 m
  - L7= 0.00 m
  - H1= 1.40 m
  - H2= 3.48 m
  - H3= 0.01 m
  - H4= 2.70 m
  - H5= 2.70 m
  - H6= 1.00 m
  - H7= 7.60 m
  - e+ = 0.00 m
  - B = 3.30 m
  - γ = 25.00 kNm3
  - L = 5.60 m
  - h = 1.30 m
- 2.- TIERRAS TRASADOS:**
- h1 = 0.00 (1/33)
  - h2 = 0.00 (1/33)
- 3.- TIERRAS ENTRADOS:**
- [σ] = 0.01 (γ)
  - γ1 = 20 kNm3
  - Kp = 3
- (γ) Porcentaje de Ep a considerar en la seguridad al deslizamiento.
- 4.- USO TRASADOS:**
- q1 = 10 kNm2
  - w2+ = 0.2
- 5.- USO ENTRADOS:**
- q1 = 6 kNm2
  - w2+ = 0.2

**RESULTADOS:**

**1.- EQUILIBRIO:**

**HIPOTESIS DESCRIPCION**

1. MAX. REACCION VERTICAL-RESTO ESF. CONC.
2. MIN. REACCION VERTICAL-RESTO ESF. CONC.
3. MAX. MOM. ESTAB-RESTO ESF. CONC.
4. MAX. MOM. TRANSV-RESTO ESF. CONC.
5. SISMO TRANSV
6. SISMO LONG.
7. SISMO TRANSV
8. SISMO VERT

Equilibrio en [B]

Nº	Fx [kN]	Fy [kN]	Fz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
1	1852.77	167.96	1441.14	9447.79	-6827.02	1534.74
2	1503.07	167.96	952.95	-5412.29	-3412.29	1534.74
3	1503.07	167.96	952.95	-5412.29	-3412.29	1534.74
4	1603.41	167.96	1474.22	8443.79	-3168.47	1534.74
5	1502.41	167.96	1462.62	8362.29	-3232.21	1534.74
6	1852.07	167.96	1075.24	7591.21	-4684.27	1534.74
7	1852.07	167.96	1075.24	7591.21	-4684.27	1534.74
8	2493.02	144.00	1052.84	2476.35	-1051.97	1534.74

**5.- REACCIONES TABLERO:**

Nº	Fx	Fy	Fz	Mx	My	Mz
1	0	0	2942.43	0	0	0
2	0	0	1660	0	0	0
3	0	0	1660	0	0	0
4	150	864	3684	748	0	0
5	162	118	2785	0	0	0
6	162	118	2785	0	0	0
7	150	864	3684	527	0	0
8	448	143	3771	648	0	0
9	153	475	345	851	0	0
10	141	141	151	171	0	0

(\*) SC1, SC2, SC3 y SISMO CONCOMITANTES

**7.- SISMO:**

Kst = 0.4259  
 η = 0.9771

**8.- COEFICIENTE DE ENLAZAMIENTO ESTRUCTURA-TERRENO**

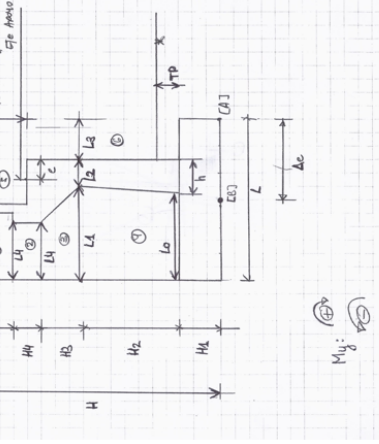
η = 1.0

**9.- DATOS DE LOS MATERIALES**

fck = 30.00 MPa  
 ftd = 500.00 MPa  
 fy = 115 (estirado)  
 fy = 130 (sismo)  
 fy = 100 (sismo)  
 form = 2.89 MPa

**6.- PILOTES:**

Nº	X [m]	Y [m]	Áreas [m²]
1	-2.10	-2.10	35.1277
2	0.952	3.75	1.35
3	0.952	3.75	1.277
4	4.675	-3.75	1.35
5	4.675	-3.75	1.277
6	4.675	3.75	1.35
7	0	0	0.000
8	0	0	0.000
9	0	0	0.000
10	0	0	0.000
11	0	0	0.000
12	0	0	0.000
13	0	0	0.000
14	0	0	0.000
15	0	0	0.000
16	0	0	0.000
17	0	0	0.000
18	0	0	0.000
19	0	0	0.000
20	0	0	0.000



**CARBAS EN PILOTES [kN]**

Nº	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ	
1	1862	1862	1862	1532	1532	1532	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1862
2	514	514	517	1577	1601	1753	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3317
3	150	150	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1501
4	150	150	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1501
5	150	150	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1501
6	307	311	324	1477	1601	1684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3314
7	2795	2809	2975	1503	1636	2044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2975
8	150	150	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1501
9	150	150	150	150	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1501
10	199	2002	2248	1589	1794	1919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2248

**2.- ARMADO:**

**MURO**  
 Arm. vert. trasado, arranque: 14.27 cm2/m  
 Arm. transversal, arranque: 0 cm2/m

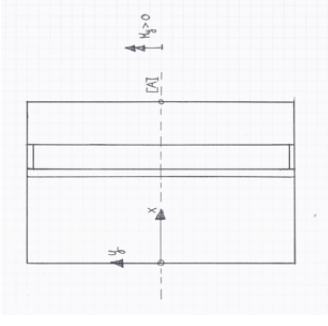
**ESPALDÓN**  
 Arm. vert. trasado: 5.88 cm2/m  
 Arm. transversal: 0 cm2/m

**ARMADURA TRANSVERSAL MINIMA**  
 Armadura por metro de ancho: 3.63 cm2/m

**ARMADO MURO, ENVOLVENTE SERVICIO Y SISMO**

SECCION B (h) [m]	Ases [cm2]	Asp [cm2]	Asm [cm2]	Cuantía [%]	Quant. min. [%]
1	0.74	SERVICIO	23.92	0.45	0.45
2	0.348	SERVICIO	23.92	0.45	0.45
3	0.622	SERVICIO	23.92	0.45	0.45
4	0.987	SERVICIO	23.92	0.45	0.45
5	1.044	SERVICIO	23.92	0.45	0.45
6	1.238	SERVICIO	23.92	0.45	0.45
7	1.586	SERVICIO	23.92	0.45	0.45
8	1.686	SERVICIO	23.92	0.45	0.45
9	1.74	SERVICIO	23.92	0.45	0.45
10	1.914	SERVICIO	23.92	0.45	0.45
11	2.292	SERVICIO	23.92	0.45	0.45
12	2.292	SERVICIO	23.92	0.45	0.45
13	2.456	SERVICIO	23.92	0.45	0.45
14	2.51	SERVICIO	23.92	0.45	0.45
15	2.998	SERVICIO	23.92	0.45	0.45
16	2.998	SERVICIO	23.92	0.45	0.45
17	3.152	SERVICIO	23.92	0.45	0.45
18	3.306	SERVICIO	23.92	0.45	0.45
19	3.46	SERVICIO	23.92	0.45	0.45
20	3.46	SERVICIO	23.92	0.45	0.45

Ases [cm2]	Asp [cm2]	Asm [cm2]	Cuantía [%]	Quant. min. [%]	
1	0.74	SERVICIO	23.92	0.45	0.45
2	0.348	SERVICIO	23.92	0.45	0.45
3	0.622	SERVICIO	23.92	0.45	0.45
4	0.987	SERVICIO	23.92	0.45	0.45
5	1.044	SERVICIO	23.92	0.45	0.45
6	1.238	SERVICIO	23.92	0.45	0.45
7	1.586	SERVICIO	23.92	0.45	0.45
8	1.686	SERVICIO	23.92	0.45	0.45
9	1.74	SERVICIO	23.92	0.45	0.45
10	1.914	SERVICIO	23.92	0.45	0.45
11	2.292	SERVICIO	23.92	0.45	0.45
12	2.292	SERVICIO	23.92	0.45	0.45
13	2.456	SERVICIO	23.92	0.45	0.45
14	2.51	SERVICIO	23.92	0.45	0.45
15	2.998	SERVICIO	23.92	0.45	0.45
16	2.998	SERVICIO	23.92	0.45	0.45
17	3.152	SERVICIO	23.92	0.45	0.45
18	3.306	SERVICIO	23.92	0.45	0.45
19	3.46	SERVICIO	23.92	0.45	0.45
20	3.46	SERVICIO	23.92	0.45	0.45



**ARMADO MURO. SERVICIO**

SECCIÓN#	H[m]	e [m]	U0 [kN/m]	Md [m.kN/m]	Hip. [kN/m/m]	U0 [kN/m]	snecc [cm2/m]	z	P	Fu sin A <sub>se</sub> [kN/m]	Ycu [kN/m]	A <sub>se</sub> [cm2/m]	A <sub>se</sub> nec ?
0	0	0	755.53	448.95	25000	25000	14.27	1.40	0.00114	567.06	253.57	-0.29	NO
1	0.174	1.30	723.20	427.67	25000	25000	13.46	1.40	0.00108	567.06	258.52	-0.43	NO
2	0.348	1.30	682.95	398.01	25000	25000	12.70	1.40	0.00102	567.06	263.63	-0.57	NO
3	0.522	1.30	643.62	375.53	25000	25000	11.97	1.40	0.00096	567.06	268.89	-0.70	NO
4	0.696	1.30	606.36	354.20	25000	25000	11.28	1.40	0.00090	567.06	274.31	-0.83	NO
5	0.87	1.30	571.91	333.97	25000	25000	10.62	1.40	0.00085	567.06	279.89	-0.95	NO
6	1.044	1.30	538.63	314.82	25000	25000	10.00	1.40	0.00080	567.06	285.62	-1.06	NO
7	1.218	1.30	506.71	296.71	25000	25000	9.41	1.40	0.00075	567.06	291.51	-1.18	NO
8	1.392	1.30	477.15	279.61	25000	25000	8.85	1.40	0.00071	567.06	297.67	-1.28	NO
9	1.566	1.30	448.84	263.47	25000	25000	8.32	1.40	0.00067	567.06	304.11	-1.38	NO
10	1.74	1.30	422.08	248.27	25000	25000	7.82	1.40	0.00063	567.06	310.81	-1.48	NO
11	1.914	1.30	396.83	233.97	25000	25000	7.35	1.40	0.00059	567.06	317.76	-1.57	NO
12	2.088	1.30	373.02	220.63	25000	25000	6.91	1.40	0.00055	567.06	324.96	-1.65	NO
13	2.262	1.30	350.61	207.92	25000	25000	6.49	1.40	0.00052	567.06	332.56	-1.73	NO
14	2.436	1.30	329.94	196.10	25000	25000	6.10	1.40	0.00049	567.06	340.54	-1.81	NO
15	2.61	1.30	309.76	185.05	25000	25000	5.73	1.40	0.00046	567.06	348.91	-1.88	NO
16	2.784	1.30	291.21	174.71	25000	25000	5.38	1.40	0.00043	567.06	357.67	-1.94	NO
17	2.958	1.30	273.85	165.07	25000	25000	5.06	1.40	0.00040	567.06	366.91	-2.01	NO
18	3.132	1.30	257.63	156.08	25000	25000	4.76	1.40	0.00038	567.06	376.63	-2.06	NO
19	3.306	1.30	242.48	147.71	25000	25000	4.48	1.40	0.00036	567.06	386.93	-2.12	NO
20	3.48	1.30	228.36	139.92	25000	25000	4.22	1.40	0.00034	567.06	397.76	-2.16	NO

cuasipermanente

**ARMADO MURO. SISMO**

SECCIÓN#	H[m]	e [m]	U0 [kN/m]	Md [m.kN/m]	Hip. [kN/m/m]	U0 [kN/m]	snecc [cm2/m]	z	P	Fu sin A <sub>se</sub> [kN/m]	Ycu [kN/m]	A <sub>se</sub> [cm2/m]	A <sub>se</sub> nec ?
0	0	0	721.97	443.11	25000	25000	14.27	1.40	0.00093	564.31	284.51	-1.12	NO
1	0.174	1.30	693.81	424.41	25000	25000	13.46	1.40	0.00088	564.31	290.10	-1.17	NO
2	0.348	1.30	663.07	403.41	25000	25000	12.70	1.40	0.00083	564.31	296.27	-1.22	NO
3	0.522	1.30	632.64	384.14	25000	25000	11.97	1.40	0.00078	564.31	303.01	-1.26	NO
4	0.696	1.30	603.48	366.61	25000	25000	11.28	1.40	0.00073	564.31	310.32	-1.30	NO
5	0.87	1.30	575.58	350.90	25000	25000	10.62	1.40	0.00069	564.31	318.27	-1.34	NO
6	1.044	1.30	549.88	337.13	25000	25000	10.00	1.40	0.00065	564.31	326.85	-1.37	NO
7	1.218	1.30	525.43	325.43	25000	25000	9.41	1.40	0.00060	564.31	336.06	-1.40	NO
8	1.392	1.30	502.13	315.77	25000	25000	8.85	1.40	0.00056	564.31	345.91	-1.42	NO
9	1.566	1.30	479.97	308.09	25000	25000	8.32	1.40	0.00052	564.31	356.41	-1.44	NO
10	1.74	1.30	458.94	302.37	25000	25000	7.82	1.40	0.00049	564.31	367.65	-1.45	NO
11	1.914	1.30	438.96	300.06	25000	25000	7.35	1.40	0.00045	564.31	379.63	-1.46	NO
12	2.088	1.30	419.97	323.22	25000	25000	6.91	1.40	0.00042	564.31	392.35	-1.47	NO
13	2.262	1.30	402.97	307.44	25000	25000	6.49	1.40	0.00039	564.31	405.80	-1.47	NO
14	2.436	1.30	387.84	300.84	25000	25000	6.10	1.40	0.00036	564.31	420.01	-1.46	NO
15	2.61	1.30	373.47	296.17	25000	25000	5.73	1.40	0.00033	564.31	435.06	-1.44	NO
16	2.784	1.30	359.76	294.35	25000	25000	5.38	1.40	0.00030	564.31	450.94	-1.42	NO
17	2.958	1.30	347.63	293.46	25000	25000	5.06	1.40	0.00027	564.31	467.64	-1.39	NO
18	3.132	1.30	337.17	293.47	25000	25000	4.76	1.40	0.00024	564.31	485.16	-1.35	NO
19	3.306	1.30	328.37	294.37	25000	25000	4.48	1.40	0.00021	564.31	503.51	-1.30	NO
20	3.48	1.30	321.37	297.37	25000	25000	4.22	1.40	0.00019	564.31	522.76	-1.26	NO

**ARMADO MURO. ENVOLVENTE SERVICIO Y SISMO**

SECCIÓN#	H[m]	e [m]	A <sub>se</sub> nec [cm2/m]	Hip. p <sub>s</sub> [kN/m]	U0 [kN/m]	snecc [cm2/m]	z	P	Fu sin A <sub>se</sub> [kN/m]	Ycu [kN/m]	A <sub>se</sub> [cm2/m]	A <sub>se</sub> nec ?	
0	0	0	14.27	SERVICIO	23.92	23.92	14.27	1.40	0.00032	564.31	205.30	-1.47	NO
1	0.174	1.30	13.46	SERVICIO	23.92	23.92	13.46	1.40	0.00032	564.31	199.14	-1.46	NO
2	0.348	1.30	12.70	SERVICIO	23.92	23.92	12.70	1.40	0.00032	564.31	192.86	-1.44	NO
3	0.522	1.30	11.97	SERVICIO	23.92	23.92	11.97	1.40	0.00032	564.31	186.44	-1.42	NO
4	0.696	1.30	11.28	SERVICIO	23.92	23.92	11.28	1.40	0.00032	564.31	179.84	-1.39	NO
5	0.87	1.30	10.62	SERVICIO	23.92	23.92	10.62	1.40	0.00032	564.31	173.05	-1.35	NO
6	1.044	1.30	10.00	SERVICIO	23.92	23.92	10.00	1.40	0.00032	564.31	166.06	-1.30	NO
7	1.218	1.30	9.41	SERVICIO	23.92	23.92	9.41	1.40	0.00032	564.31	158.89	-1.26	NO
8	1.392	1.30	8.85	SERVICIO	23.92	23.92	8.85	1.40	0.00032	564.31	151.45	-1.21	NO
9	1.566	1.30	8.32	SERVICIO	23.92	23.92	8.32	1.40	0.00032	564.31	143.76	-1.16	NO
10	1.74	1.30	7.82	SERVICIO	23.92	23.92	7.82	1.40	0.00032	564.31	135.81	-1.11	NO
11	1.914	1.30	7.35	SERVICIO	23.92	23.92	7.35	1.40	0.00032	564.31	127.61	-1.06	NO
12	2.088	1.30	6.91	SERVICIO	23.92	23.92	6.91	1.40	0.00032	564.31	119.16	-1.01	NO
13	2.262	1.30	6.49	SERVICIO	23.92	23.92	6.49	1.40	0.00032	564.31	110.46	-0.96	NO
14	2.436	1.30	6.10	SERVICIO	23.92	23.92	6.10	1.40	0.00032	564.31	101.51	-0.91	NO
15	2.61	1.30	5.73	SERVICIO	23.92	23.92	5.73	1.40	0.00032	564.31	92.31	-0.86	NO
16	2.784	1.30	5.38	SERVICIO	23.92	23.92	5.38	1.40	0.00032	564.31	82.86	-0.81	NO
17	2.958	1.30	5.06	SERVICIO	23.92	23.92	5.06	1.40	0.00032	564.31	73.16	-0.76	NO
18	3.132	1.30	4.76	SERVICIO	23.92	23.92	4.76	1.40	0.00032	564.31	63.21	-0.71	NO
19	3.306	1.30	4.48	SERVICIO	23.92	23.92	4.48	1.40	0.00032	564.31	53.01	-0.66	NO
20	3.48	1.30	4.22	SERVICIO	23.92	23.92	4.22	1.40	0.00032	564.31	42.56	-0.61	NO

**ARMADO ESPALDÓN**

SECCIÓN#	H[m]	e [m]	U0 [kN/m]	Md [m.kN/m]	Hip. [kN/m/m]	U0 [kN/m]	snecc [cm2/m]	z	P	Fu sin A <sub>se</sub> [kN/m]	Ycu [kN/m]	A <sub>se</sub> [cm2/m]	A <sub>se</sub> nec ?
0	0	0	49.90005	58.64265	71.409195	71.409195	4.79	1.89	0.00192	178.52	84.79	-3.88	NO
1	0.30	0.30	57.69	71.409195	71.409195	71.409195	5.86	1.89	0.00234	205.98	104.64	-5.11	NO

CÁLCULOS AUXILIARES ESTRIBOS

ARMADURA INTRODUCCIÓN REACCIÓN:

Fd= 4920 kN  
Tracciones inducidas= 1230 kN

Armadura: 30.75 cm<sup>2</sup> en ambos sentidos  
10 ± 20 en cada sentido

ENCEPADO

PILOTE DELANTERO:

Rd= 4710 kN  
alf= 78 °  
Td= 1001 kN  
As= 25.0 cm<sup>2</sup> BANDA PILOTES

PILOTE TRASERO:

Rd= 3885 kN  
alf= 24 °  
Td= 8726 kN  
As= 218.1 cm<sup>2</sup> BANDA PILOTES

BANDA PILOTES

218cm<sup>2</sup> → 3 capa 9 ± 32/capa

BANDA ENTRE PILOTES

95cm<sup>2</sup> → 11 ± 28/capa

ARMADURA SECUNDARIA VERTICAL

20.93 cm<sup>2</sup>/m → 1 o 16 a 0.20 (20.11cm<sup>2</sup>/m)

CUANTÍAS MÍNIMAS:

ALZADO TRASDÓS VERTICAL:  
GEOMÉTRICA: 11.7 cm<sup>2</sup>/m  
MECÁNICA: 23.92 cm<sup>2</sup>/m

DISPUESTA: f20 a 0.20 + f16 a 0.20 23.785 cm<sup>2</sup>/m

ALZADO INTRADÓS VERTICAL:  
GEOMÉTRICA: 3.9 cm<sup>2</sup>/m  
DISPUESTA: f16 a 0.20 10.085 cm<sup>2</sup>/m

ALZADO HORIZONTAL:  
GEOMÉTRICA: 8 cm<sup>2</sup>/m  
DISPUESTA: f16 a 0.20 10.085 cm<sup>2</sup>/m

ESPALDÓN TRASDÓS VERTICAL:  
GEOMÉTRICA: 2.7 cm<sup>2</sup>/m  
MECÁNICA: 5.52 cm<sup>2</sup>/m

DISPUESTA: f16 a 0.20 10.085 cm<sup>2</sup>/m

ESPALDÓN INTRADÓS VERTICAL:  
GEOMÉTRICA: 0.9 cm<sup>2</sup>/m  
DISPUESTA: f12 a 0.20 5.685 cm<sup>2</sup>/m

ESPALDÓN HORIZONTAL:  
GEOMÉTRICA: 4.8 cm<sup>2</sup>/m  
DISPUESTA: f12 a 0.20 5.685 cm<sup>2</sup>/m

BIELA MÁS COMPRESIDA  
Cd= 4815 kN  
Área biela= 0.938 m<sup>2</sup>  
Tensión= 5.1 MPa

OK!

BIELA MÁS COMPRESIDA  
Cd= 9662 kN  
Área biela= 0.938 m<sup>2</sup>  
Tensión= 10.2 MPa

OK!

ALETES:

L'aleta té un gruix de 0.40m i una alçada de 6.20m. L'amplada és variable, sent en la part inferior de 3.20m i en la part superior de 6.50m.

MATERIALS

Els materials utilitzats són els següents.

Formigó armat: HA-30

Armat passiu: B500 S

Es considera un coeficient de seguretat en ELU  $\gamma_c = 1.50$  i  $\gamma_s = 1.15$ .

ACCIONS

Les accions aplicades a l'estructura es mostren a continuació.

ACCIONS PERMANENTS

Pes propi.

Densitat del formigó 25 kN/m<sup>3</sup>

Càrrega morta

Pes d'imposta i barana: 2kN/m

Empenta de Terres.

Es considera una densitat del terreny de 20 kN/m<sup>3</sup> i un angle de fregament intern de 30°.

ACCIONS VARIABLES

Empenta de Terres.

Sobrecàrrega sobre el terreny: 10 kN/m<sup>3</sup>

## MODEL DE CÀLCUL

Per l'anàlisi de l'estructura es realitzar un model mitjançant el programa SAP2000. Es modelitza l'aleta utilitzant elements tipu "Shell".

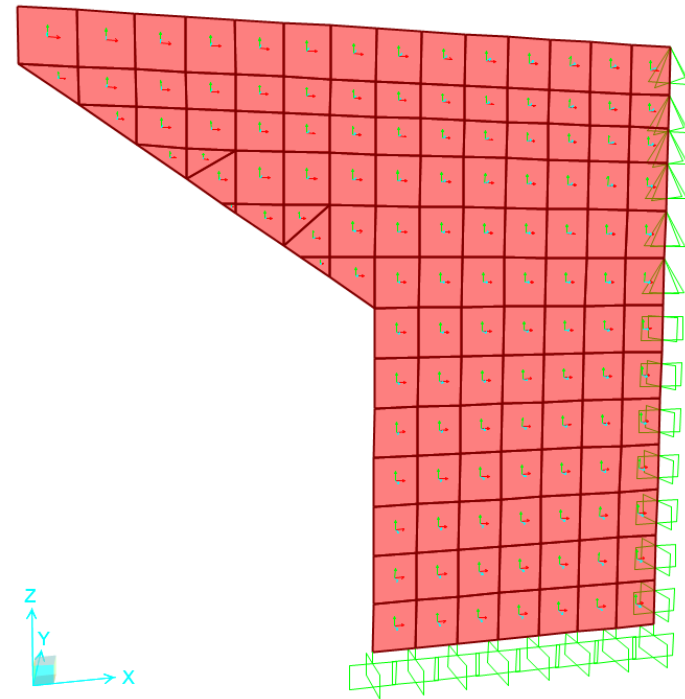
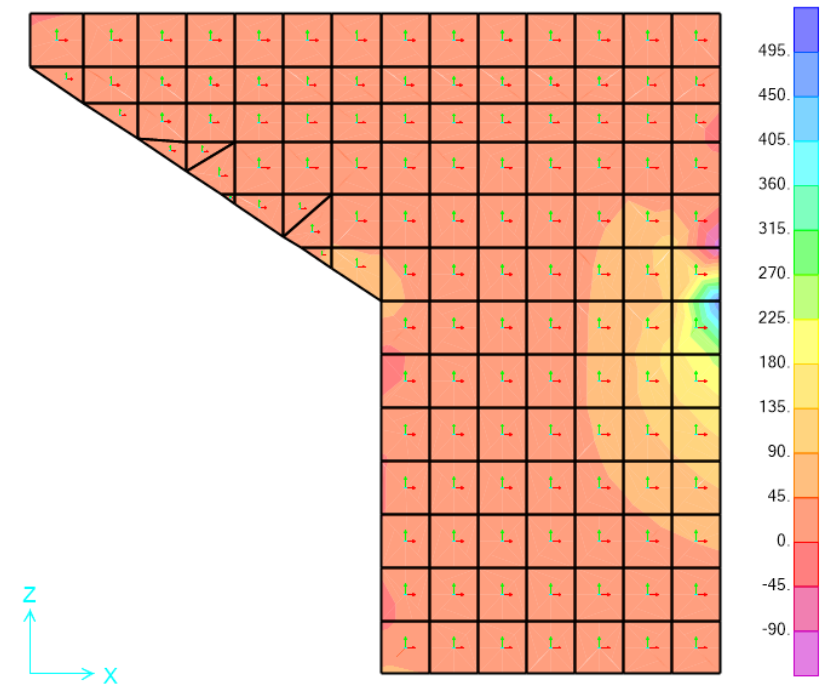


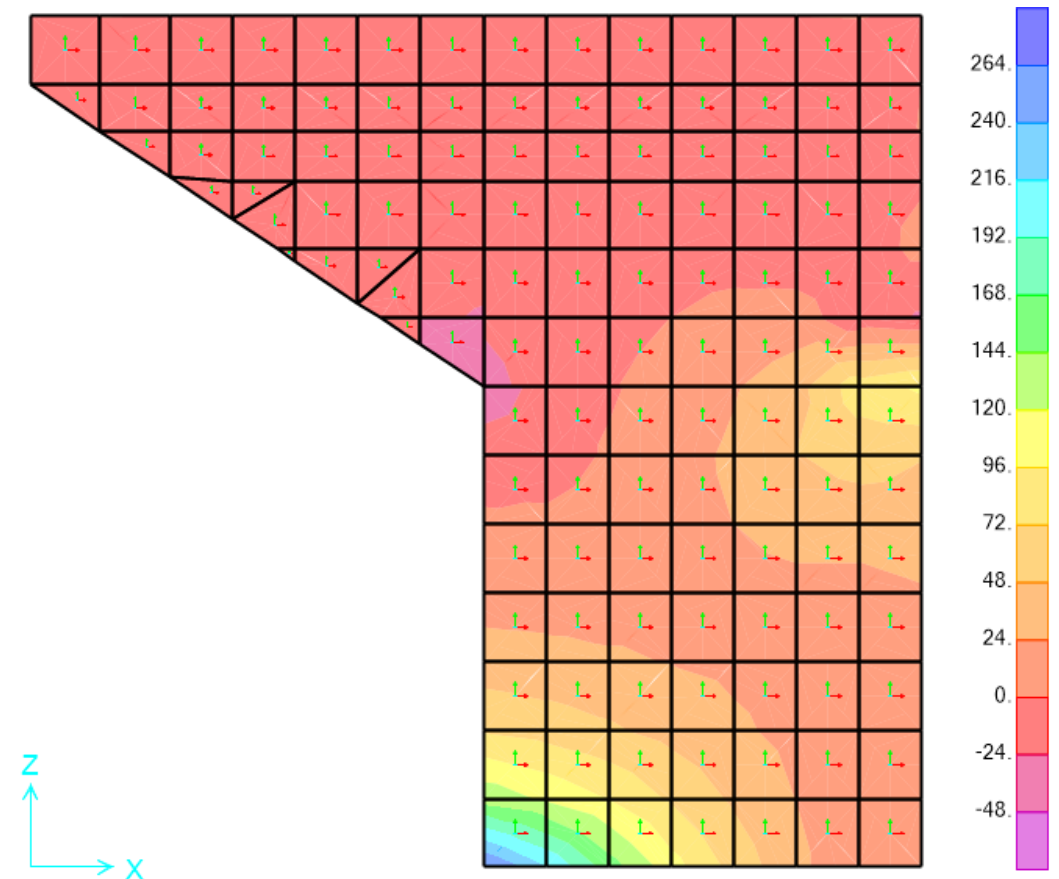
Fig. 6.1 Model 3D d'elements finits de l'aleta de l'estrep

## RESULTATS

A continuació es mostren els esforços de l'aleta en Estat Límit Últim.

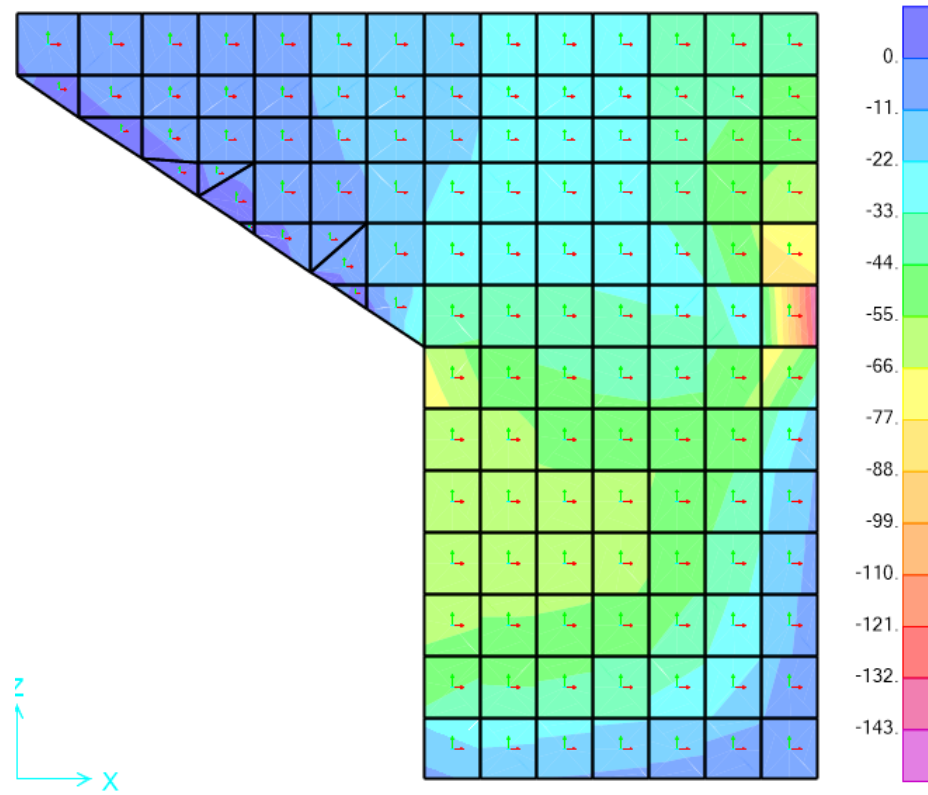


ELU. Moments flectors M11 [kNm/m]

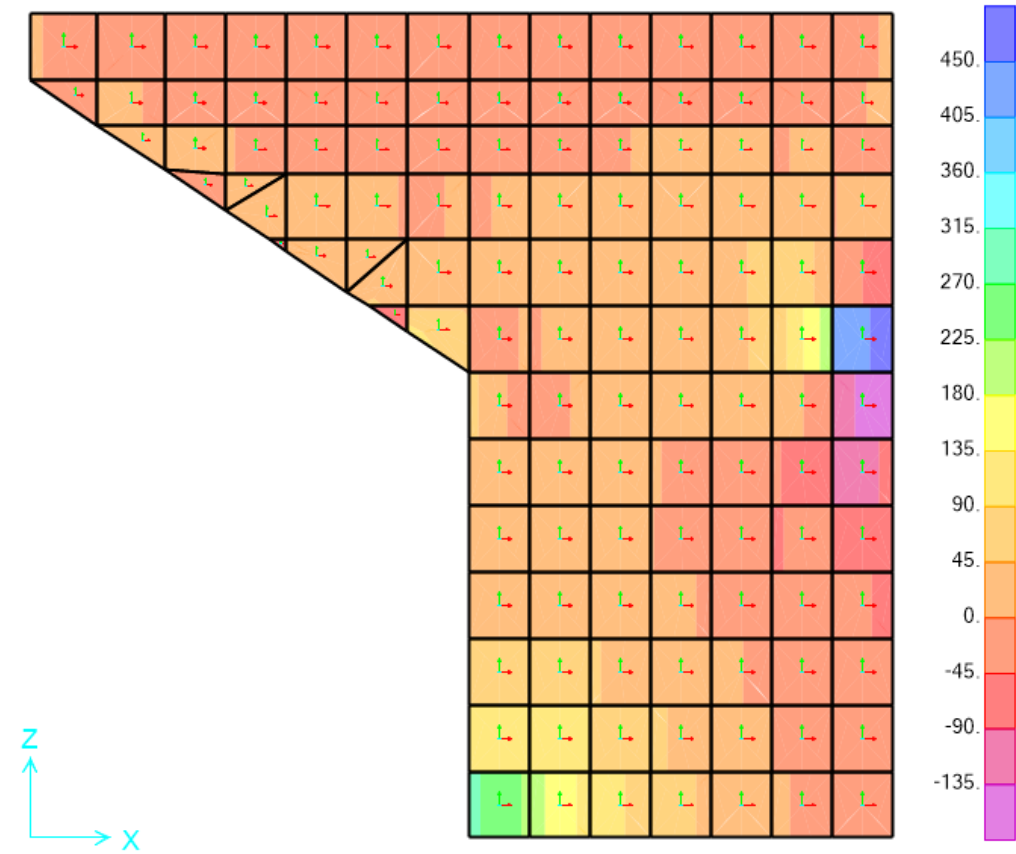


ELU. Moments flectors M22 [kNm/m]

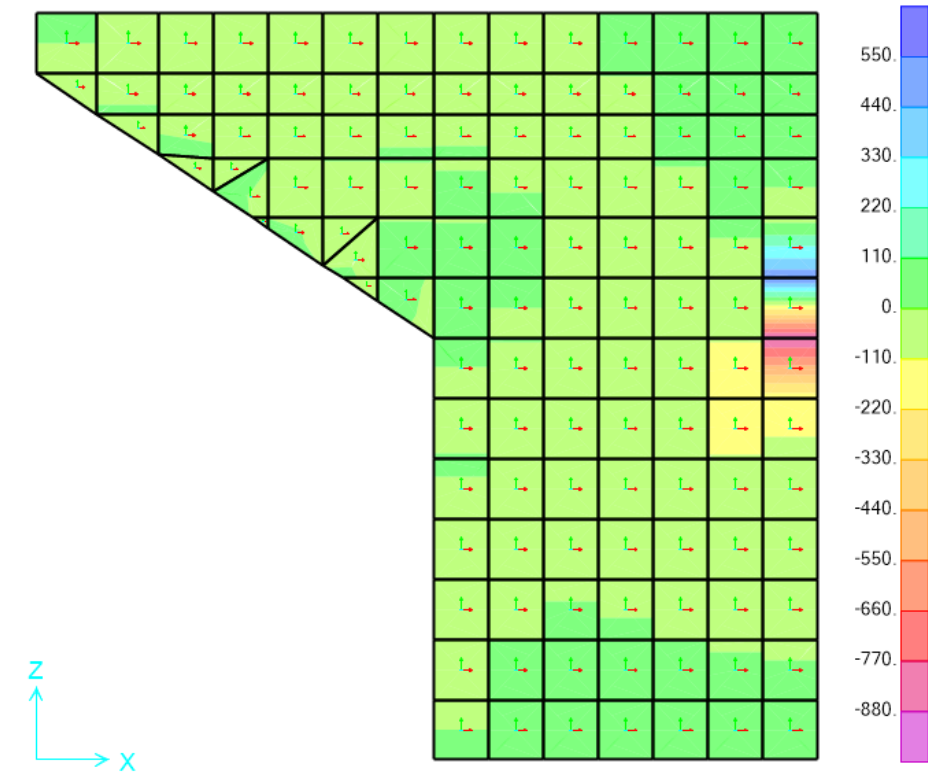




ELU. Moments flectors M12 [kNm/m]



ELU. Esforços de tallant V23 [kN/m]



ELU. Esforços de tallant V13 [kN/m]

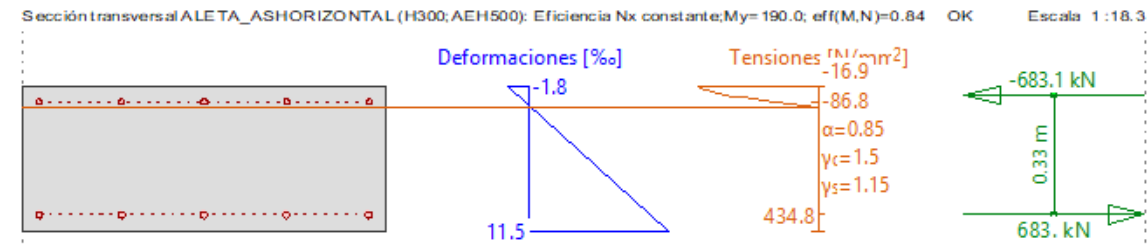
VERIFICACIONES

ESTAT LÍMIT ÚLTM – FLEXIÓ

L'armat disposat és el següent.

- Armat horitzontal mínim = 7.67 cm<sup>2</sup>/m
- Armat horitzontal disposat al intradós = Φ16 a 0.20m (10.05 cm<sup>2</sup>/m)
- Armat horitzontal disposat al trasdós = Φ20 a 0.20m (15.70 cm<sup>2</sup>/m)

El moment de disseny màxim de 190 kNm/m es resisteix amb l'armat a l'intradós amb un factor de seguretat de 1.19.



Càlc. capacidad última Sección (Viga): ALETA\_ASHORIZONTAL

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.84$  OK

No.	AP	P	Flexión y esfuerzo normal			eff(M,N)	Esfuerzos de corte y torsión			Sección completa eff(M,N,V,T)
			N [kN]	M <sub>y</sub> [kNm]	M <sub>x</sub> [kNm]		V <sub>y</sub> [kN]	V <sub>x</sub> [kN]	T [kNm]	
1	!ELU		0	190.0	0	0.84				

\* : Fuerza constante

Parámetros de análisis "¡ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama	Límites de deformación			σ <sub>s</sub> [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
		ε <sub>c2</sub> [‰]	ε <sub>cu3</sub> [‰]	ε <sub>ud</sub> [‰]		α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
!ELU	2/0	1	-2.	-3.5	10.	0.85	1.5	1.15	45.	0.

θ : Inclinación de las bielas de compresión

φ : Coef. de fluencia

Deformaciones y tensiones extremas

Nombre	Clase	y <sub>0</sub> [m]	z <sub>0</sub> [m]	ε [‰]	σ <sub>d</sub> [N/mm <sup>2</sup> ]	γ [-]
C1	H300	1.	0.4	-1.8	-16.9	1.76
C1	H300	0.	0.	11.5	0.	1.76
R1	AEH500	0.04	0.36	-0.4	-86.8	1.15
R2	AEH500	0.04	0.04	10.	434.8	1.15

Estado Último "¡ELU"

N [kN]	Esfuerzos		Deformación y curvatura			Valores rigidez		
	M <sub>y</sub> [kNm]	M <sub>x</sub> [kNm]	ε <sub>x</sub> [‰]	χ <sub>y</sub> [km <sup>-1</sup> ]	χ <sub>x</sub> [km <sup>-1</sup> ]	N/ε <sub>x</sub> [kN]	M <sub>y</sub> /χ <sub>y</sub> [kNm <sup>2</sup> ]	M <sub>x</sub> /χ <sub>x</sub> [kNm <sup>2</sup> ]
-0.1	226.6	0.	4.8	33.4	0.0	23.37	6790.49	16383.57

Sección (Viga): ALETA\_ASHORIZONTAL

Armadura G0 Σ A<sub>s</sub> = 2576.11 mm<sup>2</sup>, ρ = 0.6 %

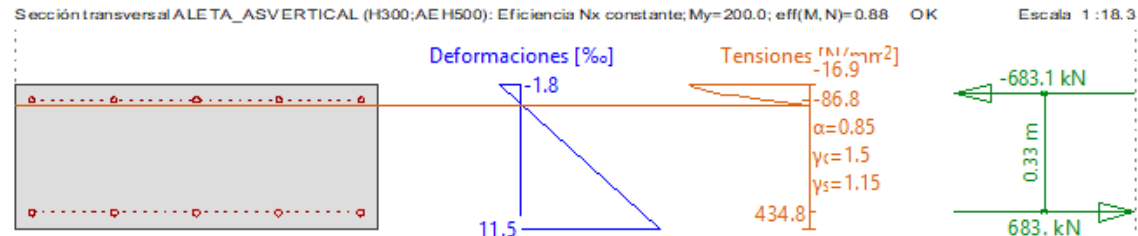
Nombre	Material	BC	Tipo	y <sub>1q</sub> [m]	z <sub>1q</sub> [m]	y <sub>2q</sub> [m]	z <sub>2q</sub> [m]	as/m' [mm <sup>2</sup> /m]	n, ∅	exist A <sub>s</sub> [mm <sup>2</sup> ]
R1	R (AEH500)	2	PL	0.04	0.36	0.96	0.36	20106.19	5∅16	1005.31
R2	R (AEH500)	2	PL	0.04	0.04	0.95	0.04	31415.93	5∅20	1570.80

BC : BC: 0=área constante, 1=dimensionar bajo tracción y compresión 2=dimensionar bajo tracción únicamente

Tipo : Definición armadura: P = Punto, L = Línea, R = De forma circular

- Armat vertical mínim = 7.67 cm<sup>2</sup>/m
- Armat vertical disposat al intradós = Φ16 a 0.20m (10.05 cm<sup>2</sup>/m)
- Armat vertical disposat al trasdós = Φ20 a 0.20m (15.70 cm<sup>2</sup>/m)

El moment de disseny màxim de 200 kNm/m es resisteix amb l'armat a l'intradós amb un factor de seguretat de 1.14.



**Càlc. capacidad última Sección (Viga): ALETA**

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.88$  OK

No.	AP	P	N [kN]	Flexión y esfuerzo normal			eff(M,N) [-]	Esfuerzos de corte y torsión			Sección completa eff(M,N,V,T) [-]
				$M_y$ [kNm]	$M_z$ [kNm]			$V_y$ [kN]	$V_z$ [kN]	T [kNm]	
1	!ELU		+ 0	200.0	0	0	0.88				

Parámetros de análisis "ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_{cc}$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{c0.3}$ [‰]	$\epsilon_{cs}$ [‰]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
!ELU	2/0	1	-2.	-3.5	10.	0.85	1.5	1.15	45.	0.	

**Deformaciones y tensiones extremas**

Nombre	Clase	$y_o$ [m]	$z_o$ [m]	$\epsilon$ [‰]	$\sigma_o$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C1	H300	1.	0.4	-1.8	-16.9	1.76
C1	H300	0.	0.	11.5	0.	1.76
R1	AEH500	0.04	0.36	-0.4	-86.8	1.15
R2	AEH500	0.04	0.04	10.	434.8	1.15

**Estado Último "ELU"**

N [kN]	Esfuerzos		Deformación y curvatura			Valores rigidez		
	$M_y$ [kNm]	$M_z$ [kNm]	$\epsilon_x$ [‰]	$\chi_{y1}$ [km <sup>-1</sup> ]	$\chi_{z1}$ [km <sup>-1</sup> ]	$N/\epsilon_x$ [kN]	$M_y/\chi_y$ [kNm <sup>2</sup> ]	$M_z/\chi_z$ [kNm <sup>2</sup> ]
-0.1	226.6	0.	4.8	33.4	0.0	23.37	6790.49	539139.19

**Sección (Viga): ALETA\_ASVERTICAL**

Armadura G0  $\Sigma A_s = 2576.11 \text{ mm}^2$ ,  $\rho = 0.6 \%$

Nombre	Material	BC	Tipo	$y_{10}$ [m]	$z_{10}$ [m]	$y_{20}$ [m]	$z_{20}$ [m]	$as/m'$ [mm <sup>2</sup> /m]	$n, \emptyset$	exist $A_s$ [mm <sup>2</sup> ]
R1	R (AEH500)	2	PL	0.04	0.36	0.96	0.36	20106.19	5Ø16	1005.31
R2	R (AEH500)	2	PL	0.04	0.04	0.95	0.04	31415.93	5Ø20	1570.80

BC : BC: 0=áreas constante, 1=dimensionar bajo tracción y compresión 2=dimensionar bajo tracción únicamente  
 Tipo : Definición armadura: P = Punto, L = Línea, R = De forma circular

**ESTAT LÍMIT ÚLTM – TALLANT**

El tallant resistent de la secció és de 225 kN/m, donat que el tallant de disseny és 200 kN/m no serà necessari disposar d'armat de tallant.

**CORTANTE EHE-08**  
 PIEZAS SIN ARMADURA DE CORTANTE  
 EHE08\_44.2\_V.00 - RESISTENCIA A ESFUERZO CORTANTE.xlsx  
 22/06/2020 **ayesa** Engineering, Information, Imagination.

fck =	30	MPa
γc =	1.5	
fcv =	30	MPa
fcd =	20.00	MPa
f1cd =	12.0	MPa
fct,m =	2.90	MPa
h =	0.4	m
b0 =	1	m
r =	0.045	m
cotg θ =	1	0.5 < cotg θ < 2.0
cotg θe =	1.00	
α =	90.00	º
cotg α =	0.0000	
As,long =	10.05	cm2
Vd =	0.2	MN
Nd =	0	MN

Axil positivo: COMPRESIÓN

**1) AGOTAMIENTO BIELAS COMPRIMIDAS**

σc =	0.00	MPa
K =	1.00	
Vu1 =	2.13	MN
CSa =	10.65	

**2) AGOTAMIENTO POR TRACCIONES EN EL ALMA**

**2.1) CONTRIBUCIÓN DEL HORMIGÓN**

ξ =	1.751	
σ'c =	0.00	MPa
z =	0.3195	m
ρ l =	0.00283	
Vu2 =	0.152	MN
Vu2,min =	0.225	MN
Vu2 =	0.225	MN
CSa =	1.13	

# Impacto:

Armat vertical:

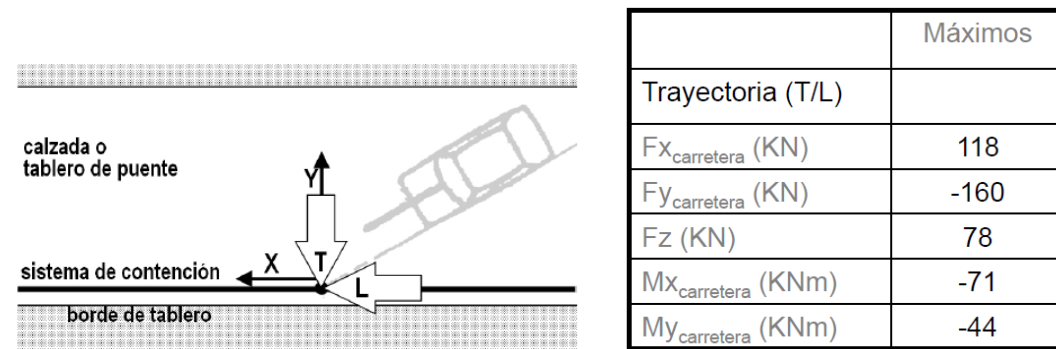
- Armat vertical trasdós:  $\Phi 20$  a 0.20m (15.71 cm<sup>2</sup>/m)
- Armat vertical intradós:  $\Phi 16$  a 0.20m (10.05 cm<sup>2</sup>/m)

Armat horizontal:

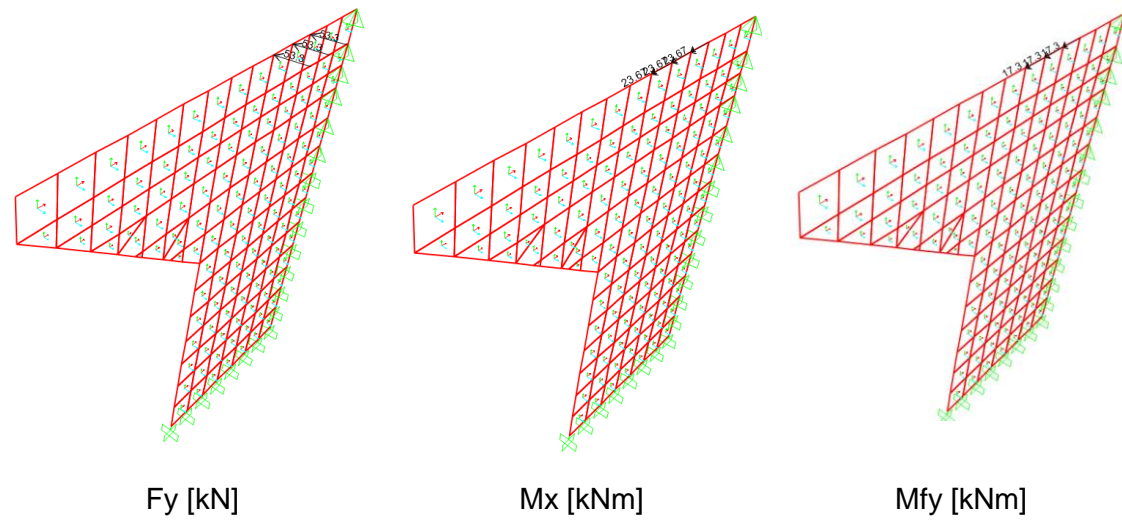
- Armadura horizontal trasdós:  $\Phi 16$  a 0.20m (10.05 cm<sup>2</sup>/m)
- Armadura horizontal intradós:  $\Phi 16$  a 0.20m (10.05 cm<sup>2</sup>/m)

## ACCIONS

- Empenta de terres: densitat del terreny de 20 kN/m<sup>3</sup> i un angle de fregament intern de 30°.
- Sobrecàrrega accidental



## APLICACIÓ DE ACCIONS SOBRE EL MODEL



**ESFORÇOS**

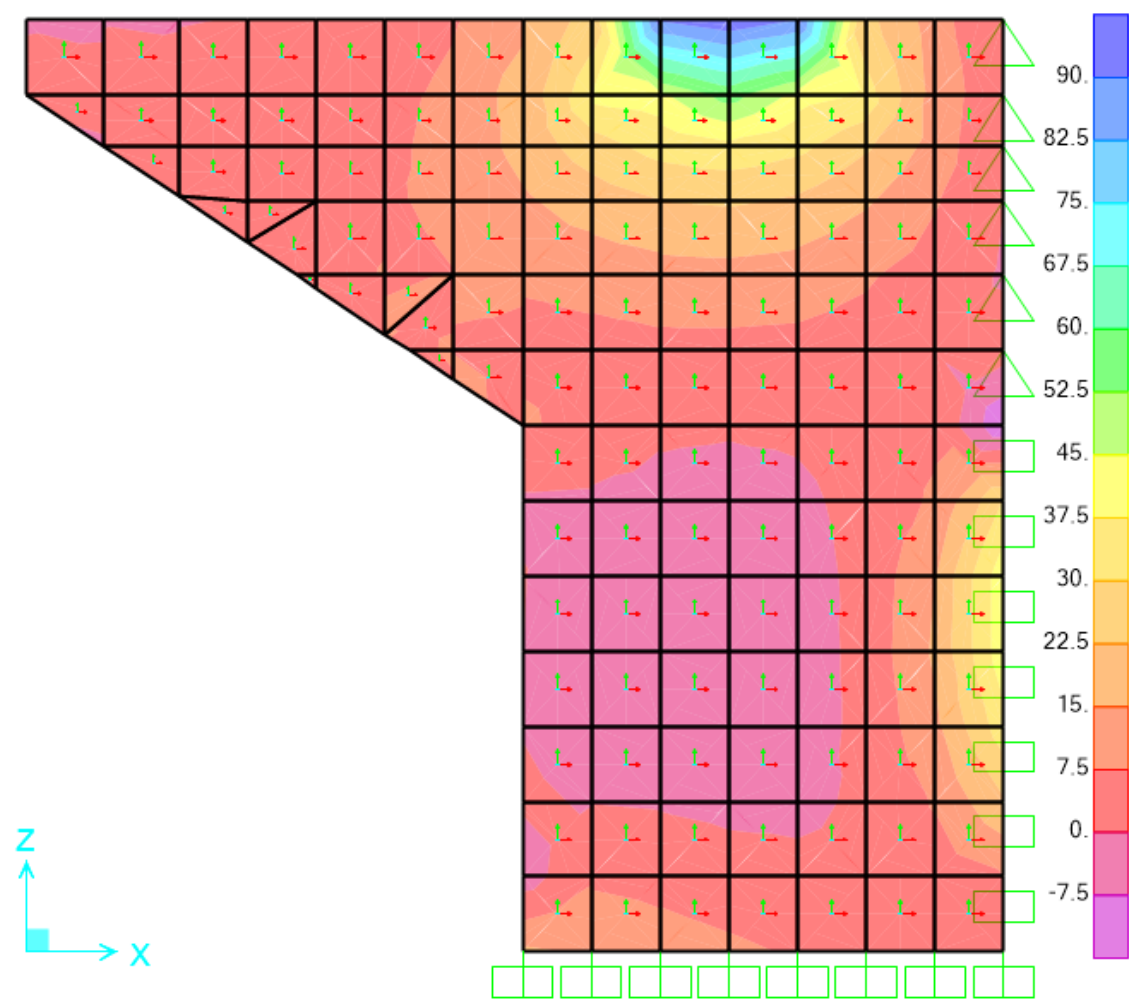


Figura 1: Model tauler 3D. ELU Moments flectors  $M_{11}$  [kNm/m]

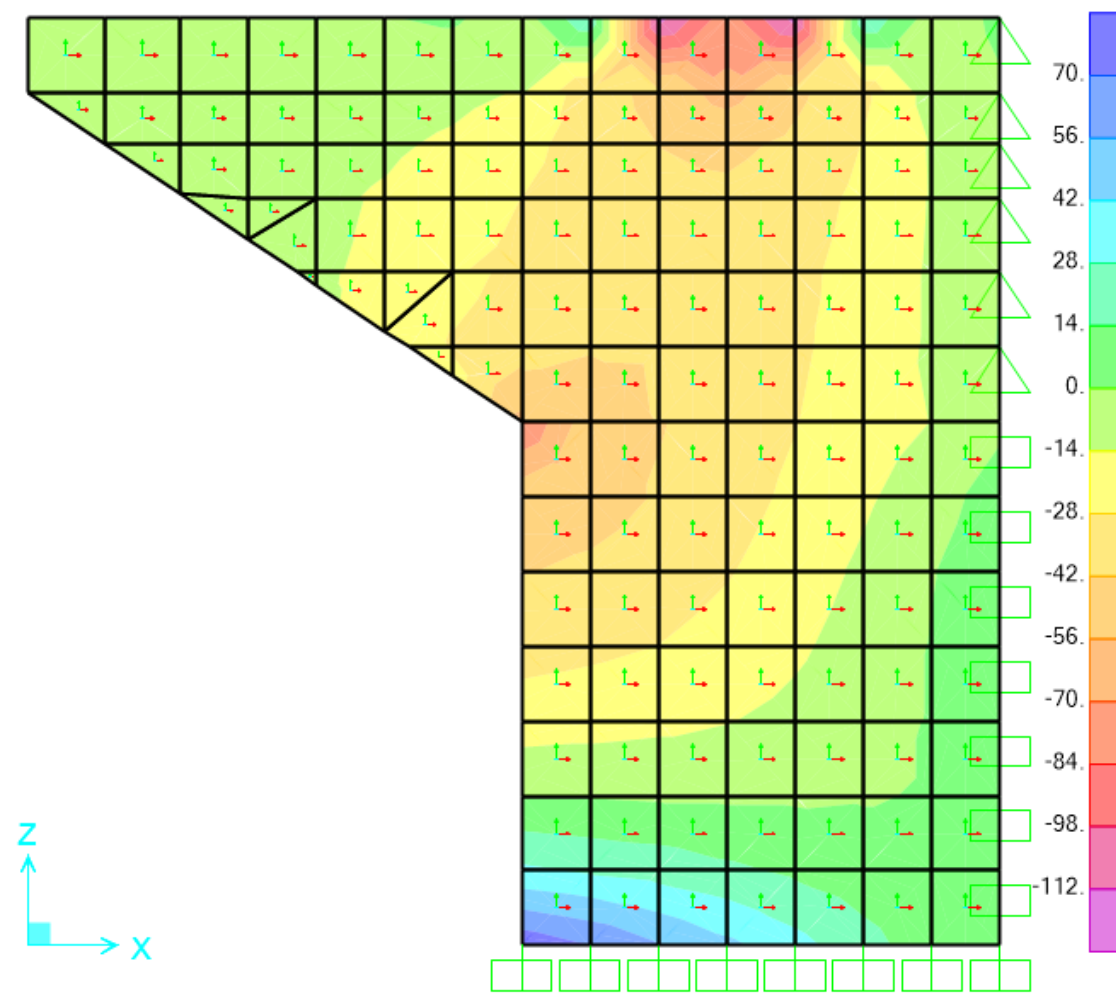


Figura 2: Model tauler 3D. ELU Moments flectors  $M_{22}$  [kNm/m]

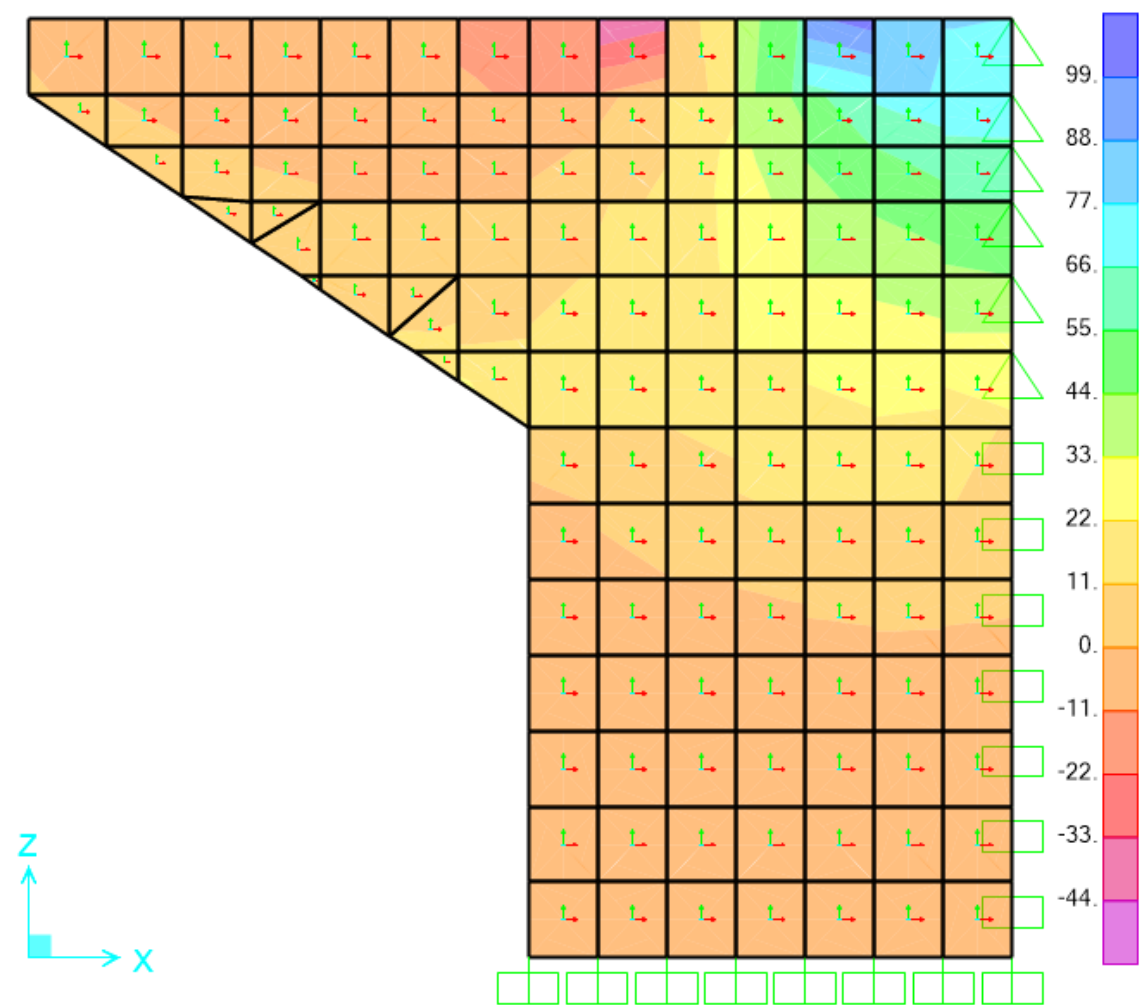


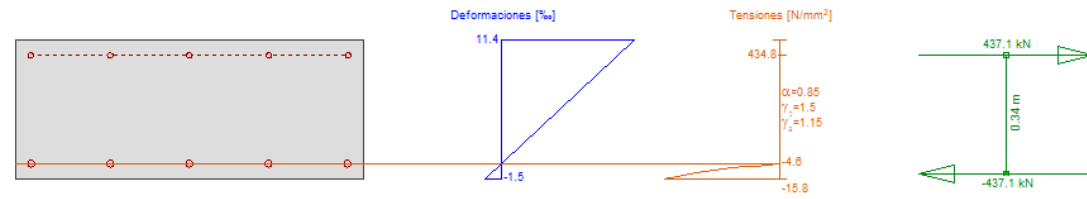
Figura 3: Modelo tauler 3D. ELU Moments flectors  $M_{12}$  [ $\text{kNm/m}$ ]



## VERIFICACIONES

Armat vertical:

Eficiencia Nx constante; My=-134.0; eff(M,N)=0.9 OK



Cálc. capacidad última Sección (Viga): ALETA\_ASVERTICAL

Solicitaciones / Factores de eficiencia: eff(M,N)=0.9 OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa eff(M,N,V,T) [-]
			N [kN]	M <sub>y</sub> [kNm]	M <sub>x</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>x</sub> [kN]	T [kNm]	eff(V,T) [-]	
1	!ELU		0	-134.0	0	0.90					

Parámetros de análisis "ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama	Límites de deformación	Factores de la resistencia				Otros valores			
			$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]	$\sigma_{cs}$ [N/mm²]	$\alpha_{cs}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]
!ELU	Z/O	1	-2.	-3.5	10.	0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas

Nombre	Clase	y <sub>0</sub> [m]	z <sub>0</sub> [m]	$\epsilon$ [‰]	$\sigma_c$ [N/mm²]	$\gamma$ [-]
C1	H300	0.	0.	-1.5	-15.8	1.76
C1	H300	1.	0.4	11.4	0.	1.76
R2	AEH500	0.04	0.04	0.	-4.6	1.15
R1	AEH500	0.04	0.36	10.	434.8	1.15

Estado Último "ELU"

N [kN]	Esfuerzos		Deformación y curvatura			Valores rigidez		
	M <sub>y</sub> [kNm]	M <sub>x</sub> [kNm]	$\epsilon_x$ [‰]	$\chi_{y1}$ [km⁻¹]	$\chi_{z1}$ [km⁻¹]	N/ $\epsilon_x$ [kN]	M <sub>y</sub> / $\chi_{y1}$ [kNm²]	M <sub>x</sub> / $\chi_{z1}$ [kNm²]
0.	-148.7	0.	5.0	-32.1	0.0	7.69	4628.19	25935.88

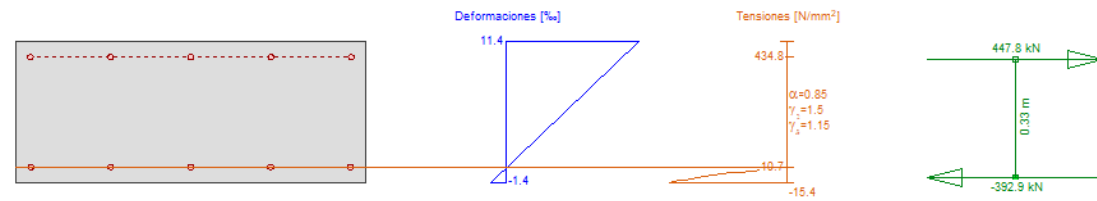
Armadura G0  $\Sigma A_s = 2576.11 \text{ mm}^2$ ,  $\rho = 0.6 \%$

Nombre	Material	BC	Tipo	y <sub>1q</sub> [m]	z <sub>1q</sub> [m]	y <sub>2q</sub> [m]	z <sub>2q</sub> [m]	as/m' [mm²/m]	n, $\emptyset$	exist A <sub>s</sub> [mm²]
R1	R(AEH500)	2	PL	0.04	0.36	0.96	0.36	20106.19	5 $\emptyset$ 16	1005.31
R2	R(AEH500)	2	PL	0.04	0.04	0.95	0.04	31415.93	5 $\emptyset$ 20	1570.80



### Armat horizontal:

Eficiencia Nx constante; Nx=55.0; My=-132.0; eff(M,N)=0.95 OK



### Cálculo capacidad última Sección (Viga): ALETA\_ASHORIZONTAL1

Solicitaciones / Factores de eficiencia: eff(M,N)=0.95 OK

No.	AP	P	Flexión y esfuerzo normal			eff(M,N)	Esfuerzos de corte y torsión			Sección completa eff(M,N,V,T)
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]		V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	
1	!ELU		+ 55.0	-132.0	0	0.95				

Fuerza constante

### Parámetros de análisis "!ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			Factores de la resistencia			Otros valores	
	c	s	ε <sub>cu2</sub> [%]	ε <sub>cu3</sub> [%]	ε <sub>cu4</sub> [%]	α <sub>oc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
!ELU	2/0	1	-2.	-3.5	10.	0.85	1.5	1.15	45.	0.

θ : Inclinación de las bielas de compresión  
φ : Coef. de fluencia

### Deformaciones y tensiones extremas

Nombre	Clase	y <sub>0</sub> [m]	z <sub>0</sub> [m]	ε [%]	σ <sub>0</sub> [N/mm²]	γ [-]
C1	H300	0.	0.	-1.4	-15.4	1.76
C1	H300	1.	0.4	11.4	0.	1.76
R2	AEH500	0.04	0.04	0.1	10.7	1.15
R1	AEH500	0.04	0.36	10.	434.8	1.15

### Estado Último "!ELU"

N [kN]	Esfuerzos		Deformación y curvatura			Valores rigidez		
	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	ε <sub>x</sub> [%]	χ <sub>y1</sub> [km <sup>-1</sup> ]	χ <sub>z1</sub> [km <sup>-1</sup> ]	N/ε <sub>x</sub> [kN]	M <sub>y</sub> /χ <sub>y1</sub> [kNm]	M <sub>z</sub> /χ <sub>z1</sub> [kNm]
54.9	-139.4	0.	5.0	-31.9	0.0	10993.01	4372.63	15697.97

Armadura G0 Σ A<sub>s</sub> = 2010.62 mm<sup>2</sup>, ρ = 0.5 %

Nombre	Material	BC	Tipo	y <sub>1q</sub> [m]	z <sub>1q</sub> [m]	y <sub>2q</sub> [m]	z <sub>2q</sub> [m]	as/m' [mm <sup>2</sup> /m]	n, ∅	exist A <sub>s</sub> [mm <sup>2</sup> ]
R1	R(AEH500)	2	PL	0.04	0.36	0.96	0.36	20106.19	5∅16	1005.31
R2	R(AEH500)	2	PL	0.04	0.04	0.95	0.04	20106.19	5∅16	1005.31

### Pilons als estreps

Segons l'annexe 07:

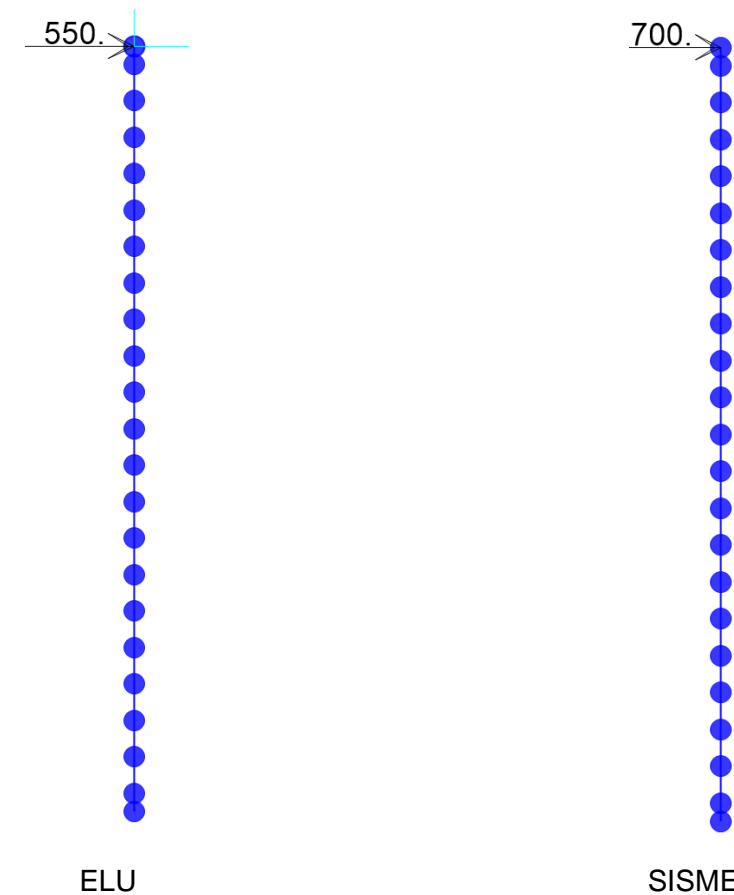
- Longitud pilons: 18 m (estrep 1) i 19 m (estrep 2)
- Axil màxim (Ndmax): 3575 kN (comb. característica) i 2296 kN (sisme)

El procediment de càlcul per obtenir els esforços y l'armadura dels pilons és el següent:

1. Model SAP de una viga aplicant motlles que simulen el terreny cada metre amb els coeficients de l'annex 7.
2. Es comprova que la reacció a les motlles es inferior a la màxima empenya passiva del terreny
3. Obtenció del esforços que dimensionen la armadura
4. Armat dels pilons mitjançant el prontuari informàtic de la EHE i fulles excel d'AYESA

A continuació es detalla cada un dels punts anterior.

Per al model SAP s'ha simulat un piló de l'estrep 1 i un altre per a l'estrep 2, tant en la situació de ELU com SISME, tal i com es mostra a la figura següent i amb les forces horitzontals indicades:



En tots els casos, la condició de contorn a la part superior del piló es un encastament mòvil. La profunditat de cada node, el coeficient de motlle aplicat (kh; annexe 07) y l'empenya passiva resistent del terreny (E<sub>p</sub>) per a cada piló segons estigui a l'estrep 1 o 2 es mostra a les següents taules

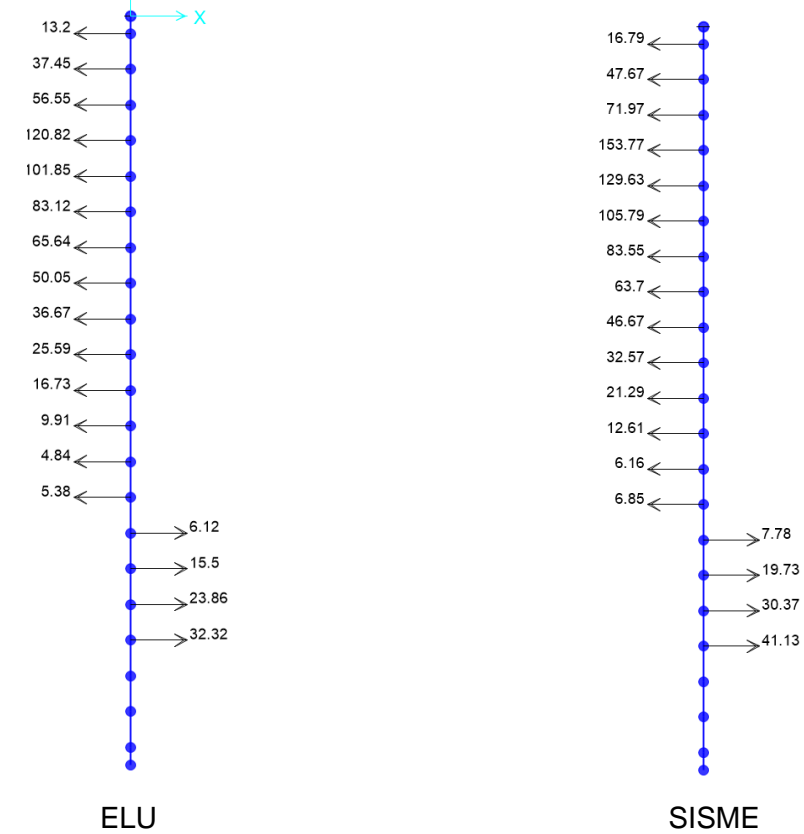
Id.	Estrep 1
Z <sub>cp</sub> (m)	42.7
Z <sub>NE</sub> (m)	40.7
L (m)	18
Z <sub>b</sub> (m)	24.7
q <sub>0</sub> (kPa)	26.6
ΔL (m)	1
D (m)	1.25

Prof.	Zi	Id.	γ	σ <sub>v</sub>	σ' <sub>v</sub>	c'	φ'	k <sub>p</sub>	Ep	kh	kh (SAP)
m	m	UG	kN/m <sup>3</sup>	kPa	kPa	kPa	(-)	(-)	kN	(MN/m)	kN
0.5	42.2	2	19	36.1	36.1	0	32	3.3	440.6	1.5	1500
1.5	41.2	2	19	55.1	55.1	0	32	3.3	672.5	4.5	4500
2.5	40.2	2	19	74.1	69.1	0	32	3.3	843.3	7.5	7500
3.5	39.2	3c	21	95.1	80.1	10	28	2.8	944.5	18.4	18375
4.5	38.2	3c	21	116.1	91.1	10	28	2.8	1058.7	18.4	18375
5.5	37.2	3c	21	137.1	102.1	10	28	2.8	1173.0	18.4	18375
6.5	36.2	3c	21	158.1	113.1	10	28	2.8	1287.3	18.4	18375
7.5	35.2	3c	21	179.1	124.1	10	28	2.8	1401.5	18.4	18375
8.5	34.2	3c	21	200.1	135.1	10	28	2.8	1515.8	18.4	18375
9.5	33.2	3c	21	221.1	146.1	10	28	2.8	1630.0	18.4	18375
10.5	32.2	3c	21	242.1	157.1	10	28	2.8	1744.3	18.4	18375
11.5	31.2	3c	21	263.1	168.1	10	28	2.8	1858.5	18.4	18375
12.5	30.2	3c	21	284.1	179.1	10	28	2.8	1972.8	18.4	18375
13.5	29.2	3s	21	305.1	190.1	0	34	3.5	2521.5	81.0	81000
14.5	28.2	3s	21	326.1	201.1	0	34	3.5	2667.4	87.0	87000
15.5	27.2	3s	21	347.1	212.1	0	34	3.5	2813.3	93.0	93000
16.5	26.2	3s	21	368.1	223.1	0	34	3.5	2959.3	99.0	99000
17.5	25.2	3s	21	389.1	234.1	0	34	3.5	3105.2	105.0	105000

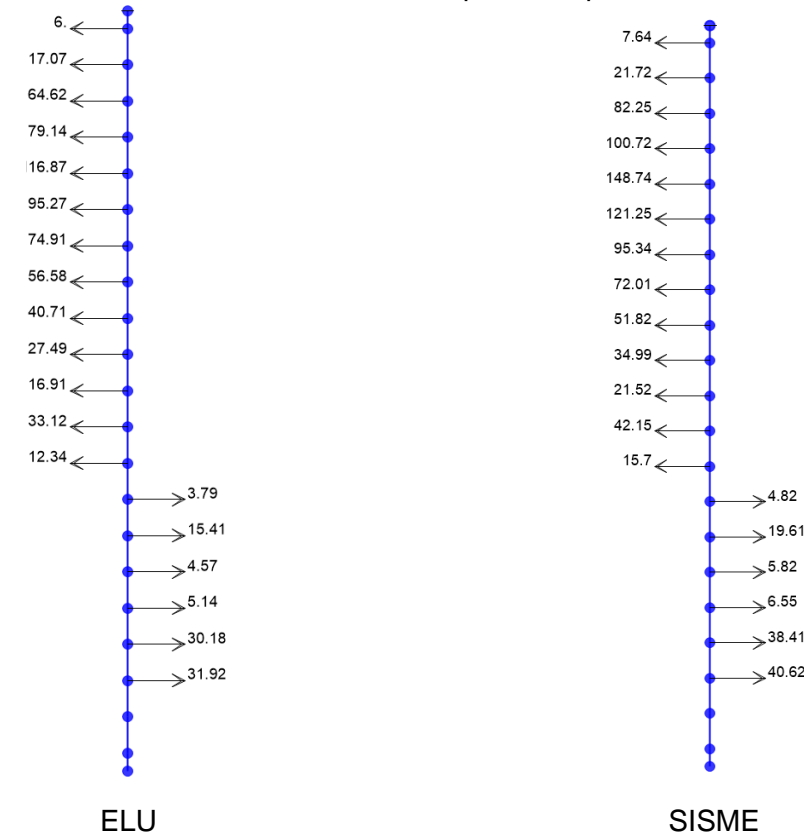
Id.	Estrep 2
Z <sub>cp</sub> (m)	43.3
Z <sub>NE</sub> (m)	40.9
L (m)	19
Z <sub>b</sub> (m)	24.3
q <sub>0</sub> (kPa)	26.6
ΔL (m)	1
D (m)	1.25

Prof.	Zi	Id.	γ	σ <sub>v</sub>	σ' <sub>v</sub>	c'	φ'	k <sub>p</sub>	Ep	kh	kh (SAP)
m	m	UG	kN/m <sup>3</sup>	kPa	kPa	kPa	(-)	(-)	kN	(MN/m)	kN
0.5	42.8	1	19	36.1	36.1	0	25	2.5	333.6	0.6	600
1.5	41.8	1	19	55.1	55.1	0	25	2.5	509.1	1.8	1800
2.5	40.8	2	19	74.1	73.1	0	32	3.3	892.2	7.5	7500
3.5	39.8	2	19	93.1	82.1	0	32	3.3	1002.0	10.5	10500
4.5	38.8	2	19	112.1	91.1	0	32	3.3	1111.8	18.4	18375
5.5	37.8	3c	21	133.1	102.1	10	28	2.8	1173.0	18.4	18375
6.5	36.8	3c	21	154.1	113.1	10	28	2.8	1287.3	18.4	18375
7.5	35.8	3c	21	175.1	124.1	10	28	2.8	1401.5	18.4	18375
8.5	34.8	3c	21	196.1	135.1	10	28	2.8	1515.8	18.4	18375
9.5	33.8	3c	21	217.1	146.1	10	28	2.8	1630.0	18.4	18375
10.5	32.8	3c	21	238.1	157.1	10	28	2.8	1744.3	18.4	18375
11.5	31.8	3c	21	259.1	168.1	10	28	2.8	1858.5	69.0	69000
12.5	30.8	3s	21	280.1	179.1	0	34	3.5	2375.6	75.0	75000
13.5	29.8	3s	21	301.1	190.1	0	34	3.5	2521.5	81.0	81000
14.5	28.8	3s	21	322.1	201.1	0	34	3.5	2667.4	87.0	87000
15.5	27.8	3c	21	343.1	212.1	10	28	2.8	2315.6	18.4	18375
16.5	26.8	3c	21	364.1	223.1	10	28	2.8	2429.8	18.4	18375
17.5	25.8	3s	21	385.1	234.1	0	34	3.5	3105.2	105.0	105000
18.5	24.8	3s	21	406.1	245.1	0	34	3.5	3251.1	111.0	111000

Reaccions motlles piló Estrep 1



Reaccions motlles piló Estrep 2



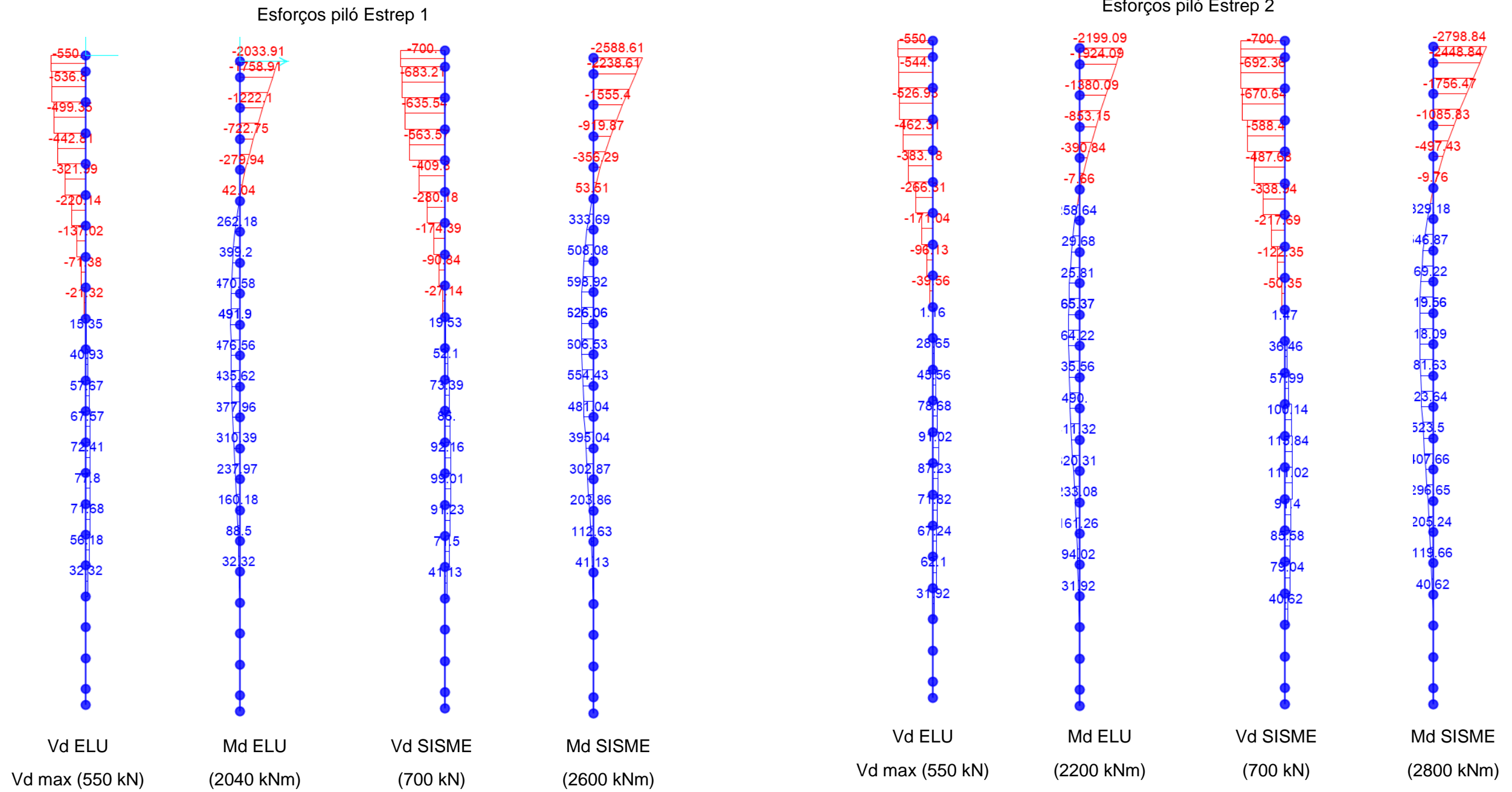
L'empenta passiva s'ha calculat considerant la "Guía de cimentaciones en obras de carretera", que considera l'efecte tridimensional segons es mostra a la següent figura

$$e(z) = \left( 9c + 3\gamma z \frac{1 + \sin \phi}{1 - \sin \phi} \right) \cdot D$$

$$E = \int_0^{L-\Delta} e(z) \cdot dz \quad \Delta = \frac{R}{e(L)}$$

A cap dels motlles es supera l'empenta passiva segons es mostra a continuació

Per a cada estrep i en cada situació (ELU i sisme), s'obtenen els següents esforços de tallant (Vd) i moment (Md) que dimensionen l'armadura necessària



Els esforços màxims es troben al piló de l'estrep 2. Per simplicitat, es calcula l'armadura necessària per aquest piló i s'aplicarà també a l'estrep 1. Donat que el moment màxim es troba al cap del piló, l'armadura consistirà en una armadura mínima base i un reforç a la zona de moment màxim (part superior)

De totes les armadures mínimes, la més restrictiva és la geomètrica segons l'article 42.3.5 de l'EHE:

Tabla 42.3.5. Cuantías geométricas mínimas, en tanto por 1000, referidas a la sección total de homigón <sup>(6)</sup>

Tipo de elemento estructural	Tipo de acero	
	Aceros con $f_y = 400\text{N/mm}^2$	Aceros con $f_y = 500\text{N/mm}^2$
Pilares	4,0	4,0

Per tant, l'armadura base per un piló de 1.25 m de diàmetre és

$$A_{s,min} = 0.004 \times A_c = 49.1 \text{ cm}^2 = 10\emptyset 25$$

no obstant, per evitar separacions superiors a 30 cm entre barres, es decideix col·locar 14 barres de 25 mm de diàmetre.

$$A_{s,min} = 14\emptyset 25 = 68.72 \text{ cm}^2$$

Amb aquesta armadura, el moment resistent en ELU i sisme depèn de l'axil. Com els esforços no són elevats, la comprovació resistent s'ha fet amb els valors màxim i mínim de l'axil (conservador) segons la taula següent obtinguda d'apartats anteriors :

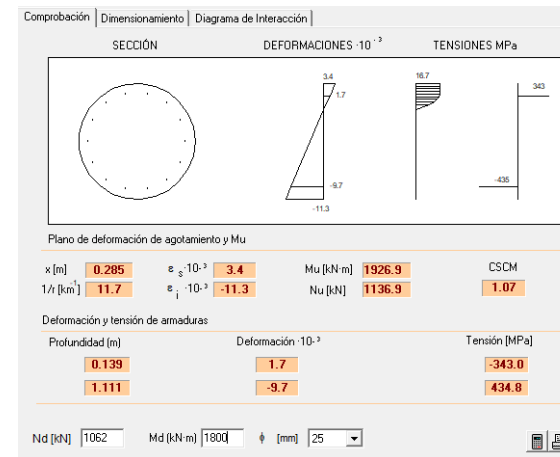
HIPÓTESIS	DESCRIPCIÓN	1	2	3	4	5	6
0	VACÍO	1062	1062	1062	1292	1292	1292
1	MÁX. REACCIÓN VERTICAL·RESTO ESF. CONC.	3110	3214	3317	1577	1680	1783
2	MÍN. REACCIÓN VERTICAL·RESTO ESF. CONC.	1827	1864	1901	1398	1435	1473
3	MÁX. MOM. VOLC.·RESTO ESF. CONC.	1830	1867	1904	1497	1535	1572
4	MÁX. MOM. ESTAB.·RESTO ESF. CONC.	3107	3211	3314	1477	1581	1684
5	MÁX. MOM. TRANSV.·RESTO ESF. CONC.	2785	3180	3575	1303	1698	2094
6	SISMO LONG	1725	1828	1931	1770	1873	1976
7	SISMO TRANSV	1791	2043	2296	1495	1747	2000
8	SISMO VERT	1918	2083	2248	1589	1754	1919

Segons la taula, els valors màxims i mínims són

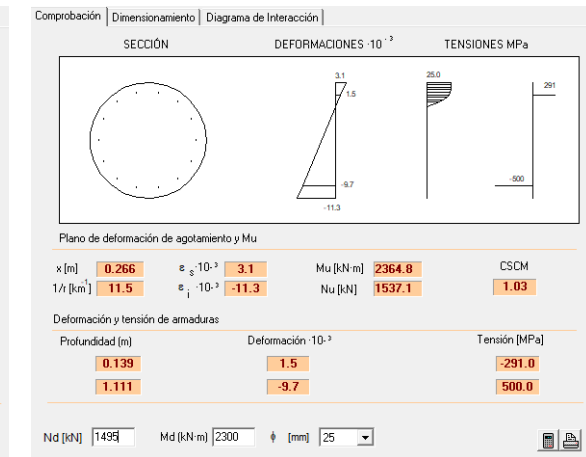
- Nd(max, min) ELU: 1062 kN; 3575 kN
- Nd(max, min) SISME: 1495; 2296 kN

A partir d'aquests valors s'obté que el factor de seguretat menor per la resistència a flexió amb l'armadura mínima es produeix amb l'axil mínim en cada cas. A continuació es mostra els valors obtinguts del prouari informàtic de l'EHE. El valor de recobriment aplicat es de 10 cm (7cm + 1.2 cm del cercos + 1.25 cm de mitja armadura longitudinal).

## Estrep 2. Resistencia a flexió amb armadura mínima



ELU (Nadmin)



SISME (Nadmin)

En resum, per l'armadura mínima es té

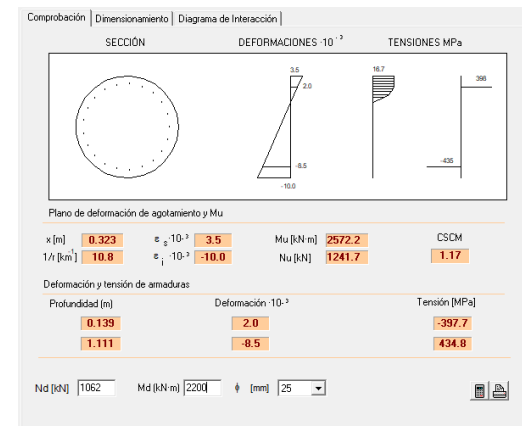
- Moment resistent ELU: 1800 kNm (profunditat = 0.75 m); FS = 1.07
- Moment resistent sisme: 2300 kNm (profunditat = 0.75 m); FS = 1.03

Per tant, cal un reforç en la part superior del piló per resistir el moments de disseny (Md) de 2200 kNm (ELU) y 2800 kNm (Sisme). Es proposa posar 7 barres addicionals de 25 mm en cada cas. En total es té

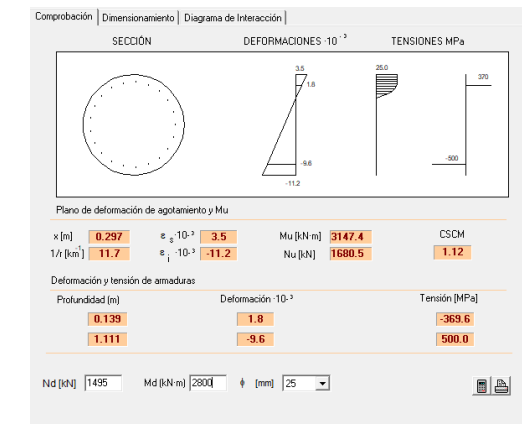
$$A_{s,long} = A_{s,min} + A_{s,reforc} = 14\emptyset 25 \text{ (tot el piló)} + 7\emptyset 25 \text{ (part superior)} = 103.1 \text{ cm}^2$$

La comprovació resistent es mostra a continuació

## Estrep 2. Resistencia a flexió amb armadura mínima + reforç



ELU (Nadmin); FS=1.17



SISME (Nadmin); FS = 1.12

Aquesta armadura es disposarà al primer metre superior + 1.25 m (decalatge) + longitud ancoratge (1.06 m en posició I de bona adherència).

$$L_{s,long} = 1 + 1.25 + 1.19 = 3.44 \text{ m} \approx 3.5 \text{ m}$$

Amb aquesta armadura longitudinal a flexió es procedeix a obtenir l'armadura de tallant. En aquest sentit, es considera una secció consistent en una secció quadrada inscrita a l'interior del pilot (conservador) on  $\frac{1}{4}$  de l'armadura longitudinal treballa a flexió. Així doncs, les característiques de la secció a tallant són:

- $b_0 = 0.9 \text{ m}$  (costat del quadrat inscrit dins del piló)
- $h = 1.25 - 0.5 \cdot (1.25 - 0.9) = 1.08 \text{ m}$
- Armadura longitudinal =  $103.1 \cdot 0.25 = 25.8 \text{ cm}^2$

Per la situació ELU s'obté  $10.1 \text{ cm}^2/\text{m}$  i  $10.9 \text{ cm}^2/\text{m}$  per la de sisme

CORTANTE EHE-08	
PIEZAS CON ARMADURA DE CORTANTE	
EHE08_44.2_V.00 - RESISTENCIA A ESFUERZO CORTANTE.xlsx	
17/09/2020	
fck =	25 MPa
$\gamma_c$ =	1.5
fcd =	16.67 MPa
f1cd =	10.0 MPa
fct,m =	2.56 MPa
h =	1.08 m
$b_0$ =	0.9 m
r =	0.1 m
cotg $\theta$ =	1 $0.5 < \text{cotg } \theta < 2.0$
cotg $\theta_e$ =	1.00
$\alpha$ =	90.00 °
cotg $\alpha$ =	0.0000
fyd =	400 MPa
As,long=	25.8 cm <sup>2</sup>
Vd =	0.55 MN
Nd =	0 MN
Compresiones positivas	
1) AGOTAMIENTO BIELAS COMPRIMIDAS	
$\sigma_c$ =	0.00 MPa
K =	1.00
Vu1 =	4.41 MN
CSa =	8.02
2) AGOTAMIENTO POR TRACCIONES EN EL ALMA	
2.1) CONTRIBUCIÓN DEL HORMIGÓN	
$\xi$ =	1.452
$\sigma'_c$ =	0.00 MPa
z =	0.882 m
$\rho_l$ =	0.00293
$\beta$ =	1.0000 con $\theta = \theta_e$
Vcu =	0.2485 MN
2.2) ARMADURA TRANSVERSAL NECESARIA	
$A_\alpha$ =	10.05 cm <sup>2</sup> /m
$A_{\alpha,\text{mín}}$ =	7.50 cm <sup>2</sup> /m
3) SEPARACIÓN LONGITUDINAL DE ARMADURAS TRANSVERSALES	
St ≤	0.60 m

ELU

CORTANTE EHE-08	
PIEZAS CON ARMADURA DE CORTANTE	
EHE08_44.2_V.00 - RESISTENCIA A ESFUERZO CORTANTE.xlsx	
17/09/2020	
fck =	25 MPa
$\gamma_c$ =	1
fcd =	25.00 MPa
f1cd =	15.0 MPa
fct,m =	2.56 MPa
h =	1.08 m
$b_0$ =	0.9 m
r =	0.1 m
cotg $\theta$ =	1 $0.5 < \text{cotg } \theta < 2.0$
cotg $\theta_e$ =	1.00
$\alpha$ =	90.00 °
cotg $\alpha$ =	0.0000
fyd =	400 MPa
As,long=	25.8 cm <sup>2</sup>
Vd =	0.7 MN
Nd =	0 MN
Compresiones positivas	
1) AGOTAMIENTO BIELAS COMPRIMIDAS	
$\sigma_c$ =	0.00 MPa
K =	1.00
Vu1 =	6.62 MN
CSa =	9.45
2) AGOTAMIENTO POR TRACCIONES EN EL ALMA	
2.1) CONTRIBUCIÓN DEL HORMIGÓN	
$\xi$ =	1.452
$\sigma'_c$ =	0.00 MPa
z =	0.882 m
$\rho_l$ =	0.00293
$\beta$ =	1.0000 con $\theta = \theta_e$
Vcu =	0.3728 MN
2.2) ARMADURA TRANSVERSAL NECESARIA	
$A_\alpha$ =	10.91 cm <sup>2</sup> /m
$A_{\alpha,\text{mín}}$ =	11.25 cm <sup>2</sup> /m
3) SEPARACIÓN LONGITUDINAL DE ARMADURAS TRANSVERSALES	
St ≤	0.60 m

SISME

L'armadura requerida es complex amb cercols de 12 mm cada 20 cm

$$A_v = 10.91 \frac{\text{cm}^2}{\text{m}} \times \frac{0.2 \text{ m}}{2 \text{ barras}} = 1.091 \frac{\text{cm}^2}{\text{barra}} < 1.13 \text{ cm}^2 (\text{área } \emptyset 12)$$

Aquesta armadura es duplicarà els primers 1.25 m de la part superior del piló.

## Càlcul de les piles

- ELU Persistente: 
$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} + \sum_{m \geq 1} \gamma_{G,m} G_{k,m}^* + \gamma_{Q,1} Q_{k,1} + \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i}$$
- ELU Sismo: 
$$\sum_{j \geq 1} G_{k,j} + \sum_{m \geq 1} G_{k,m}^* + \psi_{2,1} Q_{k,1} + A_{Ed}$$
- ELS Cuasi Permanente: 
$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} + \sum_{m \geq 1} \gamma_{G,m} G_{k,m}^* + \sum_{i > 1} \gamma_{Q,i} \psi_{2,i} Q_{k,i}$$

Se definen 6 combinaciones para ELU Persistente para las distintas acciones dominante y sus respectivas las acciones concomitante y 3 combinaciones para ELU de Sismo para cada dirección.

	G		G*	Q							A		
	G1	G2	REOLOGÍA	SC	FRENADO	W_TRANSV_CON_SC	W_LONG_CON_SC	W_TRANSV_SIN_SC	W_LONG_SIN_SC	TEMP	SISMO_TRASN	SISMO_LONG	SISMO_VERT
ELU PERS. 1	1.0/1.35	1.0/1.35	1.0/1.35	0/1.35*1	0/1.35*1	0/1.5*0.6	-	-	-	0/1.5*0.6	-	-	-
ELU PERS. 2	1.0/1.35	1.0/1.35	1.0/1.35	0/1.35*1	0/1.35*1	-	0/1.5*0.6	0	0	0/1.5*0.6	-	-	-
ELU PERS. 3	1.0/1.35	1.0/1.35	1.0/1.35	0/1.35*0.75	0/1.35*0	0/1.5*1	-	-	-	0/1.5*0.6	-	-	-
ELU PERS. 4	1.0/1.35	1.0/1.35	1.0/1.35	0/1.35*0.75	0/1.35*0	-	0/1.5*1	-	-	0/1.5*0.6	-	-	-
ELU PERS. 5	1.0/1.35	1.0/1.35	1.0/1.35	-	-	-	-	0/1.5*1	-	0/1.5*0.6	-	-	-
ELU PERS. 6	1.0/1.35	1.0/1.35	1.0/1.35	-	-	-	-	-	0/1.5*1	0/1.5*0.6	-	-	-
ELU SISMO 1	1.0/1.35	1.0/1.35	1.0/1.35	0	0	0	0	0	0	0	1	-	-
ELU SISMO 2	1.0/1.35	1.0/1.35	1.0/1.35	0	0	0	0	0	0	0	-	1	-
ELU SISMO 3	1.0/1.35	1.0/1.35	1.0/1.35	0	0	0	0	0	0	0	-	-	1
ELS CP	1	1	1	0/1*0.2	0/1*0.2	0/1*0	0/1*0	0/1	0/1	0/1*0.5	-	-	-

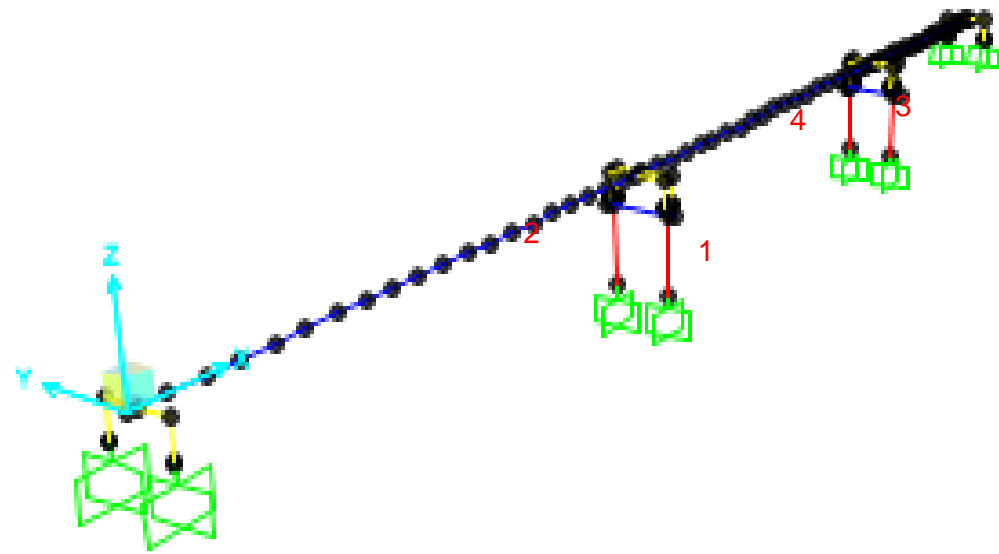
#### Leyes de esfuerzos

A partir del modelo estructural de SAP, se obtienen las leyes de esfuerzos para cada combinación de acciones definida anteriormente. En el caso de los pilares, se tiene en cuenta el efecto del pandeo según EHE-08.

#### Combinación de acciones

Según IAP-2011, la combinación de acciones se hará de acuerdo con las expresiones siguientes:





Pilar 1

	Esfuerzos axiales		Momentos flectores		Esfuerzo cortante	
	N <sub>min</sub> KN	N <sub>max</sub> KN	M <sub>Ed,Nmin</sub> KN/m	M <sub>Ed,Nmax</sub> KN/m	V <sub>2</sub> KN	V <sub>3</sub> KN
ELU PERS 1	-2340	-8919	1812	2400	-220	239
ELU PERS 2	-2392	-8919	1627	2213	-257	-3
ELU PERS 3	-2450	-7749	1437	1748	-70	396
ELU PERS 4	-2537	-7749	1037	1464	-132	-3
ELU PERS 5	-2970	-4655	920	1041	-69	178
ELU PERS 6	-2970	-4242	1010	1119	-122	-1
ELU SISMO 1	-1910	-5302	1767	2048	-164	-413
ELU SISMO 2	-2549	-4664	2779	3001	-397	-124
ELU SISMO 3	-2243	-4969	1400	1656	-175	-124

Pilar 2

	Esfuerzos axiales		Momentos flectores		Esfuerzo cortante	
	N <sub>min</sub> KN	N <sub>max</sub> KN	M <sub>Ed,Nmin</sub> KN/m	M <sub>Ed,Nmax</sub> KN/m	V <sub>2</sub> KN	V <sub>3</sub> KN
ELU PERS 1	-2846	-10059	1862	2491	-220	239
ELU PERS 2	-2856	-9532	1878	2481	-257	-3
ELU PERS 3	-2991	-9239	1470	1832	-69	396
ELU PERS 4	-2991	-8362	1078	1509	-131	-3
ELU PERS 5	-3424	-5232	953	1080	-69	178
ELU PERS 6	-3424	-4854	1050	1169	-122	-1
ELU SISMO 1	-2364	-5915	1807	2096	-164	-413
ELU SISMO 2	-3003	-5277	2828	3063	-397	-124
ELU SISMO 3	-2698	-5582	1446	1710	-175	-124

Pilar 3

	Esfuerzos axiales		Momentos flectores		Esfuerzo cortante	
	N <sub>min</sub> KN	N <sub>max</sub> KN	M <sub>Ed,Nmin</sub> KN/m	M <sub>Ed,Nmax</sub> KN/m	V <sub>2</sub> KN	V <sub>3</sub> KN
ELU PERS 1	-2394	-8332	1525	2039	-178	199
ELU PERS 2	-2437	-8332	1557	2085	-213	2
ELU PERS 3	-2494	-7264	1494	1855	125	330
ELU PERS 4	-2566	-7264	1008	1392	120	1
ELU PERS 5	-2948	-4404	1175	1300	120	151
ELU PERS 6	-2948	-4061	1038	1134	120	0
ELU SISMO 1	-2184	-4827	1793	2040	210	306
ELU SISMO 2	-2632	-4379	2877	3061	416	92
ELU SISMO 3	-2502	-4509	1815	2014	245	92

Pilar 4

	Esfuerzos axiales		Momentos flectores		Esfuerzo cortante	
	N <sub>min</sub> KN	N <sub>max</sub> KN	M <sub>Ed,Nmin</sub> KN/m	M <sub>Ed,Nmax</sub> KN/m	V <sub>2</sub> KN	V <sub>3</sub> KN
ELU PERS 1	-2449	-8787	1536	2081	-184	199
ELU PERS 2	-2449	-8348	998	1473	-213	2
ELU PERS 3	-2579	-8012	1474	1873	120	330
ELU PERS 4	-2578	-7280	1008	1392	120	1
ELU PERS 5	-2960	-4393	1157	1280	120	151
ELU PERS 6	-2960	-4077	1038	1135	120	1
ELU SISMO 1	-2196	-4843	1793	2041	210	306
ELU SISMO 2	-2644	-4395	2878	3062	416	92
ELU SISMO 3	-2514	-4525	1816	2015	245	92

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	Momentos flectores				Esfuerzo cortante	
	M <sub>vert,min</sub> KN/m	M <sub>vert,max</sub> KN/m	M <sub>hor,min</sub> KN/m	M <sub>hor,max</sub> KN/m	V <sub>2</sub> KN	V <sub>3</sub> KN
ELU PERS	-1404	1326	-1	8	705	5
ELU SISMO	-1414	1331	-5	5	710	1
ELS CP	115	118	0	0	-	-

Comprobaciones

ELU de flexocompresión

Pilar 1

ELU Persistente

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.92$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]	
1	!ELU		-2340.0	1812.0	0	0.61						
2	!ELU		-2392.0	1627.0	0	0.54						
3	!ELU		-2450.0	1437.0	0	0.48						
4	!ELU		-2537.0	1037.0	0	0.35						
5	!ELU		-2970.0	920.0	0	0.34						
6	!ELU		-2970.0	1010.0	0	0.36						
7	!ELU		-8919.0	2400.0	0	0.92						
8	!ELU		-8919.0	2213.0	0	0.87						
9	!ELU		-7749.0	1748.0	0	0.72						
10	!ELU		-7749.0	1464.0	0	0.65						
11	!ELU		-4655.0	1041.0	0	0.43						
12	!ELU		-4242.0	1119.0	0	0.43						

Parámetros de análisis "!ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
!ELU	2/0	1	-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 12)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [‰]	$\sigma_s$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-17.	1.76
C	H300	0.	-0.5	1.6	0.	1.76
CR	AEH500	0.	0.43	-3.1	-434.8	1.15
CR	AEH500	0.	-0.43	1.3	265.9	1.15

ELU Sismo

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.82$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]	
1	AP4		-1910.0	1767.0	0	0.51						
2	AP4		-2549.0	2779.0	0	0.81						
3	AP4		-2243.0	1400.0	0	0.38						
4	AP4		-5302.0	2048.0	0	0.58						
5	AP4		-4664.0	3001.0	0	0.82						
6	AP4		-4969.0	1656.0	0	0.48						

Parámetros de análisis "AP4" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
AP4	2/0	1	-2.	-3.5	10.		1.	1.3	1.	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 6)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [‰]	$\sigma_s$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-23.1	1.30
C	H300	0.	-0.5	2.3	0.	1.30
CR	AEH500	0.	0.43	-3.1	-500.	1.00
CR	AEH500	0.	-0.43	1.9	394.	1.00

Pilar 2

ELU Persistente

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.98$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	
1	IELU		-2846.0	1862.0	0	0.62					
2	IELU		-2856.0	1878.0	0	0.62					
3	IELU		-2991.0	1470.0	0	0.49					
4	IELU		-2991.0	1078.0	0	0.38					
5	IELU		-3424.0	953.0	0	0.36					
6	IELU		-3424.0	1050.0	0	0.39					
7	IELU		-10059.0	2491.0	0	0.98					
8	IELU		-9532.0	2481.0	0	0.96					
9	IELU		-9239.0	1832.0	0	0.80					
10	IELU		-8362.0	1509.0	0	0.69					
11	IELU		-5232.0	1080.0	0	0.46					
12	IELU		-4854.0	1169.0	0	0.47					

Parámetros de análisis "IELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
IELU	2/0	1	-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 12)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [‰]	$\sigma_s$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-17.	1.76
C	H300	0.	-0.5	1.4	0.	1.76
CR	AEH500	0.	0.43	-3.2	-434.8	1.15
CR	AEH500	0.	-0.43	1.1	232.4	1.15

ELU Sismo

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.84$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	
1	AP4		-2364.0	1807.0	0	0.50					
2	AP4		-3003.0	2828.0	0	0.81					
3	AP4		-2698.0	1446.0	0	0.39					
4	AP4		-5915.0	2096.0	0	0.60					
5	AP4		-5277.0	3063.0	0	0.84					
6	AP4		-5582.0	1710.0	0	0.51					

Parámetros de análisis "AP4" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [‰]	$\epsilon_{cu3}$ [‰]	$\epsilon_{ud}$ [‰]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
AP4	2/0	1	-2.	-3.5	10.		1.	1.3	1.	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 6)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [‰]	$\sigma_s$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-23.1	1.30
C	H300	0.	-0.5	2.1	0.	1.30
CR	AEH500	0.	0.43	-3.1	-500.	1.00
CR	AEH500	0.	-0.43	1.7	357.1	1.00

Pilar 3

ELU Persistente

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.82$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión			Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]
1	IELU		-2394.0	1525.0	0	0.51					
2	IELU		-2437.0	1557.0	0	0.52					
3	IELU		-2494.0	1494.0	0	0.49					
4	IELU		-2566.0	1008.0	0	0.35					
5	IELU		-2948.0	1175.0	0	0.40					
6	IELU		-2948.0	1038.0	0	0.37					
7	IELU		-8332.0	2039.0	0	0.81					
8	IELU		-8332.0	2085.0	0	0.82					
9	IELU		-7264.0	1855.0	0	0.72					
10	IELU		-7264.0	1392.0	0	0.62					
11	IELU		-4404.0	1300.0	0	0.48					
12	IELU		-4061.0	1134.0	0	0.43					

Parámetros de análisis "IELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			σ <sub>s</sub> [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	ε <sub>c2</sub> [‰]	ε <sub>cu3</sub> [‰]	ε <sub>ud</sub> [‰]		α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
IELU	2/0	1	-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 12)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	ε [‰]	σ <sub>d</sub> [N/mm <sup>2</sup> ]	γ [-]
C	H300	0.	0.5	-3.5	-17.	1.76
C	H300	0.	-0.5	1.7	0.	1.76
CR	AEH500	0.	0.43	-3.1	-434.8	1.15
CR	AEH500	0.	-0.43	1.4	287.3	1.15

ELU Sismo

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.84$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión			Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]
1	AP4		-2184.0	1793.0	0	0.51					
2	AP4		-2632.0	2877.0	0	0.84					
3	AP4		-2502.0	1815.0	0	0.50					
4	AP4		-4827.0	2040.0	0	0.56					
5	AP4		-4379.0	3061.0	0	0.84					
6	AP4		-4509.0	2014.0	0	0.55					

Parámetros de análisis "AP4" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			σ <sub>s</sub> [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	ε <sub>c2</sub> [‰]	ε <sub>cu3</sub> [‰]	ε <sub>ud</sub> [‰]		α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
AP4	2/0	1	-2.	-3.5	10.		1.	1.3	1.	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 6)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	ε [‰]	σ <sub>d</sub> [N/mm <sup>2</sup> ]	γ [-]
C	H300	0.	0.5	-3.5	-23.1	1.30
C	H300	0.	-0.5	2.9	0.	1.30
CR	AEH500	0.	0.43	-3.1	-500.	1.00
CR	AEH500	0.	-0.43	2.5	500.	1.00

Pilar 4

ELU Persistente

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.84$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	
1	!ELU		-2449.0	1536.0	0	0.51					
2	!ELU		-2449.0	998.0	0	0.34					
3	!ELU		-2579.0	1474.0	0	0.49					
4	!ELU		-2578.0	1008.0	0	0.35					
5	!ELU		-2960.0	1157.0	0	0.40					
6	!ELU		-2960.0	1038.0	0	0.37					
7	!ELU		-8787.0	2081.0	0	0.84					
8	!ELU		-8348.0	1473.0	0	0.68					
9	!ELU		-8012.0	1873.0	0	0.76					
10	!ELU		-7280.0	1392.0	0	0.62					
11	!ELU		-4393.0	1280.0	0	0.48					
12	!ELU		-4077.0	1135.0	0	0.43					

Parámetros de análisis "IELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [%]	$\epsilon_{cu3}$ [%]	$\epsilon_{ud}$ [%]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
IELU	2/0	1	-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 12)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [%]	$\sigma_d$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-17.	1.76
C	H300	0.	-0.5	1.7	0.	1.76
CR	AEH500	0.	0.43	-3.1	-434.8	1.15
CR	AEH500	0.	-0.43	1.4	286.2	1.15

ELU Sismo

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.84$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión				Sección completa
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	
1	AP4		-2196.0	1793.0	0	0.51					
2	AP4		-2644.0	2878.0	0	0.84					
3	AP4		-2514.0	1816.0	0	0.50					
4	AP4		-4843.0	2041.0	0	0.56					
5	AP4		-4395.0	3062.0	0	0.84					
6	AP4		-4525.0	2015.0	0	0.55					

Parámetros de análisis "AP4" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama		Límites de deformación			$\sigma_s$ [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s	$\epsilon_{c2}$ [%]	$\epsilon_{cu3}$ [%]	$\epsilon_{ud}$ [%]		$\alpha_{cc}$ [-]	$\gamma_c$ [-]	$\gamma_s$ [-]	$\theta$ [-]	$\phi$ [-]
AP4	2/0	1	-2.	-3.5	10.		1.	1.3	1.	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 6)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	$\epsilon$ [%]	$\sigma_d$ [N/mm <sup>2</sup> ]	$\gamma$ [-]
C	H300	0.	0.5	-3.5	-23.1	1.30
C	H300	0.	-0.5	2.9	0.	1.30
CR	AEH500	0.	0.43	-3.1	-500.	1.00
CR	AEH500	0.	-0.43	2.5	500.	1.00

Dintel

ELU Persistente

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.43$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión			Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]
1	!ELU		0	-1404.0	0.0	0.43					
2	!ELU		0	1326.0	0.0	0.41					

Parámetros de análisis "!ELU" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama			Límites de deformación			σ <sub>s</sub> [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s		ε <sub>c2</sub> [‰]	ε <sub>cu3</sub> [‰]	ε <sub>ud</sub> [‰]		α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
!ELU	2/0	1		-2.	-3.5	10.		0.85	1.5	1.15	45.	0.

Deformaciones y tensiones extremas (Resultados cálculo No 2)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	ε [‰]	σ <sub>d</sub> [N/mm <sup>2</sup> ]	γ [-]
R	H300	1.	1.2	-1.3	-14.7	1.76
R	H300	-1.	0.	10.6	0.	1.76
R2	AEH500	-0.91	1.14	-0.6	-131.9	1.15
R1	AEH500	-0.91	0.06	10.	434.8	1.15

ELU Sismo

Solicitaciones / Factores de eficiencia:  $eff(M,N)=0.38$  OK

No.	AP	P	Flexión y esfuerzo normal				Esfuerzos de corte y torsión			Sección completa	
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	eff(M,N) [-]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	eff(V,T) [-]	eff(M,N,V,T) [-]
1	AP4		0	-1414.0	0.0	0.38					
2	AP4		0	1331.0	0.0	0.36					

Parámetros de análisis "AP4" Código: EHE-08. Instr.Hormigón Estruct.

ID	Diagrama			Límites de deformación			σ <sub>s</sub> [N/mm <sup>2</sup> ]	Factores de la resistencia			Otros valores	
	c	s		ε <sub>c2</sub> [‰]	ε <sub>cu3</sub> [‰]	ε <sub>ud</sub> [‰]		α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
AP4	2/0	1		-2.	-3.5	10.		1.	1.3	1.	45.	0.

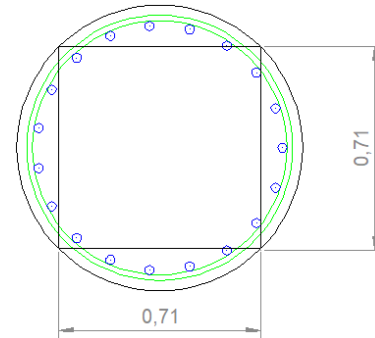
Deformaciones y tensiones extremas (Resultados cálculo No 2)

Nombre	Clase	y <sub>q</sub> [m]	z <sub>q</sub> [m]	ε [‰]	σ <sub>d</sub> [N/mm <sup>2</sup> ]	γ [-]
R	H300	1.	1.2	-1.2	-19.4	1.30
R	H300	-1.	0.	10.6	0.	1.30
R2	AEH500	-0.91	1.14	-0.6	-120.1	1.00
R1	AEH500	-0.91	0.06	10.	500.	1.00

ELU de cortante

Pilares

Consideramos la sección dentro del cuadrado inscrito en la circunferencia de diámetro 1m. Por tanto, como  $A_{s,long}$  se considera  $6\phi32 = 48.24 \text{ cm}^2$



Se calculan los coeficientes de seguridad sin armadura de cortante, tanto para ELU Persistente como para ELU Sismo, para todas las combinaciones posibles. Se observa que los coeficientes de seguridad son siempre superiores a 1, por tanto, no se requiere armadura de cortante. Se va a disponer armadura mínima.

ELU Persistente

CORTANTE EHE-08	
PIEZAS SIN ARMADURA DE CORTANTE	
EHE-08 Art. 44.2 - Resistencia a Cortante.xlsx	
19/06/2020	
fck =	30 MPa
γc =	1.5
fcv =	30 MPa
gcd =	20.00 MPa
f1cd =	12.0 MPa
fct,m =	2.90 MPa
h =	0.71 m
b0 =	0.71 m
r =	0 m
cotg θ =	1 0.5 < cotg θ < 2.0
cotg θe =	1.00
α =	90.00°
cotg α =	0.0000
As,long =	48.24 cm <sup>2</sup>

ELU Sismo

CORTANTE EHE-08	
PIEZAS SIN ARMADURA DE CORTANTE	
EHE-08 Art. 44.2 - Resistencia a Cortante.xlsx	
19/06/2020	
fck =	30 MPa
γc =	1.3
fcv =	30 MPa
gcd =	23.08 MPa
f1cd =	13.8 MPa
fct,m =	2.90 MPa
h =	0.71 m
b0 =	0.71 m
r =	0 m
cotg θ =	1 0.5 < cotg θ < 2.0
cotg θe =	1.00
α =	90.00°
cotg α =	0.0000
As,long =	48.24 cm <sup>2</sup>




Sin armadura de cortante

		$V_{ed}$ KN	$N_{ed,min}$ KN	$C_{sa}$ (agotamiento bielas comprimidas)	$C_{sa}$ (agotamiento por tracciones en el alma)	$N_{ed,max}$ KN	$C_{sa}$ (agotamiento bielas comprimidas)	$C_{sa}$ (agotamiento por tracciones en el alma)
PILAR 1	ELU PERS 1	0.325	2.34	11.47	1.95	8.919	2.69	2.27
	ELU PERS 2	0.257	2.392	14.56	2.50	8.919	3.39	2.87
	ELU PERS 3	0.402	2.45	9.35	1.62	7.749	4.35	1.83
	ELU PERS 4	0.132	2.537	28.63	5.03	7.749	13.25	5.58
	ELU PERS 5	0.191	2.97	19.80	3.82	4.655	19.80	3.86
	ELU PERS 6	0.122	2.97	30.99	5.98	4.242	30.99	6.04
	ELU SISMO 1	0.444	1.91	9.14	1.38	5.302	9.82	1.91
	ELU SISMO 2	0.416	2.549	10.23	1.71	4.664	10.49	2.05
	ELU SISMO 3	0.214	2.243	19.41	3.09	4.969	20.34	3.97
	PILAR 2	ELU PERS 1	0.325	2.34	11.47	1.95	8.919	2.69
ELU PERS 2		0.257	2.392	14.56	2.50	8.919	3.39	2.87
ELU PERS 3		0.402	2.45	9.35	1.62	7.749	4.35	1.83
ELU PERS 4		0.131	2.537	28.85	5.07	7.749	13.35	5.63
ELU PERS 5		0.191	2.97	19.80	3.82	4.655	19.80	3.86
ELU PERS 6		0.122	2.97	30.99	5.98	4.242	30.99	6.04
ELU SISMO 1		0.444	2.364	9.45	1.53	5.915	9.65	1.91
ELU SISMO 2		0.416	3.003	10.49	1.87	5.277	10.49	2.05
ELU SISMO 3		0.214	2.698	20.05	3.41	5.582	20.34	3.97
PILAR 3		ELU PERS 1	0.267	2.846	14.16	2.66	10.059	0.06
	ELU PERS 2	0.213	2.856	17.75	3.34	9.532	1.94	3.46
	ELU PERS 3	0.353	2.991	10.71	2.07	9.239	1.79	2.09
	ELU PERS 4	0.120	2.991	31.51	6.10	8.362	10.75	6.14
	ELU PERS 5	0.193	3.424	19.60	3.82	5.232	18.86	3.82
	ELU PERS 6	0.120	3.424	31.51	6.14	4.854	31.51	6.14
	ELU SISMO 1	0.371	2.184	11.17	1.76	4.827	11.75	2.29
	ELU SISMO 2	0.426	2.632	10.04	1.69	4.379	10.24	2.00
	ELU SISMO 3	0.262	2.502	16.20	2.68	4.509	16.67	3.25

PILAR 4	ELU PERS 1	0.271	2.846	13.95	2.62	10.059	0.06	2.72
	ELU PERS 2	0.213	2.856	17.75	3.34	9.532	1.94	3.46
	ELU PERS 3	0.351	2.991	10.77	2.09	9.239	1.80	2.10
	ELU PERS 4	0.120	2.991	31.51	6.10	8.362	10.75	6.14
	ELU PERS 5	0.193	3.424	19.60	3.82	5.232	18.86	3.82
	ELU PERS 6	0.120	3.424	31.51	6.14	4.854	31.51	6.14
	ELU SISMO 1	0.371	2.196	11.18	1.77	4.843	11.75	2.29
	ELU SISMO 2	0.426	2.644	10.05	1.70	4.395	10.24	2.00
	ELU SISMO 3	0.262	2.514	16.22	2.69	4.525	16.67	3.25

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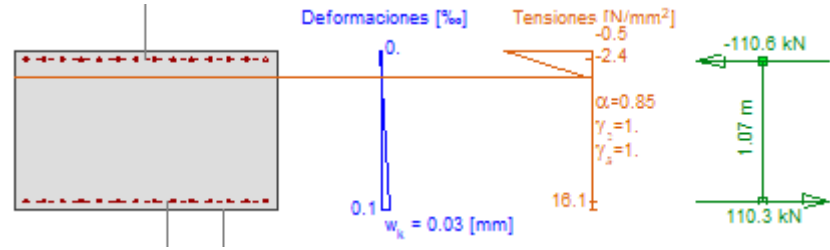
<b>CORTANTE EHE-08</b>	
<b>PIEZAS SIN ARMADURA DE CORTANTE</b>	
EHE-08 Art. 44.2 - Resistencia a Cortante.xlsx	
19/06/2020	 Engineering, Information, Imagination
fck =	30 MPa
$\gamma_c$ =	1.5
fcd =	30 MPa
fcd =	20.00 MPa
f1cd =	12.0 MPa
fct,m =	2.90 MPa
h =	1.2 m
b0 =	2 m
r =	0.07 m
cotg $\theta$ =	1 0.5 < cotg $\theta$ < 2.0
cotg $\theta_e$ =	1.00
$\alpha$ =	90.00°
cotg $\alpha$ =	0.0000
As,long=	68.72 cm <sup>2</sup>
Vd =	0.705 MN
Nd =	0 MN
Axil positivo: COMPRESIÓN	
<b>1) AGOTAMIENTO BIELAS COMPRIMIDAS</b>	
$\sigma_c$ =	0.00 MPa
K =	1.00
Vu1 =	13.56 MN
CSa =	19.23
<b>2) AGOTAMIENTO POR TRACCIONES EN EL ALMA</b>	
<b>2.1) CONTRIBUCIÓN DEL HORMIGÓN</b>	
$\xi$ =	1.421
$\sigma'_c$ =	0.00 MPa
z =	1.017 m
$\rho_l$ =	0.00304
Vu2 =	0.805 MN
Vu2,min=	1.048 MN
Vu2 =	1.048 MN
CSa =	1.49

Se dispone armadura mínima

ELS de fisuración

Dintel

ELS Cuasi Permanente



Solicitaciones

No.	AP	P	Flexión y esfuerzo normal			Esfuerzos de corte y torsión			Observaciones
			N [kN]	M <sub>y</sub> [kNm]	M <sub>z</sub> [kNm]	V <sub>y</sub> [kN]	V <sub>z</sub> [kN]	T [kNm]	
1	IELS		0	118.0	0				

Parámetros de análisis "IELS" Código: EHE-08. Instr. Hormigón Estruct.

ID	Diagrama		Límites de deformación			Factores de la resistencia				Otros valores	
	c	s	ε <sub>c2</sub> [%]	ε <sub>cu3</sub> [%]	ε <sub>ud</sub> [%]	σ <sub>s</sub> [N/mm²]	α <sub>cc</sub> [-]	γ <sub>c</sub> [-]	γ <sub>s</sub> [-]	θ [-]	φ [-]
IELS	1/0	1				200.	0.85	1.	1.	45.	0.

Verificación de las fisuras

Texto	Valor	Texto	Valor
<b>Principios básicos</b>	<b>EN 1992-1-1 7.3</b>		
<b>Sección</b>			
h	1.2 m	zona compresión (no fisurado)	0.6 m
d	1.14 m	h-d	0.06 m
Recubrimiento c	0.05 m	h <sub>c,eff</sub>	0.16 m
A <sub>c,eff</sub> (zona de tracción)	317500 mm²	= Min[2.5 (h-d); (h-x)/3; h/2]	
<b>Hormigón</b>		<b>Parámetros adicionales</b>	
E <sub>c</sub>	33 kN/mm²	Duración aplicación carga k <sub>t</sub>	0.4
α <sub>e</sub> (E <sub>s</sub> /E <sub>c</sub> )	6.364	Factor de adherencia k <sub>1</sub>	0.8
Coef. de fluencia φ	0.	Distribución de deformación	0.5
f <sub>ctm</sub>	0. N/mm²	k <sub>3</sub>	3.4
f <sub>ct,eff</sub>	0. N/mm²	k <sub>4</sub>	0.425
<b>Armadura</b>		<b>Resultados</b>	
E <sub>s</sub>	210 kN/mm²	Momento	118. kNm
A <sub>s</sub> (zona de tracción)	6872 mm²	Tensión en la armadura σ <sub>s</sub>	16.1 N/mm²
Diámetro ∅ <sub>eq</sub>	25 mm	ε <sub>sm</sub> -ε <sub>cm</sub> (7.9)	0.076 o/o
ρ <sub>eff</sub>	2.164 o/o	Separación de fisuras s <sub>r,max</sub>	<b>0.37 m</b>
		Ancho de fisuras w <sub>k</sub> (7.8)	<b>0.03 mm</b>

ENCEPADO:

OutputCase	F1	F2	F3	M1	M2
Text	KN	KN	KN	KN-m	KN-m
G1	0	0	6467	0	1
G2_MAX	0	0	1320	0	0
G2_MIN	0	0	1000	0	0
SC ENV	0	4	6928	8476	1
SC ENV	0	-4	-856	8476	0
TEMP+	50	0	8	0	307
TEMP-	-32	0	5	0	-199
W_TRANSV_SIN SC	1	241	527	623	4
W_TRANSV_CON SC	1	525	527	2983	4
W_LONG_SIN SC	74	0	0	0	379
W_LONG_CON SC	86	0	0	0	456
FRENADO	222	0	2	0	1379
REOLOGIA	81	0	13	0	502
SISMO_LONG	683	248	294	1979	4239
SISMO_TRANSV	213	826	277	6597	1325
SISMO_VERT	239	248	905	1979	1504

DIMENSIONES ENCEPADO

ANCHO 9.35 m  
LARGO 5.6 m  
ALTO 1.5 m

VOI = 78.54  
PESO = 1963.5

ALTO = 1

COORDENADAS PILOTES

N =	6
X =	3.75 m
Y =	7.5 m
φ =	1.25 m

n <sub>x</sub> =	3
n <sub>y</sub> =	2

REACCIONES EN CARA INFERIOR DEL ENCEPADO:

G1	0	0	9478	0	0	1
G2_MAX	0	0	1320	0	0	0
G2_MIN	0	0	1000	0	0	0
SC_ENV	0	4	6928	8482	1	1
SC_ENV	0	-4	-856	8470	0	0
TEMP+	50	0	-8	0	0	381
TEMP-	-32	0	5	0	0	-247
W_TRANSV_SIN SC	1	241	527	985	4	4
W_TRANSV_CON SC	1	525	527	3770	4	4
W_LONG_SIN SC	74	0	0	0	490	0
W_LONG_CON SC	86	0	0	0	586	0
FRENADO	222	0	2	0	1712	0
REOLOGÍA	81	0	13	0	624	0
SISMO_LONG	683	248	294	2351	5263	1644
SISMO_TRANSV	213	826	277	7835	1644	1644
SISMO_VERT	239	248	905	2351	1862	1862

MÁXIMA REACCIÓN VERTICAL

305	529	18268	12252	2344
304	521	10164	12241	2342
440	4	17733	8482	3306
354	529	18260	12252	2725
683	248	11092	2351	5265
213	826	11075	7835	1646
239	248	11703	2351	1863

MÍNIMA REACCIÓN VERTICAL

4070	2019
2718	670
3815	2096
4102	1984
2473	1224
2514	1177
2273	1628

CARGAS EN PILOTES

4070	2019
2718	670
3815	2096
4102	1984
2473	1224
2514	1177
2273	1628

CORTANTES RESULTANTES

101.75108
100.60008
73.314267
106.1189
121.15388
142.11421
57.336204

ARMADO ENCEPADO PILAS SENTIDO LONGITUDINAL

REACCIÓN MÁXIMA POR PILOTE Rk:	4100 kN
REACCIÓN MÁXIMA POR PILOTE Rd:	5535 kN
alfa:	35 °
BANDA PILOTES	
Td=	7905 kN
As=	198 cm2
	25 f32
BANDA ENTRE PILOTES	
As=	49 cm2
	10 f25
ARMADURA SECUNDARIA VERTICAL	
12.3 cm2/m --> 1 c 16 a 0.20 (20.11cm2/m)	

BIELA MÁS COMPRIMIDA	
Cd=	9650 kN
Área biela=	0.936 m2
Tensión=	10.3 MPa
	0.52 fck
	Ok!

ARMADO ENCEPADO PILAS SENTIDO TRANSVERSAL

REACCIÓN MÁXIMA POR PILOTE Rk:	2050 kN
REACCIÓN MÁXIMA POR PILOTE Rd:	2767.5 kN
alfa:	30 °
BANDA PILOTES	
Td=	4793 kN
As=	120 cm2
	15 f32
BANDA ENTRE PILOTES	
As=	30 cm2
	6 f25

BIELA MÁS COMPRIMIDA	
Cd=	5535 kN
Área biela=	0.936 m2
Tensión=	5.9 MPa
	0.30 fck
	Ok!

Combinación en las dos direcciones:  
0.59 fck Ok!

## Pilons de les piles

Segons l'annexe 07:

- Longitud pilons: 21 m a les dues piles
- Axil màxim (Ndmax): 4070 kN (comb. característica) i 2514 kN (sisme)

El procediment de càlcul per obtenir els esforços y l'armadura dels pilons és el següent:

5. Model SAP de una viga aplicant motlles que simulen el terreny cada metre amb els coeficients de l'annex 7.
6. Es comprova que la reacció a les motlles es inferior a la màxima empenya passiva del terreny
7. Obtenció del esforços que dimensionen la armadura
8. Armat dels pilons mitjançant el prontuari informàtic de la EHE i fulles excel d'AYESA

A continuació es detalla cada un dels punts anterior.

Per al model SAP s'ha simulat un piló de la pila 1, ja que el terreny sota aquesta es menys resistent como es mostra més endavant. Tant en la situació de ELU com SISME, la càrrega màxima horitzontal es de 400 kN i el mateix model serveix per ambdós casos.



ELU i SISME

La condició de contorn a la part superior del piló es un encastament mòvil. La profunditat de cada node, el coeficient de motlle aplicat (kh; annexe 07) y l'empenya passiva resistent del terreny (Ep) per a cada piló segons estigui a la pila 1 o 2 es mostra a les següents taules. Com l'empenya passiva es inferior al terreny sota la pila 1, el dimensionament de l'armadura s'ha fet per als pilons d'aquesta pila.

Id.	Pila 1											
Zcp (m)	40.3											
Z <sub>mf</sub> (m)	40.4											
L (m)	21											
Zb (m)	19.3											
q <sub>0</sub> (kPa)	30.4											
ΔL (m)	1											
D (m)	1.25											
Prof.	Zi	Id.	γ	σ <sub>v</sub>	σ' <sub>v</sub>	c'	φ'	k <sub>p</sub>	Ep	kh	kh (SAP)	
m	m	UG	kN/m <sup>3</sup>	kPa	kPa	kPa	(-)	(-)	kN	(MN/m)	kN/m	
0.5	39.8	2	19	39.9	33.9	0	32	3.3	413.7	1.5	1500	
1.5	38.8	2	19	58.9	42.9	0	32	3.3	523.6	4.5	4500	
2.5	37.8	2	19	77.9	51.9	0	32	3.3	633.4	7.5	7500	
3.5	36.8	3c	21	98.9	62.9	10	28	2.8	765.8	18.4	18375	
4.5	35.8	3c	21	119.9	73.9	10	28	2.8	880.1	18.4	18375	
5.5	34.8	3c	21	140.9	84.9	10	28	2.8	994.3	18.4	18375	
6.5	33.8	3c	21	161.9	95.9	10	28	2.8	1108.6	18.4	18375	
7.5	32.8	3c	21	182.9	106.9	10	28	2.8	1222.9	18.4	18375	
8.5	31.8	3c	21	203.9	117.9	10	28	2.8	1337.1	18.4	18375	
9.5	30.8	3s	21	224.9	128.9	0	34	3.5	1709.8	57.0	57000	
10.5	29.8	3s	21	245.9	139.9	0	34	3.5	1855.7	63.0	63000	
11.5	28.8	3s	21	266.9	150.9	0	34	3.5	2001.6	69.0	69000	
12.5	27.8	3s	21	287.9	161.9	0	34	3.5	2147.5	75.0	75000	
13.5	26.8	3s	21	308.9	172.9	0	34	3.5	2293.4	81.0	81000	
14.5	25.8	3s	21	329.9	183.9	0	34	3.5	2439.3	87.0	87000	
15.5	24.8	3s	21	350.9	194.9	0	34	3.5	2585.2	93.0	93000	
16.5	23.8	3s	21	371.9	205.9	0	34	3.5	2731.1	99.0	99000	
17.5	22.8	3s	21	392.9	216.9	0	34	3.5	2877.0	105.0	105000	
18.5	21.8	3s	21	413.9	227.9	0	34	3.5	3022.9	111.0	111000	
19.5	20.8	3s	21	434.9	238.9	0	34	3.5	3168.8	117.0	117000	
20.5	19.8	3s	21	455.9	249.9	0	34	3.5	3314.7	123.0	123000	

Id.	P2											
Zcp (m)	40.5											
Z <sub>mf</sub> (m)	40											
L (m)	21											
Zb (m)	19.5											
q <sub>0</sub> (kPa)	30.4											
ΔL (m)	1											
D (m)	1.25											
Prof.	Zi	Id.	γ	σ <sub>v</sub>	σ' <sub>v</sub>	c'	φ'	k <sub>p</sub>	Ep	kh	kh (SAP)	
m	m	UG	kN/m <sup>3</sup>	kPa	kPa	kPa	(-)	(-)	kN	(MN/m)	kN	
0.5	40	2	19	39.9	39.9	0	32	3.3	487.0	1.5	1500	
1.5	39	2	19	58.9	48.9	0	32	3.3	596.8	4.5	4500	
2.5	38	2	19	77.9	57.9	0	32	3.3	706.7	7.5	7500	
3.5	37	3c	21	98.9	68.9	10	28	2.8	828.2	18.4	18375	
4.5	36	3c	21	119.9	79.9	10	28	2.8	942.4	18.4	18375	
5.5	35	3c	21	140.9	90.9	10	28	2.8	1056.7	18.4	18375	
6.5	34	3c	21	161.9	101.9	10	28	2.8	1170.9	18.4	18375	
7.5	33	3c	21	182.9	112.9	10	28	2.8	1285.2	18.4	18375	
8.5	32	3c	21	203.9	123.9	10	28	2.8	1399.4	18.4	18375	
9.5	31	3c	21	224.9	134.9	10	28	2.8	1513.7	57.0	57000	
10.5	30	3c	21	245.9	145.9	10	28	2.8	1627.9	63.0	63000	
11.5	29	3c	21	266.9	156.9	10	28	2.8	1742.2	69.0	69000	
12.5	28	3c	21	287.9	167.9	10	28	2.8	1856.5	75.0	75000	
13.5	27	3s	21	308.9	178.9	0	34	3.5	2373.0	81.0	81000	
14.5	26	3s	21	329.9	189.9	0	34	3.5	2518.9	87.0	87000	
15.5	25	3s	21	350.9	200.9	0	34	3.5	2664.8	93.0	93000	
16.5	24	3s	21	371.9	211.9	0	34	3.5	2810.7	99.0	99000	
17.5	23	3s	21	392.9	222.9	0	34	3.5	2956.6	105.0	105000	
18.5	22	3s	21	413.9	233.9	0	34	3.5	3102.5	111.0	111000	
19.5	21	3s	21	434.9	244.9	0	34	3.5	3248.4	117.0	117000	
20.5	20	3s	21	455.9	255.9	0	34	3.5	3394.3	123.0	123000	

L'empenya passiva s'ha calculat considerant la "Guía de cimentaciones en obras de carretera", que considera l'efecte tridimensional segons es mostra a la següent figura

$$e(z) = \left( 9c + 3\gamma z \frac{1 + \sin \phi}{1 - \sin \phi} \right) \cdot D$$

$$E = \int_0^{L-\Delta} e(z) \cdot dz \quad \Delta = \frac{R}{e(L)}$$

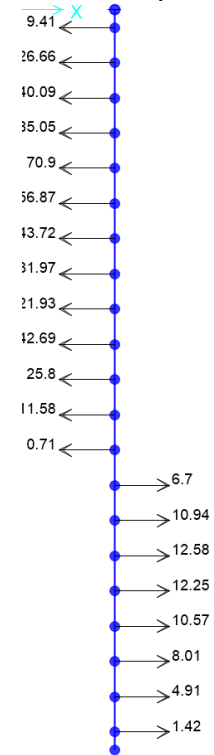
A cap dels motlles es supera l'empenta passiva segons es mostra a continuació

Reaccions motlles piló Estrep 1

ELU

SISME

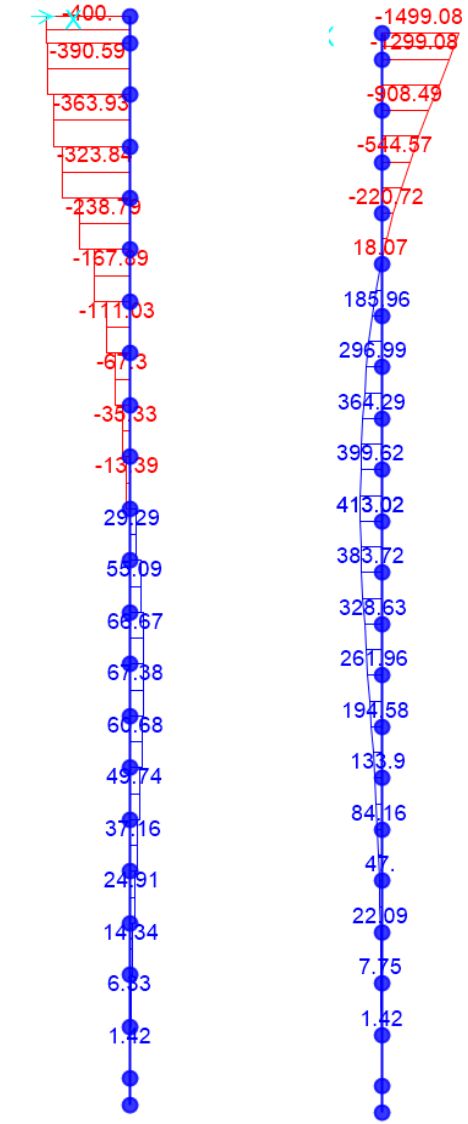
Reaccions motlles piló Estrep 2



ELU

SISME

Per a cada estrep i en cada situació (ELU i sisme), s'obtenen els següents esforços de tallant (Vd) i moment (Md) que dimensionen l'armadura necessària



Vd (ELU i SISME) Md (ELU i SISME)  
Vd max (400 kN) (1500 kNm)

De totes les armadures mínimes, la més restrictiva és la geomètrica segons l'article 42.3.5 de l'EHE:

Tabla 42.3.5. Cuantías geométricas mínimas, en tanto por 1000, referidas a la sección total de hormigón<sup>(6)</sup>

Tipo de elemento estructural	Tipo de acero	
	Aceros con $f_y = 400\text{N/mm}^2$	Aceros con $f_y = 500\text{N/mm}^2$
Pilares	4,0	4,0

Per tant, l'armadura base per un piló de 1.25 m de diàmetre és

$$A_{s,min} = 0.004 \times A_c = 49.1 \text{ cm}^2 = 10\emptyset 25$$

no obstant, per evitar separacions superiors a 30 cm entre barres, es decideix col·locar 14 barres de 25 mm de diàmetre.

$$A_{s,min} = 14\emptyset 25 = 68.72 \text{ cm}^2$$

Amb aquesta armadura, el moment resistent en ELU i sisme depèn de l'axil. Com els esforços no són elevats, la comprovació resistent s'ha fet amb els valors màxim i mínim de l'axil (conservador) segons la taula següent obtinguda d'apartats anteriors :

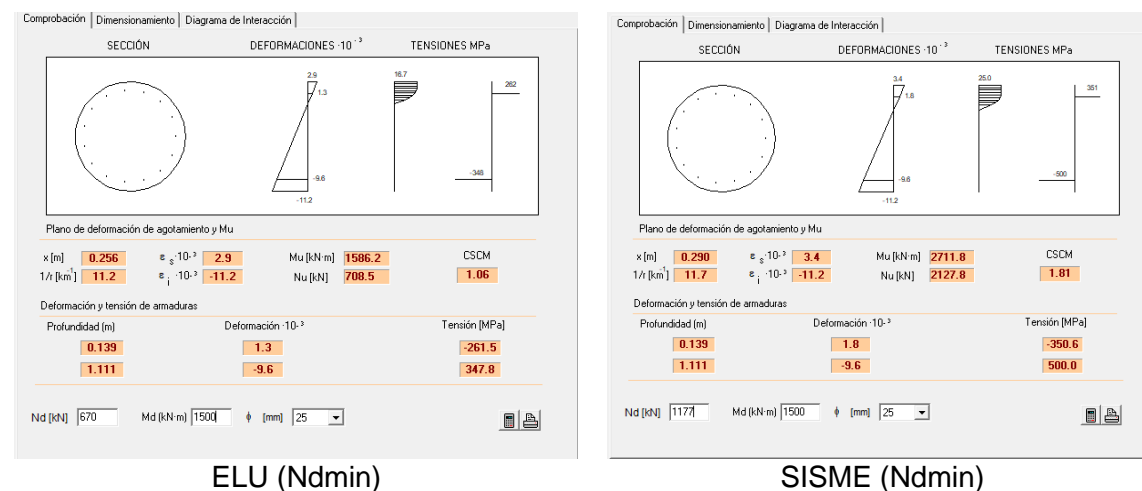
MÁXIMA REACCIÓN VERTICAL					CARGAS EN PILOTES	
305	529	18268	12252	2344	4070	2019
MÍNIMA REACCIÓN VERTICAL						
304	521	10164	12241	2342	2718	670
MAXIMO MOMENTO TRANSV						
440	4	17733	8482	3306	3815	2096
MAXIMO MOMENTO LONG (TORSIÓN TABERO)						
354	529	18260	12252	2725	4102	1984
SISMO LONG						
683	248	11092	2351	5265	2473	1224
SISMO TRANSV						
213	826	11075	7835	1646	2514	1177
SISMO VERT						
239	248	11703	2351	1863	2273	1628

Segons la taula, els valors màxims i mínims són

- Nd(max, min) ELU: 4070 kN; 670 kN
- Nd(max, min) SISME: 2514; 1177 kN

A partir d'aquests valors s'obté que el factor de seguretat menor per la resistència a flexió amb l'armadura mínima es produeix amb l'axil mínim en cada cas. A continuació es mostra els valors obtinguts del prouari informàtic de l'EHE. El valor de recobriment aplicat es de 10 cm (7cm + 1.2 cm del cercos + 1.25 cm de mitja armadura longitudinal). Degut a que amb una barra més que l'armadura mínima es suficient per que el FS sigui més gran que 1 en situació definitiva, els resultats es mostren per a 15 barres de 25 mm.

### Estrep 2. Resistencia a flexió amb armadura mínima



En resum, amb per l'armadura mínima es té

$$A_{s,long} = 15\emptyset 25 \text{ (tot el piló)} = 73.6 \text{ cm}^2$$

- Moment resistent ELU: 1500 kNm; FS = 1.06
- Moment resistent sisme: 1500 kNm; FS = 1.81

Per tant, l'únic reforç consisteix en una barra més per tal de resistir el moment de disseny (Md) de 1500 kNm (ELU i sisme).

Amb aquesta armadura longitudinal a flexió es procedeix a obtenir l'armadura de tallant. En aquest sentit, es considera una secció consistent en una secció quadrada inscrita a l'interior del pilot (conservador) on ¼ de l'armadura longitudinal treballa a flexió. Així doncs, les característiques de la secció a tallant són:

- $b_0 = 0.9 \text{ m}$  (costat del quadrat inscrit dins del piló)
- $h = 1.25 - 0.5 \cdot (1.25 - 0.9) = 1.08 \text{ m}$
- Armadura longitudinal =  $73.6 \cdot 0.25 = 18.4 \text{ cm}^2$

Per la situació ELU s'obté  $5.93 \text{ cm}^2/\text{m}$ , inferior a la mínima de  $7.5 \text{ cm}^2/\text{m}$ . L'armadura requerida es compleix amb cercols de 10 mm cada 20 cm

$$A_v = 7.5 \frac{\text{cm}^2}{\text{m}} \times \frac{0.2 \text{ m}}{2 \text{ barres}} = 0.75 \frac{\text{cm}^2}{\text{barra}} < 0.79 \text{ cm}^2 (\text{àrea } \emptyset 10)$$

No obstant, es considera que per muntatge es millor utilitzar  $\emptyset 12$  cada 20 cm. Aquesta armadura es duplicarà els primers 1.25 m de la part superior del piló.



**CORTANTE EHE-08**

PIEZAS CON ARMADURA DE CORTANTE

Pilas EHE08\_44.2\_V.00 - RESISTENCIA A ESFUERZO CORTANTE.xlsx

17/09/2020



fck =	25	MPa	Sección rectangular: 0	<input checked="" type="checkbox"/>	1
γc =	1.5		Sección circular: 1		
fcd =	16.67	MPa			
f1cd =	10.0	MPa			
fct,m =	2.56	MPa			
h =	1.08	m			
b0 =	0.9	m			
r =	0.1	m			
cotg θ =	1	0.5 < cotg θ < 2.0			
cotg θe =	1.00				
α =	90.00	°			
cotg α =	0.0000				
fyd =	400	MPa			
As,long =	18.4	cm <sup>2</sup>			
Vd =	0.4	MN			
Nd =	0	MN	Compresiones positivas		

**1) AGOTAMIENTO BIELAS COMPRIMIDAS**

σc =	0.00	MPa
K =	1.00	
Vu1 =	4.41	MN
CSa =	11.03	

**2) AGOTAMIENTO POR TRACCIONES EN EL ALMA****2.1) CONTRIBUCIÓN DEL HORMIGÓN**

ξ =	1.452	
σ'c =	0.00	MPa
z =	0.882	m
ρ l =	0.00209	
β =	1.0000	con θ = θe
Vcu =	0.2221	MN

**2.2) ARMADURA TRANSVERSAL NECESARIA**

Aα =	5.93	cm <sup>2</sup> /m
Aα,min =	7.50	cm <sup>2</sup> /m

**3) SEPARACIÓN LONGITUDINAL DE ARMADURAS TRANSVERSALES**

St ≤	0.60	m
------	------	---

ELU



## **Aparells de recolzament i juntes de calçada**

REACCIONES EN APARATOS DE APOYO:

VANO: 45 m

ACCIÓN	REACCIONES VERT		REACCIONES HOR. LONG		MOVIMIENTO LONG.		GIRO DE FLEXIÓN		REACCIONES HOR. TRANSV.		GIRO DE TORSIÓN	
	MAX [kN]	MIN [kN]	MAX [kN]	MIN [kN]	MAX [mm]	MIN [mm]	MAX [% RAD]	MIN [% RAD]	MAX [kN]	MIN [kN]	MAX [% RAD]	MIN [% RAD]
G1 viga	695.8	695.8	0	0	0	0	4.45	4.45	0	0	0	0
PRETENSADO	0	0	0	0	0	0	-9.202	-9.202	0	0	0	0
G1 losa	776	776	0	0	7.6	7.6	4.597	4.597	0	0	0	0
G2	330	250	0	0	1.4	1.4	0.819	0.819	0	0	0	0
REOLOGÍA	0	0	0	0	29.9	0	0.476	0	0	0	0	0
SC q+Q	1732	-214	0	0	4.6	0	2.882	0	0	0	0	0
TEMP +	0	0	0	0	20.9	0	-1.5	0	0	0	0	0
TEMP -	0	0	0	0	-13.2	0	0.538	0	0	0	0	0
FRENADO	0	0	74.8	0	0	0	0	0	0	0	0	0
VIENTO TRANSV	222.6	-222.6	0	0	0	0	0	0	57.2	-57.2	0	0
VIENTO TRANSV + SC	166.3	-166.3	0	0	0	0	0	0	136.3	-136.3	0	0
VIENTO LONG	0	0	14.5	-14.5	0	0	0	0	0	0	0	0
VIENTO LONG + SC	0	0	18.8	-18.8	0	0	0	0	0	0	0	0
SISMO LONG	188.4	-188.4	223.8	-223.8	0	0	0.12	-0.12	71.5	-71.5	0	0
SISMO TRANSV	322.9	-322.9	69.5	-69.5	0	0	0.12	-0.12	238.2	-238.2	0	0
SISMO VERT	393.5	-393.5	72	-72	0	0	0.25	-0.25	72	-72	0	0

COMBINACIONES

MÁXIMA REACCIÓN VERTICAL	4920	101	77	4.08	123
MÍNIMA REACCIÓN VERTICAL		76	14	3.58	86
MÁXIMA DISTORSIÓN	4771	1171	77	4.08	0
MÁXIMO GIRO	4920	118	77	8.22	123
SISMO LONG	1910	224	39	1.26	72
SISMO TRANSV	2045	70	39	1.26	238
SISMO VERT	2115	72	39	1.39	72

REACCIONES EN APARATOS DE APOYO:

VANO: 30 m

ACCIÓN	REACCIONES VERT		REACCIONES HOR. LONG.		REACCIONES HOR. TRANSV.		GIRO DE FLEXIÓN		REACCIONES HOR. TRANSV.		GIRO DE TORSIÓN	
	MAX [kN]	MIN [kN]	MAX [kN]	MIN [kN]	MAX [kN]	MIN [kN]	MAX [%o RAD]	MIN [%o RAD]	MAX [kN]	MIN [kN]	MAX [%o RAD]	MIN [%o RAD]
G1 VIBB	462.8	462.8	0	0	0	0	1.3	1.3	0	0	0	0
PRETENSADO	0	0	0	0	0	0	-2.857	-2.857	0	0	0	0
G1 losa	516.2	516.2	0	0	2.2	2.2	1.341	1.341	0	0	0	0
G2	218	250	0	0	0.6	0.6	0.379	0.379	0	0	0	0
REOLOGÍA	0	0	0	0	29.4	0	0.179	0	0	0	0	0
SC G+Q	1432	-163	0	0	4.6	0	2.098	0	0	0	0	0
TEMP +	0	0	0	0	20	0	-0.989	0	0	0	0	0
FRENADO	0	0	0	0	-12.7	0	0.178	0	0	0	0	0
VIENTO TRANSV	156.3	-156.3	0	0	0	0	0	0	39.2	-39.2	0	0
VIENTO TRANSV + SC	118.7	-118.7	0	0	0	0	0	0	93.5	-93.5	0	0
VIENTO LONG	0	0	10.8	0	0	0	0	0	0	0	0	0
VIENTO LONG + SC	0	0	13.9	0	0	0	0	0	0	0	0	0
SISMO LONG	122.3	-122.3	165.9	0	0.09	0	0.09	-0.09	38.5	-38.5	0	0
SISMO TRANSV	181.3	-181.3	51.9	0	0.09	0	0.09	0.09	128.3	-128.3	0	0
SISMO VERT	183.2	-183.2	50.9	0	0	0	0.18	-0.18	35	-35	0	0

MÁXIMA REACCIÓN VERTICAL  
MÍNIMA REACCIÓN VERTICAL  
MÁXIMA DISTORSIÓN  
MÁXIMO GIRO  
SISMO LONG  
SISMO TRANSV  
SISMO VERT

3656	830	58	68	2.34	84
43	7	2.29	7	59	
70	68	2.34	68	0	
58	68	3.62	68	84	
1351	166	0.38	32	39	
1410	52	0.38	32	128	
1412	51	0.47	32	35	


Neoprenos vanos de 45m:

600x500x(144/104)

9 capas de 11mm + 2.5mm de recubrimientos. Espesor neto de neopreno: n-e=104mm

10 capas de acero

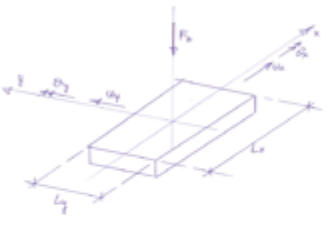
**EN 1337-3 [2005]**  
**VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES**  
EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vano 45.xlsx  
16/06/2020



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**1.- ACCIONES**

Reacción vertical F<sub>z,d</sub>: 4920 kN  
Desplazamiento U<sub>x</sub>: 22.55 mm (valor de diseño)  
Desplazamiento U<sub>y</sub>: 95.52 mm (valor de diseño)  
Gira θ<sub>x</sub>: 4.08 10<sup>-3</sup> rad (valor de diseño)  
Gira θ<sub>y</sub>: 0 10<sup>-3</sup> rad (valor de diseño)



---

**2.- DIMENSIONES**

Lx [A]: 600 mm      Lx' [A']: 590 mm  
Ly [B]: 500 mm      Ly' [A']: 490 mm  
Recubrimiento lateral (\*): 5 mm  
n: 9  
e: 11 mm      (\*): Diferencia en planta entre neopreno y placa de acero  
Recubrimiento: 2.5 mm  
Módulo de cizalla: 0.9 MPa  
Eb: 2000 MPa

Factor de forma S: 12.168 Capa tipa  
Factor de forma S: 38.241 Capa extrema  
A: 300000 mm<sup>2</sup> (área total)  
A1: 289100 mm<sup>2</sup> (área de placa de acero)  
Ar: 228992 mm<sup>2</sup> (área efectiva reducida)

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**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

σ<sub>c,d</sub>: 21.5 MPa      NO REPTA

**Capa tipa:**  
Deformación compresión ε<sub>c,d</sub>: 2.943  
Deformación cizalla γ<sub>c,d</sub>: 0.944 < 1.0 Ok!  
Deformación giro θ<sub>c,d</sub>: 0.449  
Deformación total de diseño δ<sub>c,d</sub>: 4.335

**Capa extrema:**  
Deformación compresión ε<sub>c,d</sub>: 0.936  
Deformación cizalla γ<sub>c,d</sub>: 0.944 < 1.0 Ok!  
Deformación giro θ<sub>c,d</sub>: 0.102  
Deformación total de diseño δ<sub>c,d</sub>: 1.992

**Deformación última ε<sub>u,d</sub>**: 7 Ok!

**Espeor mínima de lámina de acero:**  
f<sub>y</sub>: 275 MPa  
Espeor mínima lámina acor a<sub>r</sub>: 2.23 mm

**Condición límite de rotación:**  
Flecha vertical: 3.43 mm  
Condición rotacional: 2.76041 > 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**  
ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**  
R<sub>ox,y</sub>: 325 kN  
K<sub>f</sub>: 0.6 [kf=0.6 harmigán; kf=0.2 resto]  
μ<sub>0</sub>: 0.15488  
F<sub>x,d,r,d</sub>: 762 kN      NO DESLIZA

**DISTORSIÓN EN APOTOS**

**Deformaciones:**  
U<sub>x</sub>: 0.00 mm  
U<sub>y</sub>: 77.00 mm

**Fuerzas larga duración:**  
Distorsión calculada con G: 0.9 MPa  
F<sub>ax</sub>: 0.00 kN  
U<sub>ax</sub>: 0.00 mm  
F<sub>ay</sub>: 0.00 kN  
U<sub>ay</sub>: 0.00 mm

**Fuerzas instantáneas:**  
Distorsión calculada con G: 1.8 MPa  
F<sub>ax</sub>: 123.00 kN  
U<sub>ax</sub>: 22.55 mm  
F<sub>ay</sub>: 101.00 kN  
U<sub>ay</sub>: 18.52 mm

**Total:**  
U<sub>x</sub>: 22.55 mm  
U<sub>y</sub>: 95.52 mm

**EN 1337-3 [2005]**  
**VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES**  
 EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 45.xlsx  
 16/06/2020

**ayesa** Engineering, Information, Imagination.

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**1.- ACCIONES**

Reacción vertical $F_{x,d}$	1171 kN
Desplazamiento $U_x$	15.77 mm (valor de diseño)
Desplazamiento $U_y$	27.93 mm (valor de diseño)
Gira $\theta_x$	3.58 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	600 mm	$L_x$ [A']	590 mm
$L_y$ [B]	500 mm	$L_y$ [A']	490 mm
Recubrimiento lateral (*)	5 mm		
n	9		
e	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento ar	2.5 mm		
Módulo de cizalla	0.9 MPa		
$E_b$	2000 MPa		

Factor de forma S = 12.168 Capa típica  
 Factor de forma S = 38.241 Capa extrema

A	300000 mm <sup>2</sup> (área total)
A1	289100 mm <sup>2</sup> (área de placa de acero)
Ar	266110 mm <sup>2</sup> (área efectiva reducida)

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 4.4 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	0.603
Deformación cizalla $\epsilon_{cd}$	0.308 <1.0 Ok!
Deformación giro $\theta_{cd}$	0.394
Deformación total de diseño $\epsilon_{td}$	1.305

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	0.192
Deformación cizalla $\epsilon_{cd}$	0.308 <1.0 Ok!
Deformación giro $\theta_{cd}$	0.089
Deformación total de diseño $\epsilon_{td}$	0.590

**Deformación última  $\epsilon_{u,d}$**  = 7 Ok!

**Espejar mínima de lámina de acero:**

$f_y$	275 MPa
Espejar mínima lámina acera tr	2.00 mm

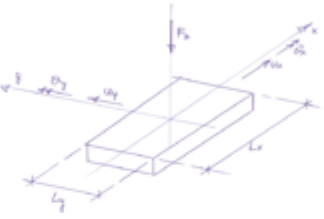
**Condición límite de rotación:**

Flèche vertical	0.82 mm
Condición rotacional	0.23088 > 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**  
ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

$F_{xy}$	141 kN
Kf	0.6 [kf=0.6 harmiqún; kf=0.2 recta]
$\mu_0$	0.33057
$F_{x,d}$	387 kN NO DESLIZA



**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00 mm
$U_y$	14.00 mm

**Fuerzas larga duración:**

Distorsión calculada con G	0.9 MPa
$F_x$	0.00 kN
$\epsilon_{xc}$	0.00 mm
$F_y$	0.00 kN
$\epsilon_{yc}$	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8 MPa
$F_x$	86.00 kN
$\epsilon_{xc}$	15.77 mm
$F_y$	76.00 kN
$\epsilon_{yc}$	13.93 mm

**Total:**

$U_x$	15.77 mm
$U_y$	27.93 mm

**EN 1337-3 [2005]**  
**VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES**  
 EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 45.xlsx  
 16/06/2020

**ayesa** Engineering, Information, Imagination.

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**1.- ACCIONES**

Reacción vertical $F_{x,d}$	4771 kN
Desplazamiento $U_x$	0.00 mm (valor de diseño)
Desplazamiento $U_y$	98.63 mm (valor de diseño)
Gira $\theta_x$	4.08 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	600 mm	$L_x$ [A']	590 mm
$L_y$ [B]	500 mm	$L_y$ [A']	490 mm
Recubrimiento lateral (*)	5 mm		
n	9		
e	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento ar	2.5 mm		
Módulo de cizalla	0.9 MPa		
$E_b$	2000 MPa		

Factor de forma S = 12.168 Capa típica  
 Factor de forma S = 38.241 Capa extrema

A	300000 mm <sup>2</sup> (área total)
A1	289100 mm <sup>2</sup> (área de placa de acero)
Ar	240770 mm <sup>2</sup> (área efectiva reducida)

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 19.8 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	2.714
Deformación cizalla $\epsilon_{cd}$	0.948 <1.0 Ok!
Deformación giro $\theta_{cd}$	0.449
Deformación total de diseño $\epsilon_{td}$	4.111

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	0.864
Deformación cizalla $\epsilon_{cd}$	0.948 <1.0 Ok!
Deformación giro $\theta_{cd}$	0.102
Deformación total de diseño $\epsilon_{td}$	1.914

**Deformación última  $\epsilon_{u,d}$**  = 7 Ok!

**Espejar mínima de lámina de acero:**

$f_y$	275 MPa
Espejar mínima lámina acera tr	2.06 mm

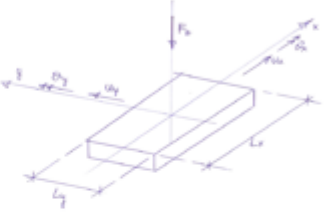
**Condición límite de rotación:**

Flèche vertical	3.32 mm
Condición rotacional	2.65663 > 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**  
ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

$F_{xy}$	218 kN
Kf	0.6 [kf=0.6 harmiqún; kf=0.2 recta]
$\mu_0$	0.15659
$F_{x,d}$	747 kN NO DESLIZA



**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00 mm
$U_y$	77.00 mm

**Fuerzas larga duración:**

Distorsión calculada con G	0.9 MPa
$F_x$	0.00 kN
$\epsilon_{xc}$	0.00 mm
$F_y$	0.00 kN
$\epsilon_{yc}$	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8 MPa
$F_x$	0.00 kN
$\epsilon_{xc}$	0.00 mm
$F_y$	118.00 kN
$\epsilon_{yc}$	21.63 mm

**Total:**

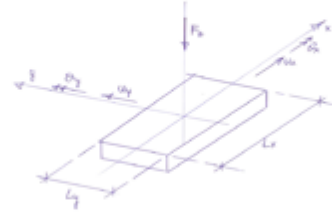
$U_x$	0.00 mm
$U_y$	98.63 mm

**1.-ACCIONES**

Reacción vertical F <sub>z,d</sub>	492.0 kN
Desplazamiento U <sub>x</sub>	0.00 mm (valor de diseño)
Desplazamiento U <sub>y</sub>	99.55 mm (valor de diseño)
Gira θ <sub>x</sub>	8.22 10 <sup>-3</sup> rad (valor de diseño)
Gira θ <sub>y</sub>	0 10 <sup>-3</sup> rad (valor de diseño)

**2.-DIMENSIONES**

Lx [A]:	600 mm	Lx' [A']:	590 mm
Ly [B]:	500 mm	Ly' [A']:	490 mm
Recubrimiento lateral (*):	5 mm		
n:	9		
e:	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento:	2.5 mm		
Módulo de cizalla:	0.9 MPa		
E <sub>b</sub> :	2000 MPa		
Factor de forma S-	12.168	Capa típica	
Factor de forma S-	38.241	Capa extrema	
A-	300000	mm <sup>2</sup> (área total)	
A1-	289100	mm <sup>2</sup> (área de placar de acero)	
Ar-	240324	mm <sup>2</sup> (área efectiva reducida)	



**DISTORSIÓN EN APOSITOS**

**Deformaciones:**

U <sub>x</sub> :	0.00 mm
U <sub>y</sub> :	77.00 mm

**Fuerzas larga duración:**

Distorsión calculada con G:	0.9 MPa
F <sub>x</sub> :	0.00 kN
G <sub>x</sub> :	0.00 mm
F <sub>y</sub> :	0.00 kN
G <sub>y</sub> :	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G:	1.8 MPa
F <sub>x</sub> :	0.00 kN
G <sub>x</sub> :	0.00 mm
F <sub>y</sub> :	123.00 kN
G <sub>y</sub> :	22.55 mm

**Total:**

U <sub>x</sub> :	0.00 mm
U <sub>y</sub> :	99.55 mm

**3.-VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

σ<sub>c,d</sub> = 20.5 MPa NO REPTA

**Capa típica:**

Deformación compresión c.d.	2.804
Deformación cizalla c.d.	0.957 < 1.0 Ok!
Deformación girata c.d.	0.904
Deformación total de diseño c.d.	4.665

**Capa extrema:**

Deformación compresión c.d.	0.892
Deformación cizalla c.d.	0.957 < 1.0 Ok!
Deformación girata c.d.	0.205
Deformación total de diseño c.d.	2.055

Deformación última ε<sub>c,d</sub> = 7 Ok!

**Espesor mínimo de lámina de acero:**

f <sub>y</sub> :	275 MPa
Espesor mínimo lámina acero tr-	2.13 mm

**Condición límite de rotación:**

Flecha vertical:	3.43 mm
Condición rotacional:	2.08421 > 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**

ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

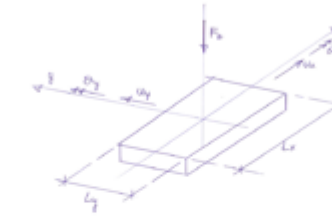
R <sub>xy</sub> :	323 kN
K <sub>f</sub> :	0.6 [kf=0.6 harmigón; kf=0.2 resto]
μ <sub>o</sub> :	0.15433
F <sub>x,d,r,d</sub> :	762 kN
	NO DESLIZA

**1.-ACCIONES**

Reacción vertical F <sub>z,d</sub>	1910 kN
Desplazamiento U <sub>x</sub>	13.20 mm (valor de diseño)
Desplazamiento U <sub>y</sub>	80.07 mm (valor de diseño)
Gira θ <sub>x</sub>	1.26 10 <sup>-3</sup> rad (valor de diseño)
Gira θ <sub>y</sub>	0 10 <sup>-3</sup> rad (valor de diseño)

**2.-DIMENSIONES**

Lx [A]:	600 mm	Lx' [A']:	590 mm
Ly [B]:	500 mm	Ly' [A']:	490 mm
Recubrimiento lateral (*):	5 mm		
n:	9		
e:	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento:	2.5 mm		
Módulo de cizalla:	0.9 MPa		
E <sub>b</sub> :	2000 MPa		
Factor de forma S-	12.168	Capa típica	
Factor de forma S-	38.241	Capa extrema	
A-	300000	mm <sup>2</sup> (área total)	
A1-	289100	mm <sup>2</sup> (área de placar de acero)	
Ar-	240324	mm <sup>2</sup> (área efectiva reducida)	



**DISTORSIÓN EN APOSITOS**

**Deformaciones:**

U <sub>x</sub> :	0.00 mm
U <sub>y</sub> :	39.00 mm

**Fuerzas larga duración:**

Distorsión calculada con G:	0.9 MPa
F <sub>x</sub> :	0.00 kN
G <sub>x</sub> :	0.00 mm
F <sub>y</sub> :	0.00 kN
G <sub>y</sub> :	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G:	1.8 MPa
F <sub>x</sub> :	0.00 kN
G <sub>x</sub> :	0.00 mm
F <sub>y</sub> :	224.00 kN
G <sub>y</sub> :	41.07 mm

**Total:**

U <sub>x</sub> :	13.20 mm
U <sub>y</sub> :	80.07 mm

**3.-VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

σ<sub>c,d</sub> = 7.9 MPa NO REPTA

**Capa típica:**

Deformación compresión c.d.	1.031
Deformación cizalla c.d.	0.780 < 1.0 Ok!
Deformación girata c.d.	0.139
Deformación total de diseño c.d.	2.000

**Capa extrema:**

Deformación compresión c.d.	0.344
Deformación cizalla c.d.	0.780 < 1.0 Ok!
Deformación girata c.d.	0.031
Deformación total de diseño c.d.	1.156

Deformación última ε<sub>c,d</sub> = 7 Ok!

**Espesor mínimo de lámina de acero:**

f <sub>y</sub> :	275 MPa
Espesor mínimo lámina acero tr-	2.00 mm

**Condición límite de rotación:**

Flecha vertical:	1.33 mm
Condición rotacional:	1.12453 > 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**

ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

R <sub>xy</sub> :	333 kN
K <sub>f</sub> :	0.6 [kf=0.6 harmigón; kf=0.2 resto]
μ <sub>o</sub> :	0.24136
F <sub>x,d,r,d</sub> :	461 kN
	NO DESLIZA

1.-ACCIONES

Reacción vertical $F_{x,d}$	2045 kN
Desplazamiento $U_x$	43.63 mm (valor de diseño)
Desplazamiento $U_y$	51.83 mm (valor de diseño)
Gira $\theta_x$	1.26 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

2.-DIMENSIONES

$L_x$ [A]	600 mm	$L_x$ [A']	590 mm
$L_y$ [B]	500 mm	$L_y$ [A']	490 mm
Recubrimiento lateral (*)	5 mm		
n	9		
e	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento	2.5 mm		
Módulo de cizalla	0.9 MPa		
$E_b$	2000 MPa		

Factor de forma S	12.168	Capa típica
Factor de forma S	38.241	Capa extrema
A	300000 mm <sup>2</sup> (área total)	
A1	289100 mm <sup>2</sup> (área de placa de acero)	
Ar	237958 mm <sup>2</sup> (área efectiva reducida)	

3.-VERIFICACIONES

3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA

$\sigma_{c,d}$  8.6 MPa NO REPTA

Capa típica:

Deformación compresión $\epsilon_{cd}$	1.177
Deformación cizalla $\epsilon_{qd}$	0.651 < 1.0 Ok!
Deformación giro $\theta_{td}$	0.129
Deformación total de diseño $\epsilon_{td}$	1.967

Capa extrema:

Deformación compresión $\epsilon_{cd}$	0.375
Deformación cizalla $\epsilon_{qd}$	0.651 < 1.0 Ok!
Deformación giro $\theta_{td}$	0.021
Deformación total de diseño $\epsilon_{td}$	1.058

Deformación última  $\epsilon_{u,d}$  7 Ok!

Espejar mínima de láminas de acero:

$f_y$	275 MPa
Espejar mínima lámina acero tr	2.00 mm

Condición límite de rotación:

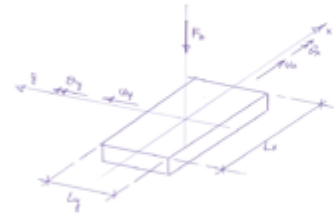
Flecha vertical:	1.42 mm
Condición rotacional:	1.21856 > 0.0 Debo cumplir limitación rotacional

Estabilidad a torsión:

ESTABILIDAD A TORSIÓN OK!

Condición de NO deslizamiento

$R_{xy}$	293 kN
Kf	0.6 [kf=0.6 hormigón; kf=0.2 resto]
$\mu$	0.22203
$F_{x,d}$	475 kN
	NO DESLIZA



DISTORSIÓN EN APOTOS

Deformaciones:

$U_x$	0.00 mm
$U_y$	39.00 mm

Fuerzas largas direcciones:

Distorsión calculada con G:	0.9 MPa
$F_x$	0.00 kN
$\epsilon_{sx}$	0.00 mm
$F_y$	0.00 kN
$\epsilon_{sy}$	0.00 mm

Fuerzas instantáneas:

Distorsión calculada con G:	1.8 MPa
$F_x$	238.00 kN
$\epsilon_{sx}$	43.63 mm
$F_y$	70.00 kN
$\epsilon_{sy}$	12.83 mm

Total:

$U_x$	43.63 mm
$U_y$	51.83 mm

1.-ACCIONES

Reacción vertical $F_{x,d}$	2115 kN
Desplazamiento $U_x$	13.20 mm (valor de diseño)
Desplazamiento $U_y$	52.20 mm (valor de diseño)
Gira $\theta_x$	1.39 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

2.-DIMENSIONES

$L_x$ [A]	600 mm	$L_x$ [A']	590 mm
$L_y$ [B]	500 mm	$L_y$ [A']	490 mm
Recubrimiento lateral (*)	5 mm		
n	9		
e	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento	2.5 mm		
Módulo de cizalla	0.9 MPa		
$E_b$	2000 MPa		

Factor de forma S	12.168	Capa típica
Factor de forma S	38.241	Capa extrema
A	300000 mm <sup>2</sup> (área total)	
A1	289100 mm <sup>2</sup> (área de placa de acero)	
Ar	255734 mm <sup>2</sup> (área efectiva reducida)	

3.-VERIFICACIONES

3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA

$\sigma_{c,d}$  8.3 MPa NO REPTA

Capa típica:

Deformación compresión $\epsilon_{cd}$	1.133
Deformación cizalla $\epsilon_{qd}$	0.518 < 1.0 Ok!
Deformación giro $\theta_{td}$	0.153
Deformación total de diseño $\epsilon_{td}$	1.803

Capa extrema:

Deformación compresión $\epsilon_{cd}$	0.360
Deformación cizalla $\epsilon_{qd}$	0.518 < 1.0 Ok!
Deformación giro $\theta_{td}$	0.035
Deformación total de diseño $\epsilon_{td}$	0.913

Deformación última  $\epsilon_{u,d}$  7 Ok!

Espejar mínima de láminas de acero:

$f_y$	275 MPa
Espejar mínima lámina acero tr	2.00 mm

Condición límite de rotación:

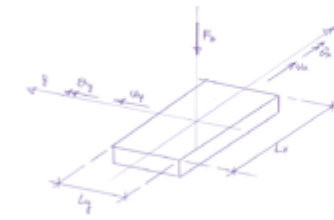
Flecha vertical:	1.47 mm
Condición rotacional:	1.24608 > 0.0 Debo cumplir limitación rotacional

Estabilidad a torsión:

ESTABILIDAD A TORSIÓN OK!

Condición de NO deslizamiento

$R_{xy}$	188 kN
Kf	0.6 [kf=0.6 hormigón; kf=0.2 resto]
$\mu$	0.22766
$F_{x,d}$	482 kN
	NO DESLIZA



DISTORSIÓN EN APOTOS

Deformaciones:

$U_x$	0.00 mm
$U_y$	39.00 mm

Fuerzas largas direcciones:

Distorsión calculada con G:	0.9 MPa
$F_x$	0.00 kN
$\epsilon_{sx}$	0.00 mm
$F_y$	0.00 kN
$\epsilon_{sy}$	0.00 mm

Fuerzas instantáneas:

Distorsión calculada con G:	1.8 MPa
$F_x$	72.00 kN
$\epsilon_{sx}$	13.20 mm
$F_y$	72.00 kN
$\epsilon_{sy}$	13.20 mm

Total:

$U_x$	13.20 mm
$U_y$	52.20 mm



Neoprenos vanos de 45m:

500x400x(129/93)

8 capas de 11mm + 2.5mm de recubrimientos. Espesor neto de neopreno: n·e=93mm

9 capas de acero

**EN 1337-3 [2005]**  
**VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES**  
 EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 30.xlrx  
 16/06/2020

**1.- ACCIONES**

Reacción vertical $F_{x,d}$	3656	kN
Desplazamiento $U_x$	20.53	mm (valor de diseño)
Desplazamiento $U_y$	82.18	mm (valor de diseño)
Gira $\theta_x$	2.24	10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0	10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	500	mm	$L_x$ [A']	490	mm
$L_y$ [B]	400	mm	$L_y$ [A']	390	mm
Recubrimiento lateral (*)	5	mm			
n	8				
e	11	mm	(*) Diferencia en planta entre neopreno y placa de acero		
Recubrimiento	2.5	mm			
Módulo de cizalla	0.9	MPa			
$E_b$	2000	MPa			
Factor de forma S-	9.871	Capa típica			
Factor de forma S-	21.023	Capa extrema			
A-	200000	mm <sup>2</sup> (área total)			
A1-	191100	mm <sup>2</sup> (área de placar de acero)			
Ar-	143989	mm <sup>2</sup> (área efectiva reducida)			

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 24.5 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	4.143
Deformación cizalla $\epsilon_{cd}$	0.911 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.182
Deformación total de diseño $\epsilon_{td}$	5.237

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	1.318
Deformación cizalla $\epsilon_{cd}$	0.911 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.042
Deformación total de diseño $\epsilon_{td}$	2.271

**Deformación última  $\epsilon_{u,d}$**  = 7 Ok!

**Espeor mínima de lámina de acero:**

$f_y$	275	MPa
Espeor mínima lámina acero $t$	2.55	mm

**Condición límite de rotación:**

Flecha vertical	4.75	mm
Condición rotacional	4.44726	> 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**  
ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

$F_{xy}$	207	kN
Kf	0.6	[kf=0.6 harmigón; kf=0.2 repta]
$\mu_e$	0.14923	
$F_{x,d,r,d}$	546	kN NO DESLIZA

**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00	mm
$U_y$	63.00	mm

**Fuerzas larga duración:**

Distorsión calculada con G	0.9	Mpa
$F_x$	0.00	kN
$\epsilon_{x-}$	0.00	mm
$F_y$	0.00	kN
$\epsilon_{y-}$	0.00	mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8	Mpa
$F_x$	84.00	kN
$\epsilon_{x-}$	20.53	mm
$F_y$	58.00	kN
$\epsilon_{y-}$	14.18	mm

**Total:**

$U_x$	20.53	mm
$U_y$	82.18	mm

**EN 1337-3 [2005]**  
**VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES**  
 EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 30.xlrx  
 16/06/2020

**1.- ACCIONES**

Reacción vertical $F_{x,d}$	830	kN
Desplazamiento $U_x$	14.42	mm (valor de diseño)
Desplazamiento $U_y$	17.51	mm (valor de diseño)
Gira $\theta_x$	2.24	10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0	10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	500	mm	$L_x$ [A']	490	mm
$L_y$ [B]	400	mm	$L_y$ [A']	390	mm
Recubrimiento lateral (*)	5	mm			
n	8				
e	11	mm	(*) Diferencia en planta entre neopreno y placa de acero		
Recubrimiento	2.5	mm			
Módulo de cizalla	0.9	MPa			
$E_b$	2000	MPa			
Factor de forma S-	9.871	Capa típica			
Factor de forma S-	21.023	Capa extrema			
A-	200000	mm <sup>2</sup> (área total)			
A1-	191100	mm <sup>2</sup> (área de placar de acero)			
Ar-	143989	mm <sup>2</sup> (área efectiva reducida)			

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 4.7 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	0.791
Deformación cizalla $\epsilon_{cd}$	0.244 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.179
Deformación total de diseño $\epsilon_{td}$	1.214

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	0.252
Deformación cizalla $\epsilon_{cd}$	0.244 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.041
Deformación total de diseño $\epsilon_{td}$	0.536

**Deformación última  $\epsilon_{u,d}$**  = 7 Ok!

**Espeor mínima de lámina de acero:**

$f_y$	275	MPa
Espeor mínima lámina acero $t$	2.00	mm

**Condición límite de rotación:**

Flecha vertical	1.03	mm
Condición rotacional	0.781	> 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**  
ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

$F_{xy}$	82	kN
Kf	0.6	[kf=0.6 harmigón; kf=0.2 repta]
$\mu_e$	0.21687	
$F_{x,d,r,d}$	263	kN NO DESLIZA

**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00	mm
$U_y$	7.00	mm

**Fuerzas larga duración:**

Distorsión calculada con G	0.9	Mpa
$F_x$	0.00	kN
$\epsilon_{x-}$	0.00	mm
$F_y$	0.00	kN
$\epsilon_{y-}$	0.00	mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8	Mpa
$F_x$	59.00	kN
$\epsilon_{x-}$	14.42	mm
$F_y$	43.00	kN
$\epsilon_{y-}$	10.51	mm

**Total:**

$U_x$	14.42	mm
$U_y$	17.51	mm

EN 1337-3 [2005]

VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES

EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 30.xlsx

16/06/2020

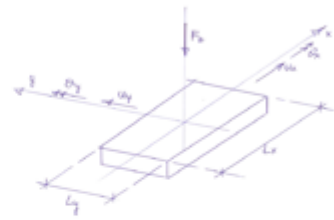


1.- ACCIONES

Reacción vertical $F_{x,d}$	3549 kN
Desplazamiento $U_x$	0.00 mm (valor de diseño)
Desplazamiento $U_y$	85.11 mm (valor de diseño)
Gira $\theta_x$	2.34 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

2.- DIMENSIONES

$L_x$ [A]	500 mm	$L_x$ [A']	490 mm
$L_y$ [B]	400 mm	$L_y$ [A']	390 mm
Recubrimiento lateral (*)	5 mm		
$n$	8		
$e$	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento	2.5 mm		
Módulo de elasticidad	0.9 MPa		
$E_b$	2000 MPa		
Factor de forma $S_c$	9.871	Capa típica	
Factor de forma $S_e$	31.023	Capa extrema	
A	200000 mm <sup>2</sup> (área total)		
A1	191100 mm <sup>2</sup> (área de placa de acero)		
Ar	157907 mm <sup>2</sup> (área efectiva reducida)		



DISTORSIÓN EN APOYOS

**Deformaciones:**

$U_x$	0.00 mm
$U_y$	68.00 mm

**Fuerzas largas direcciones:**

Distorsión calculada con G	0.9 MPa
$F_x$	0.00 kN
$U_x$	0.00 mm
$F_y$	0.00 kN
$U_y$	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8 MPa
$F_x$	0.00 kN
$U_x$	0.00 mm
$F_y$	70.00 kN
$U_y$	17.11 mm

**Total:**

$U_x$	0.00 mm
$U_y$	85.11 mm

3.- VERIFICACIONES

3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA

$\sigma_c, d$  22.5 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	3.795
Deformación cizalla $\epsilon_{cd}$	0.915 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.183
Deformación total de diseño $\epsilon_{td}$	4.893

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	1.207
Deformación cizalla $\epsilon_{cd}$	0.915 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.042
Deformación total de diseño $\epsilon_{td}$	2.164

Deformación última  $\epsilon_{u,d}$  7 Ok!

Espejar mínima de lámina de acero:

$f_y$	275 MPa
Espejar mínima lámina acero $t_r$	2.34 mm

Condición límite de rotación:

Flecha vertical	4.51 mm
Condición rotacional	4.28086 > 0.0 Debe cumplir limitación rotacional

Estabilidad a torsión:

ESTABILIDAD A TORSIÓN OK!

Condición de NO deslizamiento

$R_{xy}$	207 kN
Kf	0.6 [kf=0.6 harmigón; kf=0.2 resto]
$\mu_e$	0.15072
$F_{x,d,r,d}$	535 kN
	NO DESLIZA

EN 1337-3 [2005]

VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES

EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 30.xlsx

16/06/2020

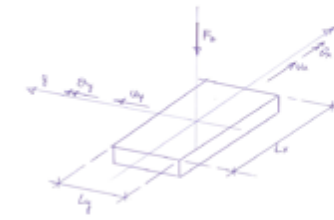


1.- ACCIONES

Reacción vertical $F_{x,d}$	3658 kN
Desplazamiento $U_x$	20.53 mm (valor de diseño)
Desplazamiento $U_y$	82.18 mm (valor de diseño)
Gira $\theta_x$	3.62 10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0 10 <sup>-3</sup> rad (valor de diseño)

2.- DIMENSIONES

$L_x$ [A]	500 mm	$L_x$ [A']	490 mm
$L_y$ [B]	400 mm	$L_y$ [A']	390 mm
Recubrimiento lateral (*)	5 mm		
$n$	8		
$e$	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento	2.5 mm		
Módulo de elasticidad	0.9 MPa		
$E_b$	2000 MPa		
Factor de forma $S_c$	9.871	Capa típica	
Factor de forma $S_e$	31.023	Capa extrema	
A	200000 mm <sup>2</sup> (área total)		
A1	191100 mm <sup>2</sup> (área de placa de acero)		
Ar	148999 mm <sup>2</sup> (área efectiva reducida)		



DISTORSIÓN EN APOYOS

**Deformaciones:**

$U_x$	0.00 mm
$U_y$	68.00 mm

**Fuerzas largas direcciones:**

Distorsión calculada con G	0.9 MPa
$F_x$	0.00 kN
$U_x$	0.00 mm
$F_y$	0.00 kN
$U_y$	0.00 mm

**Fuerzas instantáneas:**

Distorsión calculada con G	1.8 MPa
$F_x$	84.00 kN
$U_x$	20.53 mm
$F_y$	58.00 kN
$U_y$	14.18 mm

**Total:**

$U_x$	20.53 mm
$U_y$	82.18 mm

3.- VERIFICACIONES

3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA

$\sigma_c, d$  24.5 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	4.143
Deformación cizalla $\epsilon_{cd}$	0.911 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.284
Deformación total de diseño $\epsilon_{td}$	5.338

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	1.318
Deformación cizalla $\epsilon_{cd}$	0.911 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.064
Deformación total de diseño $\epsilon_{td}$	2.294

Deformación última  $\epsilon_{u,d}$  7 Ok!

Espejar mínima de lámina de acero:

$f_y$	275 MPa
Espejar mínima lámina acero $t_r$	2.55 mm

Condición límite de rotación:

Flecha vertical	4.75 mm
Condición rotacional	4.28086 > 0.0 Debe cumplir limitación rotacional

Estabilidad a torsión:

ESTABILIDAD A TORSIÓN OK!

Condición de NO deslizamiento

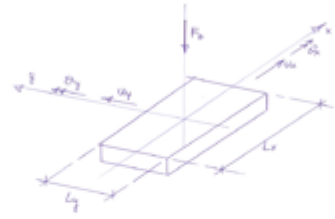
$R_{xy}$	207 kN
Kf	0.6 [kf=0.6 harmigón; kf=0.2 resto]
$\mu_e$	0.14923
$F_{x,d,r,d}$	546 kN
	NO DESLIZA

**1.- ACCIONES**

Reacción vertical $F_{x,d}$	1351	kN
Desplazamiento $U_x$	9.53	mm (valor de diseño)
Desplazamiento $U_y$	72.58	mm (valor de diseño)
Gira $\theta_x$	0.38	10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0	10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	500	mm	$L_x$ [A']	490	mm
$L_y$ [B]	400	mm	$L_y$ [A']	390	mm
Recubrimiento lateral (*)	5	mm			
$n$	8				
$e$	11	mm	(*) Diferencia en planta entre neopreno y placa de acero		
Recubrimiento	2.5	mm			
Módulo de cizalla	0.9	MPa			
$E_b$	2000	MPa			
Factor de forma $S_c$	9.871	Capa típica			
Factor de forma $S_e$	31.023	Capa extrema			
A	200000	mm <sup>2</sup> (área total)			
A1	191100	mm <sup>2</sup> (área de placar de acero)			
Ar	158123	mm <sup>2</sup> (área efectiva reducida)			



**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00	mm
$U_y$	32.00	mm

**Fuerzas larga dirección:**

Distorsión calculada con G	0.9	MPa
$F_x$	0.00	kN
$U_x$	0.00	mm
$F_y$	0.00	kN
$U_y$	0.00	mm

**Fuerzas inerciales:**

Distorsión calculada con G	1.8	MPa
$F_x$	29.00	kN
$U_x$	9.53	mm
$F_y$	166.00	kN
$U_y$	40.58	mm

**Total:**

$U_x$	9.53	mm
$U_y$	72.58	mm

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 8.9 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	1.443
Deformación cizalla $\epsilon_{cd}$	0.787 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.030
Deformación total de diseño $\epsilon_{td}$	2.259

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	0.459
Deformación cizalla $\epsilon_{cd}$	0.787 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.007
Deformación total de diseño $\epsilon_{td}$	1.253

Deformación última  $\epsilon_{u,d}$  = 7 Ok!

**Espejar mínima de lámina de acero:**

$f_y$	275	MPa
Espejar mínima lámina acero $t_r$	2.00	mm

**Condición límite de rotación:**

Flèche vertical	1.76	mm
Condición rotacional	1.70641	> 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**

ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

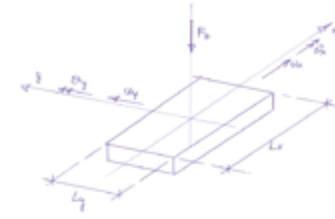
$R_{xy}$	231	kN
Kf	0.6	[kf=0.6 harmigán; kf=0.2 reseta]
$\mu_e$	0.23223	
$F_{x,d,r,d}$	315	kN NO DESLIZA

**1.- ACCIONES**

Reacción vertical $F_{x,d}$	1410	kN
Desplazamiento $U_x$	31.29	mm (valor de diseño)
Desplazamiento $U_y$	44.71	mm (valor de diseño)
Gira $\theta_x$	0.38	10 <sup>-3</sup> rad (valor de diseño)
Gira $\theta_y$	0	10 <sup>-3</sup> rad (valor de diseño)

**2.- DIMENSIONES**

$L_x$ [A]	500	mm	$L_x$ [A']	490	mm
$L_y$ [B]	400	mm	$L_y$ [A']	390	mm
Recubrimiento lateral (*)	5	mm			
$n$	8				
$e$	11	mm	(*) Diferencia en planta entre neopreno y placa de acero		
Recubrimiento	2.5	mm			
Módulo de cizalla	0.9	MPa			
$E_b$	2000	MPa			
Factor de forma $S_c$	9.871	Capa típica			
Factor de forma $S_e$	31.023	Capa extrema			
A	200000	mm <sup>2</sup> (área total)			
A1	191100	mm <sup>2</sup> (área de placar de acero)			
Ar	158123	mm <sup>2</sup> (área efectiva reducida)			



**DISTORSIÓN EN APOYOS**

**Deformaciones:**

$U_x$	0.00	mm
$U_y$	32.00	mm

**Fuerzas larga dirección:**

Distorsión calculada con G	0.9	MPa
$F_x$	0.00	kN
$U_x$	0.00	mm
$F_y$	0.00	kN
$U_y$	0.00	mm

**Fuerzas inerciales:**

Distorsión calculada con G	1.8	MPa
$F_x$	128.00	kN
$U_x$	31.29	mm
$F_y$	52.00	kN
$U_y$	12.71	mm

**Total:**

$U_x$	31.29	mm
$U_y$	44.71	mm

**3.- VERIFICACIONES**

**3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA**

$\sigma_{c,d}$  = 8.9 MPa NO REPTA

**Capa típica:**

Deformación compresión $\epsilon_{cd}$	1.504
Deformación cizalla $\epsilon_{cd}$	0.587 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.030
Deformación total de diseño $\epsilon_{td}$	2.120

**Capa extrema:**

Deformación compresión $\epsilon_{cd}$	0.478
Deformación cizalla $\epsilon_{cd}$	0.587 < 1.0 Ok!
Deformación giro $\theta_{cd}$	0.007
Deformación total de diseño $\epsilon_{td}$	1.072

Deformación última  $\epsilon_{u,d}$  = 7 Ok!

**Espejar mínima de lámina de acero:**

$f_y$	275	MPa
Espejar mínima lámina acero $t_r$	2.00	mm

**Condición límite de rotación:**

Flèche vertical	1.83	mm
Condición rotacional	1.78308	> 0.0 Debe cumplir limitación rotacional

**Estabilidad a torsión:**

ESTABILIDAD A TORSIÓN OK!

**Condición de NO deslizamiento**

$R_{xy}$	171	kN
Kf	0.6	[kf=0.6 harmigán; kf=0.2 reseta]
$\mu_e$	0.22766	
$F_{x,d,r,d}$	321	kN NO DESLIZA

EN 1337-3 [2005]

VERIFICACIÓN APARATOS DE APOYO DE NEOPRENO ZUNCHADO RECTANGULARES

EN1337-3\_5.0 - APARATOS DE APOYO ELASTOMÉRICOS\_vana 30.xlsx

16/06/2020



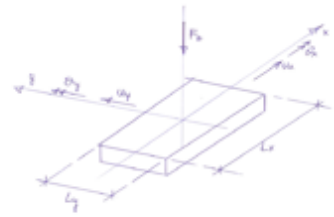
1.-ACCIONES

Reacción vertical F <sub>v,d</sub>	1412 kN
Desplazamiento U <sub>x</sub>	8.56 mm (valor de diseño)
Desplazamiento U <sub>y</sub>	44.47 mm (valor de diseño)
Gira θ <sub>x</sub>	0.47 10 <sup>-3</sup> rad (valor de diseño)
Gira θ <sub>y</sub>	0 10 <sup>-3</sup> rad (valor de diseño)

2.-DIMENSIONES

L <sub>x</sub> [A]	500 mm	L <sub>x</sub> [A']	490 mm
L <sub>y</sub> [B]	400 mm	L <sub>y</sub> [A']	390 mm
Recubrimiento lateral (*)	5 mm		
n	8		
e	11 mm	(*) Diferencia en planta entre neopreno y placa de acero	
Recubrimiento	2.5 mm		
Módulo de cizalla	0.9 MPa		
E <sub>b</sub>	20000 MPa		

Factor de forma S <sub>c</sub>	9.874	Capa típica
Factor de forma S <sub>e</sub>	31.023	Capa extrema
A	2000000 mm <sup>2</sup> (área total)	
A <sub>1</sub>	191100 mm <sup>2</sup> (área de placa de acero)	
A <sub>r</sub>	169566 mm <sup>2</sup> (área efectiva reducida)	



DISTORSIÓN EN APOYOS

Deformaciones:

U <sub>x</sub>	0.00 mm
U <sub>y</sub>	32.00 mm

Fuerzas largas duración:

Distorsión calculada con G <sub>1</sub>	0.9 MPa
F <sub>x</sub>	0.00 kN
U <sub>x</sub>	0.00 mm
F <sub>y</sub>	0.00 kN
U <sub>y</sub>	0.00 mm

Fuerzas instantáneas:

Distorsión calculada con G <sub>2</sub>	1.8 MPa
F <sub>x</sub>	35.00 kN
U <sub>x</sub>	8.56 mm
F <sub>y</sub>	51.00 kN
U <sub>y</sub>	12.47 mm

Total:

U <sub>x</sub>	8.56 mm
U <sub>y</sub>	44.47 mm

3.-VERIFICACIONES

3.1.- DEFORMACIÓN DE DISEÑO MÁXIMA

σ<sub>c,d</sub> 8.2 MPa NO REPTA

Capa típica:	
Deformación compresión σ <sub>c,d</sub>	1.406
Deformación cizalla τ <sub>q,d</sub>	0.487 < 1.0 Ok!
Deformación giro θ <sub>q,d</sub>	0.037
Deformación total de diseño σ <sub>c,d</sub>	1.920

Capa extrema:	
Deformación compresión σ <sub>c,d</sub>	0.447
Deformación cizalla τ <sub>q,d</sub>	0.487 < 1.0 Ok!
Deformación giro θ <sub>q,d</sub>	0.008
Deformación total de diseño σ <sub>c,d</sub>	0.943

Deformación última σ<sub>c,d</sub> 7 Ok!

Espesor mínimo de lámina de acero:

F <sub>y</sub>	2.75 MPa
Espesor mínimo lámina acero t <sub>r</sub>	2.00 mm

Condición límite de rotación:

Flacha vertical:	1.84 mm
Condición rotacional:	1.77393 > 0.0 Debe cumplir limitación rotacional

Estabilidad a torsión:

ESTABILIDAD A TORSIÓN OK!

Condición de NO deslizamiento

F <sub>xy</sub>	113 kN
K <sub>f</sub>	0.6 [kf=0.6 hormigón; kf=0.2 reseta]
μ <sub>o</sub>	0.22748
F <sub>cd,r,d</sub>	321 kN NO DESLIZA

MOVIMIENTOS EN JUNTAS DE DILATACIÓN

	ABERTURA [mm]	CIERRE [mm]
G1 viga	0.0	0.0
PRETENSADO	0.0	0.0
G1 losa	0.0	-7.6
G2	0.0	-1.4
REOLOGÍA	29.9	0.0
SC q+Q	0.0	-4.6
TEMP +	0.0	-20.9
TEMP -	13.2	0.0
FRENADO	18.0	-18.0
VIENTO TRANSV	0.0	0.0
VIENTO TRANSV + SC	0.0	0.0
VIENTO LONG	5.0	-5.0
VIENTO LONG + SC	5.0	-5.0
SISMO LONG	55.0	-55.0
SISMO TRANSV	17.0	-17.0
SISMO VERT	17.0	-17.0

SERVICIO:	66.1	-57.5
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SISMO:	84.9	-64.0
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PROPUESTA:	100.0	-70.0
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## Models de càlcul global

# 1. MODELO DE SAP

**Table: Case - Static 1 - Load Assignments**

Table: Case - Static 1 - Load Assignments			
Case	LoadType	LoadName	LoadSF
DEAD	Load pattern	DEAD	1.
SC1	Load pattern	SC1	1.
TEMP+	Load pattern	TEMP+	1.
TEMP-	Load pattern	TEMP-	1.
W_TRANSV_SIN SC	Load pattern	W_TRANSV_SIN SC	1.
W_TRANSV_CON SC	Load pattern	W_TRANSV_CON SC	1.
W_LONG_SIN SC	Load pattern	W_LONG_SIN SC	1.
W_LONG_CON SC	Load pattern	W_LONG_CON SC	1.
FRENADO	Load pattern	FRENADO	1.
REOLOGÍA	Load pattern	REOLOGÍA	1.

**Table: Connectivity - Frame, Part 1 of 2**

Table: Connectivity - Frame, Part 1 of 2							
Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
2	1	2	No	2.25	3.375	0.	0.
3	2	3	No	2.25	5.625	0.	0.
4	3	4	No	2.25	7.875	0.	0.
5	4	5	No	2.25	10.125	0.	0.
6	5	6	No	2.25	12.375	0.	0.
7	6	7	No	2.25	14.625	0.	0.
8	7	8	No	2.25	16.875	0.	0.
9	8	9	No	2.25	19.125	0.	0.
10	9	10	No	2.25	21.375	0.	0.
11	10	11	No	2.25	23.625	0.	0.
12	11	12	No	2.25	25.875	0.	0.
13	12	13	No	2.25	28.125	0.	0.
14	13	14	No	2.25	30.375	0.	0.
15	14	15	No	2.25	32.625	0.	0.
16	15	16	No	2.25	34.875	0.	0.
17	16	17	No	2.25	37.125	0.	0.
18	17	18	No	2.25	39.375	0.	0.
19	18	19	No	2.25	41.625	0.	0.
22	20	21	No	2.25	48.375	0.	0.
23	21	22	No	2.25	50.625	0.	0.
24	22	23	No	2.25	52.875	0.	0.
25	23	24	No	2.25	55.125	0.	0.
26	24	25	No	2.25	57.375	0.	0.
27	25	26	No	2.25	59.625	0.	0.
28	26	27	No	2.25	61.875	0.	0.
29	27	28	No	2.25	64.125	0.	0.
30	28	29	No	2.25	66.375	0.	0.
31	29	30	No	2.25	68.625	0.	0.
32	30	31	No	2.25	70.875	0.	0.
33	31	32	No	2.25	73.125	0.	0.
34	32	33	No	2.25	75.375	0.	0.
35	33	34	No	2.25	77.625	0.	0.

**Table: Connectivity - Frame, Part 1 of 2**

Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
36	34	35	No	2.25	79.875	0.	0.
37	35	36	No	2.25	82.125	0.	0.
38	36	37	No	2.25	84.375	0.	0.
39	37	38	No	2.25	86.625	0.	0.
42	39	40	No	1.5	92.25	0.	0.
43	40	41	No	1.5	93.75	0.	0.
44	41	42	No	1.5	95.25	0.	0.
45	42	43	No	1.5	96.75	0.	0.
46	43	44	No	1.5	98.25	0.	0.
47	44	45	No	1.5	99.75	0.	0.
48	45	46	No	1.5	101.25	0.	0.
49	46	47	No	1.5	102.75	0.	0.
50	47	48	No	1.5	104.25	0.	0.
51	48	49	No	1.5	105.75	0.	0.
52	49	50	No	1.5	107.25	0.	0.
53	50	51	No	1.5	108.75	0.	0.
54	51	52	No	1.5	110.25	0.	0.
55	52	53	No	1.5	111.75	0.	0.
56	53	54	No	1.5	113.25	0.	0.
57	54	55	No	1.5	114.75	0.	0.
58	55	56	No	1.5	116.25	0.	0.
59	56	57	No	1.5	117.75	0.	0.
61	65	66	No	2.25	0.5	1.125	0.
62	67	65	No	2.25	0.5	-1.125	0.
63	66	68	No	1.896	0.5	2.25	-0.948
64	67	69	No	1.896	0.5	-2.25	-0.948
65	70	71	No	2.25	44.5	1.125	0.
66	72	70	No	2.25	44.5	-1.125	0.
67	71	73	No	1.896	44.5	2.25	-0.948
68	72	74	No	1.896	44.5	-2.25	-0.948
69	68	75	No	0.104	0.5	2.25	-1.948
70	69	76	No	0.104	0.5	-2.25	-1.948
71	73	77	No	0.104	44.5	2.25	-1.948
72	74	78	No	0.104	44.5	-2.25	-1.948
73	63	65	No	0.5	0.25	0.	0.
74	65	1	No	1.75	1.375	0.	0.
75	81	82	No	2.25	119.5	1.125	0.
76	83	81	No	2.25	119.5	-1.125	0.
77	82	84	No	1.907	119.5	2.25	-0.9535
78	83	85	No	1.907	119.5	-2.25	-0.9535
79	84	86	No	0.093	119.5	2.25	-1.9535
80	85	87	No	0.093	119.5	-2.25	-1.9535
81	88	89	No	4.5	45.	0.	-2.6
82	90	88	No	0.6	45.	2.25	-2.3
83	91	89	No	0.6	45.	-2.25	-2.3
84	92	93	No	2.25	45.5	1.125	0.
85	94	92	No	2.25	45.5	-1.125	0.
86	93	95	No	1.896	45.5	2.25	-0.948
87	94	96	No	1.896	45.5	-2.25	-0.948
88	95	97	No	0.104	45.5	2.25	-1.948
89	96	98	No	0.104	45.5	-2.25	-1.948
90	78	91	No	0.5	44.75	-2.25	-2.
91	91	98	No	0.5	45.25	-2.25	-2.
92	77	90	No	0.5	44.75	2.25	-2.

Table: Connectivity - Frame, Part 1 of 2

Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
93	90	97	No	0.5	45.25	2.25	-2.
94	88	99	No	5.6	45.	2.25	-5.4
95	89	100	No	5.6	45.	-2.25	-5.4
96	19	70	No	1.75	43.625	0.	0.
97	70	64	No	0.5	44.75	0.	0.
98	64	92	No	0.5	45.25	0.	0.
99	92	20	No	1.75	46.375	0.	0.
100	38	123	No	1.75	88.625	0.	0.
101	123	79	No	0.5	89.75	0.	0.
102	79	134	No	0.5	90.25	0.	0.
103	134	39	No	1.	91.	0.	0.
104	57	81	No	1.	119.	0.	0.
105	81	80	No	0.5	119.75	0.	0.
117	121	88	No	0.75	45.	2.625	-2.6
118	89	122	No	0.75	45.	-2.625	-2.6
119	123	124	No	2.25	89.5	1.125	0.
120	125	123	No	2.25	89.5	-1.125	0.
121	124	126	No	1.896	89.5	2.25	-0.948
122	125	127	No	1.896	89.5	-2.25	-0.948
123	126	128	No	0.104	89.5	2.25	-1.948
124	127	129	No	0.104	89.5	-2.25	-1.948
125	130	131	No	4.5	90.	0.	-2.6
126	132	130	No	0.6	90.	2.25	-2.3
127	133	131	No	0.6	90.	-2.25	-2.3
128	134	135	No	2.25	90.5	1.125	0.
129	136	134	No	2.25	90.5	-1.125	0.
130	135	137	No	1.907	90.5	2.25	-0.9535
131	136	138	No	1.907	90.5	-2.25	-0.9535
132	137	139	No	0.093	90.5	2.25	-1.9535
133	138	140	No	0.093	90.5	-2.25	-1.9535
134	129	133	No	0.5	89.75	-2.25	-2.
135	133	140	No	0.5	90.25	-2.25	-2.
136	128	132	No	0.5	89.75	2.25	-2.
137	132	139	No	0.5	90.25	2.25	-2.
138	130	141	No	5.6	90.	2.25	-5.4
139	131	142	No	5.6	90.	-2.25	-5.4
140	143	130	No	0.75	90.	2.625	-2.6
141	131	144	No	0.75	90.	-2.625	-2.6

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
7	44a4f9ac-5f9d-404f-a6f0-f0aefeba5bbf
8	6782b1bf-044c-4e23-9dc-a-b931100b645c
9	02e243a0-b4a1-48e1-9a06-e388f3a8f1ab
10	388ef73c-dd53-4262-bb23-3408e8458396
11	018ebef8-15b9-49f5-bbd1-b378762ab313
12	46e76c43-2064-4366-a020-757e49068bab
13	da107a03-e81c-486f-8e81-42a24b21ba3e
14	20b2a596-f969-497b-92e4-7989aecb3703
15	9cae7b2e-4ef7-43f8-b6a1-320921c9170b
16	e0c435e7-d2b1-4ffa-ac25-fe60e94655f1
17	3e25b875-cd8d-4ed5-bb01-c4089cfab09
18	dc036f6e-2131-4a77-aa03-3806701b4e1e
19	48aed3ed-42d1-4b3e-b008-48a2491e888b
22	d3437f5d-385b-4d91-93ca-5293e4d8d9f8
23	cc1683a2-a233-4d18-a021-080ed001004e
24	90180320-92db-449f-859f-c762ee62ddc6
25	09039317-698c-4940-a2f4-5f8f397b5b80
26	bddb9f0b-7e5f-441e-8a77-cc6c777b8a2b
27	aad64ed3-13af-4bab-9c82-c39591286544
28	202bac71-7fb0-4d17-aa3c-fde1614a9f69
29	5875b3b3-3590-4bcb-a4aa-f9faa9033cc4
30	d98fb302-dd37-44c6-97af-8929f88d7802
31	b4783e03-b47a-407b-9b96-7ee387acf046
32	337391c3-e9e0-4644-88eb-985240367ce1
33	00a98d87-9d2e-4f96-b452-f5487d81e6e4
34	9725b33d-2007-4c4b-9080-bd67dd146e8b
35	7f4b7e6a-df47-49d3-83f2-ed40afc435ed
36	37518cc5-f3ea-45c6-88cc-cb6e3907a1b5
37	20cad9ae-f770-4243-b4c0-c4f5cddd3ac6
38	3db2964f-008f-4abc-86fd-af1df26f27ca

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
2	7fcd1b55-1ded-4a05-b20b-9716b738e860
3	867718a2-3b26-4c77-953d-91f249ee9035
4	9904a7af-ae33-425e-b6b4-47d149bd3168
5	bd9471d4-b88d-47ac-ba5b-8ef5e051ca4a
6	c50a07d3-ad08-421a-b080-9f370c9aac2a



Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
39	3d279fb1-e843-44fa-be7f-16178cfa5643
42	6c3eef06-b68f-41fc-b490-73df0358fd72
43	2f21dd74-97ff-4370-ba21-92f9e92faf8c
44	c8d8e514-1505-4b94-af58-77c611921c9d
45	1159b93d-54f8-4364-87d-d-4ced4c6277e
46	dd363462-18fb-4539-95f-d-e9788278035e
47	a4b2a01c-0155-4c82-93bc-d754eeab97fd
48	8e177c41-730f-446e-89a4-5a7dfe7c8dbd
49	199aabd1-4078-4316-bc78-5ffe91b8dcb5
50	e2ed63ad-070e-40ba-99ea-9cd19af5bb1b
51	ebfada3a-3ea9-43e0-b928-af0d3cda6a73
52	372ed8e2-6078-403c-b487-15c79bcec616
53	41c1f7b3-d234-4183-aaf0-b546bf88acbb
54	ea1316fe-1e2b-4fe9-9118-763aab07041d
55	fc746848-eddd-4ce4-9191-17d1b3189fe1
56	f28394f2-d4e2-4ac6-b3f2-d098afd631c6
57	e2057889-66cb-4eef-beb0-a306c589fbd5
58	b45aa8d3-70a7-4a5f-9f32-6196df8fd187
59	5190c7bf-feed-4753-8f7c-a883a5a95668
61	4d459a75-37b4-4d12-83bc-fcdfb68093ba
62	981a0301-14bd-4bdd-a2cd-d71b410d798e
63	7b6abc79-0dd4-4274-ab05-8316dae59fa4
64	b959c638-7323-4304-8809-5c093349d8c8
65	b696ed09-3774-4be4-b785-5d9c98f871e7
66	b2e71b85-eb6a-4fd1-9ee4-d1f0916cb12a
67	a735df57-cc65-468d-b914-344c2473a1a4
68	845370a9-f175-4f45-9ba6-fa85afa8048b
69	c5f7db5e-062c-413c-a311-299ac83dd0e7
70	62d6b13d-d9c6-4f88-8fc4-8b58a1dc9357
71	1dc9a57a-5c09-4b3c-83a0-1d56f059c460

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
72	6cdd5e66-aac5-4b97-8664-6bf916bf4e0d
73	1c244519-aca1-4230-8c67-2c26c08f0398
74	34b11583-9d02-4813-a7d5-f804e05537e5
75	6bb78061-ee59-40ab-8206-d6dd004fcc9a
76	fc0ca126-455c-430e-a85a-861694dc2921
77	3b996311-fa6f-451f-9023-f3dba4c3e00c
78	c51859f3-fca9-4762-bb88-42a28655a821
79	1cabd784-5fab-4385-a828-011e5bb82248
80	84173685-f8bc-4797-a95e-de59dda9fe3b
81	1af9fd82-028a-407c-ac3b-dba24f80a825
82	13ec3472-d096-42a2-9baf-0ebdc927e751
83	430cc1a7-34a7-4f27-b8ad-5ed29623566f
84	84f3e168-93f0-4c47-954b-1b840aa2bc50
85	47c4d82f-5620-42d1-bda7-dca48c673ef7
86	f18c0bf7-e0c6-4566-89f6-f4a8959be090
87	7e374107-4588-4c7e-b6e1-7dbd7bc78a58
88	24b9d2d4-6233-43c8-8e20-3f969fc4049f
89	b4ce3a3f-0458-43ae-af19-d0f138506401
90	b9d64537-810d-44eb-b566-4553043269c9
91	5bc8f859-19f2-4bc7-911a-3c57f6af4617
92	ea8fce3a-2911-45c9-91ab-11a72fbd0a22
93	a925b603-08f6-4f63-83e1-20a2010eb0e6
94	c324d370-a8d0-4093-8383-d6b40da4300a
95	2ce99a31-0f2a-495c-af84-a5b58ab6d5f8
96	1aba0eec-528c-4e17-87d5-2ed71333f2e1
97	2c09b946-fc2b-4651-ba02-acc7b9bc9d06
98	d85057ee-77a7-4657-bd62-60ea29637bea
99	a48a4e89-4983-4bc5-a678-707f88b836e6
100	2ef4bd3f-be7d-492a-a71a-9137305003a9
101	7a5e5003-292c-4491-83e6-035ea913677d

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
102	0b24a933-a3ea-4405-8d b0-abddb42232f6
103	50fb96d4-ad0e-4a40-bd7 4-1e34a366a52e
104	edccb293-b049-4a4c-a2 24-15a9417d7c42
105	8583b25c-81d1-43b7-a7 5f-1abe4dda65d7
117	96c63a7b-a7a5-4412-ac d1-eaeb1d4d817e
118	f05fdbbc-6b2c-490c-8da a-7e4c35db0e6b
119	307939cc-70ce-4fbf-a91 9-05c213383da4
120	1569a644-d86d-40af-b17 2-3bef2dd63486
121	ce83aeb6-cc47-4922-a0 9d-15efcdc19229
122	c6a74bd4-7c11-43c2-9cc 8-580229ae02e0
123	bfe417a4-7861-4ace-b05 3-50e84730a2d4
124	bba22c6d-f118-4ce2-9f0 c-34c0dc0ff561
125	f968c9ee-933b-488a-822 6-17a83dcc71ac
126	8f1f0e30-0e4a-4294-991 d-69029bd58148
127	72bfcef3-3057-45d0-900 0-fab0fe23c391
128	969883e4-f9aa-44d5-b84 1-011afae5773c
129	a110fa98-dc27-4565-838 d-9de633421d29
130	c36dc237-9373-4898-87 c4-4a2df0b30065
131	c65ca44a-fcd2-4ca2-b69 1-1430e43f815a
132	38f67c0d-45f8-4901-aae 7-4ef61ad38e9b
133	bb34e633-4184-4c0f-894 c-583a159771cb
134	593c2e3e-4c04-4b39-88 22-439c71cdb8c2
135	26d018ab-8ed5-4e11-9a b3-431d660cf9fb
136	86423494-f624-4b36-929 c-8a76f1d999b3
137	543989fa-3700-4e41-af5f -6adb32763813
138	ac6e7b0e-17bc-4855-bc bf-8f267dd85d0f
139	e84512f3-484f-45e5-adc 4-04d4ca3e3b43
140	b6cfa97-788d-4590-81c c-65cc10d9e557
141	a5d0d133-f6b9-4bb4-8a2 8-30fa912dfc30

Table: Coordinate Systems

Table: Coordinate Systems							
Name	Type	X	Y	Z	AboutZ	AboutY	AboutX
		m	m	m	Degrees	Degrees	Degrees
GLOBAL	Cartesian	0.	0.	0.	0.	0.	0.

Table: Frame Added Mass Assignments

Table: Frame Added Mass Assignments	
Frame	MassPerLen
	KN-s2/m2
2	2.27
3	2.27
4	2.27
5	2.27
6	2.27
7	2.27
8	2.27
9	2.27
10	2.27
11	2.27
12	2.27
13	2.27
14	2.27
15	2.27
16	2.27
17	2.27
18	2.27
19	2.27
22	2.27
23	2.27
24	2.27
25	2.27
26	2.27
27	2.27
28	2.27
29	2.27
30	2.27
31	2.27
32	2.27
33	2.27
34	2.27
35	2.27
36	2.27
37	2.27
38	2.27
39	2.27
42	2.27
43	2.27
44	2.27
45	2.27
46	2.27
47	2.27
48	2.27

Table: Frame Added Mass Assignments

Frame	MassPerLen KN-s2/m2
49	2.27
50	2.27
51	2.27
52	2.27
53	2.27
54	2.27
55	2.27
56	2.27
57	2.27
58	2.27
59	2.27
73	2.27
74	2.27
96	2.27
97	2.27
98	2.27
99	2.27
100	2.27
101	2.27
102	2.27
103	2.27
104	2.27
105	2.27

Table: Frame Auto Mesh Assignments

Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
2	Yes	Yes	No	0	0.	0.
3	Yes	Yes	No	0	0.	0.
4	Yes	Yes	No	0	0.	0.
5	Yes	Yes	No	0	0.	0.
6	Yes	Yes	No	0	0.	0.
7	Yes	Yes	No	0	0.	0.
8	Yes	Yes	No	0	0.	0.
9	Yes	Yes	No	0	0.	0.
10	Yes	Yes	No	0	0.	0.
11	Yes	Yes	No	0	0.	0.
12	Yes	Yes	No	0	0.	0.
13	Yes	Yes	No	0	0.	0.
14	Yes	Yes	No	0	0.	0.
15	Yes	Yes	No	0	0.	0.
16	Yes	Yes	No	0	0.	0.
17	Yes	Yes	No	0	0.	0.
18	Yes	Yes	No	0	0.	0.
19	Yes	Yes	No	0	0.	0.
22	Yes	Yes	No	0	0.	0.
23	Yes	Yes	No	0	0.	0.
24	Yes	Yes	No	0	0.	0.
25	Yes	Yes	No	0	0.	0.
26	Yes	Yes	No	0	0.	0.

Table: Frame Auto Mesh Assignments

Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
27	Yes	Yes	No	0	0.	0.
28	Yes	Yes	No	0	0.	0.
29	Yes	Yes	No	0	0.	0.
30	Yes	Yes	No	0	0.	0.
31	Yes	Yes	No	0	0.	0.
32	Yes	Yes	No	0	0.	0.
33	Yes	Yes	No	0	0.	0.
34	Yes	Yes	No	0	0.	0.
35	Yes	Yes	No	0	0.	0.
36	Yes	Yes	No	0	0.	0.
37	Yes	Yes	No	0	0.	0.
38	Yes	Yes	No	0	0.	0.
39	Yes	Yes	No	0	0.	0.
42	Yes	Yes	No	0	0.	0.
43	Yes	Yes	No	0	0.	0.
44	Yes	Yes	No	0	0.	0.
45	Yes	Yes	No	0	0.	0.
46	Yes	Yes	No	0	0.	0.
47	Yes	Yes	No	0	0.	0.
48	Yes	Yes	No	0	0.	0.
49	Yes	Yes	No	0	0.	0.
50	Yes	Yes	No	0	0.	0.
51	Yes	Yes	No	0	0.	0.
52	Yes	Yes	No	0	0.	0.
53	Yes	Yes	No	0	0.	0.
54	Yes	Yes	No	0	0.	0.
55	Yes	Yes	No	0	0.	0.
56	Yes	Yes	No	0	0.	0.
57	Yes	Yes	No	0	0.	0.
58	Yes	Yes	No	0	0.	0.
59	Yes	Yes	No	0	0.	0.
61	Yes	Yes	No	0	0.	0.
62	Yes	Yes	No	0	0.	0.
63	Yes	Yes	No	0	0.	0.
64	Yes	Yes	No	0	0.	0.
65	Yes	Yes	No	0	0.	0.
66	Yes	Yes	No	0	0.	0.
67	Yes	Yes	No	0	0.	0.
68	Yes	Yes	No	0	0.	0.
69	Yes	Yes	No	0	0.	0.
70	Yes	Yes	No	0	0.	0.
71	Yes	Yes	No	0	0.	0.
72	Yes	Yes	No	0	0.	0.
73	Yes	Yes	No	0	0.	0.
74	Yes	Yes	No	0	0.	0.
75	Yes	Yes	No	0	0.	0.
76	Yes	Yes	No	0	0.	0.
77	Yes	Yes	No	0	0.	0.
78	Yes	Yes	No	0	0.	0.
79	Yes	Yes	No	0	0.	0.
80	Yes	Yes	No	0	0.	0.
81	Yes	Yes	No	0	0.	0.
82	Yes	Yes	No	0	0.	0.

Table: Frame Auto Mesh Assignments

Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
83	Yes	Yes	No	0	0.	0.
84	Yes	Yes	No	0	0.	0.
85	Yes	Yes	No	0	0.	0.
86	Yes	Yes	No	0	0.	0.
87	Yes	Yes	No	0	0.	0.
88	Yes	Yes	No	0	0.	0.
89	Yes	Yes	No	0	0.	0.
90	Yes	Yes	No	0	0.	0.
91	Yes	Yes	No	0	0.	0.
92	Yes	Yes	No	0	0.	0.
93	Yes	Yes	No	0	0.	0.
94	Yes	Yes	No	0	0.	0.
95	Yes	Yes	No	0	0.	0.
96	Yes	Yes	No	0	0.	0.
97	Yes	Yes	No	0	0.	0.
98	Yes	Yes	No	0	0.	0.
99	Yes	Yes	No	0	0.	0.
100	Yes	Yes	No	0	0.	0.
101	Yes	Yes	No	0	0.	0.
102	Yes	Yes	No	0	0.	0.
103	Yes	Yes	No	0	0.	0.
104	Yes	Yes	No	0	0.	0.
105	Yes	Yes	No	0	0.	0.
117	Yes	Yes	No	0	0.	0.
118	Yes	Yes	No	0	0.	0.
119	Yes	Yes	No	0	0.	0.
120	Yes	Yes	No	0	0.	0.
121	Yes	Yes	No	0	0.	0.
122	Yes	Yes	No	0	0.	0.
123	Yes	Yes	No	0	0.	0.
124	Yes	Yes	No	0	0.	0.
125	Yes	Yes	No	0	0.	0.
126	Yes	Yes	No	0	0.	0.
127	Yes	Yes	No	0	0.	0.
128	Yes	Yes	No	0	0.	0.
129	Yes	Yes	No	0	0.	0.
130	Yes	Yes	No	0	0.	0.
131	Yes	Yes	No	0	0.	0.
132	Yes	Yes	No	0	0.	0.
133	Yes	Yes	No	0	0.	0.
134	Yes	Yes	No	0	0.	0.
135	Yes	Yes	No	0	0.	0.
136	Yes	Yes	No	0	0.	0.
137	Yes	Yes	No	0	0.	0.
138	Yes	Yes	No	0	0.	0.
139	Yes	Yes	No	0	0.	0.
140	Yes	Yes	No	0	0.	0.
141	Yes	Yes	No	0	0.	0.

Table: Frame Load Transfer Options

Table: Frame Load Transfer Options	
Frame	Transfer
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes
31	Yes
32	Yes
33	Yes
34	Yes
35	Yes
36	Yes
37	Yes
38	Yes
39	Yes
42	Yes
43	Yes
44	Yes
45	Yes
46	Yes
47	Yes
48	Yes
49	Yes
50	Yes
51	Yes
52	Yes
53	Yes
54	Yes
55	Yes
56	Yes
57	Yes

Table: Frame Load Transfer Options

Frame	Transfer
58	Yes
59	Yes
61	Yes
62	Yes
63	Yes
64	Yes
65	Yes
66	Yes
67	Yes
68	Yes
69	Yes
70	Yes
71	Yes
72	Yes
73	Yes
74	Yes
75	Yes
76	Yes
77	Yes
78	Yes
79	Yes
80	Yes
81	Yes
82	Yes
83	Yes
84	Yes
85	Yes
86	Yes
87	Yes
88	Yes
89	Yes
90	Yes
91	Yes
92	Yes
93	Yes
94	Yes
95	Yes
96	Yes
97	Yes
98	Yes
99	Yes
100	Yes
101	Yes
102	Yes
103	Yes
104	Yes
105	Yes
117	Yes
118	Yes
119	Yes
120	Yes
121	Yes
122	Yes

Table: Frame Load Transfer Options

Frame	Transfer
123	Yes
124	Yes
125	Yes
126	Yes
127	Yes
128	Yes
129	Yes
130	Yes
131	Yes
132	Yes
133	Yes
134	Yes
135	Yes
136	Yes
137	Yes
138	Yes
139	Yes
140	Yes
141	Yes

Table: Frame Loads - Distributed, Part 1 of 3

Table: Frame Loads - Distributed, Part 1 of 3						
Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
81	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
81	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
94	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
94	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
94	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
95	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
95	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
95	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
117	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
117	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
118	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
118	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
125	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
125	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
138	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
138	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
138	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
139	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
139	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
139	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
140	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
140	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
141	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
141	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
2	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
2	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
2	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
2	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
2	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
2	FRENADO	GLOBAL	Force	X	RelDist	0.
3	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
3	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
3	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
3	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
3	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
3	FRENADO	GLOBAL	Force	X	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
4	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
4	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
4	FRENADO	GLOBAL	Force	X	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
5	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
5	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
5	FRENADO	GLOBAL	Force	X	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
6	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
6	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
6	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
7	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
7	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
7	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
7	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
7	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
7	FRENADO	GLOBAL	Force	X	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
8	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
8	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
8	FRENADO	GLOBAL	Force	X	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
9	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
9	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
9	FRENADO	GLOBAL	Force	X	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
10	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
10	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
10	FRENADO	GLOBAL	Force	X	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
11	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
11	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
11	FRENADO	GLOBAL	Force	X	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
12	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
12	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
12	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
12	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
12	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
12	FRENADO	GLOBAL	Force	X	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
13	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
13	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
13	FRENADO	GLOBAL	Force	X	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
14	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
14	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
14	FRENADO	GLOBAL	Force	X	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
15	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
15	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
15	FRENADO	GLOBAL	Force	X	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
16	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
16	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
16	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
16	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
16	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
16	FRENADO	GLOBAL	Force	X	RelDist	0.
17	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
17	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
17	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
17	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
17	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
17	FRENADO	GLOBAL	Force	X	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
18	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
18	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
18	FRENADO	GLOBAL	Force	X	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
19	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
19	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
19	FRENADO	GLOBAL	Force	X	RelDist	0.
22	SC1	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
22	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
22	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
22	FRENADO	GLOBAL	Force	X	RelDist	0.
23	SC1	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
23	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
23	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
23	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
23	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
23	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
23	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
24	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
24	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
24	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
25	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
25	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
25	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
26	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
26	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
26	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
27	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
27	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
27	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
27	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
27	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
28	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
28	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
28	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
29	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
29	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
29	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
30	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
30	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
30	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
31	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.



Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
31	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
31	FRENADO	GLOBAL	Force	X	RelDist	0.
32	SC1	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
32	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
32	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
32	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
32	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
32	FRENADO	GLOBAL	Force	X	RelDist	0.
33	SC1	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
33	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
33	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
33	FRENADO	GLOBAL	Force	X	RelDist	0.
34	SC1	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
34	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
34	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
34	FRENADO	GLOBAL	Force	X	RelDist	0.
35	SC1	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
35	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
35	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
35	FRENADO	GLOBAL	Force	X	RelDist	0.
36	SC1	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
36	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
36	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
36	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
36	FRENADO	GLOBAL	Force	X	RelDist	0.
37	SC1	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
37	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
37	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
37	FRENADO	GLOBAL	Force	X	RelDist	0.
38	SC1	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
38	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
38	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
38	FRENADO	GLOBAL	Force	X	RelDist	0.
39	SC1	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
39	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
39	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
39	FRENADO	GLOBAL	Force	X	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
42	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
42	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
42	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
42	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
42	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
42	FRENADO	GLOBAL	Force	X	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
43	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
43	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
43	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
43	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
43	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
43	FRENADO	GLOBAL	Force	X	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
44	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
44	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
44	FRENADO	GLOBAL	Force	X	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
45	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
45	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
45	FRENADO	GLOBAL	Force	X	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
46	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
46	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
46	FRENADO	GLOBAL	Force	X	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
47	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
47	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
47	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
47	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
47	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
47	FRENADO	GLOBAL	Force	X	RelDist	0.
48	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
48	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
48	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
48	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
48	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
48	FRENADO	GLOBAL	Force	X	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
49	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
49	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
49	FRENADO	GLOBAL	Force	X	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
50	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
50	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
50	FRENADO	GLOBAL	Force	X	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
51	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
51	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
51	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
52	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
52	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
52	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
52	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
52	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
52	FRENADO	GLOBAL	Force	X	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
53	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
53	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
53	FRENADO	GLOBAL	Force	X	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
54	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
54	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
54	FRENADO	GLOBAL	Force	X	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
55	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
55	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
55	FRENADO	GLOBAL	Force	X	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
56	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
56	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
56	FRENADO	GLOBAL	Force	X	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
57	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
57	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
57	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
57	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
57	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
57	FRENADO	GLOBAL	Force	X	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
58	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
58	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
58	FRENADO	GLOBAL	Force	X	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
59	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
59	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
59	FRENADO	GLOBAL	Force	X	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
73	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
73	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
73	FRENADO	GLOBAL	Force	X	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
74	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
74	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
74	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
74	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
74	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
74	FRENADO	GLOBAL	Force	X	RelDist	0.
96	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
96	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
96	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
96	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
96	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
96	FRENADO	GLOBAL	Force	X	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
97	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
97	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
97	FRENADO	GLOBAL	Force	X	RelDist	0.
98	SC1	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
98	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
98	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
98	FRENADO	GLOBAL	Force	X	RelDist	0.
99	SC1	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
99	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
99	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
99	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
100	SC1	GLOBAL	Force	Z	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
100	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
100	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
100	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
100	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
100	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
100	FRENADO	GLOBAL	Force	X	RelDist	0.
101	SC1	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
101	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
101	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
101	FRENADO	GLOBAL	Force	X	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
102	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
102	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
102	FRENADO	GLOBAL	Force	X	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
103	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
103	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
103	FRENADO	GLOBAL	Force	X	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
104	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
104	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
104	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
104	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
104	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
104	FRENADO	GLOBAL	Force	X	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
105	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
105	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
105	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
105	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
105	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
105	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA m	AbsDistB m	FOverLA KN/m	FOverLB KN/m	MOverLA KN-m/m
81	W_LONG_SIN SC	1.	0.	4.5	2.52	2.52	
81	W_LONG_CON SC	1.	0.	4.5	2.52	2.52	
94	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
94	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
94	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
95	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
95	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
95	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
117	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
117	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
118	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
118	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
125	W_LONG_SIN SC	1.	0.	4.5	2.52	2.52	
125	W_LONG_CON SC	1.	0.	4.5	2.52	2.52	
138	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
138	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
138	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
139	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
139	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
139	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
140	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
140	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
141	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
141	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
2	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
2	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
2	W_TRANSV_SIN SC	1.	0.	2.25			27.7
2	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
2	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA m	AbsDistB m	FOverLA KN/m	FOverLB KN/m	MOverLA KN-m/m
2	W_TRANSV_CON SC	1.	0.	2.25			28.4
2	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
2	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
2	FRENADO	1.	0.	2.25	5.7	5.7	
3	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
3	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
3	W_TRANSV_SIN SC	1.	0.	2.25			27.7
3	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
3	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
3	W_TRANSV_CON SC	1.	0.	2.25			28.4
3	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
3	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
3	FRENADO	1.	0.	2.25	5.7	5.7	
4	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
4	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
4	W_TRANSV_SIN SC	1.	0.	2.25			27.7
4	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
4	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
4	W_TRANSV_CON SC	1.	0.	2.25			28.4
4	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
4	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
4	FRENADO	1.	0.	2.25	5.7	5.7	
5	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
5	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
5	W_TRANSV_SIN SC	1.	0.	2.25			27.7
5	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
5	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
5	W_TRANSV_CON SC	1.	0.	2.25			28.4
5	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
5	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
5	FRENADO	1.	0.	2.25	5.7	5.7	
6	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
6	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
6	W_TRANSV_SIN SC	1.	0.	2.25			27.7
6	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
6	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
6	W_TRANSV_CON SC	1.	0.	2.25			28.4
6	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
6	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
6	FRENADO	1.	0.	2.25	5.7	5.7	
7	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
7	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
7	W_TRANSV_SIN SC	1.	0.	2.25			27.7

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
7	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
7	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
7	W_TRANSV_CON SC	1.	0.	2.25			28.4
7	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
7	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
7	FRENADO	1.	0.	2.25	5.7	5.7	
8	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
8	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
8	W_TRANSV_SIN SC	1.	0.	2.25			27.7
8	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
8	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
8	W_TRANSV_CON SC	1.	0.	2.25			28.4
8	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
8	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
8	FRENADO	1.	0.	2.25	5.7	5.7	
9	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
9	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
9	W_TRANSV_SIN SC	1.	0.	2.25			27.7
9	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
9	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
9	W_TRANSV_CON SC	1.	0.	2.25			28.4
9	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
9	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
9	FRENADO	1.	0.	2.25	5.7	5.7	
10	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
10	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
10	W_TRANSV_SIN SC	1.	0.	2.25			27.7
10	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
10	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
10	W_TRANSV_CON SC	1.	0.	2.25			28.4
10	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
10	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
10	FRENADO	1.	0.	2.25	5.7	5.7	
11	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
11	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
11	W_TRANSV_SIN SC	1.	0.	2.25			27.7
11	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
11	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
11	W_TRANSV_CON SC	1.	0.	2.25			28.4
11	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
11	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
11	FRENADO	1.	0.	2.25	5.7	5.7	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
12	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
12	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
12	W_TRANSV_SIN SC	1.	0.	2.25			27.7
12	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
12	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
12	W_TRANSV_CON SC	1.	0.	2.25			28.4
12	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
12	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
12	FRENADO	1.	0.	2.25	5.7	5.7	
13	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
13	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
13	W_TRANSV_SIN SC	1.	0.	2.25			27.7
13	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
13	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
13	W_TRANSV_CON SC	1.	0.	2.25			28.4
13	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
13	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
13	FRENADO	1.	0.	2.25	5.7	5.7	
14	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
14	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
14	W_TRANSV_SIN SC	1.	0.	2.25			27.7
14	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
14	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
14	W_TRANSV_CON SC	1.	0.	2.25			28.4
14	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
14	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
14	FRENADO	1.	0.	2.25	5.7	5.7	
15	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
15	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
15	W_TRANSV_SIN SC	1.	0.	2.25			27.7
15	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
15	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
15	W_TRANSV_CON SC	1.	0.	2.25			28.4
15	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
15	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
15	FRENADO	1.	0.	2.25	5.7	5.7	
16	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
16	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
16	W_TRANSV_SIN SC	1.	0.	2.25			27.7
16	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
16	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
16	W_TRANSV_CON SC	1.	0.	2.25			28.4

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
16	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
16	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
16	FRENADO	1.	0.	2.25	5.7	5.7	
17	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
17	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
17	W_TRANSV_SIN SC	1.	0.	2.25			27.7
17	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
17	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
17	W_TRANSV_CON SC	1.	0.	2.25			28.4
17	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
17	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
17	FRENADO	1.	0.	2.25	5.7	5.7	
18	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
18	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
18	W_TRANSV_SIN SC	1.	0.	2.25			27.7
18	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
18	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
18	W_TRANSV_CON SC	1.	0.	2.25			28.4
18	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
18	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
18	FRENADO	1.	0.	2.25	5.7	5.7	
19	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
19	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
19	W_TRANSV_SIN SC	1.	0.	2.25			27.7
19	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
19	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
19	W_TRANSV_CON SC	1.	0.	2.25			28.4
19	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
19	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
19	FRENADO	1.	0.	2.25	5.7	5.7	
22	SC1	1.	0.	2.25	-50.	-50.	
22	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
22	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
22	W_TRANSV_SIN SC	1.	0.	2.25			27.7
22	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
22	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
22	W_TRANSV_CON SC	1.	0.	2.25			28.4
22	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
22	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
22	FRENADO	1.	0.	2.25	5.7	5.7	
23	SC1	1.	0.	2.25	-50.	-50.	
23	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
23	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
23	W_TRANSV_SIN SC	1.	0.	2.25			27.7

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
23	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
23	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
23	W_TRANSV_CON SC	1.	0.	2.25			28.4
23	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
23	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
23	FRENADO	1.	0.	2.25	5.7	5.7	
24	SC1	1.	0.	2.25	-50.	-50.	
24	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
24	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
24	W_TRANSV_SIN SC	1.	0.	2.25			27.7
24	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
24	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
24	W_TRANSV_CON SC	1.	0.	2.25			28.4
24	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
24	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
24	FRENADO	1.	0.	2.25	5.7	5.7	
25	SC1	1.	0.	2.25	-50.	-50.	
25	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
25	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
25	W_TRANSV_SIN SC	1.	0.	2.25			27.7
25	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
25	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
25	W_TRANSV_CON SC	1.	0.	2.25			28.4
25	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
25	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
25	FRENADO	1.	0.	2.25	5.7	5.7	
26	SC1	1.	0.	2.25	-50.	-50.	
26	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
26	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
26	W_TRANSV_SIN SC	1.	0.	2.25			27.7
26	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
26	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
26	W_TRANSV_CON SC	1.	0.	2.25			28.4
26	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
26	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
26	FRENADO	1.	0.	2.25	5.7	5.7	
27	SC1	1.	0.	2.25	-50.	-50.	
27	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
27	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
27	W_TRANSV_SIN SC	1.	0.	2.25			27.7
27	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
27	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
27	W_TRANSV_CON SC	1.	0.	2.25			28.4
27	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
27	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
27	FRENADO	1.	0.	2.25	5.7	5.7	
28	SC1	1.	0.	2.25	-50.	-50.	
28	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
28	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
28	W_TRANSV_SIN SC	1.	0.	2.25			27.7
28	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
28	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
28	W_TRANSV_CON SC	1.	0.	2.25			28.4
28	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
28	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
28	FRENADO	1.	0.	2.25	5.7	5.7	
29	SC1	1.	0.	2.25	-50.	-50.	
29	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
29	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
29	W_TRANSV_SIN SC	1.	0.	2.25			27.7
29	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
29	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
29	W_TRANSV_CON SC	1.	0.	2.25			28.4
29	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
29	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
29	FRENADO	1.	0.	2.25	5.7	5.7	
30	SC1	1.	0.	2.25	-50.	-50.	
30	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
30	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
30	W_TRANSV_SIN SC	1.	0.	2.25			27.7
30	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
30	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
30	W_TRANSV_CON SC	1.	0.	2.25			28.4
30	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
30	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
30	FRENADO	1.	0.	2.25	5.7	5.7	
31	SC1	1.	0.	2.25	-50.	-50.	
31	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
31	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
31	W_TRANSV_SIN SC	1.	0.	2.25			27.7
31	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
31	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
31	W_TRANSV_CON SC	1.	0.	2.25			28.4
31	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
31	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
31	FRENADO	1.	0.	2.25	5.7	5.7	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
32	SC1	1.	0.	2.25	-50.	-50.	
32	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
32	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
32	W_TRANSV_SIN SC	1.	0.	2.25			27.7
32	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
32	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
32	W_TRANSV_CON SC	1.	0.	2.25			28.4
32	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
32	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
32	FRENADO	1.	0.	2.25	5.7	5.7	
33	SC1	1.	0.	2.25	-50.	-50.	
33	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
33	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
33	W_TRANSV_SIN SC	1.	0.	2.25			27.7
33	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
33	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
33	W_TRANSV_CON SC	1.	0.	2.25			28.4
33	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
33	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
33	FRENADO	1.	0.	2.25	5.7	5.7	
34	SC1	1.	0.	2.25	-50.	-50.	
34	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
34	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
34	W_TRANSV_SIN SC	1.	0.	2.25			27.7
34	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
34	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
34	W_TRANSV_CON SC	1.	0.	2.25			28.4
34	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
34	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
34	FRENADO	1.	0.	2.25	5.7	5.7	
35	SC1	1.	0.	2.25	-50.	-50.	
35	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
35	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
35	W_TRANSV_SIN SC	1.	0.	2.25			27.7
35	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
35	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
35	W_TRANSV_CON SC	1.	0.	2.25			28.4
35	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
35	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
35	FRENADO	1.	0.	2.25	5.7	5.7	
36	SC1	1.	0.	2.25	-50.	-50.	
36	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
36	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
36	W_TRANSV_SIN SC	1.	0.	2.25			27.7



Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
36	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
36	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
36	W_TRANSV_CON SC	1.	0.	2.25			28.4
36	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
36	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
36	FRENADO	1.	0.	2.25	5.7	5.7	
37	SC1	1.	0.	2.25	-50.	-50.	
37	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
37	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
37	W_TRANSV_SIN SC	1.	0.	2.25			27.7
37	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
37	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
37	W_TRANSV_CON SC	1.	0.	2.25			28.4
37	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
37	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
37	FRENADO	1.	0.	2.25	5.7	5.7	
38	SC1	1.	0.	2.25	-50.	-50.	
38	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
38	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
38	W_TRANSV_SIN SC	1.	0.	2.25			27.7
38	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
38	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
38	W_TRANSV_CON SC	1.	0.	2.25			28.4
38	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
38	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
38	FRENADO	1.	0.	2.25	5.7	5.7	
39	SC1	1.	0.	2.25	-50.	-50.	
39	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
39	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
39	W_TRANSV_SIN SC	1.	0.	2.25			27.7
39	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
39	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
39	W_TRANSV_CON SC	1.	0.	2.25			28.4
39	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
39	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
39	FRENADO	1.	0.	2.25	5.7	5.7	
42	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
42	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
42	W_TRANSV_SIN SC	1.	0.	1.5			27.7
42	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
42	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
42	W_TRANSV_CON SC	1.	0.	1.5			28.4

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
42	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
42	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
42	FRENADO	1.	0.	1.5	5.7	5.7	
43	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
43	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
43	W_TRANSV_SIN SC	1.	0.	1.5			27.7
43	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
43	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
43	W_TRANSV_CON SC	1.	0.	1.5			28.4
43	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
43	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
43	FRENADO	1.	0.	1.5	5.7	5.7	
44	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
44	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
44	W_TRANSV_SIN SC	1.	0.	1.5			27.7
44	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
44	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
44	W_TRANSV_CON SC	1.	0.	1.5			28.4
44	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
44	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
44	FRENADO	1.	0.	1.5	5.7	5.7	
45	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
45	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
45	W_TRANSV_SIN SC	1.	0.	1.5			27.7
45	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
45	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
45	W_TRANSV_CON SC	1.	0.	1.5			28.4
45	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
45	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
45	FRENADO	1.	0.	1.5	5.7	5.7	
46	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
46	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
46	W_TRANSV_SIN SC	1.	0.	1.5			27.7
46	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
46	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
46	W_TRANSV_CON SC	1.	0.	1.5			28.4
46	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
46	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
46	FRENADO	1.	0.	1.5	5.7	5.7	
47	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
47	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
47	W_TRANSV_SIN SC	1.	0.	1.5			27.7
47	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
47	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
47	W_TRANSV_CON SC	1.	0.	1.5			28.4
47	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
47	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
47	FRENADO	1.	0.	1.5	5.7	5.7	
48	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
48	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
48	W_TRANSV_SIN SC	1.	0.	1.5			27.7
48	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
48	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
48	W_TRANSV_CON SC	1.	0.	1.5			28.4
48	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
48	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
48	FRENADO	1.	0.	1.5	5.7	5.7	
49	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
49	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
49	W_TRANSV_SIN SC	1.	0.	1.5			27.7
49	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
49	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
49	W_TRANSV_CON SC	1.	0.	1.5			28.4
49	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
49	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
49	FRENADO	1.	0.	1.5	5.7	5.7	
50	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
50	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
50	W_TRANSV_SIN SC	1.	0.	1.5			27.7
50	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
50	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
50	W_TRANSV_CON SC	1.	0.	1.5			28.4
50	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
50	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
50	FRENADO	1.	0.	1.5	5.7	5.7	
51	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
51	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
51	W_TRANSV_SIN SC	1.	0.	1.5			27.7
51	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
51	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
51	W_TRANSV_CON SC	1.	0.	1.5			28.4
51	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
51	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
51	FRENADO	1.	0.	1.5	5.7	5.7	
52	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
52	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
52	W_TRANSV_SIN SC	1.	0.	1.5			27.7
52	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
52	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
52	W_TRANSV_CON SC	1.	0.	1.5			28.4
52	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
52	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
52	FRENADO	1.	0.	1.5	5.7	5.7	
53	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
53	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
53	W_TRANSV_SIN SC	1.	0.	1.5			27.7
53	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
53	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
53	W_TRANSV_CON SC	1.	0.	1.5			28.4
53	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
53	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
53	FRENADO	1.	0.	1.5	5.7	5.7	
54	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
54	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
54	W_TRANSV_SIN SC	1.	0.	1.5			27.7
54	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
54	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
54	W_TRANSV_CON SC	1.	0.	1.5			28.4
54	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
54	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
54	FRENADO	1.	0.	1.5	5.7	5.7	
55	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
55	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
55	W_TRANSV_SIN SC	1.	0.	1.5			27.7
55	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
55	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
55	W_TRANSV_CON SC	1.	0.	1.5			28.4
55	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
55	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
55	FRENADO	1.	0.	1.5	5.7	5.7	
56	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
56	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
56	W_TRANSV_SIN SC	1.	0.	1.5			27.7
56	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
56	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
56	W_TRANSV_CON SC	1.	0.	1.5			28.4
56	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
56	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
56	FRENADO	1.	0.	1.5	5.7	5.7	
57	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
57	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
57	W_TRANSV_SIN SC	1.	0.	1.5			27.7
57	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
57	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
57	W_TRANSV_CON SC	1.	0.	1.5			28.4
57	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
57	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
57	FRENADO	1.	0.	1.5	5.7	5.7	
58	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
58	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
58	W_TRANSV_SIN SC	1.	0.	1.5			27.7
58	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
58	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
58	W_TRANSV_CON SC	1.	0.	1.5			28.4
58	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
58	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
58	FRENADO	1.	0.	1.5	5.7	5.7	
59	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
59	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
59	W_TRANSV_SIN SC	1.	0.	1.5			27.7
59	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
59	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
59	W_TRANSV_CON SC	1.	0.	1.5			28.4
59	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
59	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
59	FRENADO	1.	0.	1.5	5.7	5.7	
73	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
73	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
73	W_TRANSV_SIN SC	1.	0.	0.5			27.7
73	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
73	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
73	W_TRANSV_CON SC	1.	0.	0.5			28.4
73	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
73	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
73	FRENADO	1.	0.	0.5	5.7	5.7	
74	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
74	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
74	W_TRANSV_SIN SC	1.	0.	1.75			27.7
74	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
74	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
74	W_TRANSV_CON SC	1.	0.	1.75			28.4
74	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
74	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
74	FRENADO	1.	0.	1.75	5.7	5.7	
96	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
96	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
96	W_TRANSV_SIN SC	1.	0.	1.75			27.7
96	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
96	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
96	W_TRANSV_CON SC	1.	0.	1.75			28.4
96	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
96	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
96	FRENADO	1.	0.	1.75	5.7	5.7	
97	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
97	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
97	W_TRANSV_SIN SC	1.	0.	0.5			27.7
97	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
97	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
97	W_TRANSV_CON SC	1.	0.	0.5			28.4
97	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
97	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
97	FRENADO	1.	0.	0.5	5.7	5.7	
98	SC1	1.	0.	0.5	-50.	-50.	
98	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
98	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
98	W_TRANSV_SIN SC	1.	0.	0.5			27.7
98	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
98	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
98	W_TRANSV_CON SC	1.	0.	0.5			28.4
98	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
98	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
98	FRENADO	1.	0.	0.5	5.7	5.7	
99	SC1	1.	0.	1.75	-50.	-50.	
99	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
99	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
99	W_TRANSV_SIN SC	1.	0.	1.75			27.7
99	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
99	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
99	W_TRANSV_CON SC	1.	0.	1.75			28.4
99	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
99	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
99	FRENADO	1.	0.	1.75	5.7	5.7	
100	SC1	1.	0.	1.75	-50.	-50.	
100	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
100	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
100	W_TRANSV_SIN SC	1.	0.	1.75			27.7
100	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
100	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
100	W_TRANSV_CON SC	1.	0.	1.75			28.4
100	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
100	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
100	FRENADO	1.	0.	1.75	5.7	5.7	
101	SC1	1.	0.	0.5	-50.	-50.	
101	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
101	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
101	W_TRANSV_SIN SC	1.	0.	0.5			27.7
101	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
101	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
101	W_TRANSV_CON SC	1.	0.	0.5			28.4
101	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
101	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
101	FRENADO	1.	0.	0.5	5.7	5.7	
102	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
102	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
102	W_TRANSV_SIN SC	1.	0.	0.5			27.7
102	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
102	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
102	W_TRANSV_CON SC	1.	0.	0.5			28.4
102	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
102	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
102	FRENADO	1.	0.	0.5	5.7	5.7	
103	W_TRANSV_SIN SC	1.	0.	1.	4.98	4.98	
103	W_TRANSV_SIN SC	1.	0.	1.	-11.72	-11.72	
103	W_TRANSV_SIN SC	1.	0.	1.			27.7
103	W_TRANSV_CON SC	1.	0.	1.	11.84	11.84	
103	W_TRANSV_CON SC	1.	0.	1.	-11.72	-11.72	
103	W_TRANSV_CON SC	1.	0.	1.			28.4
103	W_LONG_SIN SC	1.	0.	1.	1.03	1.03	
103	W_LONG_CON SC	1.	0.	1.	1.35	1.35	
103	FRENADO	1.	0.	1.	5.7	5.7	
104	W_TRANSV_SIN SC	1.	0.	1.	4.98	4.98	
104	W_TRANSV_SIN SC	1.	0.	1.	-11.72	-11.72	
104	W_TRANSV_SIN SC	1.	0.	1.			27.7
104	W_TRANSV_CON SC	1.	0.	1.	11.84	11.84	
104	W_TRANSV_CON SC	1.	0.	1.	-11.72	-11.72	
104	W_TRANSV_CON SC	1.	0.	1.			28.4

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
104	W_LONG_SIN SC	1.	0.	1.	1.03	1.03	
104	W_LONG_CON SC	1.	0.	1.	1.35	1.35	
104	FRENADO	1.	0.	1.	5.7	5.7	
105	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
105	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
105	W_TRANSV_SIN SC	1.	0.	0.5			27.7
105	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
105	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
105	W_TRANSV_CON SC	1.	0.	0.5			28.4
105	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
105	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
105	FRENADO	1.	0.	0.5	5.7	5.7	

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB	GUID
		KN-m/m	
81	W_LONG_SIN SC		08499e94-115d-4351-96b7-a0acab3130d4
81	W_LONG_CON SC		cb42ad7e-6197-40cc-91ab-024da5bd9b45
94	W_TRANSV_SIN SC		5c9e4cfb-c45f-4333-b040-ed4b0f3ae691
94	W_LONG_SIN SC		07c799f7-96b8-4cf0-a44d-df8d8a4a9b90
94	W_LONG_CON SC		09925d96-d064-4ef0-baa5-0c4cbe3aba55
95	W_TRANSV_SIN SC		215e5833-0f7d-4dec-ae17-edc5cc214b02
95	W_LONG_SIN SC		aea4e6ef-320f-44e7-8b7a-08b6ef773c04
95	W_LONG_CON SC		b3ee8df7-cf87-4457-b399-9ba89c32f311
117	W_LONG_SIN SC		b6639836-cb8b-410f-a7f4-8e4fc3799854
117	W_LONG_CON SC		aefb08c1-dcdd-48bc-a74a-f40b0ebebfb6
118	W_LONG_SIN SC		97ae7ef9-1d3b-4a7b-bb0a-26f9127615b8
118	W_LONG_CON SC		50c31f86-c1b7-4513-a008-995afe28d7b4
125	W_LONG_SIN SC		4a855ed9-c820-4051-8f6a-aad5cc4dd49d
125	W_LONG_CON SC		71985996-0e0d-4209-8f87-c585a87082c4
138	W_TRANSV_SIN SC		ef26d67d-6656-46f7-bacc-ff1ace2a8a97
138	W_LONG_SIN SC		640cc753-0582-4447-be6b-ec925a8e1b69
138	W_LONG_CON SC		2e1ab1d3-0157-4f56-b60e-69bda717cd44
139	W_TRANSV_SIN SC		f32cc90f-b141-4f77-b498-d2e6b3694b42

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
139	W_LONG_SIN SC		47d974e0-ad57-463c-b651-66262ce8851a
139	W_LONG_CON SC		11ad3f8e-da75-42f1-8d53-d35b33f4d7e8
140	W_LONG_SIN SC		99c5d001-8a55-41e5-b4ca-16bdca09d74a
140	W_LONG_CON SC		f2f37a2f-9619-4a9c-87bc-7011ada9e059
141	W_LONG_SIN SC		062c5a2b-4a72-4cba-a901-d5dc3149a40d
141	W_LONG_CON SC		2f0efc17-5d7e-43b6-9377-921f65026569
2	W_TRANSV_SIN SC		5e18de43-8c10-4db3-8ea0-c4bc60241db6
2	W_TRANSV_SIN SC		665b91e7-76a1-4d6f-bf9a-df998acc4ffa
2	W_TRANSV_SIN SC	27.7	9d0a511b-aa11-4fd2-bf5c-a5812c136e88
2	W_TRANSV_CON SC		e4b42b70-14be-4102-beae-8f3b79483029
2	W_TRANSV_CON SC		bb7d0b7d-2b89-4659-8d7e-3fe687f6f0b4
2	W_TRANSV_CON SC	28.4	44267e9d-fc1b-4476-8118-66f9a44875b0
2	W_LONG_SIN SC		3ca46034-47f6-4fcf-b0b3-ef3a3b219e6f
2	W_LONG_CON SC		b0905b34-111a-458e-9912-7a951fb6b5af
2	FRENADO		04fbd9e0-1ec6-4b86-845d-03918381a4e0
3	W_TRANSV_SIN SC		95c2f5bf-1c30-4146-bd6c-64cea14cf899
3	W_TRANSV_SIN SC		8aa654bd-728b-4097-9693-664098731ee6
3	W_TRANSV_SIN SC	27.7	c1a48586-a13e-4dea-8f69-78abcd17fff
3	W_TRANSV_CON SC		adcc37fc-f2b7-417e-b8fd-a65f447c85a5
3	W_TRANSV_CON SC		c475204a-a6c1-4e7a-8b9c-340ef54432c2
3	W_TRANSV_CON SC	28.4	2b5f5a3e-d0a6-4c76-a851-70408a1f8690
3	W_LONG_SIN SC		ca459b68-e598-4d35-b643-d7447f9c89fe
3	W_LONG_CON SC		de2c8d0e-5c0c-49dc-807e-d11f49e073b1
3	FRENADO		23c21438-988b-4fb1-9952-2f395a271b1b
4	W_TRANSV_SIN SC		f78c861d-e749-4cbd-af2f-1ab9efff92b5
4	W_TRANSV_SIN SC		fdcb0c36-79f5-4e80-9aa3-46dde25c90bb
4	W_TRANSV_SIN SC	27.7	8b054cf3-713a-46ed-83a0-136aebff81e4
4	W_TRANSV_CON SC		7230a29a-7518-48a7-a99a-86f1f421a4b5
4	W_TRANSV_CON SC		d7e1fb6a-4f32-420f-8d3d-f131ce321535
4	W_TRANSV_CON SC	28.4	a855bbfc-d955-4a29-9da1-7af01f3b4029

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
4	W_LONG_SIN SC		fc8c08e8-0c82-44da-b2e2-dcbef7ee988e
4	W_LONG_CON SC		22d93f99-7011-4495-bf0c-a38c1dea7034
4	FRENADO		bce8f987-1503-4e0d-976a-093ebb55e920
5	W_TRANSV_SIN SC		b6d44bd1-299f-46eb-820f-6be38f849207
5	W_TRANSV_SIN SC		f9d2b5d3-b1dd-467c-a2eb-852c3f0bbabe
5	W_TRANSV_SIN SC	27.7	0d409c44-e7ac-4f97-932d-83427adb7551
5	W_TRANSV_CON SC		b564a66c-0d05-4a00-a58a-601d80a179e8
5	W_TRANSV_CON SC		e940cdf2-3e4a-4064-b364-54fc23575351
5	W_TRANSV_CON SC	28.4	1f0cd14b-1b42-43c1-a6bd-c29463c07bfd
5	W_LONG_SIN SC		0647cd76-65a7-4f4f-a605-55f4e1209e0d
5	W_LONG_CON SC		caa29aa3-46ec-4607-aa31-ed1fd31cd61a
5	FRENADO		3097dc79-175c-4eb5-b9c4-8bc675959231
6	W_TRANSV_SIN SC		e0a50133-5f35-47a4-94c0-b51a5e9f9b42
6	W_TRANSV_SIN SC		e33108ea-5d33-4576-b5db-eb6989a14059
6	W_TRANSV_SIN SC	27.7	de48ccd6-5db6-4d87-ab85-d1233284545f
6	W_TRANSV_CON SC		9689faa9-1ab1-4fb6-88d2-34ece66b5f9d
6	W_TRANSV_CON SC		f8677c47-13d7-45fe-a5f4-8c8994792aa9
6	W_TRANSV_CON SC	28.4	150e1fbb-1bdb-48b8-957e-7d776f093cfb
6	W_LONG_SIN SC		de56850f-dee3-4b4d-8b74-9ba6e566bca9
6	W_LONG_CON SC		c18daa42-cf1d-460b-934b-0ab9e0849e0e
6	FRENADO		1193dbd9-9356-4105-b993-e10384fbfb9e
7	W_TRANSV_SIN SC		55f90fcc-f83e-44a9-afed-2caee7dbfbfc
7	W_TRANSV_SIN SC		51863910-2e86-480d-877b-187412bc5f6a
7	W_TRANSV_SIN SC	27.7	0d4e6e8b-3cdc-4244-a838-2d725d2f8030
7	W_TRANSV_CON SC		135b2951-3643-4746-a022-d6ef647b5e56
7	W_TRANSV_CON SC		bdfa8187-a329-47e5-9c12-5f02e3ee1d89
7	W_TRANSV_CON SC	28.4	f8cf41f0-31b6-43c0-ba1f-31ac53ee7a2d
7	W_LONG_SIN SC		f874f394-7ac3-4ead-835e-9844e7487f46
7	W_LONG_CON SC		f034373a-c50c-4ea6-be3c-73a94337c97d
7	FRENADO		d0504b29-56ee-46c5-b99a-59ded3c1a4b6

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
8	W_TRANSV_SIN SC		0f735a0e-c9e4-40db-82c5-0a0ff8a1e627
8	W_TRANSV_SIN SC		39f54a21-7b1d-4da7-98ca-dc7ee7276f67
8	W_TRANSV_SIN SC	27.7	3e85c628-8350-45fc-bb1d-9511714808a9
8	W_TRANSV_CON SC		3c4e4531-5678-4001-b008-788ae24ec563
8	W_TRANSV_CON SC		d4548410-9843-4290-8df5-17f6c93d0c79
8	W_TRANSV_CON SC	28.4	fae13344-8d67-465c-9701-3a6b66b39619
8	W_LONG_SIN SC		26aa0e6b-621b-4168-8dad-c17e238076d3
8	W_LONG_CON SC		8e2c9a88-6c05-4ff0-b681-f8bc00ffaffd
8	FRENADO		0d2f4dcd-77fd-48fe-ae8d-566fab13e4f1
9	W_TRANSV_SIN SC		1a0b2a25-22d1-4f40-b7d0-1ce4607c47fc
9	W_TRANSV_SIN SC		faeb9e43-7760-4f71-890b-72217172a4a1
9	W_TRANSV_SIN SC	27.7	0f4f3617-a747-428c-95e3-deeeac5c8d39
9	W_TRANSV_CON SC		9b9cbc65-6f41-4f51-a175-345fb945cde6
9	W_TRANSV_CON SC		52d81066-9c1d-48a0-bd7c-ffc165cca1e4
9	W_TRANSV_CON SC	28.4	17475b0e-49a3-4e47-81d4-7a70811b5a2b
9	W_LONG_SIN SC		f5bbfd3c-7e2e-4027-b3a0-049e89af47da
9	W_LONG_CON SC		e1f7dfda-e362-463e-b8a1-fe27b9f7fcea
9	FRENADO		49e120b8-f313-44ee-a57a-3259d5108e29
10	W_TRANSV_SIN SC		30fcf071-85c9-48cf-a8f6-7c0265290741
10	W_TRANSV_SIN SC		785547f1-3fa4-4ef6-82dd-66ac5480957f
10	W_TRANSV_SIN SC	27.7	615e0362-25dc-45aa-a9b0-cff9fd489a0b
10	W_TRANSV_CON SC		0bb54869-78d2-44eb-9ad5-05f8f5f6eca9
10	W_TRANSV_CON SC		32cfea11-b141-4102-808e-a7a50b1e9ab0
10	W_TRANSV_CON SC	28.4	3fa38e1c-90e7-4a19-a41d-58bb66488e92
10	W_LONG_SIN SC		cca46c0a-1418-408e-9000-5fb965aec2c8
10	W_LONG_CON SC		3233825d-f9b5-434e-a588-2b7c4b246fe7
10	FRENADO		1b42d5dc-d13d-422d-9d0a-ead82b5af975
11	W_TRANSV_SIN SC		f2f86c97-c5b9-4f3b-abe3-1f5267560507
11	W_TRANSV_SIN SC		0579c54d-8e6b-4957-883d-ceaae3203d0f
11	W_TRANSV_SIN SC	27.7	7e609852-1eed-47a0-b3ce-d0a57c6800e4

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
11	W_TRANSV_CON SC		732a0f7f-b2d5-4d56-bb6e-14fa81dd62a8
11	W_TRANSV_CON SC		2a7e0ae2-e7fd-4abe-9de6-6cca626c48b2
11	W_TRANSV_CON SC	28.4	fd45760e-5667-4449-919d-782b7154a485
11	W_LONG_SIN SC		763aeca2-611d-4a33-a5f5-289f6ef823af
11	W_LONG_CON SC		885a477b-d634-4768-aa6d-76e68ead864c
11	FRENADO		9d553785-3272-4987-9c5c-cce22f438e22
12	W_TRANSV_SIN SC		4c499150-060a-4b28-8560-5498fa2a008a
12	W_TRANSV_SIN SC		a3ead859-2833-4727-b127-c731525f1a53
12	W_TRANSV_SIN SC	27.7	64525de8-e41e-4630-8d66-ef1b66913185
12	W_TRANSV_CON SC		5bcb8f30-b652-447e-bd29-9784a74d2ea6
12	W_TRANSV_CON SC		601a18f6-ce4d-408e-8f79-292663a89f97
12	W_TRANSV_CON SC	28.4	d1d5a927-76b6-4337-8675-1bbf11a7ce2d
12	W_LONG_SIN SC		a47f9344-1f39-402f-ad98-feb6ab5b5150
12	W_LONG_CON SC		2b5de71e-0f74-4cb5-9ef3-388003bb1716
12	FRENADO		3a063749-6572-4337-9514-5a3caa52df8f
13	W_TRANSV_SIN SC		78893435-992b-4cbd-b606-d644b55715e0
13	W_TRANSV_SIN SC		6a66e805-39cb-4d84-baac-cabfb31346be
13	W_TRANSV_SIN SC	27.7	6bb32b57-17e2-4831-87e0-312998472a54
13	W_TRANSV_CON SC		d8872b92-a643-4fe0-add0-00076da3052b
13	W_TRANSV_CON SC		f1f5a847-fd2a-451a-9c66-f33b498b3e4d
13	W_TRANSV_CON SC	28.4	815eb7c9-a093-4ba4-b570-e20105464929
13	W_LONG_SIN SC		ab5c6908-fa32-4220-abc6-6ccbf8520050
13	W_LONG_CON SC		ad5b248e-b300-412a-9720-f5ba37a80bec
13	FRENADO		b5c3f6ba-a8ea-4cbb-8dfc-d79932d26df1
14	W_TRANSV_SIN SC		9b2e377a-922c-4d5c-a824-6b7b7424b805
14	W_TRANSV_SIN SC		50d6c8bc-eb2a-4d0f-98f4-eb9f6a92ed0d
14	W_TRANSV_SIN SC	27.7	a4d33cf4-de3e-47e6-bc87-218b8b17ba40
14	W_TRANSV_CON SC		fbcdf5e9-79ca-4645-b643-79e0d6969a20
14	W_TRANSV_CON SC		5cd7ed6d-41d4-4e87-a086-4b72ab7619a0
14	W_TRANSV_CON SC	28.4	889204c4-0422-44aa-a8ae-d44cd18b0df

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
14	W_LONG_SIN SC		07423993-19ff-4ace-8bdf -da6b131ce2fe
14	W_LONG_CON SC		b723c914-28ed-4d02-bb 59-36ff6d8bf44f
14	FRENADO		7a456e64-d962-4617-b2f 9-595eee5a7734
15	W_TRANSV_SIN SC		c3a36ff9-9784-458d-a17 4-4fe9f07423e8
15	W_TRANSV_SIN SC		6a3cd14e-08f8-409d-803 8-5c8ef220cd49
15	W_TRANSV_SIN SC	27.7	c0a98f78-5fc2-44f8-ac07 -54c97853ecd4
15	W_TRANSV_CON SC		98ecaac9-1cc5-42ad-b90 7-02126c993596
15	W_TRANSV_CON SC		1da2d954-0fec-407b-bba b-6f16f390d9f5
15	W_TRANSV_CON SC	28.4	e9b4ff49-d5a8-4c95-afe7 -1081253a49e7
15	W_LONG_SIN SC		82fb9aa9-3235-4ed6-84e 9-c35f0443c19d
15	W_LONG_CON SC		a182ccd3-a666-47b0-9a a3-25999eddb1de
15	FRENADO		20a7a19d-e2d4-4c7c-9c 3e-054529bd6946
16	W_TRANSV_SIN SC		0fc9279a-44da-402a-aae a-bb5cfb97d46c
16	W_TRANSV_SIN SC		e8930a19-d5a4-497f-bc9 2-79f520961c38
16	W_TRANSV_SIN SC	27.7	f949d2a6-dac8-40d7-896 f-80b5b8235a5e
16	W_TRANSV_CON SC		b54446dc-08f3-4d14-ae 9-0e53ae236aef
16	W_TRANSV_CON SC		df1ab43e-ed9-4943-a2f 5-879d5fabae3
16	W_TRANSV_CON SC	28.4	214841f2-e243-4cd2-9d8 f-471d62130c62
16	W_LONG_SIN SC		87cf427c-be22-44c2-b82 c-89d5be734554
16	W_LONG_CON SC		1ce857c8-455f-4a58-94c f-aa7a0ff5f30f
16	FRENADO		45aa4921-49a3-4b9e-a1 2f-555e7eae454d
17	W_TRANSV_SIN SC		4d46d6bf-411b-4550-a11 3-45afc1dcbcb
17	W_TRANSV_SIN SC		b0949c45-ce23-45d4-b4 72-4439be66d604
17	W_TRANSV_SIN SC	27.7	3a0abad4-a580-4f15-bec 4-d909c4315d25
17	W_TRANSV_CON SC		aec6bbcb-f3c5-48c0-acf1 -b79162fc286d
17	W_TRANSV_CON SC		ec35dd6c-da7a-41ae-a1 d9-c9b1ba487d3d
17	W_TRANSV_CON SC	28.4	7c413ba7-0ee8-4d76-b5 ca-29e1d6e1b928
17	W_LONG_SIN SC		a7329134-b904-4ff0-8ad 3-1fc4787b5877
17	W_LONG_CON SC		46af2d88-39c2-42d7-91b e-e5e5c903414c
17	FRENADO		7fa519bb-d0e0-4eb8-903 5-18b7127d606f

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
18	W_TRANSV_SIN SC		3afb0297-344c-4166-a0e a-762396f8aa99
18	W_TRANSV_SIN SC		dbe6f501-59db-4b34-893 8-9aae643cdee2
18	W_TRANSV_SIN SC	27.7	1f0d9eec-818c-4b72-8dc b-3029e8598eb8
18	W_TRANSV_CON SC		788ea2cb-9dff-48b7-a0fb -5591253dd9f9
18	W_TRANSV_CON SC		6053a9c1-de0c-45fa-9ce 7-f8d8e6082aff
18	W_TRANSV_CON SC	28.4	e61998fc-67d0-43b2-9d2 1-e80a1cd54118
18	W_LONG_SIN SC		0b46e628-2c67-4bee-a8 ef-38e91fa189b8
18	W_LONG_CON SC		89ed2ca2-ad02-4179-8c df-650f10c57214
18	FRENADO		170cf239-c838-4c15-b0e c-347433bf6a7b
19	W_TRANSV_SIN SC		f9aaa684-82d0-4215-ac3 c-91d5eab817cb
19	W_TRANSV_SIN SC		067179ac-170e-4c5d-9f7 e-a52f1724bfd2
19	W_TRANSV_SIN SC	27.7	bb8ca890-8194-43e8-98 7a-18b16b759d78
19	W_TRANSV_CON SC		7391144d-e3d8-4b71-b2 df-8137e4b4f453
19	W_TRANSV_CON SC		1e9f632b-709e-4e66-891 2-4d61b8a08340
19	W_TRANSV_CON SC	28.4	c208f77d-16d7-4efc-802 1-887d2bdcaea6
19	W_LONG_SIN SC		b0435253-3658-4b24-94 c1-e51557e2e407
19	W_LONG_CON SC		4821af98-4611-4e7c-83a 8-ee21743c537
19	FRENADO		e2808ede-7e4c-42f4-a08 7-383be2b0f4b7
22	SC1		e51efbec-e495-44e1-833 a-dcac42eb805c
22	W_TRANSV_SIN SC		71a1fe32-81f2-481c-a87 d-ea9c6c7bd306
22	W_TRANSV_SIN SC		7492f5fe-2d54-4bb1-b16 7-6b13a9664a90
22	W_TRANSV_SIN SC	27.7	a91ae0ca-8c45-4799-84 d6-218783f5b822
22	W_TRANSV_CON SC		20238168-d135-4d11-a7 48-028a8630032d
22	W_TRANSV_CON SC		68bc207d-0c21-41f1-adf 9-e542eb635818
22	W_TRANSV_CON SC	28.4	a52ed63e-e1f9-4dbc-92b 2-57d65ec3e6a9
22	W_LONG_SIN SC		ebe13ac2-1394-4c53-a6 a2-590e70e752ff
22	W_LONG_CON SC		91a08ff7-f997-4c57-a9ba -01ec1afda448
22	FRENADO		18cb0cf0-dbad-4f5c-99d b-426896d212d1
23	SC1		fd10e563-211e-4252-9b7 2-6b3386e7aed4
23	W_TRANSV_SIN SC		7c836a19-b16c-4ef6-97d 6-ea679ea0591e

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
23	W_TRANSV_SIN SC		b8059bd8-8ce8-4fd1-ada3-7788baf74a6a
23	W_TRANSV_SIN SC	27.7	7133771f-cd8b-45e8-bf52-90bf2046a255
23	W_TRANSV_CON SC		9f301110-f60e-47d1-9abc-a71fc65c6600
23	W_TRANSV_CON SC		e3019c64-5488-4b71-9c38-5f5c6325f610
23	W_TRANSV_CON SC	28.4	e39e9f0b-a7ac-4f99-82bc-c3405edda969
23	W_LONG_SIN SC		c3375a35-4e73-4031-9598-3ada03ceb903
23	W_LONG_CON SC		ab856aca-7083-4d64-91cc-91609e8fb673
23	FRENADO		5af7e68d-0bb1-42a8-8e1e-6c67bb4105a6
24	SC1		4692c414-69f9-41d6-891e-c14197b4a1f9
24	W_TRANSV_SIN SC		37bbcea5-7e56-4600-908f-d18c8067cc29
24	W_TRANSV_SIN SC		3d80356a-3cfb-4092-bb6e-f703b29e6f47
24	W_TRANSV_SIN SC	27.7	e8a2b775-95cd-4bc0-810c-ae8057dfaf5
24	W_TRANSV_CON SC		0bd3e01d-6a52-413f-a863-1aabc88877da
24	W_TRANSV_CON SC		d779dbce-262e-4959-9e30-969527eaa0c6
24	W_TRANSV_CON SC	28.4	60975a1c-6b3c-4ac5-a8fb-c5c1d8ade0fd
24	W_LONG_SIN SC		22a636e4-d8cc-4e81-84f6-d1228da6d8c4
24	W_LONG_CON SC		649764c3-9a6d-4c3c-91e7-7ff6da691d22
24	FRENADO		8807c74a-b2ed-4c38-826b-d7350d5dc473
25	SC1		47978c66-77fb-43f2-9128-e4baf3a1360f
25	W_TRANSV_SIN SC		f0adaa82-c451-4377-b983-2e33f9bd96da
25	W_TRANSV_SIN SC		8ae72ba5-eb86-42d8-953d-2b834f302fb6
25	W_TRANSV_SIN SC	27.7	7bf116e1-9554-4b46-8b02-8db5317e4b13
25	W_TRANSV_CON SC		ff436ac2-e3c1-4f74-b70a-74732f64f709
25	W_TRANSV_CON SC		4ed4fb65-6880-4701-a0d0-c52c40a631f4
25	W_TRANSV_CON SC	28.4	9bb1ac05-57fc-4dc2-a988-e64a49eee2c0
25	W_LONG_SIN SC		8bf74fd8-8b62-494f-bef9-c666da412bcf
25	W_LONG_CON SC		84b1257d-17e0-43ee-b13a-1cd61ce5b5f7
25	FRENADO		23df12fd-d6ea-4d2e-be74-4b60e520264e
26	SC1		896a1010-c92b-46bb-9ece-fe4025ceee24
26	W_TRANSV_SIN SC		a30e9d43-c79d-4a0a-8d82-381683859749

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
26	W_TRANSV_SIN SC		c2e4627a-937a-432b-9105-70bcad678c55
26	W_TRANSV_SIN SC	27.7	22e5e312-6baa-49cc-809c-a13cbf2942c8
26	W_TRANSV_CON SC		7bd37e9b-7318-4d8c-adad-8476d36d075b
26	W_TRANSV_CON SC		66bbfd75-52b4-470f-b306-4599c52f4f03
26	W_TRANSV_CON SC	28.4	dfd10ba8-ea6d-4629-b02d-c4d5b1392cce
26	W_LONG_SIN SC		a94424b8-b149-43ae-abbf-ee491e3fa316
26	W_LONG_CON SC		1ae7ae8f-8d88-4c38-abc d-6e2cdb6f9d77
26	FRENADO		34a93de2-6e1c-469d-8568-9a2588259bad
27	SC1		c4f724d1-f651-47f0-bb14-a26ae1cf4086
27	W_TRANSV_SIN SC		43695257-f626-4eb8-9421-c10329e7966b
27	W_TRANSV_SIN SC		0d37728e-4de6-43c2-8e95-9c7db3a87536
27	W_TRANSV_SIN SC	27.7	3c18ab49-5aeb-42a7-8776-61367f91ae88
27	W_TRANSV_CON SC		ca6d794d-fda7-43cc-9454-f8024e5d2072
27	W_TRANSV_CON SC		dd3a892e-8b8c-47c4-ba5d-be517c2f75b7
27	W_TRANSV_CON SC	28.4	a0978e43-d9ac-453c-8374-5d4f5325dafc
27	W_LONG_SIN SC		d8e7665c-39ed-42be-b9d6-d7a84e02e65a
27	W_LONG_CON SC		5c207e2d-0b5d-433e-b6ee-bb86d26e99da
27	FRENADO		fae76440-1b9e-4393-993f-952043067959
28	SC1		d1595f13-9b4d-4228-92b8-c06ead1fd5c5
28	W_TRANSV_SIN SC		f985fe01-3d82-4b73-bb94-6660d2720844
28	W_TRANSV_SIN SC		36a1c382-19e7-4481-8575-6f7c70e505aa
28	W_TRANSV_SIN SC	27.7	1ff1826d-719e-4827-81dc-c019d57f9af7
28	W_TRANSV_CON SC		0beaa3c5-acda-4bb7-a2da-6f30ec1e29dd
28	W_TRANSV_CON SC		25a35512-57be-4722-84e5-946c21b2f695
28	W_TRANSV_CON SC	28.4	1b8169e3-7e27-4940-8e6d-78c3c9029d77
28	W_LONG_SIN SC		0469cf65-c6c4-4be2-b1b1-b91a11446278
28	W_LONG_CON SC		0e80eeae-4eb9-469b-b537-1d9a884c096a
28	FRENADO		28abd296-f3de-4cab-a15a-8214aecb199
29	SC1		ada3d29c-bd3c-4938-be55-3bab24235bae
29	W_TRANSV_SIN SC		832926df-8bf4-4736-8169-dbd572f5bfcc



Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
29	W_TRANSV_SIN SC		48c46e44-7236-4f32-9617-0f2f4a7b4bde
29	W_TRANSV_SIN SC	27.7	03c7516f-0364-40ab-a00e-af2c5669de1f
29	W_TRANSV_CON SC		7cfe2786-c47a-47c5-bd98-f9511205705d
29	W_TRANSV_CON SC		9ca06554-5ab4-4324-ac25-bfc1c6621c01
29	W_TRANSV_CON SC	28.4	1f9e7f3b-129a-42eb-abc-c-aaa7d793bed5
29	W_LONG_SIN SC		e4d44a2b-08c8-404c-a36b-f7baac3e76bb
29	W_LONG_CON SC		efba160a-e536-4d22-b480-f47ba0872940
29	FRENADO		cfdd4b66-c728-4066-ad84-62c6fb0ecb9d
30	SC1		ac7809fc-497a-4820-a92b-0a98401bae3f
30	W_TRANSV_SIN SC		fb98bfe6-70a4-41d0-b587-9f1062f2ce20
30	W_TRANSV_SIN SC		02b15e8c-b1fd-4919-a02f-262161d703b2
30	W_TRANSV_SIN SC	27.7	3b878e8b-ed0c-4534-a665-4b679c001923
30	W_TRANSV_CON SC		a7642f8b-9ffd-41af-a657-85937fd16c02
30	W_TRANSV_CON SC		686bb25c-b3bc-4f01-b828-5bfb67b3af7d
30	W_TRANSV_CON SC	28.4	4d63ddd8-9e0c-4bac-8499-9aa2f68538c2
30	W_LONG_SIN SC		a8a2b6a3-4261-4a7b-90a3-4906d8dc4e46
30	W_LONG_CON SC		f071e88a-963c-4e81-a13b-8635988ea08d
30	FRENADO		2603281f-e011-4165-a24d-989aef63f90c
31	SC1		81846035-fe6e-4914-9879-8729949ac493
31	W_TRANSV_SIN SC		394bc19b-ba26-4980-ac4-fa9b61f99469
31	W_TRANSV_SIN SC		6fff9ccf-6540-485c-a86a-24b7e5599e08
31	W_TRANSV_SIN SC	27.7	3e3ebd2d-5998-48fc-93e8-8eaa19dd810f
31	W_TRANSV_CON SC		22ce3620-d513-48bc-9557-574f6f14f94c
31	W_TRANSV_CON SC		91654440-dd23-43f4-a60f-724eb1d27c7f
31	W_TRANSV_CON SC	28.4	d6d6466e-aadb-4f71-a771-42db48ec9bff
31	W_LONG_SIN SC		fc1215b7-bac8-41cf-b079-75bd85f02242
31	W_LONG_CON SC		dc77f87f-7adb-426d-a4d5-975b893a4825
31	FRENADO		4610d36a-20c0-4df8-b4f4-a453066d94ed
32	SC1		2a4c1ae3-65bc-4c80-9d90-85c532103e67
32	W_TRANSV_SIN SC		e7b3136a-205f-4899-b305-83bb30641af1

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
32	W_TRANSV_SIN SC		18a01bea-53e0-42e9-aaf5-9c62b1ebb63f
32	W_TRANSV_SIN SC	27.7	deb1880f-5f62-4e81-b9e0-92c02e6b416f
32	W_TRANSV_CON SC		be302229-7939-4658-9b4b-c479708a184d
32	W_TRANSV_CON SC		0b6b0aab-a04e-4228-8c3c-50b8e78db442
32	W_TRANSV_CON SC	28.4	bec3e884-6eee-4415-86ef-365380227397
32	W_LONG_SIN SC		c40a248d-5d3a-4132-bdd6-701edb89fb0f
32	W_LONG_CON SC		b26ec4e5-1d6b-45c5-bde9-d1ffb600c817
32	FRENADO		1227e821-8825-4e9c-9c3a-1461948f7dbb
33	SC1		abf196fd-e129-4f82-ba83-e591fb5fd849
33	W_TRANSV_SIN SC		9ad14f0f-a491-413c-b975-d48e7273dd2b
33	W_TRANSV_SIN SC		ba7f70df-3dc0-4808-ac62-174ce884644f
33	W_TRANSV_SIN SC	27.7	3693cb2a-d41b-431e-9bf9-7defccfd6bd2
33	W_TRANSV_CON SC		6140d3c7-b991-43c3-bc6b-5bb9ae91ca97
33	W_TRANSV_CON SC		2d673cce-e063-43ba-891f-acb378188001
33	W_TRANSV_CON SC	28.4	c5a235b0-13db-4fb3-926e-21584379b70c
33	W_LONG_SIN SC		8a825bfd-f16f-45d5-ab75-0d3c613a82df
33	W_LONG_CON SC		289eb5be-f338-4dfd-8aec-0f07f4c9fb6e
33	FRENADO		c34fe84f-d61f-4f1c-9579-ebf24edc96a1
34	SC1		24e0bd55-83f5-4d7c-8f09-2a8cdab18112
34	W_TRANSV_SIN SC		6f05429a-b770-4d45-b1af-f-24cc2ec924c5
34	W_TRANSV_SIN SC		63912772-a83b-42e2-8a4a-c42274d60dd3
34	W_TRANSV_SIN SC	27.7	4a128422-5e99-475b-a207-d887a6958262
34	W_TRANSV_CON SC		cc496be9-537a-456d-8379-f565df0b5771
34	W_TRANSV_CON SC		a29ea297-5daa-4a7f-8326-5e3fd39d39fe
34	W_TRANSV_CON SC	28.4	a4725c00-c671-4ec7-82f5-298afa72ba93
34	W_LONG_SIN SC		1c72a80b-69e5-4044-8366-81536cd54a01
34	W_LONG_CON SC		d54c1f15-32af-4579-9ff8-93199406f3c7
34	FRENADO		81fa6119-55ca-4c93-8680-d20ddbeaec91
35	SC1		397a9355-7f5f-462c-87ca-e23deca2f3b2
35	W_TRANSV_SIN SC		82ed7e0a-7363-4dc0-9b7c-ab962cb71a61

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
35	W_TRANSV_SIN SC		c28a9b6a-8c27-44e1-91c8-f7f102234b77
35	W_TRANSV_SIN SC	27.7	93dbc567-0471-4fd1-972f-08020d209ebc
35	W_TRANSV_CON SC		34a43f3e-2155-479a-b40c-f91ce4e37326
35	W_TRANSV_CON SC		45810335-19f4-40c4-b93a-79e35e86bbe1
35	W_TRANSV_CON SC	28.4	e6f4e130-7b05-43e1-b8bb-114d5239449c
35	W_LONG_SIN SC		eaac364d-3c25-40b8-8bc3-2828959f9f15
35	W_LONG_CON SC		8dad126f-867c-4135-a358-75573b4ed8fc
35	FRENADO		846e0e72-e42f-4863-ba9d-5016067747d7
36	SC1		599dbee5-4dfd-4aab-86d3-a595342d8c0a
36	W_TRANSV_SIN SC		7c784512-3650-46ba-82b8-ae229896eca1
36	W_TRANSV_SIN SC		89106174-c771-4b2e-ab81-febeec533769
36	W_TRANSV_SIN SC	27.7	c1453b6a-3cdb-4db2-80ad-0b96d3a1907c
36	W_TRANSV_CON SC		181f7447-2bb9-42fd-bfc5-d17bfd96c3c
36	W_TRANSV_CON SC		e1e1c494-c53a-48cb-9cb3-e5715ee9d0d0
36	W_TRANSV_CON SC	28.4	7c2437a2-eb0d-41ea-825c-25d32f06225a
36	W_LONG_SIN SC		3a4c2847-187f-443f-8f7f-1fed8cb4d743
36	W_LONG_CON SC		fba2045f-e041-4306-909f-2a8b2912079e
36	FRENADO		582d6604-2bf4-4d41-98f4-481fa3635405
37	SC1		fe8ceba9-a342-4b3c-bbbd-20b82ffce13
37	W_TRANSV_SIN SC		01798438-e0a3-4561-a4e6-b19aae309711
37	W_TRANSV_SIN SC		1ccd6993-7d1d-4478-a87e-5e302da635c2
37	W_TRANSV_SIN SC	27.7	22273583-c280-4e3e-b83a-125923b7339f
37	W_TRANSV_CON SC		04c26009-09b1-4cf6-b8dc-c15c3dfbb934
37	W_TRANSV_CON SC		60cce0c1-83f2-4bd3-9e5d-8ea4d5c796d0
37	W_TRANSV_CON SC	28.4	f215b507-1053-455f-b8a0-2ec3a7d66ed4
37	W_LONG_SIN SC		0299ce79-6fc0-49a1-aaff-4d740f01a296
37	W_LONG_CON SC		a2b049d7-354f-40db-bb9c-bf3bc020ec3b
37	FRENADO		4185f1ad-2e31-4488-b91d-556c987ee368
38	SC1		99f01ce4-f6d3-468f-89d9-55947eb05b10
38	W_TRANSV_SIN SC		598797fe-1dc7-46ff-a650-e3a0d54f09a0

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
38	W_TRANSV_SIN SC		57498a4e-9163-4061-8f64-13ec38e1fac1
38	W_TRANSV_SIN SC	27.7	3f8e470a-1fdd-43be-acb8-aefd0660be37
38	W_TRANSV_CON SC		af42a8c4-79d1-4c3c-ace2-8ee43f74c72d
38	W_TRANSV_CON SC		75e9a82f-01ba-4174-814f-7565d5c8233f
38	W_TRANSV_CON SC	28.4	711998ba-86fc-4bfd-aae1-e637e76f2075
38	W_LONG_SIN SC		bf665a97-e4cd-4455-8d30-5c158b9a6552
38	W_LONG_CON SC		62a37015-0339-42ae-9495-caafc5025e9
38	FRENADO		ffb7a94b-e0ee-44a6-9147-14b37b5cd7a5
39	SC1		0761b762-40ab-4ccc-83e2-d030e7c1fc31
39	W_TRANSV_SIN SC		9d984060-ce0b-4914-ba33-267e14492973
39	W_TRANSV_SIN SC		c43ba29d-ff95-40a8-beba-39c5f20f74da
39	W_TRANSV_SIN SC	27.7	040f444b-4a92-4114-881b-c5541c9d334b
39	W_TRANSV_CON SC		2fc280be-2956-4bf5-b198-a97c0ded836e
39	W_TRANSV_CON SC		5ff5cab8-474e-416c-a229-2b5fd4e7fe38
39	W_TRANSV_CON SC	28.4	363081a8-4689-4c87-b3bd-b889d76c67d5
39	W_LONG_SIN SC		b8b14125-0caa-4f93-bb97-b584f090ac9f
39	W_LONG_CON SC		04cb5763-4340-4d4b-9432-79df335844fc
39	FRENADO		bee91be1-c929-4895-9330-f3462ca2f052
42	W_TRANSV_SIN SC		87c2a0af-32da-42ee-976b-fc2fd44fce96
42	W_TRANSV_SIN SC		8a7fb9fc-745f-4063-9c93-f640b728d154
42	W_TRANSV_SIN SC	27.7	05244bce-0704-4e99-832d-8b78b60de9bc
42	W_TRANSV_CON SC		156248f0-85c9-490e-a147-cf966c6dae3f
42	W_TRANSV_CON SC		66420b89-4fbf-4734-a3ef-b67406ce9218
42	W_TRANSV_CON SC	28.4	82873669-69c4-4f91-aa79-2b13a256590a
42	W_LONG_SIN SC		fe382120-35f5-40bf-ba46-441b2b6077dc
42	W_LONG_CON SC		2618af65-d5c8-4da4-b5de-06ce1a402ef2
42	FRENADO		0c57e2a0-d818-49d8-9c46-6e0b16828e8b
43	W_TRANSV_SIN SC		fc87cdf7-92d1-4279-a53c-96239b46ada8
43	W_TRANSV_SIN SC		6126e4b0-22fb-4763-bd7b-1218c6f97695
43	W_TRANSV_SIN SC	27.7	270e5afb-0cc0-4b17-b782-3c617cc0b1a7

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
43	W_TRANSV_CON SC		eb6a1757-fdcc-4355-a083-8a492e8fade0
43	W_TRANSV_CON SC		2da7c03b-a4c6-48fd-91b7-6f9503b95196
43	W_TRANSV_CON SC	28.4	31cbffc2-3067-473b-9ce3-63da4c56bf97
43	W_LONG_SIN SC		c1758948-9e2d-4e80-83b6-5f482d797ebc
43	W_LONG_CON SC		7488a2a5-be99-4cfd-ad50-23c5e7c4361e
43	FRENADO		b3a04b47-44e4-4f53-9cf6-a6c56c1f8c73
44	W_TRANSV_SIN SC		922623eb-a9e6-4768-a5a0-1c417873a3ed
44	W_TRANSV_SIN SC		5fc3fa6b-f439-4744-b63e-1c1a77a279c2
44	W_TRANSV_SIN SC	27.7	f9ba83a2-af7f-429e-82ef-8ab44eb8f54e
44	W_TRANSV_CON SC		8d86ed19-5ced-442e-bdb7-af1268baa763
44	W_TRANSV_CON SC		ac7b0da5-688a-4264-9a15-af90be1e16de
44	W_TRANSV_CON SC	28.4	36241786-e757-47d0-8e88-e187529d8e26
44	W_LONG_SIN SC		17a2bdbf-275b-420a-b834-cd11b9002cf5
44	W_LONG_CON SC		cc94d525-c3c9-4858-bebd-c8d840a4f8bf
44	FRENADO		877323c7-c9e7-42f3-b101-7513e12b6e16
45	W_TRANSV_SIN SC		d5d27df2-b7b0-4d0c-883c-47c64c57dd15
45	W_TRANSV_SIN SC		d5e0df38-6082-4d75-8e6e-d393f5611fd7
45	W_TRANSV_SIN SC	27.7	17440bde-84ef-40ea-9f94-a4a4598cb906
45	W_TRANSV_CON SC		d17d0c9e-de1d-4c2f-99ac-20c10ea0a2e2
45	W_TRANSV_CON SC		745350d3-d884-4d45-96f6-eab982e69ce0
45	W_TRANSV_CON SC	28.4	3fa17fb5-66a4-4298-b7f3-370b792252b2
45	W_LONG_SIN SC		d1de945e-b4bb-4064-985d-3598888be11d
45	W_LONG_CON SC		796f4947-a115-4162-b89d-5f390a75afd7
45	FRENADO		e7fd4101-4424-4fbb-be3e-2662f158edc4
46	W_TRANSV_SIN SC		ed22c27c-31b7-4169-aa09-dd74320f89a8
46	W_TRANSV_SIN SC		22379789-4ce8-4df6-b097-ed486fbdaba6
46	W_TRANSV_SIN SC	27.7	a55a129d-88f2-4fa8-9cf9-0ebf24c26db2
46	W_TRANSV_CON SC		754f46e1-7881-4b97-a1fa-71ab265b0983
46	W_TRANSV_CON SC		e9a8cbe1-fa7b-46b4-8d05-d517f770e470
46	W_TRANSV_CON SC	28.4	cbf76cf2-976b-40ad-b410-6bcf311a39c7

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
46	W_LONG_SIN SC		f2bdcadd-47cc-4dee-91b6-2cb119a9c518
46	W_LONG_CON SC		6c85afb9-2bff-410b-a2a2-0a755de17664
46	FRENADO		78a6d2ff-dc9f-4d46-acf3-4b12356ed13b
47	W_TRANSV_SIN SC		ac0713f4-c8e0-470f-97bd-06df78bd4e39
47	W_TRANSV_SIN SC		78052851-b72b-4110-892c-4e8da4c05eee
47	W_TRANSV_SIN SC	27.7	3c7a6f1c-08b5-41c2-a96c-4d7233b1c3a7
47	W_TRANSV_CON SC		6c64587d-7914-47f9-9426-d2fb072ff45d
47	W_TRANSV_CON SC		695e7bb7-c4e8-4e29-a5a3-dba4b3b733d0
47	W_TRANSV_CON SC	28.4	5a24e1b4-ac0a-4708-acf9-137696f1ac29
47	W_LONG_SIN SC		ac6a450f-aa36-4ee7-90f7-e26130a382dd
47	W_LONG_CON SC		95743cca-33c8-41e5-8dd8-32bea1845897
47	FRENADO		05ab0114-cf22-45f1-adfc-3f056cfa0acd
48	W_TRANSV_SIN SC		63623407-f6ec-4c3d-b8e9-b7611798feb
48	W_TRANSV_SIN SC		e47dc150-53e7-434d-8de75-e9139ac37963
48	W_TRANSV_SIN SC	27.7	38df2646-57aa-4046-a915-bf949ccd9aca
48	W_TRANSV_CON SC		e2a321dd-c46e-4d10-b098-6ff446e46d11
48	W_TRANSV_CON SC		84306c4b-a7e3-4acf-b211-b48ccb5a3dfe
48	W_TRANSV_CON SC	28.4	fdb8dea1-a5ff-455e-b173-6cca27825826
48	W_LONG_SIN SC		a854372f-1ffc-43e6-aece-35b6f5419af8
48	W_LONG_CON SC		7767cb0b-adb3-42af-94e2-1fff6df9eef
48	FRENADO		ac246614-806d-4907-a29c-d43bfe1281f2
49	W_TRANSV_SIN SC		9561ce27-df81-40ad-90aa-ef2eab04922e
49	W_TRANSV_SIN SC		4a7b5afc-28c4-446c-a248-8f9e7ce24e8c
49	W_TRANSV_SIN SC	27.7	bce0d912-ba63-4a3d-bb12-3a68243b4905
49	W_TRANSV_CON SC		c7be9011-82c7-4aa4-8782-09d9659e9380
49	W_TRANSV_CON SC		59f0039e-b29c-49cb-a262-12d3836d78b3
49	W_TRANSV_CON SC	28.4	f8ab23a5-1e3f-42ce-a3b7-2559812c819a
49	W_LONG_SIN SC		bc7ddf32-1cb4-4f77-a601-9d48fe097b16
49	W_LONG_CON SC		2ef3c8be-60ff-41cc-b461-719a1f9663d1
49	FRENADO		81b7a7e3-4dfa-4278-9181-d4d9ced08f4f

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
50	W_TRANSV_SIN SC		09dec54c-3f82-4750-b5d b-333bca56f02c
50	W_TRANSV_SIN SC		73543541-c5dd-49fc-b7a 3-96185730a9dd
50	W_TRANSV_SIN SC	27.7	e67dfab2-0519-49ae-a52 b-4b3b2b5f4f18
50	W_TRANSV_CON SC		802e84f9-ecb7-4490-bb5 1-beab97fa6b01
50	W_TRANSV_CON SC		9499a334-ec60-4776-b5 7e-4d17cd315b61
50	W_TRANSV_CON SC	28.4	35b942f2-0505-4f05-af5d -937403f10e1c
50	W_LONG_SIN SC		ec90b140-806e-4aa5-b4 da-92dead625a01
50	W_LONG_CON SC		c7ec91ab-81bd-405d-b5 24-8e3bf4ab5594
50	FRENADO		e37fd232-724c-4fdd-ab3 b-b827e11f3371
51	W_TRANSV_SIN SC		2a6691a0-99d4-4156-91 e7-af42468e54bc
51	W_TRANSV_SIN SC		958b2091-cf5b-45ee-a65 d-d17de29c7438
51	W_TRANSV_SIN SC	27.7	3e8e7eb6-97c1-42c6-b2 84-04ad32d5900e
51	W_TRANSV_CON SC		b1e17d04-4bed-4e08-89 14-35d07670a9ad
51	W_TRANSV_CON SC		0710a608-5f3b-4d1d-b9c 0-b8aa453a2a0b
51	W_TRANSV_CON SC	28.4	6c63461e-ab93-4b44-b5 c2-5752fb64324d
51	W_LONG_SIN SC		3d5de1bc-ddc4-4391-a4f 0-f830bb0a782c
51	W_LONG_CON SC		73e1a727-72df-4c41-8e6 b-96aef227c9fb
51	FRENADO		b14f32bd-5a93-4643-b0e 0-8e278e2b1b93
52	W_TRANSV_SIN SC		786b794d-f9e6-4b28-8a5 1-f63f476539cd
52	W_TRANSV_SIN SC		f1a1c93e-3276-457b-890 1-0f34082d5770
52	W_TRANSV_SIN SC	27.7	3aec3019-765f-4bc9-8c2 7-ba303aabe4b1
52	W_TRANSV_CON SC		e70f71e6-fcdd-4707-b9b a-c71d594196a7
52	W_TRANSV_CON SC		e99f28fd-7884-4fdd-9d9b -bc59160e42b4
52	W_TRANSV_CON SC	28.4	c19ac91d-619a-4d1f-94a 3-e5c80c5f5bed
52	W_LONG_SIN SC		aa927874-b1ea-42e5-a4 e4-c9f40ed68dc1
52	W_LONG_CON SC		6b1a71eb-83f8-4f30-92d 6-9d1de9b738d9
52	FRENADO		62ddc0dd-a0ce-498e-b7 dd-6d810c66c241
53	W_TRANSV_SIN SC		032b1b60-0eb7-44fe-b3d b-b39c97f22822
53	W_TRANSV_SIN SC		322b1245-d8f6-43e9-898 9-24794773b650
53	W_TRANSV_SIN SC	27.7	5b52c9a7-2c95-4164-ab 22-8edcf562c3eb

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
53	W_TRANSV_CON SC		6089ea07-46ac-4538-93 70-61ae63cb21c4
53	W_TRANSV_CON SC		c28c26aa-59eb-464e-ad c4-517ab4f818d9
53	W_TRANSV_CON SC	28.4	78941ad4-1cbe-473c-99 df-81e3f7f04ee5
53	W_LONG_SIN SC		6597cc85-fdcb-44de-a54 e-8d59c7b07bb7
53	W_LONG_CON SC		a305d8df-8981-4b7e-97c 9-58178699049b
53	FRENADO		bad8413b-bda0-4957-89 80-97efc967f162
54	W_TRANSV_SIN SC		fe340c62-25b2-40c7-89b c-433ee38d6909
54	W_TRANSV_SIN SC		1104ee20-9021-4d32-84f 2-7d6d4e772309
54	W_TRANSV_SIN SC	27.7	f035389e-4ecb-4a75-afc 1-dbc7e75ad066
54	W_TRANSV_CON SC		9450067b-7d70-4ba1-88 1a-3e3fd6b48832
54	W_TRANSV_CON SC		e9b26039-7aa2-42e8-88 c9-fb81f9793dfd
54	W_TRANSV_CON SC	28.4	b14adecf-a3df-4e17-bfaf- f46493f0f361
54	W_LONG_SIN SC		0fb60719-a829-402e-b6c 3-77b0bc0859e3
54	W_LONG_CON SC		c44307d7-d36f-4420-850 2-14a6b88f2dfd
54	FRENADO		7fd32efe-0124-45b1-9c0 e-ddca06fff207
55	W_TRANSV_SIN SC		548f8a9c-c59f-4ab8-a33 4-2069e83ae00e
55	W_TRANSV_SIN SC		c89ba06e-0fb8-4cca-946 8-cb8be4e8029f
55	W_TRANSV_SIN SC	27.7	c3e32906-fb0f-4966-8c1 d-3522c4847ef5
55	W_TRANSV_CON SC		7eea4578-657a-45ba-b4 73-013d9acc926f
55	W_TRANSV_CON SC		ae432fe6-141d-4900-b3b f-96b4f736f853
55	W_TRANSV_CON SC	28.4	e6f62a38-8cb9-46d0-b5a 0-0e4e11141ba9
55	W_LONG_SIN SC		159fdcd2-2b76-4bf2-b97 9-affc4dd541e7
55	W_LONG_CON SC		15e98234-795f-4796-8e4 1-958d3df21dda
55	FRENADO		2ff65e85-f6fa-4a2e-b10c- 4863b8076338
56	W_TRANSV_SIN SC		4ed95ecc-54aa-41eb-be 9f-76123a95f43a
56	W_TRANSV_SIN SC		ec682103-0116-4369-91 7c-f8b6c556b38b
56	W_TRANSV_SIN SC	27.7	287daf0a-c2c9-4419-a06 8-8b53f02f64f5
56	W_TRANSV_CON SC		ff122232-878c-428e-b50 4-55f1a2774d0f
56	W_TRANSV_CON SC		ffbc1e41-e2af-4f8b-8bf6- 321440e27653
56	W_TRANSV_CON SC	28.4	83e4072d-520f-41b4-a68 6-c31c7bf99b79

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
56	W_LONG_SIN SC		e1380077-26fb-47ea-bf07-e07ad8346e65
56	W_LONG_CON SC		bc62358b-ecfb-418e-9d38-0608c1845fc5
56	FRENADO		6f91c5af-38bc-4fd0-8bd5-38a1268cda02
57	W_TRANSV_SIN SC		3a164f6b-2b10-47f9-90f5-fd9008a91fef
57	W_TRANSV_SIN SC		f6924047-015b-4546-a4a2-60c88046903e
57	W_TRANSV_SIN SC	27.7	f6162818-ae2d-4345-870a-d84d9e1ef90f
57	W_TRANSV_CON SC		12d08896-cac0-4ac6-8dda-e3df758442f9
57	W_TRANSV_CON SC		434fc496-bc8b-4e9f-90e8-9c29fd5463d5
57	W_TRANSV_CON SC	28.4	73aa62af-7983-4ff9-b18c-9e8a3764f7da
57	W_LONG_SIN SC		9017c6ee-1a69-4527-a285-242f38d5914d
57	W_LONG_CON SC		c183991a-bd8f-4cc7-b907-914bfa95d21b
57	FRENADO		d8f008f3-7fb8-478a-8c78-7dd64497e677
58	W_TRANSV_SIN SC		d14d3a0c-7d2b-49d4-956c-bdc539811db9
58	W_TRANSV_SIN SC		45d4417f-fbca-4fb6-8840-f4ff0a9832b2
58	W_TRANSV_SIN SC	27.7	9db278b5-7eb4-4175-88b2-6e075742b66f
58	W_TRANSV_CON SC		ae79ff8f-a73f-491f-89d4-cd4eb40373c0
58	W_TRANSV_CON SC		b8afe665-466b-45c8-9d6f-ffd84e52151a
58	W_TRANSV_CON SC	28.4	26873acd-8b34-4eb6-8708-82926847cdf8
58	W_LONG_SIN SC		62cc5791-7535-4c2a-8377-3b51a9ee902e
58	W_LONG_CON SC		0a015253-10d9-49bf-99d3-325ddba63d11
58	FRENADO		d537c25c-97e1-4e99-a0ef-e1577bfe9349
59	W_TRANSV_SIN SC		1c56afcd-66e6-4e38-add6-c660814f5148
59	W_TRANSV_SIN SC		da7c298c-7e4c-47a9-83b6-6378a0f51b61
59	W_TRANSV_SIN SC	27.7	94e6bf3e-bf17-46e0-913d-e7fc973375d5
59	W_TRANSV_CON SC		d22eae68-52cd-4e02-98df-acfd4644426a
59	W_TRANSV_CON SC		40212765-72f5-4787-a3fc-1fe5357710d1
59	W_TRANSV_CON SC	28.4	7d98cda7-8e3a-409d-871a-1cabdd9146be
59	W_LONG_SIN SC		da1794da-0007-4e05-98e4-08ef1f846c3a
59	W_LONG_CON SC		5c6d8a3e-8e3b-4258-a55c-f63f02df45b4
59	FRENADO		97c1b90d-033a-4f87-bfe8-0485927f7f84

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
73	W_TRANSV_SIN SC		8266508a-2972-498c-a000-11e91f49dea6
73	W_TRANSV_SIN SC		f72be235-30e8-459a-bb3a-61241938232b
73	W_TRANSV_SIN SC	27.7	c1ab5251-48e9-411e-b072-e01801324a5e
73	W_TRANSV_CON SC		0d819f3b-e7d8-4594-98f8-399673ebda8a
73	W_TRANSV_CON SC		6f1cc808-5213-44a8-b8d9-0a1b099d354f
73	W_TRANSV_CON SC	28.4	ea727674-7a08-4f85-a10a-35a23ac0c2e6
73	W_LONG_SIN SC		eba3c4bd-edb4-4b62-87b8-0c4a65f5346f
73	W_LONG_CON SC		b04fe868-33c3-4cf9-a9dc-2b51a7353ebb
73	FRENADO		36bb0f18-3185-4c00-a86e-d08501c68296
74	W_TRANSV_SIN SC		9c51c401-dd6d-403a-9f0d-9842a567904a
74	W_TRANSV_SIN SC		d7d69416-7b48-4a6a-86c8-dbd0aa700f23
74	W_TRANSV_SIN SC	27.7	833ca7b5-ead2-4eef-b270-bef188b31c90
74	W_TRANSV_CON SC		68cd978f-7694-4351-8f9f-38cae85434cc
74	W_TRANSV_CON SC		770e1d44-7477-43bf-aa7d-7ca8f11b0a43
74	W_TRANSV_CON SC	28.4	8f123f65-2489-4b3f-aadf-a17342a18d6f
74	W_LONG_SIN SC		f9b80d13-f000-4710-86bd-88a37364558b
74	W_LONG_CON SC		c7d3ed65-4809-48a4-88c4-0ab90708ab61
74	FRENADO		4e41871f-9d60-44a2-be36-e014922a3838
96	W_TRANSV_SIN SC		1b0d774e-170b-42c6-bbc0-46d257cdbedd
96	W_TRANSV_SIN SC		3e825779-d313-4e02-b9ee-eb3afc0cd78e
96	W_TRANSV_SIN SC	27.7	287104cf-77a6-4b8e-aace-0810b9ea6627
96	W_TRANSV_CON SC		e30c483e-aac7-4d3a-9e11-f47372281a5f
96	W_TRANSV_CON SC		f07a98d6-37c8-47b8-9a66-79959a72c0a9
96	W_TRANSV_CON SC	28.4	283ceae7-8bb6-4a1c-87d9-12b992edf6da
96	W_LONG_SIN SC		9a7c742d-a98f-493a-9c22-99732ee1d0e0
96	W_LONG_CON SC		e8e7c2ea-4c41-439f-8049-eeefa1e2ed528
96	FRENADO		bcd92526-2753-4aad-8d80-97e89898822b
97	W_TRANSV_SIN SC		15d9cf97-3850-4e4d-a141-5c324c8d2058
97	W_TRANSV_SIN SC		8ceae58-cf84-474f-bfde-183ac511316b
97	W_TRANSV_SIN SC	27.7	da4b7320-8f3c-48de-963f-0f952505646c

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
97	W_TRANSV_CON SC		4be493d6-fdb3-46e6-920 3-85a6337a6ab0
97	W_TRANSV_CON SC		821268e3-ae80-4fa5-b38 c-8a9c05adfb62
97	W_TRANSV_CON SC	28.4	6d68d85d-5f93-4df9-a2e 8-50b4ce2dc53b
97	W_LONG_SIN SC		10378375-c947-4459-91 7c-3a651c2e4189
97	W_LONG_CON SC		b01bca40-2a28-4d86-91 07-26630bd7a8dc
97	FRENADO		d856a639-d109-43df-a4d 4-02a9bddce56d
98	SC1		8e0b8285-364c-40f4-893 4-dbd74a1d553b0
98	W_TRANSV_SIN SC		daf99ea3-2777-4110-97d a-292b7b70264f
98	W_TRANSV_SIN SC		beb1251e-7438-409c-97 3b-1773a57c280f
98	W_TRANSV_SIN SC	27.7	c97b5b46-a3a6-42ed-97 72-8442c8194ced
98	W_TRANSV_CON SC		fafcce7c-c932-4559-b998 -10579e01560f
98	W_TRANSV_CON SC		c016a2b2-bff3-4d7c-8f9e -47d6ab13ba18
98	W_TRANSV_CON SC	28.4	a81b322b-1688-4981-ae af-e04e9670ea9f
98	W_LONG_SIN SC		6b8c0eb6-08ae-436a-bff 8-e2f86f92dcc6
98	W_LONG_CON SC		ec24d5ea-857c-4565-b0 e6-f4c327dd0d25
98	FRENADO		6f7a7018-f977-4e7e-bd2 a-74312829ad27
99	SC1		8aeeaf2f-92ce-4b81-aacf -3c7b7d6b80ab
99	W_TRANSV_SIN SC		bdfc6592-0a32-46d2-8db 4-7e31bfb99651
99	W_TRANSV_SIN SC		2e428289-5dab-49a6-94 2e-c819840d3035
99	W_TRANSV_SIN SC	27.7	449f804b-6abb-4e75-a45 8-d9c7df2fcea1
99	W_TRANSV_CON SC		d24d21c4-3857-437f-984 b-4339d27b2e6b
99	W_TRANSV_CON SC		96f36422-3f0c-47db-ac2f -fb5aabbfeecf
99	W_TRANSV_CON SC	28.4	ba7c38e7-6ced-4b67-94 56-56b300e58c26
99	W_LONG_SIN SC		4ba3d21a-a893-418e-b6 0e-77fd42bafefc
99	W_LONG_CON SC		b8f5e011-67e4-455b-925 b-4d49fcb6e7d
99	FRENADO		c42b8b26-8789-46ca-9c 4a-3a0f5604294d
100	SC1		58570537-b225-403a-ae db-4e4e83abb037
100	W_TRANSV_SIN SC		670868a4-720d-40ae-89 29-2e50cb5a6882
100	W_TRANSV_SIN SC		817e9657-de69-4149-aa 62-817afe091436
100	W_TRANSV_SIN SC	27.7	3be482b5-5c96-4f25-9d0 7-1b7a3feef609

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
100	W_TRANSV_CON SC		72fc5756-e91d-4273-a87 1-a47beee114a4
100	W_TRANSV_CON SC		12eee9e5-0e3e-44f9-92f 0-6a4fa0d49ae4
100	W_TRANSV_CON SC	28.4	f824a11a-4c35-4f14-940 d-6194f66afcf5
100	W_LONG_SIN SC		b673351e-41b1-4095-89 c8-8929c2d3a8e0
100	W_LONG_CON SC		0b61daef-449b-49a6-beb 2-e310083d228b
100	FRENADO		8daa5789-69c1-4e2f-908 e-1df28f4010be
101	SC1		02bb6fef-308c-4a67-bcb 2-bdf64be77cf8
101	W_TRANSV_SIN SC		82d92b0e-06bf-42e2-9cf 3-1b6cc10f1f8a
101	W_TRANSV_SIN SC		284317a6-46a5-4510-94 ab-6a4c5624e95c
101	W_TRANSV_SIN SC	27.7	67f981a0-3f0d-4723-858 9-9b8818a47ce2
101	W_TRANSV_CON SC		c582b7e7-715f-420e-978 c-d9801fcae17f
101	W_TRANSV_CON SC		2b1291df-e7fc-41ba-8e3 4-ee70a28aa18b
101	W_TRANSV_CON SC	28.4	3634bb79-4d44-4ede-b5 c4-ca098556f6f6
101	W_LONG_SIN SC		12710a6a-8644-46ab-99 05-cd8ecd56dca3
101	W_LONG_CON SC		98f401cb-9bde-4a08-8b2 8-56b3fb9b44a1
101	FRENADO		c6ddd06e-a5a2-448a-98 41-5f7eff705e7a
102	W_TRANSV_SIN SC		c4966ba9-b046-4f5a-a3c 3-63936a2e4fb0
102	W_TRANSV_SIN SC		58ffe07d-b2c9-494e-bf1b -1cc3e7c688dd
102	W_TRANSV_SIN SC	27.7	fe21cea3-224f-4d4f-b4d0 -6e8b404daf98
102	W_TRANSV_CON SC		61cb5020-c8f8-45c9-8be 4-021223fc6a35
102	W_TRANSV_CON SC		adc833b9-1322-4750-be 76-0b3fd378682c
102	W_TRANSV_CON SC	28.4	d92605b0-344c-467b-93 41-05e17c01cfcd
102	W_LONG_SIN SC		aba4d168-bbea-4a53-8a 55-94d57c59f309
102	W_LONG_CON SC		cf148132-0a62-4fb9-8f01 -b92b6e75c6f9
102	FRENADO		23e45e78-bc5b-4716-96 2a-3d2f69e15331
103	W_TRANSV_SIN SC		7fcfa69-fc6c-4d58-81e9 -41ec2fdbe4ef
103	W_TRANSV_SIN SC		48428393-f463-4837-841 d-ecbd85498270
103	W_TRANSV_SIN SC	27.7	d28ceb40-a96a-452d-81 98-fbf503673642
103	W_TRANSV_CON SC		eb61f972-dd56-4fee-906 1-661d82340cbd
103	W_TRANSV_CON SC		5f8c1502-bfe9-4e8d-94c 9-50bfb5c7c653

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
103	W_TRANSV_CON SC	28.4	f3c0a443-148f-45a8-af31-aa0825a2a0d4
103	W_LONG_SIN SC		f6109951-ebbe-4e78-81f6-c21ea1be0192
103	W_LONG_CON SC		fb96b534-325d-4ca9-a188-053a965f09f6
103	FRENADO		6c87e04e-2453-4ff7-8732-ae108db5fe38
104	W_TRANSV_SIN SC		6b78e4ce-ee42-4751-9d45-c15ef41c2a56
104	W_TRANSV_SIN SC		c144ccfa-b95b-4769-b302-97b80f9efc9e
104	W_TRANSV_SIN SC	27.7	02f77b34-1798-4be3-9510-e3bc46137c04
104	W_TRANSV_CON SC		10f9d3a8-5d8a-41d9-be8c-4aad6f6aee1f
104	W_TRANSV_CON SC		914eb2f2-7a44-42ad-a340-43d5ea0d77a7
104	W_TRANSV_CON SC	28.4	51c248be-a3a5-45dc-b6d7-52852aaba5a4
104	W_LONG_SIN SC		1aa9ba0c-154c-4606-91db-bd0dea53a48e
104	W_LONG_CON SC		dfe05fb5-cfa7-4422-b930-ac014e024dab
104	FRENADO		14bbfc56-6dd3-4542-90e3-38e277227ea1
105	W_TRANSV_SIN SC		9da771c6-8ab4-4e7a-adb5-266e60220a8c
105	W_TRANSV_SIN SC		25bfda4c-f188-4ca2-87a5-023707442e79
105	W_TRANSV_SIN SC	27.7	6ca6b647-6701-45de-bf2a-e72b5be56530
105	W_TRANSV_CON SC		2e1349f6-8220-4a84-b436-b7edb251d98f
105	W_TRANSV_CON SC		915d313c-5376-489b-aaef-044ab433c57d
105	W_TRANSV_CON SC	28.4	015b4c10-47b9-4403-9e1c-3d5a174577ef
105	W_LONG_SIN SC		3d5fe3a5-71ef-4557-86e7-1d0ba8fd31d8
105	W_LONG_CON SC		b79a877a-67cc-46f7-906c-7fb654ae4dc5
105	FRENADO		1773b1c0-a824-432c-9f1a-1729ab73ac7a

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
2	TEMP+	Temperature	31.		None
2	TEMP+	Gradient2		-6.	None
2	TEMP-	Temperature	-20.		None
2	TEMP-	Gradient2		3.2	None
2	REOLOGÍA	Temperature	-50.		None
3	TEMP+	Temperature	31.		None
3	TEMP+	Gradient2		-6.	None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
3	TEMP-	Temperature	-20.		None
3	TEMP-	Gradient2		3.2	None
3	REOLOGÍA	Temperature	-50.		None
4	TEMP+	Temperature	31.		None
4	TEMP+	Gradient2		-6.	None
4	TEMP-	Temperature	-20.		None
4	TEMP-	Gradient2		3.2	None
4	REOLOGÍA	Temperature	-50.		None
5	TEMP+	Temperature	31.		None
5	TEMP+	Gradient2		-6.	None
5	TEMP-	Temperature	-20.		None
5	TEMP-	Gradient2		3.2	None
5	REOLOGÍA	Temperature	-50.		None
6	TEMP+	Temperature	31.		None
6	TEMP+	Gradient2		-6.	None
6	TEMP-	Temperature	-20.		None
6	TEMP-	Gradient2		3.2	None
6	REOLOGÍA	Temperature	-50.		None
7	TEMP+	Temperature	31.		None
7	TEMP+	Gradient2		-6.	None
7	TEMP-	Temperature	-20.		None
7	TEMP-	Gradient2		3.2	None
7	REOLOGÍA	Temperature	-50.		None
8	TEMP+	Temperature	31.		None
8	TEMP+	Gradient2		-6.	None
8	TEMP-	Temperature	-20.		None
8	TEMP-	Gradient2		3.2	None
8	REOLOGÍA	Temperature	-50.		None
9	TEMP+	Temperature	31.		None
9	TEMP+	Gradient2		-6.	None
9	TEMP-	Temperature	-20.		None
9	TEMP-	Gradient2		3.2	None
9	REOLOGÍA	Temperature	-50.		None
10	TEMP+	Temperature	31.		None
10	TEMP+	Gradient2		-6.	None
10	TEMP-	Temperature	-20.		None
10	TEMP-	Gradient2		3.2	None
10	REOLOGÍA	Temperature	-50.		None
11	TEMP+	Temperature	31.		None
11	TEMP+	Gradient2		-6.	None
11	TEMP-	Temperature	-20.		None
11	TEMP-	Gradient2		3.2	None
11	REOLOGÍA	Temperature	-50.		None
12	TEMP+	Temperature	31.		None
12	TEMP+	Gradient2		-6.	None
12	TEMP-	Temperature	-20.		None
12	TEMP-	Gradient2		3.2	None
12	REOLOGÍA	Temperature	-50.		None
13	TEMP+	Temperature	31.		None
13	TEMP+	Gradient2		-6.	None
13	TEMP-	Temperature	-20.		None
13	TEMP-	Gradient2		3.2	None
13	REOLOGÍA	Temperature	-50.		None
14	TEMP+	Temperature	31.		None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
14	TEMP+	Gradient2		-6.	None
14	TEMP-	Temperature	-20.		None
14	TEMP-	Gradient2		3.2	None
14	REOLOGÍA	Temperature	-50.		None
15	TEMP+	Temperature	31.		None
15	TEMP+	Gradient2		-6.	None
15	TEMP-	Temperature	-20.		None
15	TEMP-	Gradient2		3.2	None
15	REOLOGÍA	Temperature	-50.		None
16	TEMP+	Temperature	31.		None
16	TEMP+	Gradient2		-6.	None
16	TEMP-	Temperature	-20.		None
16	TEMP-	Gradient2		3.2	None
16	REOLOGÍA	Temperature	-50.		None
17	TEMP+	Temperature	31.		None
17	TEMP+	Gradient2		-6.	None
17	TEMP-	Temperature	-20.		None
17	TEMP-	Gradient2		3.2	None
17	REOLOGÍA	Temperature	-50.		None
18	TEMP+	Temperature	31.		None
18	TEMP+	Gradient2		-6.	None
18	TEMP-	Temperature	-20.		None
18	TEMP-	Gradient2		3.2	None
18	REOLOGÍA	Temperature	-50.		None
19	TEMP+	Temperature	31.		None
19	TEMP+	Gradient2		-6.	None
19	TEMP-	Temperature	-20.		None
19	TEMP-	Gradient2		3.2	None
19	REOLOGÍA	Temperature	-50.		None
22	TEMP+	Temperature	31.		None
22	TEMP+	Gradient2		-6.	None
22	TEMP-	Temperature	-20.		None
22	TEMP-	Gradient2		3.2	None
22	REOLOGÍA	Temperature	-50.		None
23	TEMP+	Temperature	31.		None
23	TEMP+	Gradient2		-6.	None
23	TEMP-	Temperature	-20.		None
23	TEMP-	Gradient2		3.2	None
23	REOLOGÍA	Temperature	-50.		None
24	TEMP+	Temperature	31.		None
24	TEMP+	Gradient2		-6.	None
24	TEMP-	Temperature	-20.		None
24	TEMP-	Gradient2		3.2	None
24	REOLOGÍA	Temperature	-50.		None
25	TEMP+	Temperature	31.		None
25	TEMP+	Gradient2		-6.	None
25	TEMP-	Temperature	-20.		None
25	TEMP-	Gradient2		3.2	None
25	REOLOGÍA	Temperature	-50.		None
26	TEMP+	Temperature	31.		None
26	TEMP+	Gradient2		-6.	None
26	TEMP-	Temperature	-20.		None
26	TEMP-	Gradient2		3.2	None
26	REOLOGÍA	Temperature	-50.		None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
27	TEMP+	Temperature	31.		None
27	TEMP+	Gradient2		-6.	None
27	TEMP-	Temperature	-20.		None
27	TEMP-	Gradient2		3.2	None
27	REOLOGÍA	Temperature	-50.		None
28	TEMP+	Temperature	31.		None
28	TEMP+	Gradient2		-6.	None
28	TEMP-	Temperature	-20.		None
28	TEMP-	Gradient2		3.2	None
28	REOLOGÍA	Temperature	-50.		None
29	TEMP+	Temperature	31.		None
29	TEMP+	Gradient2		-6.	None
29	TEMP-	Temperature	-20.		None
29	TEMP-	Gradient2		3.2	None
29	REOLOGÍA	Temperature	-50.		None
30	TEMP+	Temperature	31.		None
30	TEMP+	Gradient2		-6.	None
30	TEMP-	Temperature	-20.		None
30	TEMP-	Gradient2		3.2	None
30	REOLOGÍA	Temperature	-50.		None
31	TEMP+	Temperature	31.		None
31	TEMP+	Gradient2		-6.	None
31	TEMP-	Temperature	-20.		None
31	TEMP-	Gradient2		3.2	None
31	REOLOGÍA	Temperature	-50.		None
32	TEMP+	Temperature	31.		None
32	TEMP+	Gradient2		-6.	None
32	TEMP-	Temperature	-20.		None
32	TEMP-	Gradient2		3.2	None
32	REOLOGÍA	Temperature	-50.		None
33	TEMP+	Temperature	31.		None
33	TEMP+	Gradient2		-6.	None
33	TEMP-	Temperature	-20.		None
33	TEMP-	Gradient2		3.2	None
33	REOLOGÍA	Temperature	-50.		None
34	TEMP+	Temperature	31.		None
34	TEMP+	Gradient2		-6.	None
34	TEMP-	Temperature	-20.		None
34	TEMP-	Gradient2		3.2	None
34	REOLOGÍA	Temperature	-50.		None
35	TEMP+	Temperature	31.		None
35	TEMP+	Gradient2		-6.	None
35	TEMP-	Temperature	-20.		None
35	TEMP-	Gradient2		3.2	None
35	REOLOGÍA	Temperature	-50.		None
36	TEMP+	Temperature	31.		None
36	TEMP+	Gradient2		-6.	None
36	TEMP-	Temperature	-20.		None
36	TEMP-	Gradient2		3.2	None
36	REOLOGÍA	Temperature	-50.		None
37	TEMP+	Temperature	31.		None
37	TEMP+	Gradient2		-6.	None
37	TEMP-	Temperature	-20.		None
37	TEMP-	Gradient2		3.2	None



Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
37	REOLOGÍA	Temperature	-50.		None
38	TEMP+	Temperature	31.		None
38	TEMP+	Gradient2		-6.	None
38	TEMP-	Temperature	-20.		None
38	TEMP-	Gradient2		3.2	None
38	REOLOGÍA	Temperature	-50.		None
39	TEMP+	Temperature	31.		None
39	TEMP+	Gradient2		-6.	None
39	TEMP-	Temperature	-20.		None
39	TEMP-	Gradient2		3.2	None
39	REOLOGÍA	Temperature	-50.		None
42	TEMP+	Temperature	31.		None
42	TEMP+	Gradient2		-6.	None
42	TEMP-	Temperature	-20.		None
42	TEMP-	Gradient2		3.2	None
42	REOLOGÍA	Temperature	-50.		None
43	TEMP+	Temperature	31.		None
43	TEMP+	Gradient2		-6.	None
43	TEMP-	Temperature	-20.		None
43	TEMP-	Gradient2		3.2	None
43	REOLOGÍA	Temperature	-50.		None
44	TEMP+	Temperature	31.		None
44	TEMP+	Gradient2		-6.	None
44	TEMP-	Temperature	-20.		None
44	TEMP-	Gradient2		3.2	None
44	REOLOGÍA	Temperature	-50.		None
45	TEMP+	Temperature	31.		None
45	TEMP+	Gradient2		-6.	None
45	TEMP-	Temperature	-20.		None
45	TEMP-	Gradient2		3.2	None
45	REOLOGÍA	Temperature	-50.		None
46	TEMP+	Temperature	31.		None
46	TEMP+	Gradient2		-6.	None
46	TEMP-	Temperature	-20.		None
46	TEMP-	Gradient2		3.2	None
46	REOLOGÍA	Temperature	-50.		None
47	TEMP+	Temperature	31.		None
47	TEMP+	Gradient2		-6.	None
47	TEMP-	Temperature	-20.		None
47	TEMP-	Gradient2		3.2	None
47	REOLOGÍA	Temperature	-50.		None
48	TEMP+	Temperature	31.		None
48	TEMP+	Gradient2		-6.	None
48	TEMP-	Temperature	-20.		None
48	TEMP-	Gradient2		3.2	None
48	REOLOGÍA	Temperature	-50.		None
49	TEMP+	Temperature	31.		None
49	TEMP+	Gradient2		-6.	None
49	TEMP-	Temperature	-20.		None
49	TEMP-	Gradient2		3.2	None
49	REOLOGÍA	Temperature	-50.		None
50	TEMP+	Temperature	31.		None
50	TEMP+	Gradient2		-6.	None
50	TEMP-	Temperature	-20.		None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
50	TEMP-	Gradient2		3.2	None
50	REOLOGÍA	Temperature	-50.		None
51	TEMP+	Temperature	31.		None
51	TEMP+	Gradient2		-6.	None
51	TEMP-	Temperature	-20.		None
51	TEMP-	Gradient2		3.2	None
51	REOLOGÍA	Temperature	-50.		None
52	TEMP+	Temperature	31.		None
52	TEMP+	Gradient2		-6.	None
52	TEMP-	Temperature	-20.		None
52	TEMP-	Gradient2		3.2	None
52	REOLOGÍA	Temperature	-50.		None
53	TEMP+	Temperature	31.		None
53	TEMP+	Gradient2		-6.	None
53	TEMP-	Temperature	-20.		None
53	TEMP-	Gradient2		3.2	None
53	REOLOGÍA	Temperature	-50.		None
54	TEMP+	Temperature	31.		None
54	TEMP+	Gradient2		-6.	None
54	TEMP-	Temperature	-20.		None
54	TEMP-	Gradient2		3.2	None
54	REOLOGÍA	Temperature	-50.		None
55	TEMP+	Temperature	31.		None
55	TEMP+	Gradient2		-6.	None
55	TEMP-	Temperature	-20.		None
55	TEMP-	Gradient2		3.2	None
55	REOLOGÍA	Temperature	-50.		None
56	TEMP+	Temperature	31.		None
56	TEMP+	Gradient2		-6.	None
56	TEMP-	Temperature	-20.		None
56	TEMP-	Gradient2		3.2	None
56	REOLOGÍA	Temperature	-50.		None
57	TEMP+	Temperature	31.		None
57	TEMP+	Gradient2		-6.	None
57	TEMP-	Temperature	-20.		None
57	TEMP-	Gradient2		3.2	None
57	REOLOGÍA	Temperature	-50.		None
58	TEMP+	Temperature	31.		None
58	TEMP+	Gradient2		-6.	None
58	TEMP-	Temperature	-20.		None
58	TEMP-	Gradient2		3.2	None
58	REOLOGÍA	Temperature	-50.		None
59	TEMP+	Temperature	31.		None
59	TEMP+	Gradient2		-6.	None
59	TEMP-	Temperature	-20.		None
59	TEMP-	Gradient2		3.2	None
59	REOLOGÍA	Temperature	-50.		None
73	TEMP+	Temperature	31.		None
73	TEMP+	Gradient2		-6.	None
73	TEMP-	Temperature	-20.		None
73	TEMP-	Gradient2		3.2	None
73	REOLOGÍA	Temperature	-50.		None
74	TEMP+	Temperature	31.		None
74	TEMP+	Gradient2		-6.	None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
74	TEMP-	Temperature	-20.		None
74	TEMP-	Gradient2		3.2	None
74	REOLOGÍA	Temperature	-50.		None
96	TEMP+	Temperature	31.		None
96	TEMP+	Gradient2		-6.	None
96	TEMP-	Temperature	-20.		None
96	TEMP-	Gradient2		3.2	None
96	REOLOGÍA	Temperature	-50.		None
97	TEMP+	Temperature	31.		None
97	TEMP+	Gradient2		-6.	None
97	TEMP-	Temperature	-20.		None
97	TEMP-	Gradient2		3.2	None
97	REOLOGÍA	Temperature	-50.		None
98	TEMP+	Temperature	31.		None
98	TEMP+	Gradient2		-6.	None
98	TEMP-	Temperature	-20.		None
98	TEMP-	Gradient2		3.2	None
98	REOLOGÍA	Temperature	-50.		None
99	TEMP+	Temperature	31.		None
99	TEMP+	Gradient2		-6.	None
99	TEMP-	Temperature	-20.		None
99	TEMP-	Gradient2		3.2	None
99	REOLOGÍA	Temperature	-50.		None
100	TEMP+	Temperature	31.		None
100	TEMP+	Gradient2		-6.	None
100	TEMP-	Temperature	-20.		None
100	TEMP-	Gradient2		3.2	None
100	REOLOGÍA	Temperature	-50.		None
101	TEMP+	Temperature	31.		None
101	TEMP+	Gradient2		-6.	None
101	TEMP-	Temperature	-20.		None
101	TEMP-	Gradient2		3.2	None
101	REOLOGÍA	Temperature	-50.		None
102	TEMP+	Temperature	31.		None
102	TEMP+	Gradient2		-6.	None
102	TEMP-	Temperature	-20.		None
102	TEMP-	Gradient2		3.2	None
102	REOLOGÍA	Temperature	-50.		None
103	TEMP+	Temperature	31.		None
103	TEMP+	Gradient2		-6.	None
103	TEMP-	Temperature	-20.		None
103	TEMP-	Gradient2		3.2	None
103	REOLOGÍA	Temperature	-50.		None
104	TEMP+	Temperature	31.		None
104	TEMP+	Gradient2		-6.	None
104	TEMP-	Temperature	-20.		None
104	TEMP-	Gradient2		3.2	None
104	REOLOGÍA	Temperature	-50.		None
105	TEMP+	Temperature	31.		None
105	TEMP+	Gradient2		-6.	None
105	TEMP-	Temperature	-20.		None
105	TEMP-	Gradient2		3.2	None
105	REOLOGÍA	Temperature	-50.		None

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcc	AddAtElmin t	AddAtPtLoa d
			m		
2	MaxStaSpcg		0.5	Yes	Yes
3	MaxStaSpcg		0.5	Yes	Yes
4	MaxStaSpcg		0.5	Yes	Yes
5	MaxStaSpcg		0.5	Yes	Yes
6	MaxStaSpcg		0.5	Yes	Yes
7	MaxStaSpcg		0.5	Yes	Yes
8	MaxStaSpcg		0.5	Yes	Yes
9	MaxStaSpcg		0.5	Yes	Yes
10	MaxStaSpcg		0.5	Yes	Yes
11	MaxStaSpcg		0.5	Yes	Yes
12	MaxStaSpcg		0.5	Yes	Yes
13	MaxStaSpcg		0.5	Yes	Yes
14	MaxStaSpcg		0.5	Yes	Yes
15	MaxStaSpcg		0.5	Yes	Yes
16	MaxStaSpcg		0.5	Yes	Yes
17	MaxStaSpcg		0.5	Yes	Yes
18	MaxStaSpcg		0.5	Yes	Yes
19	MaxStaSpcg		0.5	Yes	Yes
22	MaxStaSpcg		0.5	Yes	Yes
23	MaxStaSpcg		0.5	Yes	Yes
24	MaxStaSpcg		0.5	Yes	Yes
25	MaxStaSpcg		0.5	Yes	Yes
26	MaxStaSpcg		0.5	Yes	Yes
27	MaxStaSpcg		0.5	Yes	Yes
28	MaxStaSpcg		0.5	Yes	Yes
29	MaxStaSpcg		0.5	Yes	Yes
30	MaxStaSpcg		0.5	Yes	Yes
31	MaxStaSpcg		0.5	Yes	Yes
32	MaxStaSpcg		0.5	Yes	Yes
33	MaxStaSpcg		0.5	Yes	Yes
34	MaxStaSpcg		0.5	Yes	Yes
35	MaxStaSpcg		0.5	Yes	Yes
36	MaxStaSpcg		0.5	Yes	Yes
37	MaxStaSpcg		0.5	Yes	Yes
38	MaxStaSpcg		0.5	Yes	Yes
39	MaxStaSpcg		0.5	Yes	Yes
42	MaxStaSpcg		0.5	Yes	Yes
43	MaxStaSpcg		0.5	Yes	Yes
44	MaxStaSpcg		0.5	Yes	Yes
45	MaxStaSpcg		0.5	Yes	Yes
46	MaxStaSpcg		0.5	Yes	Yes
47	MaxStaSpcg		0.5	Yes	Yes
48	MaxStaSpcg		0.5	Yes	Yes
49	MaxStaSpcg		0.5	Yes	Yes
50	MaxStaSpcg		0.5	Yes	Yes
51	MaxStaSpcg		0.5	Yes	Yes
52	MaxStaSpcg		0.5	Yes	Yes
53	MaxStaSpcg		0.5	Yes	Yes
54	MaxStaSpcg		0.5	Yes	Yes
55	MaxStaSpcg		0.5	Yes	Yes
56	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
57	MaxStaSpcg		0.5	Yes	Yes
58	MaxStaSpcg		0.5	Yes	Yes
59	MaxStaSpcg		0.5	Yes	Yes
61	MaxStaSpcg		0.5	Yes	Yes
62	MaxStaSpcg		0.5	Yes	Yes
63	MinNumSta	3		Yes	Yes
64	MinNumSta	3		Yes	Yes
65	MaxStaSpcg		0.5	Yes	Yes
66	MaxStaSpcg		0.5	Yes	Yes
67	MinNumSta	3		Yes	Yes
68	MinNumSta	3		Yes	Yes
69	MinNumSta	3		Yes	Yes
70	MinNumSta	3		Yes	Yes
71	MinNumSta	3		Yes	Yes
72	MinNumSta	3		Yes	Yes
73	MaxStaSpcg		0.5	Yes	Yes
74	MaxStaSpcg		0.5	Yes	Yes
75	MaxStaSpcg		0.5	Yes	Yes
76	MaxStaSpcg		0.5	Yes	Yes
77	MinNumSta	3		Yes	Yes
78	MinNumSta	3		Yes	Yes
79	MinNumSta	3		Yes	Yes
80	MinNumSta	3		Yes	Yes
81	MaxStaSpcg		0.5	Yes	Yes
82	MinNumSta	3		Yes	Yes
83	MinNumSta	3		Yes	Yes
84	MaxStaSpcg		0.5	Yes	Yes
85	MaxStaSpcg		0.5	Yes	Yes
86	MinNumSta	3		Yes	Yes
87	MinNumSta	3		Yes	Yes
88	MinNumSta	3		Yes	Yes
89	MinNumSta	3		Yes	Yes
90	MaxStaSpcg		0.5	Yes	Yes
91	MaxStaSpcg		0.5	Yes	Yes
92	MaxStaSpcg		0.5	Yes	Yes
93	MaxStaSpcg		0.5	Yes	Yes
94	MinNumSta	3		Yes	Yes
95	MinNumSta	3		Yes	Yes
96	MaxStaSpcg		0.5	Yes	Yes
97	MaxStaSpcg		0.5	Yes	Yes
98	MaxStaSpcg		0.5	Yes	Yes
99	MaxStaSpcg		0.5	Yes	Yes
100	MaxStaSpcg		0.5	Yes	Yes
101	MaxStaSpcg		0.5	Yes	Yes
102	MaxStaSpcg		0.5	Yes	Yes
103	MaxStaSpcg		0.5	Yes	Yes
104	MaxStaSpcg		0.5	Yes	Yes
105	MaxStaSpcg		0.5	Yes	Yes
117	MaxStaSpcg		0.5	Yes	Yes
118	MaxStaSpcg		0.5	Yes	Yes
119	MaxStaSpcg		0.5	Yes	Yes
120	MaxStaSpcg		0.5	Yes	Yes
121	MinNumSta	3		Yes	Yes

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
122	MinNumSta	3		Yes	Yes
123	MinNumSta	3		Yes	Yes
124	MinNumSta	3		Yes	Yes
125	MaxStaSpcg		0.5	Yes	Yes
126	MinNumSta	3		Yes	Yes
127	MinNumSta	3		Yes	Yes
128	MaxStaSpcg		0.5	Yes	Yes
129	MaxStaSpcg		0.5	Yes	Yes
130	MinNumSta	3		Yes	Yes
131	MinNumSta	3		Yes	Yes
132	MinNumSta	3		Yes	Yes
133	MinNumSta	3		Yes	Yes
134	MaxStaSpcg		0.5	Yes	Yes
135	MaxStaSpcg		0.5	Yes	Yes
136	MaxStaSpcg		0.5	Yes	Yes
137	MaxStaSpcg		0.5	Yes	Yes
138	MinNumSta	3		Yes	Yes
139	MinNumSta	3		Yes	Yes
140	MaxStaSpcg		0.5	Yes	Yes
141	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Release Assignments 1 - General, Part 1 of 2

Frame	PI	V2I	V3I	TI	M2I	M3I	PJ	V2J
98	No	Yes	No	No	No	Yes	No	No
102	No	Yes	No	No	No	Yes	No	No

Table: Frame Release Assignments 1 - General, Part 2 of 2

Frame	V3J	TJ	M2J	M3J	PartialFix
98	No	No	No	No	No
102	No	No	No	No	No

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
2	Section Designer	N.A.	MG	N.A.	Default
3	Section Designer	N.A.	MG	N.A.	Default
4	Section Designer	N.A.	MG	N.A.	Default
5	Section Designer	N.A.	MG	N.A.	Default
6	Section Designer	N.A.	MG	N.A.	Default
7	Section Designer	N.A.	MG	N.A.	Default
8	Section Designer	N.A.	MG	N.A.	Default
9	Section Designer	N.A.	MG	N.A.	Default
10	Section Designer	N.A.	MG	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
11	Section Designer	N.A.	MG	N.A.	Default
12	Section Designer	N.A.	MG	N.A.	Default
13	Section Designer	N.A.	MG	N.A.	Default
14	Section Designer	N.A.	MG	N.A.	Default
15	Section Designer	N.A.	MG	N.A.	Default
16	Section Designer	N.A.	MG	N.A.	Default
17	Section Designer	N.A.	MG	N.A.	Default
18	Section Designer	N.A.	MG	N.A.	Default
19	Section Designer	N.A.	MG	N.A.	Default
22	Section Designer	N.A.	MG	N.A.	Default
23	Section Designer	N.A.	MG	N.A.	Default
24	Section Designer	N.A.	MG	N.A.	Default
25	Section Designer	N.A.	MG	N.A.	Default
26	Section Designer	N.A.	MG	N.A.	Default
27	Section Designer	N.A.	MG	N.A.	Default
28	Section Designer	N.A.	MG	N.A.	Default
29	Section Designer	N.A.	MG	N.A.	Default
30	Section Designer	N.A.	MG	N.A.	Default
31	Section Designer	N.A.	MG	N.A.	Default
32	Section Designer	N.A.	MG	N.A.	Default
33	Section Designer	N.A.	MG	N.A.	Default
34	Section Designer	N.A.	MG	N.A.	Default
35	Section Designer	N.A.	MG	N.A.	Default
36	Section Designer	N.A.	MG	N.A.	Default
37	Section Designer	N.A.	MG	N.A.	Default
38	Section Designer	N.A.	MG	N.A.	Default
39	Section Designer	N.A.	MG	N.A.	Default
42	Section Designer	N.A.	MG	N.A.	Default
43	Section Designer	N.A.	MG	N.A.	Default
44	Section Designer	N.A.	MG	N.A.	Default
45	Section Designer	N.A.	MG	N.A.	Default
46	Section Designer	N.A.	MG	N.A.	Default
47	Section Designer	N.A.	MG	N.A.	Default
48	Section Designer	N.A.	MG	N.A.	Default
49	Section Designer	N.A.	MG	N.A.	Default
50	Section Designer	N.A.	MG	N.A.	Default
51	Section Designer	N.A.	MG	N.A.	Default
52	Section Designer	N.A.	MG	N.A.	Default
53	Section Designer	N.A.	MG	N.A.	Default
54	Section Designer	N.A.	MG	N.A.	Default
55	Section Designer	N.A.	MG	N.A.	Default
56	Section Designer	N.A.	MG	N.A.	Default
57	Section Designer	N.A.	MG	N.A.	Default
58	Section Designer	N.A.	MG	N.A.	Default
59	Section Designer	N.A.	MG	N.A.	Default
61	General	N.A.	BIELA	N.A.	Default
62	General	N.A.	BIELA	N.A.	Default
63	General	N.A.	BIELA	N.A.	Default
64	General	N.A.	BIELA	N.A.	Default
65	General	N.A.	BIELA	N.A.	Default
66	General	N.A.	BIELA	N.A.	Default
67	General	N.A.	BIELA	N.A.	Default
68	General	N.A.	BIELA	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
69	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
70	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
71	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
72	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
73	Section Designer	N.A.	MG	N.A.	Default
74	Section Designer	N.A.	MG	N.A.	Default
75	General	N.A.	BIELA	N.A.	Default
76	General	N.A.	BIELA	N.A.	Default
77	General	N.A.	BIELA	N.A.	Default
78	General	N.A.	BIELA	N.A.	Default
79	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
80	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
81	Rectangular	N.A.	DINTEL	DINTEL	Default
82	General	N.A.	BIELA	N.A.	Default
83	General	N.A.	BIELA	N.A.	Default
84	General	N.A.	BIELA	N.A.	Default
85	General	N.A.	BIELA	N.A.	Default
86	General	N.A.	BIELA	N.A.	Default
87	General	N.A.	BIELA	N.A.	Default
88	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
89	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
90	General	N.A.	BIELA	N.A.	Default
91	General	N.A.	BIELA	N.A.	Default
92	General	N.A.	BIELA	N.A.	Default
93	General	N.A.	BIELA	N.A.	Default
94	Circle	N.A.	PILARES	PILARES	Default
95	Circle	N.A.	PILARES	PILARES	Default
96	Section Designer	N.A.	MG	N.A.	Default
97	Section Designer	N.A.	MG	N.A.	Default
98	Section Designer	N.A.	MG	N.A.	Default
99	Section Designer	N.A.	MG	N.A.	Default
100	Section Designer	N.A.	MG	N.A.	Default
101	Section Designer	N.A.	MG	N.A.	Default
102	Section Designer	N.A.	MG	N.A.	Default
103	Section Designer	N.A.	MG	N.A.	Default
104	Section Designer	N.A.	MG	N.A.	Default
105	Section Designer	N.A.	MG	N.A.	Default
117	Rectangular	N.A.	DINTEL	DINTEL	Default
118	Rectangular	N.A.	DINTEL	DINTEL	Default
119	General	N.A.	BIELA	N.A.	Default
120	General	N.A.	BIELA	N.A.	Default
121	General	N.A.	BIELA	N.A.	Default
122	General	N.A.	BIELA	N.A.	Default
123	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
124	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
125	Rectangular	N.A.	DINTEL	DINTEL	Default
126	General	N.A.	BIELA	N.A.	Default
127	General	N.A.	BIELA	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
128	General	N.A.	BIELA	N.A.	Default
129	General	N.A.	BIELA	N.A.	Default
130	General	N.A.	BIELA	N.A.	Default
131	General	N.A.	BIELA	N.A.	Default
132	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
133	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
134	General	N.A.	BIELA	N.A.	Default
135	General	N.A.	BIELA	N.A.	Default
136	General	N.A.	BIELA	N.A.	Default
137	General	N.A.	BIELA	N.A.	Default
138	Circle	N.A.	PILARES	PILARES	Default
139	Circle	N.A.	PILARES	PILARES	Default
140	Rectangular	N.A.	DINTEL	DINTEL	Default
141	Rectangular	N.A.	DINTEL	DINTEL	Default

Table: Frame Section Properties 01 - General, Part 1 of 6

Table: Frame Section Properties 01 - General, Part 1 of 6

SectionName	Material	Shape	t3 m	t2 m	Area m2	TorsConst m4
BIELA	BIELA	General	0.1	0.1	100.	100.
DINTEL	HA-30	Rectangular	1.2	2.	2.4	0.721247
MG	HA-50	SD Section			4.86448	3.594913
MG_GENERAL	HA-50	General	0.4572	0.254	4.8601	30.
NZ_500.400.(129/93)	NEOPRENO	Rectangular	0.4	0.5	0.2	0.005474
NZ_600.500.(144/104)	NEOPRENO	Rectangular	0.5	0.6	0.3	0.012402
PILARES	HA-30	Circle	1.		0.785398	0.098175

Table: Frame Section Properties 01 - General, Part 2 of 6

Table: Frame Section Properties 01 - General, Part 2 of 6

SectionName	I33 m4	I22 m4	I23 m4	AS2 m2	AS3 m2	S33 m3	S22 m3
BIELA	100.	100.	0.	0.	0.	1.	1.
DINTEL	0.288	0.8	0.	2.	2.	0.48	0.8
MG	4.102445	30.141251	0.	1.637659	3.078773	2.550938	6.481989
MG_GENERAL	4.0999	29.9244	0.	0.	0.	1.	1.
NZ_500.400.(129/93)	0.002667	0.004167	0.	0.166667	0.166667	0.013333	0.016667
NZ_600.500.(144/104)	0.00625	0.009	0.	0.25	0.25	0.025	0.03
PILARES	0.049087	0.049087	0.	0.706858	0.706858	0.098175	0.098175

Table: Frame Section Properties 01 - General, Part 3 of 6

Table: Frame Section Properties 01 - General, Part 3 of 6

SectionName	Z33 m3	Z22 m3	R33 m	R22 m	EccV2 m	ConcCol	ConcBeam
BIELA	1.	1.	1.	1.	0.	No	No
DINTEL	0.72	1.2	0.34641	0.57735		Yes	No
MG	3.406723	9.202041	0.918339	2.489215		No	No
MG_GENERAL	1.	1.	1.	1.	0.	No	No

Table: Frame Section Properties 01 - General, Part 3 of 6

SectionName	Z33 m3	Z22 m3	R33 m	R22 m	EccV2 m	ConcCol	ConcBeam
NZ_500.400.(129/93)	0.02	0.025	0.11547	0.144338		No	No
NZ_600.500.(144/104)	0.0375	0.045	0.144338	0.173205		No	No
PILARES	0.166667	0.166667	0.25	0.25		Yes	No

Table: Frame Section Properties 01 - General, Part 4 of 6

Table: Frame Section Properties 01 - General, Part 4 of 6

SectionName	Color	TotalWt KN	TotalMass KN-s2/m	FromFile	AMod	A2Mod	A3Mod
BIELA	Yellow	0.	0.	No	1.	1.	1.
DINTEL	Blue	720.	73.42	No	1.	1.	1.
MG	Blue	15681.	1599.02	No	1.	1.	1.
MG_GENERAL	Magenta	0.	0.	No	1.	1.	1.
NZ_500.400.(129/93)	Magenta	0.	0.	No	1000.	1.	1.
NZ_600.500.(144/104)	Cyan	0.	0.	No	1000.	1.	1.
PILARES	Red	439.823	44.85	No	1.	1.	1.

Table: Frame Section Properties 01 - General, Part 5 of 6

Table: Frame Section Properties 01 - General, Part 5 of 6

SectionName	JMod	I2Mod	I3Mod	MMod	WMod	GUID
BIELA	1.	1.	1.	1.	1.	
DINTEL	1.	1.	1.	1.	1.	
MG	1.	1.	1.	1.	1.	
MG_GENERAL	1.	1.	1.	1.	1.	
NZ_500.400.(129/93)	1.	1.	1.	1.	1.	
NZ_600.500.(144/104)	1.	1.	1.	1.	1.	
PILARES	1.	1.	1.	1.	1.	

Table: Frame Section Properties 01 - General, Part 6 of 6

Table: Frame Section Properties 01 - General, Part 6 of 6

SectionName	Notes
BIELA	Added 12/06/2020 11:13:38
DINTEL	Added 12/06/2020 11:15:33
MG	Added 12/06/2020 11:03:20
MG_GENERAL	Added 12/06/2020 11:56:56
NZ_500.400.(129/93)	Added 15/06/2020 15:16:22
NZ_600.500.(144/104)	Added 12/06/2020 11:22:57
PILARES	Added 12/06/2020 11:12:41

**Table: Frame Section Properties 02 - Concrete Column, Part 1 of 2**

Table: Frame Section Properties 02 - Concrete Column, Part 1 of 2								
SectionName	RebarMatL	RebarMatC	ReinfConfig	LatReinf	Cover	NumBars3Dir	NumBars2Dir	NumBarsCirc
					m			
DINTEL	A615Gr60	A615Gr60	Rectangular	Ties	0.04	3	3	
PILARES	A615Gr60	A615Gr60	Circular	Ties	0.04			8

**Table: Frame Section Properties 02 - Concrete Column, Part 2 of 2**

Table: Frame Section Properties 02 - Concrete Column, Part 2 of 2						
SectionName	BarSizeL	BarSizeC	SpacingC	NumCBars2	NumCBars3	ReinfType
			m			
DINTEL	#9	#4	0.15	3	3	Design
PILARES	#9	#4	0.15			Design

**Table: Frame Section Properties 13 - Time Dependent**

Table: Frame Section Properties 13 - Time Dependent				
SectionName	TypeSize	AutoValSize	AutoSFSize	UserValSize
		m		m
BIELA	None			
DINTEL	Auto	0.75	1.	
MG	Auto	0.27692	1.	
MG_GENERAL	None			
NZ_500.400.(129/93)	Auto	0.22222	1.	
NZ_600.500.(144/104)	Auto	0.27273	1.	
PILARES	Auto	0.5	1.	

**Table: Joint Coordinates, Part 1 of 2**

Table: Joint Coordinates, Part 1 of 2							
Joint	CoordSys	CoordType	XorR	Y	Z	SpecialJt	GlobalX
			m	m	m		m
1	GLOBAL	Cartesian	2.25	0.	0.	No	2.25
2	GLOBAL	Cartesian	4.5	0.	0.	No	4.5
3	GLOBAL	Cartesian	6.75	0.	0.	No	6.75
4	GLOBAL	Cartesian	9.	0.	0.	No	9.
5	GLOBAL	Cartesian	11.25	0.	0.	No	11.25
6	GLOBAL	Cartesian	13.5	0.	0.	No	13.5
7	GLOBAL	Cartesian	15.75	0.	0.	No	15.75
8	GLOBAL	Cartesian	18.	0.	0.	No	18.
9	GLOBAL	Cartesian	20.25	0.	0.	No	20.25
10	GLOBAL	Cartesian	22.5	0.	0.	No	22.5
11	GLOBAL	Cartesian	24.75	0.	0.	No	24.75
12	GLOBAL	Cartesian	27.	0.	0.	No	27.
13	GLOBAL	Cartesian	29.25	0.	0.	No	29.25
14	GLOBAL	Cartesian	31.5	0.	0.	No	31.5
15	GLOBAL	Cartesian	33.75	0.	0.	No	33.75
16	GLOBAL	Cartesian	36.	0.	0.	No	36.
17	GLOBAL	Cartesian	38.25	0.	0.	No	38.25
18	GLOBAL	Cartesian	40.5	0.	0.	No	40.5
19	GLOBAL	Cartesian	42.75	0.	0.	No	42.75

**Table: Joint Coordinates, Part 1 of 2**

Joint	CoordSys	CoordType	XorR	Y	Z	SpecialJt	GlobalX
			m	m	m		m
20	GLOBAL	Cartesian	47.25	0.	0.	No	47.25
21	GLOBAL	Cartesian	49.5	0.	0.	No	49.5
22	GLOBAL	Cartesian	51.75	0.	0.	No	51.75
23	GLOBAL	Cartesian	54.	0.	0.	No	54.
24	GLOBAL	Cartesian	56.25	0.	0.	No	56.25
25	GLOBAL	Cartesian	58.5	0.	0.	No	58.5
26	GLOBAL	Cartesian	60.75	0.	0.	No	60.75
27	GLOBAL	Cartesian	63.	0.	0.	No	63.
28	GLOBAL	Cartesian	65.25	0.	0.	No	65.25
29	GLOBAL	Cartesian	67.5	0.	0.	No	67.5
30	GLOBAL	Cartesian	69.75	0.	0.	No	69.75
31	GLOBAL	Cartesian	72.	0.	0.	No	72.
32	GLOBAL	Cartesian	74.25	0.	0.	No	74.25
33	GLOBAL	Cartesian	76.5	0.	0.	No	76.5
34	GLOBAL	Cartesian	78.75	0.	0.	No	78.75
35	GLOBAL	Cartesian	81.	0.	0.	No	81.
36	GLOBAL	Cartesian	83.25	0.	0.	No	83.25
37	GLOBAL	Cartesian	85.5	0.	0.	No	85.5
38	GLOBAL	Cartesian	87.75	0.	0.	No	87.75
39	GLOBAL	Cartesian	91.5	0.	0.	No	91.5
40	GLOBAL	Cartesian	93.	0.	0.	No	93.
41	GLOBAL	Cartesian	94.5	0.	0.	No	94.5
42	GLOBAL	Cartesian	96.	0.	0.	No	96.
43	GLOBAL	Cartesian	97.5	0.	0.	No	97.5
44	GLOBAL	Cartesian	99.	0.	0.	No	99.
45	GLOBAL	Cartesian	100.5	0.	0.	No	100.5
46	GLOBAL	Cartesian	102.	0.	0.	No	102.
47	GLOBAL	Cartesian	103.5	0.	0.	No	103.5
48	GLOBAL	Cartesian	105.	0.	0.	No	105.
49	GLOBAL	Cartesian	106.5	0.	0.	No	106.5
50	GLOBAL	Cartesian	108.	0.	0.	No	108.
51	GLOBAL	Cartesian	109.5	0.	0.	No	109.5
52	GLOBAL	Cartesian	111.	0.	0.	No	111.
53	GLOBAL	Cartesian	112.5	0.	0.	No	112.5
54	GLOBAL	Cartesian	114.	0.	0.	No	114.
55	GLOBAL	Cartesian	115.5	0.	0.	No	115.5
56	GLOBAL	Cartesian	117.	0.	0.	No	117.
57	GLOBAL	Cartesian	118.5	0.	0.	No	118.5
63	GLOBAL	Cartesian	0.	0.	0.	No	0.
64	GLOBAL	Cartesian	45.	0.	0.	No	45.
65	GLOBAL	Cartesian	0.5	0.	0.	No	0.5
66	GLOBAL	Cartesian	0.5	2.25	0.	No	0.5
67	GLOBAL	Cartesian	0.5	-2.25	0.	No	0.5
68	GLOBAL	Cartesian	0.5	2.25	-1.896	No	0.5
69	GLOBAL	Cartesian	0.5	-2.25	-1.896	No	0.5
70	GLOBAL	Cartesian	44.5	0.	0.	No	44.5
71	GLOBAL	Cartesian	44.5	2.25	0.	No	44.5
72	GLOBAL	Cartesian	44.5	-2.25	0.	No	44.5
73	GLOBAL	Cartesian	44.5	2.25	-1.896	No	44.5
74	GLOBAL	Cartesian	44.5	-2.25	-1.896	No	44.5
75	GLOBAL	Cartesian	0.5	2.25	-2.	No	0.5
76	GLOBAL	Cartesian	0.5	-2.25	-2.	No	0.5
77	GLOBAL	Cartesian	44.5	2.25	-2.	No	44.5
78	GLOBAL	Cartesian	44.5	-2.25	-2.	No	44.5

Table: Joint Coordinates, Part 1 of 2

Joint	CoordSys	CoordType	XorR m	Y m	Z m	SpecialJt	GlobalX m
79	GLOBAL	Cartesian	90.	0.	0.	No	90.
80	GLOBAL	Cartesian	120.	0.	0.	No	120.
81	GLOBAL	Cartesian	119.5	0.	0.	No	119.5
82	GLOBAL	Cartesian	119.5	2.25	0.	No	119.5
83	GLOBAL	Cartesian	119.5	-2.25	0.	No	119.5
84	GLOBAL	Cartesian	119.5	2.25	-1.907	No	119.5
85	GLOBAL	Cartesian	119.5	-2.25	-1.907	No	119.5
86	GLOBAL	Cartesian	119.5	2.25	-2.	No	119.5
87	GLOBAL	Cartesian	119.5	-2.25	-2.	No	119.5
88	GLOBAL	Cartesian	45.	2.25	-2.6	No	45.
89	GLOBAL	Cartesian	45.	-2.25	-2.6	No	45.
90	GLOBAL	Cartesian	45.	2.25	-2.	No	45.
91	GLOBAL	Cartesian	45.	-2.25	-2.	No	45.
92	GLOBAL	Cartesian	45.5	0.	0.	No	45.5
93	GLOBAL	Cartesian	45.5	2.25	0.	No	45.5
94	GLOBAL	Cartesian	45.5	-2.25	0.	No	45.5
95	GLOBAL	Cartesian	45.5	2.25	-1.896	No	45.5
96	GLOBAL	Cartesian	45.5	-2.25	-1.896	No	45.5
97	GLOBAL	Cartesian	45.5	2.25	-2.	No	45.5
98	GLOBAL	Cartesian	45.5	-2.25	-2.	No	45.5
99	GLOBAL	Cartesian	45.	2.25	-8.2	No	45.
100	GLOBAL	Cartesian	45.	-2.25	-8.2	No	45.
121	GLOBAL	Cartesian	45.	3.	-2.6	No	45.
122	GLOBAL	Cartesian	45.	-3.	-2.6	No	45.
123	GLOBAL	Cartesian	89.5	0.	0.	No	89.5
124	GLOBAL	Cartesian	89.5	2.25	0.	No	89.5
125	GLOBAL	Cartesian	89.5	-2.25	0.	No	89.5
126	GLOBAL	Cartesian	89.5	2.25	-1.896	No	89.5
127	GLOBAL	Cartesian	89.5	-2.25	-1.896	No	89.5
128	GLOBAL	Cartesian	89.5	2.25	-2.	No	89.5
129	GLOBAL	Cartesian	89.5	-2.25	-2.	No	89.5
130	GLOBAL	Cartesian	90.	2.25	-2.6	No	90.
131	GLOBAL	Cartesian	90.	-2.25	-2.6	No	90.
132	GLOBAL	Cartesian	90.	2.25	-2.	No	90.
133	GLOBAL	Cartesian	90.	-2.25	-2.	No	90.
134	GLOBAL	Cartesian	90.5	0.	0.	No	90.5
135	GLOBAL	Cartesian	90.5	2.25	0.	No	90.5
136	GLOBAL	Cartesian	90.5	-2.25	0.	No	90.5
137	GLOBAL	Cartesian	90.5	2.25	-1.907	No	90.5
138	GLOBAL	Cartesian	90.5	-2.25	-1.907	No	90.5
139	GLOBAL	Cartesian	90.5	2.25	-2.	No	90.5
140	GLOBAL	Cartesian	90.5	-2.25	-2.	No	90.5
141	GLOBAL	Cartesian	90.	2.25	-8.2	No	90.
142	GLOBAL	Cartesian	90.	-2.25	-8.2	No	90.
143	GLOBAL	Cartesian	90.	3.	-2.6	No	90.
144	GLOBAL	Cartesian	90.	-3.	-2.6	No	90.

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
2	0.	0.	6b97d9a2-2f9d-4689-ac94-324560f226a2
3	0.	0.	acf74b23-2cc2-4bfe-aa15-1594cfcff718
4	0.	0.	a9013c89-dbf8-4b2b-99c6-cc80182f97b1
5	0.	0.	4a3b1642-9eaf-4d87-a5af-238fb21b2982
6	0.	0.	fc578de3-3348-4ebb-ae6e-62a1057893bc
7	0.	0.	66b7f8d9-b21c-4ce0-b410-4ef956feaf27
8	0.	0.	32876635-c301-4016-a530-d049b0f8d10b
9	0.	0.	d235ce2c-52a3-477d-b17a-9abd32f022c8
10	0.	0.	9a98ec2b-ac06-48ee-831d-534667c2e888
11	0.	0.	98ed7f86-7495-477a-8a3a-61ab7a54d8c5
12	0.	0.	871a6dcc-6ce5-487d-a155-cf3f5a255009
13	0.	0.	7635b6a4-92df-4704-ae42-959b4cbe6469
14	0.	0.	e9a8d4df-c55a-4377-921c-87b34fd827a8
15	0.	0.	5f829b75-541a-48cb-9848-de0b71b2afe6
16	0.	0.	d5a0d785-e6ee-44b4-8139-6e39190cbece
17	0.	0.	e69e4ea0-7be7-4d55-b9c9-e33c770f1dc0
18	0.	0.	497dce26-ca0b-44f0-9cec-61d239aa3c5f
19	0.	0.	d1e4c800-b737-4d42-a867-07d327c3d8d3
20	0.	0.	417d9934-d277-43e0-883a-37af943f170f
21	0.	0.	90814c07-4c4b-40d7-930a-7bb17332d41a
22	0.	0.	fcdb18db-7f29-4679-81bf-37cea09ea4b6
23	0.	0.	6b743b80-9e14-482d-a17c-c94288a48954
24	0.	0.	c8a7a035-064f-40c9-8d3d-f3997c475b8a
25	0.	0.	2df2926f-5e2e-4da7-93e1-2340483a5f1d
26	0.	0.	d46ff447-ed03-4d98-aef0-7deb042189d6
27	0.	0.	408066d4-ab04-4314-9a47-6f4fc3b029c6
28	0.	0.	3ddcf968-e3b7-406b-8a85-0e7bc0aa8ee4
29	0.	0.	428745f1-9596-4296-9dbc-97339a795c22
30	0.	0.	d6dc0b01-2da8-4ae4-b9bf-0326f38af18d
31	0.	0.	1860d09f-8460-45e3-8c45-7fa3dd874659

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
1	0.	0.	d05c1164-173c-415b-9edb-728a6a0a730f

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
32	0.	0.	0dc8ad44-08f2-4db2-878c-835fdb326f1
33	0.	0.	eb94545d-9655-4bdf-a424-f67a3754bfe3
34	0.	0.	18b7d30f-faff-4578-b04e-834f59ec3bf6
35	0.	0.	5195c399-f90c-4169-9722-f8f282651716
36	0.	0.	91156e7a-461d-4c00-9c49-09e5388617d7
37	0.	0.	5bd268c4-5dc6-46ab-afee-806b86f90e2d
38	0.	0.	d2abb0f6-64a6-47d9-a6d9-fe4ad8c7d5b2
39	0.	0.	00f19098-796a-4dfe-b4b3-f78e745d4c5a
40	0.	0.	731f194f-a4f6-4467-b7e6-91843c5df28e
41	0.	0.	79016158-deed-41bf-8f98-507756433012
42	0.	0.	68fcbc3c-fc69-4270-9c36-86e78a6f9a04
43	0.	0.	a9aca5c0-b6d1-4f8a-8aab-e48baf945f6b
44	0.	0.	8a04af72-63fc-401f-b8f8-76d4d208daa2
45	0.	0.	967c8307-c53e-47a9-9653-46afbb80cc1b
46	0.	0.	e44c3665-3739-4da5-9d04-55f427a9ff0a
47	0.	0.	53fe6bc1-6bdf-4c56-b6a7-7c976ce91539
48	0.	0.	caee6e8d-92d4-414d-9769-c3fbed314cca
49	0.	0.	f845e042-5a18-4116-8b16-a88256f4b1b6
50	0.	0.	f908ee04-80d5-443f-8f15-5343d666cf90
51	0.	0.	4140b362-1260-4cd4-a6be-b1960ae2767f
52	0.	0.	2a3d43c3-b90f-40db-9269-f1c3aa55f18b
53	0.	0.	cfb63d06-d213-48b8-91b7-1ea14509388f
54	0.	0.	eea9f207-4e5a-47df-96a0-e3befddcc31d
55	0.	0.	e4fd0778-692e-407a-8704-19437a7f8445
56	0.	0.	59120438-6696-44b4-95a6-fb419628dc50
57	0.	0.	31db3622-d5a2-4623-a210-e1d4ca0a2710
63	0.	0.	778b8359-c542-4970-bb04-0e2466f04172
64	0.	0.	72a0a5cf-d98e-4f86-9807-174b824a2f47
65	0.	0.	02569b19-4746-4372-a0d6-f85ca95dbacf
66	2.25	0.	1acb5cf3-68dd-4140-bb34-9ae2dbb72f70

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
67	-2.25	0.	b63877d5-6f6c-4f81-9deb-82b9f6e36605
68	2.25	-1.896	b764142d-a67f-4e2c-a1b0-7f1e69470f9b
69	-2.25	-1.896	4026250a-6c85-47f8-b5fe-b6db58a3ee61
70	0.	0.	38e38e73-b62f-4afa-8c40-af5b386985e7
71	2.25	0.	1fd3b37d-a212-4cad-aa4f-4ab38baeeb35
72	-2.25	0.	168f0ceb-f349-4fd8-ae9e-76e0d7793104
73	2.25	-1.896	017db964-0852-4937-97f0-328d7dde21af
74	-2.25	-1.896	40206c6b-bbcd-478d-b743-d1b2268b5b5c
75	2.25	-2.	372e93a8-b5e0-4889-920c-dbb711a93695
76	-2.25	-2.	c1609882-fc71-48cb-9211-5c6b0199d615
77	2.25	-2.	9e7e0c61-7fc9-480c-bd1a-e47b906dc226
78	-2.25	-2.	2701f0e7-6c25-4e4f-811f-ccad6a4c9edd
79	0.	0.	103791de-ee5f-42d0-a6e9-c19b519ccd6b
80	0.	0.	4010d0fb-db46-44bf-a45a-07fd2d677ff1
81	0.	0.	d9c593c6-9a41-4511-8968-50f2f85ad944
82	2.25	0.	dd529566-4ca5-41c4-8add-e3256064ca57
83	-2.25	0.	804d6b02-5968-4f34-86d0-7c6ebd85e057
84	2.25	-1.907	e025dedf-0fbc-44c9-9c5d-e6961086b0c7
85	-2.25	-1.907	89dcfaab-3337-44f5-b712-2ff4336db618
86	2.25	-2.	2389ccc1-106e-4c8a-a90a-c04c76e6a970
87	-2.25	-2.	eeeed4fa-f499-4c1e-aa9d-48cd922c898b
88	2.25	-2.6	1f85d779-a95e-45ab-8bd8-6ec6d6079879
89	-2.25	-2.6	c225297e-21ad-4f5d-b1fe-92747b8814ff
90	2.25	-2.	eee195e8-7bb4-4af0-bd20-5c10d84b6b03
91	-2.25	-2.	75a15670-9f09-4cee-9ad3-746d14e719d6
92	0.	0.	b06883b4-c8ce-4805-ba7a-4680efbb5436
93	2.25	0.	4c77200e-51ae-48db-915b-750d9dd7df6d
94	-2.25	0.	c6438240-fe03-4549-bb9d-681befe2fcf5
95	2.25	-1.896	f7f98bd6-adc0-4f8a-8cab-d9838d1f3e28
96	-2.25	-1.896	8f482254-d8f1-4aff-a492-f06b6b84abd1



Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
97	2.25	-2.	e94781d2-4ab1-4996-9d12-8167d236bb24
98	-2.25	-2.	3b469e70-5b25-4f1b-8f4a-3c7babb3e24f
99	2.25	-8.2	a9e3a99d-ffcb-4fd9-bc14-d86a29d8780b
100	-2.25	-8.2	e82cb81c-cad7-456a-a3ee-dda95db3b605
121	3.	-2.6	7c760473-fb50-4987-b9f6-c14514d1c173
122	-3.	-2.6	4ffb61a5-6a78-4235-beb5-03519d04b2e8
123	0.	0.	6d03bd39-f3ce-4c3e-8969-d850407e9813
124	2.25	0.	54862123-d2d5-459a-a3ad-4e04fc966468
125	-2.25	0.	e0abe029-2364-4479-97bf-c22c4a89144d
126	2.25	-1.896	d4b4d562-27bc-450a-a6b1-d8291ea6ceea
127	-2.25	-1.896	8c93a67a-64b3-4dcf-a39a-c93aa09b54a5
128	2.25	-2.	ed41c844-c1cb-48ee-a715-48c896cbd5cd
129	-2.25	-2.	09d25980-8080-494d-bff8-534596d1bf4c
130	2.25	-2.6	9c7c0472-c476-46d6-b203-764e7ffdb3f3
131	-2.25	-2.6	f3b86aee-6390-48b7-b2a4-0413bb69f30d
132	2.25	-2.	9df79ab8-e796-47ba-bc36-158e3e85469d
133	-2.25	-2.	311e2150-3f0c-4cf7-90e0-db058bde84c7
134	0.	0.	564a3aa9-fe19-4117-8547-5325d58378e2
135	2.25	0.	daab7865-4e67-4379-ac96-b6676c4f7635
136	-2.25	0.	1967730c-fe35-46a6-9dde-4bb76843d894
137	2.25	-1.907	05610b3a-5643-4fce-ac7f-4f7a198f8d66
138	-2.25	-1.907	cf1ff3d4-5f6b-453a-8866-b1c78f971c73
139	2.25	-2.	f337a219-95a5-4186-9c3d-8369b7f2241c
140	-2.25	-2.	02f7aaee-8b36-48fe-b4ec-160628939abf
141	2.25	-8.2	66a6ea8b-6448-45e0-9536-d7d83062170b
142	-2.25	-8.2	55ab1661-7666-4e52-b3c9-f0f47f0ac3ec
143	3.	-2.6	65e79e86-0126-47da-aa8c-fdcf84b779e1
144	-3.	-2.6	82d83ce0-939d-492b-8390-ed7904edd586

Table: Load Case Definitions, Part 1 of 3

Table: Load Case Definitions, Part 1 of 3							
Case	Type	InitialCond	ModalCase	BaseCase	MassSource	DesTypeOpt	DesignType
DEAD	LinStatic	Zero				Prog Det	Dead
MODAL	LinModal	Zero				Prog Det	Other
SC1	LinStatic	Zero				Prog Det	Dead
TEMP+	LinStatic	Zero				Prog Det	Dead
TEMP-	LinStatic	Zero				Prog Det	Dead
W_TRANSV _SIN SC	LinStatic	Zero				Prog Det	Dead
W_TRANSV _CON SC	LinStatic	Zero				Prog Det	Dead
W_LONG_SI N SC	LinStatic	Zero				Prog Det	Dead
W_LONG_C ON SC	LinStatic	Zero				Prog Det	Dead
FRENADO	LinStatic	Zero				Prog Det	Dead
REOLOGÍA	LinStatic	Zero				Prog Det	Dead

Table: Load Case Definitions, Part 2 of 3

Table: Load Case Definitions, Part 2 of 3							
Case	DesActOpt	DesignAct	AutoType	RunCase	CaseStatus	GUID	
DEAD	Prog Det	Non-Compos ite	None	Yes	Not Run	64ea085f-ebef-4d83-aec1-7e51b1edec8f	
MODAL	Prog Det	Other	None	Yes	Not Run	775678b0-e134-464a-a544-d2c08f2ea5d4	
SC1	Prog Det	Non-Compos ite	None	Yes	Not Run	5810e76e-1c93-4ab5-9184-735e9af8ccd3	
TEMP+	Prog Det	Non-Compos ite	None	Yes	Not Run	af872b97-1eb1-45f3-bacc-34fc8f719cd6	
TEMP-	Prog Det	Non-Compos ite	None	Yes	Not Run	a220224f-d2af-439a-a4f4-5f830b4fce85	
W_TRANSV _SIN SC	Prog Det	Non-Compos ite	None	Yes	Not Run	d75a9e16-04e5-4e08-9c15-c2cda619292d	
W_TRANSV _CON SC	Prog Det	Non-Compos ite	None	Yes	Not Run	13d13855-d2ba-467a-a28e-82dd3b0bf5de	
W_LONG_SI N SC	Prog Det	Non-Compos ite	None	Yes	Not Run	e5549487-0dcb-4ced-b0f0-1a60b816c63c	
W_LONG_C ON SC	Prog Det	Non-Compos ite	None	Yes	Not Run	13364c90-3700-4a35-8b10-05d3bb4d5fab	
FRENADO	Prog Det	Non-Compos ite	None	Yes	Not Run	8a42a991-2449-4db2-af77-5895c1c2aace	
REOLOGÍA	Prog Det	Non-Compos ite	None	Yes	Not Run	048e039b-f057-4efa-a39d-cd3cfb3db4fb	

Table: Load Case Definitions, Part 3 of 3

Table: Load Case Definitions, Part 3 of 3

Case	Notes
DEAD	
MODAL	
SC1	
TEMP+	
TEMP-	

Table: Load Case Definitions, Part 3 of 3

Case	Notes
W_TRANSV_SIN SC	
W_TRANSV_CON SC	
W_LONG_SIN SC	
W_LONG_CON SC	
FRENADO	
REOLOGÍA	

Table: Load Pattern Definitions

Table: Load Pattern Definitions

LoadPat	DesignType	SelfWtMult	AutoLoad	GUID	Notes
DEAD	Dead	1.		a9e2fea9-93e8-49d6-b0f6-338e97ca801a	
SC1	Dead	0.		c59d7960-2ca7-4ca3-a5aa-71f567492f6c	Added 15/06/2020 12:33:30
TEMP+	Dead	0.		43a4a0e7-88fd-4bb5-83dc-ec65585f9560	Added 15/06/2020 12:38:31
TEMP-	Dead	0.		5e45a8ce-bb1a-4b77-88f8-c6ac6a7a0f3c	Added 15/06/2020 12:38:34
W_TRANSV_SIN SC	Dead	0.		2eb56e50-3f33-4e82-a3e7-4b12c1c0c407	Added 15/06/2020 12:55:36
W_TRANSV_CON SC	Dead	0.		d4fed5d6-7e7c-4049-aa41-574b0f53f740	Added 15/06/2020 12:55:42
W_LONG_SIN SC	Dead	0.		bc0614ff-9b2f-4253-b5c2-3e15f8af34a3	Added 15/06/2020 12:55:51
W_LONG_CON SC	Dead	0.		535016a5-11e8-4823-8dcc-a1131cbd1d85	Added 15/06/2020 12:55:57
FRENADO	Dead	0.		301a0c84-2cdc-44b2-89d5-e51b6c896a52	Added 15/06/2020 14:30:35
REOLOGÍA	Dead	0.		1565bdd3-4a3b-4569-b5dc-173f3ee35783	Added 15/06/2020 15:06:42

Table: Material Properties 01 - General, Part 1 of 2

Table: Material Properties 01 - General, Part 1 of 2

Material	Type	Grade	SymType	TempDepend	Color	GUID
4000Psi	Concrete	f'c 4000 psi	Isotropic	No	Cyan	0ee38a9d-920b-43cf-9334-12c5db91b7b3
A416Gr270	Tendon	Grade 270	Uniaxial	No	Cyan	f56f99fa-f32e-4d8b-b06b-b1a0c1b6e42b
A615Gr60	Rebar	Grade 60	Uniaxial	No	Green	270d7b43-b969-46a1-8d3f-1c660b25bedd
A992Fy50	Steel	Grade 50	Isotropic	No	Green	cb94cf6a-fd36-4a3d-bb38-123428e852d3
BIELA	Other		Isotropic	No	Blue	67705611-4a9b-4669-850b-41f5b3801dc6
HA-30	Concrete	HA-30	Isotropic	No	Red	5af6b717-a167-4c89-91a7-5c8208540b91

Table: Material Properties 01 - General, Part 1 of 2

Material	Type	Grade	SymType	TempDepend	Color	GUID
HA-50	Concrete	HA-50	Isotropic	No	Magenta	1e50f14f-43bf-4a81-8867-0c4657b67308
NEOPRENO	Other		Isotropic	No	Gray8Dark	b6f2e659-fea0-4825-9c2e-35e212bba294

Table: Material Properties 01 - General, Part 2 of 2

Table: Material Properties 01 - General, Part 2 of 2

Material	Notes
4000Psi	Customary f'c 4000 psi 12/06/2020 9:54:29
A416Gr270	ASTM A416 Grade 270 12/06/2020 12:24:16
A615Gr60	ASTM A615 Grade 60 12/06/2020 11:03:30
A992Fy50	ASTM A992 Grade 50 12/06/2020 12:24:16
BIELA	MAT added 12/06/2020 11:13:13
HA-30	Spain EHE - Instrucción de Hormigón Estructural HA-30 added 12/06/2020 10:02:10
HA-50	Spain EHE - Instrucción de Hormigón Estructural HA-50 added 12/06/2020 10:02:17
NEOPRENO	MAT added 12/06/2020 11:18:02

Table: Material Properties 02 - Basic Mechanical Properties

Table: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight	UnitMass	E1	G12	U12	A1
	KN/m3	KN-s2/m4	KN/m2	KN/m2		1/C
4000Psi	2.3563E+01	2.4028E+00	24855578.06	10356490.86	0.2	9.9000E-06
A416Gr270	7.6973E+01	7.8490E+00	196500599.9			1.1700E-05
A615Gr60	7.6973E+01	7.8490E+00	199947978.8			1.1700E-05
A992Fy50	7.6973E+01	7.8490E+00	199947978.8	76903068.77	0.3	1.1700E-05
BIELA	0.0000E+00	0.0000E+00	999900000.	384576923.	0.3	1.1700E-05
HA-30	2.5000E+01	2.5493E+00	33577729.38	13990720.58	0.2	1.0000E-05
HA-50	2.5000E+01	2.5493E+00	38660380.45	16108491.85	0.2	1.0000E-05
NEOPRENO	0.0000E+00	0.0000E+00	3861.	1485.	0.3	1.1700E-05

Table: Material Properties 03a - Steel Data, Part 1 of 2

Table: Material Properties 03a - Steel Data, Part 1 of 2

Material	Fy	Fu	EffFy	EffFu	SSCurveOpt	SSHysType	SHard	SMax
	KN/m2	KN/m2	KN/m2	KN/m2				
A992Fy50	344737.89	448159.26	379211.68	492975.19	Simple	Kinematic	0.015	0.11

**Table: Material Properties 03a - Steel Data, Part 2 of 2**

Table: Material Properties 03a - Steel Data, Part 2 of 2

Material	SRup	FinalSlope
A992Fy50	0.17	-0.1

**Table: Material Properties 03b - Concrete Data, Part 1 of 2**

Table: Material Properties 03b - Concrete Data, Part 1 of 2

Material	Fc KN/m2	eFc KN/m2	LtWtConc	SSCurveOpt	SSHysType	SFc	SCap	FinalSlope
4000Psi	27579.03	27579.03	No	Mander	Takeda	0.002219	0.005	-0.1
HA-30	30000.	30000.	No	Mander	Takeda	0.00179	0.0037	-0.1
HA-50	50000.	50000.	No	Mander	Takeda	0.0026	0.003	-0.1

**Table: Material Properties 03b - Concrete Data, Part 2 of 2**

Table: Material Properties 03b - Concrete Data, Part 2 of 2

Material	FAngle Degrees	DAngle Degrees
4000Psi	0.	0.
HA-30	0.	0.
HA-50	0.	0.

**Table: Material Properties 03e - Rebar Data, Part 1 of 2**

Table: Material Properties 03e - Rebar Data, Part 1 of 2

Material	Fy KN/m2	Fu KN/m2	EffFy KN/m2	EffFu KN/m2	SSCurveOpt	SSHysType	SHard	SCap
A615Gr60	413685.47	620528.21	455054.02	682581.03	Simple	Kinematic	0.01	0.09

**Table: Material Properties 03e - Rebar Data, Part 2 of 2**

Table: Material Properties 03e - Rebar Data, Part 2 of 2

Material	FinalSlope	UseCTDef
A615Gr60	-0.1	No

**Table: Material Properties 03f - Tendon Data**

Table: Material Properties 03f - Tendon Data

Material	Fy KN/m2	Fu KN/m2	SSCurveOpt	SSHysType	FinalSlope
A416Gr270	1689905.16	1861584.63	270 ksi	Kinematic	-0.1

**Table: Material Properties 03g - Other Data**

Table: Material Properties 03g - Other Data

Material	SSHysType	FAngle Degrees	DAngle Degrees
BIELA	Takeda	0.	0.
NEOPRENO	Takeda	0.	0.

**Table: Material Properties 04 - User Stress-Strain Curves**

Table: Material Properties 04 - User Stress-Strain Curves

Material	Point	Strain	Stress KN/m2	PointID
BIELA	1	-1.000E-09	-1.	
BIELA	2	0.	0.	A
BIELA	3	1.000E-09	1.	
NEOPRENO	1	-0.000259	-1.	
NEOPRENO	2	0.	0.	A
NEOPRENO	3	0.000259	1.	

**Table: Material Properties 06 - Damping Parameters**

Table: Material Properties 06 - Damping Parameters

Material	ModalRatio	VisMass 1/Sec	VisStiff Sec	HysMass 1/Sec2	HysStiff
4000Psi	0.	0.	0.	0.	0.
A416Gr270	0.	0.	0.	0.	0.
A615Gr60	0.	0.	0.	0.	0.
A992Fy50	0.	0.	0.	0.	0.
BIELA	0.	0.	0.	0.	0.
HA-30	0.	0.	0.	0.	0.
HA-50	0.	0.	0.	0.	0.
NEOPRENO	0.	0.	0.	0.	0.

**Table: Program Control, Part 1 of 2**

Table: Program Control, Part 1 of 2

ProgramName	Version	ProgLevel	LicenseNum	LicenseOS	LicenseSC	LicenseHT	CurrUnits
SAP2000	21.2.0	Plus	2010*1548B3D7Y5ZN4CR	No	No	No	KN, m, C

**Table: Program Control, Part 2 of 2**

Table: Program Control, Part 2 of 2

SteelCode	ConcCode	AlumCode	ColdCode	RegenHinge
AISC 360-10	ACI 318-14	AA-ASD 2000	AISI-ASD96	Yes

**Table: Section Designer Properties 01 - General, Part 1 of 6**

Table: Section Designer Properties 01 - General, Part 1 of 6

SectionName	DesignType	DsgnOrChck	BaseMat	IncludeVStr	AxisAngle	MeshSzAbs
MG	No Check/Design	Check	HA-50	No	90.	0.

**Table: Section Designer Properties 01 - General, Part 2 of 6**

Table: Section Designer Properties 01 - General, Part 2 of 6

SectionName	MeshSzRel	nTotalShp	nWideFlng	nChannel	nTee	nAngle	nDbAngle
MG	0.05	34	0	0	0	0	0

**Table: Section Designer Properties 01 - General, Part 3 of 6**

Table: Section Designer Properties 01 - General, Part 3 of 6

SectionName	nBoxTube	nPipe	nPlate	nSolidRect	nSolidCirc	nSolidSeg	nSolidSect
MG	0	0	0	0	0	0	0

**Table: Section Designer Properties 01 - General, Part 4 of 6**

Table: Section Designer Properties 01 - General, Part 4 of 6

SectionName	nPolygon	nReinfSing	nReinfLine	nReinfRect	nReinfCirc	nRefLine	nRefCirc
MG	3	0	0	0	0	31	0

**Table: Section Designer Properties 01 - General, Part 5 of 6**

Table: Section Designer Properties 01 - General, Part 5 of 6

SectionName	nCaltransSq	nCaltransCr	nCaltransHx	nCaltransOc	nBSectShell	nBSectSolid	nBSectCut
MG	0	0	0	0	0	0	0

**Table: Section Designer Properties 01 - General, Part 6 of 6**

Table: Section Designer Properties 01 - General, Part 6 of 6

SectionName	nBSectCenter
MG	0

**Table: Section Designer Properties 16 - Shape Polygon, Part 1 of 2**

Table: Section Designer Properties 16 - Shape Polygon, Part 1 of 2

SectionName	ShapeName	X	Y	Radius	ShapeMat	ZOrder	FillColor
MG	Polygon1	-4.65	-0.343	0.	HA-30	32	Red
MG	Polygon1	-4.65	-0.093	0.			
MG	Polygon1	0.	0.	0.			

Table: Section Designer Properties 16 - Shape Polygon, Part 1 of 2

SectionName	ShapeName	X	Y	Radius	ShapeMat	ZOrder	FillColor
MG	Polygon1	4.65	-0.093	0.			
MG	Polygon1	4.65	-0.343	0.			
MG	Polygon2	-3.224	-0.343	0.	HA-50	33	Magenta
MG	Polygon2	-2.979568	-2.243	0.			
MG	Polygon2	-1.520432	-2.243	0.			
MG	Polygon2	-1.276	-0.343	0.			
MG	Polygon2	-0.7125	-0.343	0.			
MG	Polygon2	-0.7325	-0.443	0.			
MG	Polygon2	-1.157141	-0.594657	0.			
MG	Polygon2	-1.407792	-2.543	0.			
MG	Polygon2	-3.092208	-2.543	0.			
MG	Polygon2	-3.342859	-0.594657	0.			
MG	Polygon2	-3.7675	-0.443	0.			
MG	Polygon2	-3.7875	-0.343	0.			
MG	Polygon3	1.276	-0.343	0.	HA-50	34	Magenta
MG	Polygon3	1.520432	-2.243	0.			
MG	Polygon3	2.979568	-2.243	0.			
MG	Polygon3	3.224	-0.343	0.			
MG	Polygon3	3.7875	-0.343	0.			
MG	Polygon3	3.7675	-0.443	0.			
MG	Polygon3	3.342859	-0.594657	0.			
MG	Polygon3	3.092208	-2.543	0.			
MG	Polygon3	1.407792	-2.543	0.			
MG	Polygon3	1.157141	-0.594657	0.			
MG	Polygon3	0.7325	-0.443	0.			
MG	Polygon3	0.7125	-0.343	0.			

**Table: Section Designer Properties 16 - Shape Polygon, Part 2 of 2**

Table: Section Designer Properties 16 - Shape Polygon, Part 2 of 2

SectionName	ShapeName	Reinforcing	RebarMat	BarMatType	ConcCover
MG	Polygon1	No			
MG	Polygon1				
MG	Polygon1				
MG	Polygon1				
MG	Polygon2	No			
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon2				
MG	Polygon3	No			
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				

Table: Section Designer Properties 16 - Shape Polygon, Part 2 of 2

SectionName	ShapeName	Reinforcing	RebarMat	BarMatType	ConcCover
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				

Table: Section Designer Properties 30 - Fiber General, Part 2 of 2

Table: Section Designer Properties 30 - Fiber General, Part 2 of 2

SectionName	FiberMC
MG	No

Table: Section Designer Properties 21 - Shape Reference Line

Table: Section Designer Properties 21 - Shape Reference Line

SectionName	ShapeName	X1 m	Y1 m	X2 m	Y2 m
MG	RefLine1	4.65	-0.093	0.	0.
MG	RefLine2	0.	0.	-4.65	-0.093
MG	RefLine3	4.65	-0.093	4.65	-0.343
MG	RefLine4	4.65	-0.343	3.7875	-0.343
MG	RefLine5	0.7125	-0.343	-0.7125	-0.343
MG	RefLine6	-0.7125	-0.343	-3.7875	-0.343
MG	RefLine7	-3.7875	-0.343	-4.65	-0.343
MG	RefLine8	-4.65	-0.343	-4.65	-0.093
MG	RefLine9	-2.25	-2.543	-3.092208	-2.543
MG	RefLine10	-3.092208	-2.543	-3.342859	-0.594657
MG	RefLine11	-3.342859	-0.594657	-3.7675	-0.443
MG	RefLine12	-3.7675	-0.443	-3.7875	-0.343
MG	RefLine13	-3.224	-0.343	-2.979568	-2.243
MG	RefLine14	-2.979568	-2.243	-1.520432	-2.243
MG	RefLine15	-1.520432	-2.243	-1.276	-0.343
MG	RefLine16	-0.7125	-0.343	-0.7325	-0.443
MG	RefLine17	-0.7325	-0.443	-1.157141	-0.594657
MG	RefLine18	-1.157141	-0.594657	-1.407792	-2.543
MG	RefLine19	-1.407792	-2.543	-2.25	-2.543
MG	RefLine20	0.7125	-0.343	3.7875	-0.343
MG	RefLine21	2.25	-2.543	3.092208	-2.543
MG	RefLine22	3.092208	-2.543	3.342859	-0.594657
MG	RefLine23	3.342859	-0.594657	3.7675	-0.443
MG	RefLine24	3.7675	-0.443	3.7875	-0.343
MG	RefLine25	3.224	-0.343	2.979568	-2.243
MG	RefLine26	2.979568	-2.243	1.520432	-2.243
MG	RefLine27	1.520432	-2.243	1.276	-0.343
MG	RefLine28	0.7125	-0.343	0.7325	-0.443
MG	RefLine29	0.7325	-0.443	1.157141	-0.594657
MG	RefLine30	1.157141	-0.594657	1.407792	-2.543
MG	RefLine31	1.407792	-2.543	2.25	-2.543

Table: Section Designer Properties 30 - Fiber General, Part 1 of 2

Table: Section Designer Properties 30 - Fiber General, Part 1 of 2

SectionName	NumFibersD2	NumFibersD3	CoordSys	GridAngle	LumpRebar	FiberPMM
MG	5	5	Cartesian	0	No	No

# MODELO SAP CÁLCULO DINÁMICO

**Table: Case - Modal 1 - General**

Table: Case - Modal 1 - General							
Case	ModeType	MaxNumModes	MinNumModes	EigenShift Cyc/sec	EigenCutoff Cyc/sec	EigenTol	AutoShift
MODAL	Eigen	20	1	0.0000E+00	0.0000E+00	1.0000E-09	Yes

**Table: Case - Response Spectrum 1 - General, Part 1 of 2**

Table: Case - Response Spectrum 1 - General, Part 1 of 2							
Case	ModalComb	GMCf1 Cyc/sec	GMCf2 Cyc/sec	PerRigid	DirCombo	ABSSF	MotionType
SISMO_LONG	SRSS	1.0000E+00	0.0000E+00	SRSS	ABS	1.	Acceleration
SISMO_TRANSV	SRSS	1.0000E+00	0.0000E+00	SRSS	ABS	1.	Acceleration
SISMO_VERT	SRSS	1.0000E+00	0.0000E+00	SRSS	ABS	1.	Acceleration

**Table: Case - Response Spectrum 1 - General, Part 2 of 2**

Table: Case - Response Spectrum 1 - General, Part 2 of 2				
Case	DampingType	ConstDamp	EccenRatio	NumOverride
SISMO_LONG	Constant	0.05	0.	0
SISMO_TRANSV	Constant	0.05	0.	0
SISMO_VERT	Constant	0.05	0.	0

**Table: Case - Response Spectrum 2 - Load Assignments**

Table: Case - Response Spectrum 2 - Load Assignments						
Case	LoadType	LoadName	CoordSys	Function	Angle Degrees	TransAccSF m/sec2
SISMO_LONG	Acceleration	U1	GLOBAL	ESPECTRO	0.	9.8
SISMO_LONG	Acceleration	U2	GLOBAL	ESPECTRO	0.	2.94
SISMO_LONG	Acceleration	U3	GLOBAL	ESPECTRO	0.	2.058
SISMO_TRANSV	Acceleration	U1	GLOBAL	ESPECTRO	0.	2.94
SISMO_TRANSV	Acceleration	U2	GLOBAL	ESPECTRO	0.	9.8
SISMO_TRANSV	Acceleration	U3	GLOBAL	ESPECTRO	0.	2.058
SISMO_VERT	Acceleration	U1	GLOBAL	ESPECTRO	0.	2.94
SISMO_VERT	Acceleration	U2	GLOBAL	ESPECTRO	0.	2.94
SISMO_VERT	Acceleration	U3	GLOBAL	ESPECTRO	0.	6.86

**Table: Case - Static 1 - Load Assignments**

Table: Case - Static 1 - Load Assignments			
Case	LoadType	LoadName	LoadSF
DEAD	Load pattern	DEAD	1.
SC1	Load pattern	SC1	1.
TEMP+	Load pattern	TEMP+	1.
TEMP-	Load pattern	TEMP-	1.

**Table: Case - Static 1 - Load Assignments**

Case	LoadType	LoadName	LoadSF
W_TRANSV_SIN SC	Load pattern	W_TRANSV_SIN SC	1.
W_TRANSV_CON SC	Load pattern	W_TRANSV_CON SC	1.
W_LONG_SIN SC	Load pattern	W_LONG_SIN SC	1.
W_LONG_CON SC	Load pattern	W_LONG_CON SC	1.
FRENADO	Load pattern	FRENADO	1.
REOLOGÍA	Load pattern	REOLOGÍA	1.

**Table: Connectivity - Frame, Part 1 of 2**

Table: Connectivity - Frame, Part 1 of 2							
Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
2	1	2	No	2.25	3.375	0.	0.
3	2	3	No	2.25	5.625	0.	0.
4	3	4	No	2.25	7.875	0.	0.
5	4	5	No	2.25	10.125	0.	0.
6	5	6	No	2.25	12.375	0.	0.
7	6	7	No	2.25	14.625	0.	0.
8	7	8	No	2.25	16.875	0.	0.
9	8	9	No	2.25	19.125	0.	0.
10	9	10	No	2.25	21.375	0.	0.
11	10	11	No	2.25	23.625	0.	0.
12	11	12	No	2.25	25.875	0.	0.
13	12	13	No	2.25	28.125	0.	0.
14	13	14	No	2.25	30.375	0.	0.
15	14	15	No	2.25	32.625	0.	0.
16	15	16	No	2.25	34.875	0.	0.
17	16	17	No	2.25	37.125	0.	0.
18	17	18	No	2.25	39.375	0.	0.
19	18	19	No	2.25	41.625	0.	0.
22	20	21	No	2.25	48.375	0.	0.
23	21	22	No	2.25	50.625	0.	0.
24	22	23	No	2.25	52.875	0.	0.
25	23	24	No	2.25	55.125	0.	0.
26	24	25	No	2.25	57.375	0.	0.
27	25	26	No	2.25	59.625	0.	0.
28	26	27	No	2.25	61.875	0.	0.
29	27	28	No	2.25	64.125	0.	0.
30	28	29	No	2.25	66.375	0.	0.
31	29	30	No	2.25	68.625	0.	0.
32	30	31	No	2.25	70.875	0.	0.
33	31	32	No	2.25	73.125	0.	0.
34	32	33	No	2.25	75.375	0.	0.
35	33	34	No	2.25	77.625	0.	0.
36	34	35	No	2.25	79.875	0.	0.
37	35	36	No	2.25	82.125	0.	0.
38	36	37	No	2.25	84.375	0.	0.
39	37	38	No	2.25	86.625	0.	0.
42	39	40	No	1.5	92.25	0.	0.
43	40	41	No	1.5	93.75	0.	0.
44	41	42	No	1.5	95.25	0.	0.
45	42	43	No	1.5	96.75	0.	0.
46	43	44	No	1.5	98.25	0.	0.

Table: Connectivity - Frame, Part 1 of 2

Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
47	44	45	No	1.5	99.75	0.	0.
48	45	46	No	1.5	101.25	0.	0.
49	46	47	No	1.5	102.75	0.	0.
50	47	48	No	1.5	104.25	0.	0.
51	48	49	No	1.5	105.75	0.	0.
52	49	50	No	1.5	107.25	0.	0.
53	50	51	No	1.5	108.75	0.	0.
54	51	52	No	1.5	110.25	0.	0.
55	52	53	No	1.5	111.75	0.	0.
56	53	54	No	1.5	113.25	0.	0.
57	54	55	No	1.5	114.75	0.	0.
58	55	56	No	1.5	116.25	0.	0.
59	56	57	No	1.5	117.75	0.	0.
61	65	66	No	2.25	0.5	1.125	0.
62	67	65	No	2.25	0.5	-1.125	0.
63	66	68	No	1.896	0.5	2.25	-0.948
64	67	69	No	1.896	0.5	-2.25	-0.948
65	70	71	No	2.25	44.5	1.125	0.
66	72	70	No	2.25	44.5	-1.125	0.
67	71	73	No	1.896	44.5	2.25	-0.948
68	72	74	No	1.896	44.5	-2.25	-0.948
69	68	75	No	0.104	0.5	2.25	-1.948
70	69	76	No	0.104	0.5	-2.25	-1.948
71	73	77	No	0.104	44.5	2.25	-1.948
72	74	78	No	0.104	44.5	-2.25	-1.948
73	63	65	No	0.5	0.25	0.	0.
74	65	1	No	1.75	1.375	0.	0.
75	81	82	No	2.25	119.5	1.125	0.
76	83	81	No	2.25	119.5	-1.125	0.
77	82	84	No	1.907	119.5	2.25	-0.9535
78	83	85	No	1.907	119.5	-2.25	-0.9535
79	84	86	No	0.093	119.5	2.25	-1.9535
80	85	87	No	0.093	119.5	-2.25	-1.9535
81	88	89	No	4.5	45.	0.	-2.6
82	90	88	No	0.6	45.	2.25	-2.3
83	91	89	No	0.6	45.	-2.25	-2.3
84	92	93	No	2.25	45.5	1.125	0.
85	94	92	No	2.25	45.5	-1.125	0.
86	93	95	No	1.896	45.5	2.25	-0.948
87	94	96	No	1.896	45.5	-2.25	-0.948
88	95	97	No	0.104	45.5	2.25	-1.948
89	96	98	No	0.104	45.5	-2.25	-1.948
90	78	91	No	0.5	44.75	-2.25	-2.
91	91	98	No	0.5	45.25	-2.25	-2.
92	77	90	No	0.5	44.75	2.25	-2.
93	90	97	No	0.5	45.25	2.25	-2.
94	88	99	No	5.6	45.	2.25	-5.4
95	89	100	No	5.6	45.	-2.25	-5.4
96	19	70	No	1.75	43.625	0.	0.
97	70	64	No	0.5	44.75	0.	0.
98	64	92	No	0.5	45.25	0.	0.
99	92	20	No	1.75	46.375	0.	0.
100	38	123	No	1.75	88.625	0.	0.
101	123	79	No	0.5	89.75	0.	0.

Table: Connectivity - Frame, Part 1 of 2

Frame	JointI	JointJ	IsCurved	Length m	CentroidX m	CentroidY m	CentroidZ m
102	79	134	No	0.5	90.25	0.	0.
103	134	39	No	1.	91.	0.	0.
104	57	81	No	1.	119.	0.	0.
105	81	80	No	0.5	119.75	0.	0.
117	121	88	No	0.75	45.	2.625	-2.6
118	89	122	No	0.75	45.	-2.625	-2.6
119	123	124	No	2.25	89.5	1.125	0.
120	125	123	No	2.25	89.5	-1.125	0.
121	124	126	No	1.896	89.5	2.25	-0.948
122	125	127	No	1.896	89.5	-2.25	-0.948
123	126	128	No	0.104	89.5	2.25	-1.948
124	127	129	No	0.104	89.5	-2.25	-1.948
125	130	131	No	4.5	90.	0.	-2.6
126	132	130	No	0.6	90.	2.25	-2.3
127	133	131	No	0.6	90.	-2.25	-2.3
128	134	135	No	2.25	90.5	1.125	0.
129	136	134	No	2.25	90.5	-1.125	0.
130	135	137	No	1.907	90.5	2.25	-0.9535
131	136	138	No	1.907	90.5	-2.25	-0.9535
132	137	139	No	0.093	90.5	2.25	-1.9535
133	138	140	No	0.093	90.5	-2.25	-1.9535
134	129	133	No	0.5	89.75	-2.25	-2.
135	133	140	No	0.5	90.25	-2.25	-2.
136	128	132	No	0.5	89.75	2.25	-2.
137	132	139	No	0.5	90.25	2.25	-2.
138	130	141	No	5.6	90.	2.25	-5.4
139	131	142	No	5.6	90.	-2.25	-5.4
140	143	130	No	0.75	90.	2.625	-2.6
141	131	144	No	0.75	90.	-2.625	-2.6

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
2	7fcd1b55-1ded-4a05-b20 b-9716b738e860
3	867718a2-3b26-4c77-95 3d-91f249ee9035
4	9904a7af-ae33-425e-b6b 4-47d149bd3168
5	bd9471d4-b88d-47ac-ba 5b-8ef5e051ca4a
6	c50a07d3-ad08-421a-b0 80-9f370c9aac2a
7	44a4f9ac-5f9d-404f-a6f0- f0aefeba5bbf
8	6782b1bf-044c-4e23-9dc a-b931100b645c
9	02e243a0-b4a1-48e1-9a 06-e388f3a8f1ab
10	388ef73c-dd53-4262-bb2 3-3408e8458396
11	018ebef8-15b9-49f5-bbd 1-b378762ab313

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
12	46e76c43-2064-4366-a020-757e49068bab
13	da107a03-e81c-486f-8e81-42a24b21ba3e
14	20b2a596-f969-497b-92e4-7989aecb3703
15	9cae7b2e-4ef7-43f8-b6a1-320921c9170b
16	e0c435e7-d2b1-4ffa-ac25-fe60e94655f1
17	3e25b875-cd8d-4ed5-bb01-c4089cfab09
18	dc036f6e-2131-4a77-aa03-3806701b4e1e
19	48aed3ed-42d1-4b3e-b008-48a2491e888b
22	d3437f5d-385b-4d91-93ca-5293e4d8d9f8
23	cc1683a2-a233-4d18-a021-080ed001004e
24	90180320-92db-449f-859f-c762ee62ddc6
25	09039317-698c-4940-a2f4-5f8f397b5b80
26	bddb9f0b-7e5f-441e-8a77-cc6c777b8a2b
27	aad64ed3-13af-4bab-9c82-c39591286544
28	202bac71-7fb0-4d17-aa3c-fde1614a9f69
29	5875b3b3-3590-4bcb-a4aa-f9faa9033cc4
30	d98fb302-dd37-44c6-97af-8929f88d7802
31	b4783e03-b47a-407b-9b96-7ee387acf046
32	337391c3-e9e0-4644-88eb-985240367ce1
33	00a98d87-9d2e-4f96-b452-f5487d81e6e4
34	9725b33d-2007-4c4b-9080-bd67dd146e8b
35	7f4b7e6a-df47-49d3-83f2-ed40afc435ed
36	37518cc5-f3ea-45c6-88cc-cb6e3907a1b5
37	20cad9ae-f770-4243-b4c0-c4f5cddd3ac6
38	3db2964f-008f-4abc-86fd-af1df26f27ca
39	3d279fb1-e843-44fa-be7f-16178cfa5643
42	6c3eef06-b68f-41fc-b490-73df0358fd72
43	2f21dd74-97ff-4370-ba21-92f9e92faf8c
44	c8d8e514-1505-4b94-af58-77c611921c9d
45	1159b93d-54f8-4364-87dd-d4ced4c6277e

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
46	dd363462-18fb-4539-95fd-e9788278035e
47	a4b2a01c-0155-4c82-93bc-d754eeab97fd
48	8e177c41-730f-446e-89a4-5a7dfe7c8dbd
49	199aab1-4078-4316-bc78-5ffe91b8dcb5
50	e2ed63ad-070e-40ba-99ea-9cd19af5bb1b
51	ebfada3a-3ea9-43e0-b928-af0d3cda6a73
52	372ed8e2-6078-403c-b487-15c79bcec616
53	41c1f7b3-d234-4183-aaf0-b546bf88acbb
54	ea1316fe-1e2b-4fe9-9118-763aab07041d
55	fc746848-eddd-4ce4-9191-17d1b3189fe1
56	f28394f2-d4e2-4ac6-b3f2-d098afd631c6
57	e2057889-66cb-4eef-beb0-a306c589fbd5
58	b45aa8d3-70a7-4a5f-9f32-6196df8fd187
59	5190c7bf-feed-4753-8f7c-a883a5a95668
61	4d459a75-37b4-4d12-83bc-fcdfb68093ba
62	981a0301-14bd-4bdd-a2cd-d71b410d798e
63	7b6abc79-0dd4-4274-ab05-8316dae59fa4
64	b959c638-7323-4304-8809-5c093349d8c8
65	b696ed09-3774-4be4-b785-5d9c98f71e7
66	b2e71b85-eb6a-4fd1-9ee4-d1f0916cb12a
67	a735df57-cc65-468d-b914-344c2473a1a4
68	845370a9-f175-4f45-9ba6-fa85afa8048b
69	c5f7db5e-062c-413c-a311-299ac83dd0e7
70	62d6b13d-d9c6-4f88-8fc4-8b58a1dc9357
71	1dc9a57a-5c09-4b3c-83a0-1d56f059c460
72	6cdd5e66-aac5-4b97-8664-6bf916bf4e0d
73	1c244519-aca1-4230-8c67-2c26c08f0398
74	34b11583-9d02-4813-a7d5-f804e05537e5
75	6bb78061-ee59-40ab-8206-d6dd004fcc9a
76	fc0ca126-455c-430e-a85a-861694dc2921



Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
77	3b996311-fa6f-451f-9023-f3dba4c3e00c
78	c51859f3-fca9-4762-bb88-42a28655a821
79	1cabd784-5fab-4385-a828-011e5bb82248
80	84173685-f8bc-4797-a95e-de59dda9fe3b
81	1af9fd82-028a-407c-ac3b-dba24f80a825
82	13ec3472-d096-42a2-9bcf-0ebdc927e751
83	430cc1a7-34a7-4f27-b8ad-5ed29623566f
84	84f3e168-93f0-4c47-954b-1b840aa2bc50
85	47c4d82f-5620-42d1-bda7-dca48c673ef7
86	f18c0bf7-e0c6-4566-89f6-f4a8959be090
87	7e374107-4588-4c7e-b6e1-7dbd7bc78a58
88	24b9d2d4-6233-43c8-8e20-3f969fc4049f
89	b4ce3a3f-0458-43ae-af19-d0f138506401
90	b9d64537-810d-44eb-b566-4553043269c9
91	5bc8f859-19f2-4bc7-911a-3c57f6af4617
92	ea8fce3a-2911-45c9-91ab-11a72fbd0a22
93	a925b603-08f6-4f63-83e1-20a2010eb0e6
94	c324d370-a8d0-4093-8383-d6b40da4300a
95	2ce99a31-0f2a-495c-af84-a5b58ab6d5f8
96	1aba0eec-528c-4e17-87d5-2ed71333f2e1
97	2c09b946-fc2b-4651-ba02-acc7b9bc9d06
98	d85057ee-77a7-4657-bd62-60ea29637bea
99	a48a4e89-4983-4bc5-a678-707f88b836e6
100	2ef4bd3f-be7d-492a-a71a-9137305003a9
101	7a5e5003-292c-4491-83e6-035ea913677d
102	0b24a933-a3ea-4405-8db0-abddb42232f6
103	50fb96d4-ad0e-4a40-bd74-1e34a366a52e
104	edccb293-b049-4a4c-a224-15a9417d7c42
105	8583b25c-81d1-43b7-a75f-1abe4dda65d7
117	96c63a7b-a7a5-4412-acd1-eaeb1d4d817e

Table: Connectivity - Frame, Part 2 of 2

Frame	GUID
118	f05fdbbc-6b2c-490c-8daa-7e4c35db0e6b
119	307939cc-70ce-4fbf-a919-05c213383da4
120	1569a644-d86d-40af-b172-3bef2dd63486
121	ce83aeb6-cc47-4922-a09d-15efcdc19229
122	c6a74bd4-7c11-43c2-9cc8-580229ae02e0
123	bfe417a4-7861-4ace-b053-50e84730a2d4
124	bba22c6d-f118-4ce2-9f0c-34c0dc0ff561
125	f968c9ee-933b-488a-8226-17a83dcc71ac
126	8f1f0e30-0e4a-4294-991d-69029bd58148
127	72bfcef3-3057-45d0-9000-fab0fe23c391
128	969883e4-f9aa-44d5-b841-011afae5773c
129	a110fa98-dc27-4565-838d-9de633421d29
130	c36dc237-9373-4898-87c4-4a2df0b30065
131	c65ca44a-fcd2-4ca2-b691-1430e43f815a
132	38f67c0d-45f8-4901-aae7-4ef61ad38e9b
133	bb34e633-4184-4c0f-894c-583a159771cb
134	593c2e3e-4c04-4b39-8822-439c71cdb8c2
135	26d018ab-8ed5-4e11-9ab3-431d660cf9fb
136	86423494-f624-4b36-929c-8a76f1d999b3
137	543989fa-3700-4e41-af5f-6adb32763813
138	ac6e7b0e-17bc-4855-bcbf-8f267dd85d0f
139	e84512f3-484f-45e5-adc4-04d4ca3e3b43
140	b6cfa97-788d-4590-81cc-65cc10d9e557
141	a5d0d133-f6b9-4bb4-8a28-30fa912dfc30

Table: Coordinate Systems

Table: Coordinate Systems		X	Y	Z	AboutZ	AboutY	AboutX
Name	Type	m	m	m	Degrees	Degrees	Degrees
GLOBAL	Cartesian	0.	0.	0.	0.	0.	0.

**Table: Frame Added Mass Assignments**

Table: Frame Added Mass Assignments	
Frame	MassPerLen KN-s2/m2
2	2.27
3	2.27
4	2.27
5	2.27
6	2.27
7	2.27
8	2.27
9	2.27
10	2.27
11	2.27
12	2.27
13	2.27
14	2.27
15	2.27
16	2.27
17	2.27
18	2.27
19	2.27
22	2.27
23	2.27
24	2.27
25	2.27
26	2.27
27	2.27
28	2.27
29	2.27
30	2.27
31	2.27
32	2.27
33	2.27
34	2.27
35	2.27
36	2.27
37	2.27
38	2.27
39	2.27
42	2.27
43	2.27
44	2.27
45	2.27
46	2.27
47	2.27
48	2.27
49	2.27
50	2.27
51	2.27
52	2.27
53	2.27
54	2.27
55	2.27
56	2.27
57	2.27

**Table: Frame Added Mass Assignments**

Frame	MassPerLen KN-s2/m2
58	2.27
59	2.27
73	2.27
74	2.27
96	2.27
97	2.27
98	2.27
99	2.27
100	2.27
101	2.27
102	2.27
103	2.27
104	2.27
105	2.27

**Table: Frame Auto Mesh Assignments**

Table: Frame Auto Mesh Assignments						
Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
2	Yes	Yes	No	0	0.	0.
3	Yes	Yes	No	0	0.	0.
4	Yes	Yes	No	0	0.	0.
5	Yes	Yes	No	0	0.	0.
6	Yes	Yes	No	0	0.	0.
7	Yes	Yes	No	0	0.	0.
8	Yes	Yes	No	0	0.	0.
9	Yes	Yes	No	0	0.	0.
10	Yes	Yes	No	0	0.	0.
11	Yes	Yes	No	0	0.	0.
12	Yes	Yes	No	0	0.	0.
13	Yes	Yes	No	0	0.	0.
14	Yes	Yes	No	0	0.	0.
15	Yes	Yes	No	0	0.	0.
16	Yes	Yes	No	0	0.	0.
17	Yes	Yes	No	0	0.	0.
18	Yes	Yes	No	0	0.	0.
19	Yes	Yes	No	0	0.	0.
22	Yes	Yes	No	0	0.	0.
23	Yes	Yes	No	0	0.	0.
24	Yes	Yes	No	0	0.	0.
25	Yes	Yes	No	0	0.	0.
26	Yes	Yes	No	0	0.	0.
27	Yes	Yes	No	0	0.	0.
28	Yes	Yes	No	0	0.	0.
29	Yes	Yes	No	0	0.	0.
30	Yes	Yes	No	0	0.	0.
31	Yes	Yes	No	0	0.	0.
32	Yes	Yes	No	0	0.	0.
33	Yes	Yes	No	0	0.	0.
34	Yes	Yes	No	0	0.	0.
35	Yes	Yes	No	0	0.	0.

Table: Frame Auto Mesh Assignments

Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
36	Yes	Yes	No	0	0.	0.
37	Yes	Yes	No	0	0.	0.
38	Yes	Yes	No	0	0.	0.
39	Yes	Yes	No	0	0.	0.
42	Yes	Yes	No	0	0.	0.
43	Yes	Yes	No	0	0.	0.
44	Yes	Yes	No	0	0.	0.
45	Yes	Yes	No	0	0.	0.
46	Yes	Yes	No	0	0.	0.
47	Yes	Yes	No	0	0.	0.
48	Yes	Yes	No	0	0.	0.
49	Yes	Yes	No	0	0.	0.
50	Yes	Yes	No	0	0.	0.
51	Yes	Yes	No	0	0.	0.
52	Yes	Yes	No	0	0.	0.
53	Yes	Yes	No	0	0.	0.
54	Yes	Yes	No	0	0.	0.
55	Yes	Yes	No	0	0.	0.
56	Yes	Yes	No	0	0.	0.
57	Yes	Yes	No	0	0.	0.
58	Yes	Yes	No	0	0.	0.
59	Yes	Yes	No	0	0.	0.
61	Yes	Yes	No	0	0.	0.
62	Yes	Yes	No	0	0.	0.
63	Yes	Yes	No	0	0.	0.
64	Yes	Yes	No	0	0.	0.
65	Yes	Yes	No	0	0.	0.
66	Yes	Yes	No	0	0.	0.
67	Yes	Yes	No	0	0.	0.
68	Yes	Yes	No	0	0.	0.
69	Yes	Yes	No	0	0.	0.
70	Yes	Yes	No	0	0.	0.
71	Yes	Yes	No	0	0.	0.
72	Yes	Yes	No	0	0.	0.
73	Yes	Yes	No	0	0.	0.
74	Yes	Yes	No	0	0.	0.
75	Yes	Yes	No	0	0.	0.
76	Yes	Yes	No	0	0.	0.
77	Yes	Yes	No	0	0.	0.
78	Yes	Yes	No	0	0.	0.
79	Yes	Yes	No	0	0.	0.
80	Yes	Yes	No	0	0.	0.
81	Yes	Yes	No	0	0.	0.
82	Yes	Yes	No	0	0.	0.
83	Yes	Yes	No	0	0.	0.
84	Yes	Yes	No	0	0.	0.
85	Yes	Yes	No	0	0.	0.
86	Yes	Yes	No	0	0.	0.
87	Yes	Yes	No	0	0.	0.
88	Yes	Yes	No	0	0.	0.
89	Yes	Yes	No	0	0.	0.
90	Yes	Yes	No	0	0.	0.
91	Yes	Yes	No	0	0.	0.

Table: Frame Auto Mesh Assignments

Frame	AutoMesh	AtJoints	AtFrames	NumSegments	MaxLength m	MaxDegrees Degrees
92	Yes	Yes	No	0	0.	0.
93	Yes	Yes	No	0	0.	0.
94	Yes	Yes	No	0	0.	0.
95	Yes	Yes	No	0	0.	0.
96	Yes	Yes	No	0	0.	0.
97	Yes	Yes	No	0	0.	0.
98	Yes	Yes	No	0	0.	0.
99	Yes	Yes	No	0	0.	0.
100	Yes	Yes	No	0	0.	0.
101	Yes	Yes	No	0	0.	0.
102	Yes	Yes	No	0	0.	0.
103	Yes	Yes	No	0	0.	0.
104	Yes	Yes	No	0	0.	0.
105	Yes	Yes	No	0	0.	0.
117	Yes	Yes	No	0	0.	0.
118	Yes	Yes	No	0	0.	0.
119	Yes	Yes	No	0	0.	0.
120	Yes	Yes	No	0	0.	0.
121	Yes	Yes	No	0	0.	0.
122	Yes	Yes	No	0	0.	0.
123	Yes	Yes	No	0	0.	0.
124	Yes	Yes	No	0	0.	0.
125	Yes	Yes	No	0	0.	0.
126	Yes	Yes	No	0	0.	0.
127	Yes	Yes	No	0	0.	0.
128	Yes	Yes	No	0	0.	0.
129	Yes	Yes	No	0	0.	0.
130	Yes	Yes	No	0	0.	0.
131	Yes	Yes	No	0	0.	0.
132	Yes	Yes	No	0	0.	0.
133	Yes	Yes	No	0	0.	0.
134	Yes	Yes	No	0	0.	0.
135	Yes	Yes	No	0	0.	0.
136	Yes	Yes	No	0	0.	0.
137	Yes	Yes	No	0	0.	0.
138	Yes	Yes	No	0	0.	0.
139	Yes	Yes	No	0	0.	0.
140	Yes	Yes	No	0	0.	0.
141	Yes	Yes	No	0	0.	0.

Table: Frame Load Transfer Options

Frame	Transfer
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes

Table: Frame Load Transfer  
Options

Frame	Transfer
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes
31	Yes
32	Yes
33	Yes
34	Yes
35	Yes
36	Yes
37	Yes
38	Yes
39	Yes
42	Yes
43	Yes
44	Yes
45	Yes
46	Yes
47	Yes
48	Yes
49	Yes
50	Yes
51	Yes
52	Yes
53	Yes
54	Yes
55	Yes
56	Yes
57	Yes
58	Yes
59	Yes
61	Yes
62	Yes
63	Yes
64	Yes
65	Yes
66	Yes

Table: Frame Load Transfer  
Options

Frame	Transfer
67	Yes
68	Yes
69	Yes
70	Yes
71	Yes
72	Yes
73	Yes
74	Yes
75	Yes
76	Yes
77	Yes
78	Yes
79	Yes
80	Yes
81	Yes
82	Yes
83	Yes
84	Yes
85	Yes
86	Yes
87	Yes
88	Yes
89	Yes
90	Yes
91	Yes
92	Yes
93	Yes
94	Yes
95	Yes
96	Yes
97	Yes
98	Yes
99	Yes
100	Yes
101	Yes
102	Yes
103	Yes
104	Yes
105	Yes
117	Yes
118	Yes
119	Yes
120	Yes
121	Yes
122	Yes
123	Yes
124	Yes
125	Yes
126	Yes
127	Yes
128	Yes
129	Yes
130	Yes

Table: Frame Load Transfer Options

Frame	Transfer
131	Yes
132	Yes
133	Yes
134	Yes
135	Yes
136	Yes
137	Yes
138	Yes
139	Yes
140	Yes
141	Yes

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
81	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
81	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
94	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
94	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
94	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
95	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
95	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
95	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
117	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
117	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
118	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
118	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
125	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
125	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
138	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
138	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
138	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
139	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
139	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
139	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
140	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
140	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
141	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
141	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
2	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
2	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
2	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
2	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
2	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
2	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
2	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
3	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
3	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
3	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
3	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
3	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
3	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
3	FRENADO	GLOBAL	Force	X	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
4	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
4	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
4	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
4	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
4	FRENADO	GLOBAL	Force	X	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
5	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
5	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
5	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
5	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
5	FRENADO	GLOBAL	Force	X	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
6	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
6	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
6	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
6	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
6	FRENADO	GLOBAL	Force	X	RelDist	0.
7	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
7	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
7	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
7	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
7	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
7	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
7	FRENADO	GLOBAL	Force	X	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
8	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
8	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
8	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
8	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
8	FRENADO	GLOBAL	Force	X	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
9	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
9	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
9	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
9	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
9	FRENADO	GLOBAL	Force	X	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
10	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
10	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
10	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
10	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
10	FRENADO	GLOBAL	Force	X	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
11	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
11	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
11	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
11	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
11	FRENADO	GLOBAL	Force	X	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
12	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
12	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
12	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
12	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
12	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
12	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
12	FRENADO	GLOBAL	Force	X	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
13	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
13	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
13	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
13	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
13	FRENADO	GLOBAL	Force	X	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
14	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
14	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
14	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
14	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
14	FRENADO	GLOBAL	Force	X	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
15	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
15	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
15	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
15	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
15	FRENADO	GLOBAL	Force	X	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
16	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
16	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
16	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
16	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
16	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
16	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
16	FRENADO	GLOBAL	Force	X	RelDist	0.
17	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
17	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
17	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
17	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
17	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
17	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
17	FRENADO	GLOBAL	Force	X	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
18	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
18	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
18	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
18	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
18	FRENADO	GLOBAL	Force	X	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
19	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
19	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
19	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
19	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
19	FRENADO	GLOBAL	Force	X	RelDist	0.
22	SC1	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
22	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
22	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
22	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
22	FRENADO	GLOBAL	Force	X	RelDist	0.
23	SC1	GLOBAL	Force	Z	RelDist	0.
23	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
23	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
23	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
23	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
23	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
23	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
23	FRENADO	GLOBAL	Force	X	RelDist	0.
24	SC1	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
24	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
24	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
24	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
24	FRENADO	GLOBAL	Force	X	RelDist	0.
25	SC1	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
25	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
25	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
25	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
25	FRENADO	GLOBAL	Force	X	RelDist	0.
26	SC1	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
26	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
26	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
26	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
26	FRENADO	GLOBAL	Force	X	RelDist	0.
27	SC1	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
27	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
27	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
27	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
27	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
27	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
27	FRENADO	GLOBAL	Force	X	RelDist	0.
28	SC1	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
28	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
28	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
28	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
28	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
28	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
28	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
29	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
29	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
29	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
29	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
30	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
30	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
30	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
30	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
30	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
31	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
31	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
31	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
31	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
32	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
32	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
32	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
32	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
32	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
32	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
33	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
33	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
33	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
33	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
34	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
34	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
34	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
34	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
35	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
35	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
35	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
35	FRENADO SC1	GLOBAL	Force	X	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
36	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
36	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.



Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
36	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
36	FRENADO	GLOBAL	Force	X	RelDist	0.
37	SC1	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
37	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
37	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
37	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
37	FRENADO	GLOBAL	Force	X	RelDist	0.
38	SC1	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
38	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
38	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
38	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
38	FRENADO	GLOBAL	Force	X	RelDist	0.
39	SC1	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
39	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
39	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
39	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
39	FRENADO	GLOBAL	Force	X	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
42	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
42	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
42	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
42	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
42	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
42	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
42	FRENADO	GLOBAL	Force	X	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
43	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
43	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
43	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
43	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
43	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
43	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
43	FRENADO	GLOBAL	Force	X	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
44	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
44	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
44	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
44	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
44	FRENADO	GLOBAL	Force	X	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
45	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
45	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
45	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
45	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
45	FRENADO	GLOBAL	Force	X	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
46	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
46	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
46	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
46	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
46	FRENADO	GLOBAL	Force	X	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
47	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
47	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
47	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
47	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
47	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
47	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
47	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
48	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
48	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
48	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
48	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
48	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
48	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
48	FRENADO	GLOBAL	Force	X	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
49	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
49	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
49	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
49	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
49	FRENADO	GLOBAL	Force	X	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
50	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
50	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
50	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
50	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
50	FRENADO	GLOBAL	Force	X	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
51	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
51	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
51	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
51	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
51	FRENADO	GLOBAL	Force	X	RelDist	0.
52	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
52	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
52	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
52	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
52	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
52	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
52	FRENADO	GLOBAL	Force	X	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
53	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
53	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
53	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
53	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
53	FRENADO	GLOBAL	Force	X	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
54	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
54	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
54	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
54	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
54	FRENADO	GLOBAL	Force	X	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
55	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
55	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
55	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
55	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
55	FRENADO	GLOBAL	Force	X	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
56	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
56	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
56	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
56	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
56	FRENADO	GLOBAL	Force	X	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
57	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
57	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
57	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
57	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
57	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
57	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
57	FRENADO	GLOBAL	Force	X	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
58	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
58	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
58	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
58	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
58	FRENADO	GLOBAL	Force	X	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
59	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
59	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
59	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
59	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
59	FRENADO	GLOBAL	Force	X	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
73	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
73	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
73	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
73	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
73	FRENADO	GLOBAL	Force	X	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
74	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
74	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
74	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
74	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
74	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
74	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
74	FRENADO	GLOBAL	Force	X	RelDist	0.
96	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
96	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
96	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
96	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
96	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
96	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
96	FRENADO	GLOBAL	Force	X	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
97	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
97	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
97	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
97	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
97	FRENADO	GLOBAL	Force	X	RelDist	0.
98	SC1	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
98	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
98	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
98	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
98	FRENADO	GLOBAL	Force	X	RelDist	0.
99	SC1	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
99	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
99	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
99	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
99	FRENADO	GLOBAL	Force	X	RelDist	0.
100	SC1	GLOBAL	Force	Z	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
100	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
100	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
100	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
100	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
100	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
100	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
100	FRENADO	GLOBAL	Force	X	RelDist	0.
101	SC1	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
101	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
101	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
101	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
101	FRENADO	GLOBAL	Force	X	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
102	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
102	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
102	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
102	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
102	FRENADO	GLOBAL	Force	X	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
103	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
103	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
103	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
103	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
103	FRENADO	GLOBAL	Force	X	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
104	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.
104	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
104	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
104	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
104	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
104	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
104	FRENADO	GLOBAL	Force	X	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Force	Y	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Force	Z	RelDist	0.
105	W_TRANSV_SIN SC	GLOBAL	Moment	X	RelDist	0.

Table: Frame Loads - Distributed, Part 1 of 3

Frame	LoadPat	CoordSys	Type	Dir	DistType	RelDistA
105	W_TRANSV_CON SC	GLOBAL	Force	Y	RelDist	0.
105	W_TRANSV_CON SC	GLOBAL	Force	Z	RelDist	0.
105	W_TRANSV_CON SC	GLOBAL	Moment	X	RelDist	0.
105	W_LONG_SIN SC	GLOBAL	Force	X	RelDist	0.
105	W_LONG_CON SC	GLOBAL	Force	X	RelDist	0.
105	FRENADO	GLOBAL	Force	X	RelDist	0.

Table: Frame Loads - Distributed, Part 2 of 3

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA m	AbsDistB m	FOverLA KN/m	FOverLB KN/m	MOverLA KN-m/m
81	W_LONG_SIN SC	1.	0.	4.5	2.52	2.52	
81	W_LONG_CON SC	1.	0.	4.5	2.52	2.52	
94	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
94	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
94	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
95	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
95	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
95	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
117	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
117	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
118	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
118	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
125	W_LONG_SIN SC	1.	0.	4.5	2.52	2.52	
125	W_LONG_CON SC	1.	0.	4.5	2.52	2.52	
138	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
138	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
138	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
139	W_TRANSV_SIN SC	1.	0.	5.6	1.82	1.82	
139	W_LONG_SIN SC	1.	0.	5.6	1.82	1.82	
139	W_LONG_CON SC	1.	0.	5.6	1.82	1.82	
140	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
140	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
141	W_LONG_SIN SC	1.	0.	0.75	2.52	2.52	
141	W_LONG_CON SC	1.	0.	0.75	2.52	2.52	
2	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
2	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	27.7
2	W_TRANSV_SIN SC	1.	0.	2.25			
2	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
2	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
2	W_TRANSV_CON SC	1.	0.	2.25			28.4
2	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
2	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
2	FRENADO	1.	0.	2.25	5.7	5.7	
3	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
3	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
3	W_TRANSV_SIN SC	1.	0.	2.25			27.7

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
3	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
3	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
3	W_TRANSV_CON SC	1.	0.	2.25			28.4
3	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
3	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
3	FRENADO	1.	0.	2.25	5.7	5.7	
4	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
4	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
4	W_TRANSV_SIN SC	1.	0.	2.25			27.7
4	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
4	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
4	W_TRANSV_CON SC	1.	0.	2.25			28.4
4	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
4	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
4	FRENADO	1.	0.	2.25	5.7	5.7	
5	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
5	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
5	W_TRANSV_SIN SC	1.	0.	2.25			27.7
5	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
5	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
5	W_TRANSV_CON SC	1.	0.	2.25			28.4
5	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
5	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
5	FRENADO	1.	0.	2.25	5.7	5.7	
6	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
6	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
6	W_TRANSV_SIN SC	1.	0.	2.25			27.7
6	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
6	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
6	W_TRANSV_CON SC	1.	0.	2.25			28.4
6	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
6	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
6	FRENADO	1.	0.	2.25	5.7	5.7	
7	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
7	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
7	W_TRANSV_SIN SC	1.	0.	2.25			27.7
7	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
7	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
7	W_TRANSV_CON SC	1.	0.	2.25			28.4
7	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
7	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
7	FRENADO	1.	0.	2.25	5.7	5.7	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
8	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
8	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
8	W_TRANSV_SIN SC	1.	0.	2.25			27.7
8	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
8	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
8	W_TRANSV_CON SC	1.	0.	2.25			28.4
8	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
8	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
8	FRENADO	1.	0.	2.25	5.7	5.7	
9	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
9	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
9	W_TRANSV_SIN SC	1.	0.	2.25			27.7
9	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
9	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
9	W_TRANSV_CON SC	1.	0.	2.25			28.4
9	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
9	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
9	FRENADO	1.	0.	2.25	5.7	5.7	
10	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
10	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
10	W_TRANSV_SIN SC	1.	0.	2.25			27.7
10	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
10	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
10	W_TRANSV_CON SC	1.	0.	2.25			28.4
10	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
10	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
10	FRENADO	1.	0.	2.25	5.7	5.7	
11	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
11	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
11	W_TRANSV_SIN SC	1.	0.	2.25			27.7
11	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
11	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
11	W_TRANSV_CON SC	1.	0.	2.25			28.4
11	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
11	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
11	FRENADO	1.	0.	2.25	5.7	5.7	
12	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
12	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
12	W_TRANSV_SIN SC	1.	0.	2.25			27.7
12	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
12	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
12	W_TRANSV_CON SC	1.	0.	2.25			28.4

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
12	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
12	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
12	FRENADO	1.	0.	2.25	5.7	5.7	
13	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
13	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
13	W_TRANSV_SIN SC	1.	0.	2.25			27.7
13	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
13	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
13	W_TRANSV_CON SC	1.	0.	2.25			28.4
13	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
13	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
13	FRENADO	1.	0.	2.25	5.7	5.7	
14	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
14	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
14	W_TRANSV_SIN SC	1.	0.	2.25			27.7
14	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
14	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
14	W_TRANSV_CON SC	1.	0.	2.25			28.4
14	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
14	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
14	FRENADO	1.	0.	2.25	5.7	5.7	
15	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
15	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
15	W_TRANSV_SIN SC	1.	0.	2.25			27.7
15	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
15	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
15	W_TRANSV_CON SC	1.	0.	2.25			28.4
15	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
15	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
15	FRENADO	1.	0.	2.25	5.7	5.7	
16	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
16	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
16	W_TRANSV_SIN SC	1.	0.	2.25			27.7
16	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
16	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
16	W_TRANSV_CON SC	1.	0.	2.25			28.4
16	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
16	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
16	FRENADO	1.	0.	2.25	5.7	5.7	
17	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
17	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
17	W_TRANSV_SIN SC	1.	0.	2.25			27.7
17	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
17	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
17	W_TRANSV_CON SC	1.	0.	2.25			28.4
17	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
17	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
17	FRENADO	1.	0.	2.25	5.7	5.7	
18	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
18	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
18	W_TRANSV_SIN SC	1.	0.	2.25			27.7
18	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
18	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
18	W_TRANSV_CON SC	1.	0.	2.25			28.4
18	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
18	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
18	FRENADO	1.	0.	2.25	5.7	5.7	
19	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
19	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
19	W_TRANSV_SIN SC	1.	0.	2.25			27.7
19	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
19	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
19	W_TRANSV_CON SC	1.	0.	2.25			28.4
19	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
19	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
19	FRENADO	1.	0.	2.25	5.7	5.7	
22	SC1	1.	0.	2.25	-50.	-50.	
22	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
22	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
22	W_TRANSV_SIN SC	1.	0.	2.25			27.7
22	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
22	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
22	W_TRANSV_CON SC	1.	0.	2.25			28.4
22	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
22	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
22	FRENADO	1.	0.	2.25	5.7	5.7	
23	SC1	1.	0.	2.25	-50.	-50.	
23	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
23	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
23	W_TRANSV_SIN SC	1.	0.	2.25			27.7
23	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
23	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
23	W_TRANSV_CON SC	1.	0.	2.25			28.4
23	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
23	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
23	FRENADO	1.	0.	2.25	5.7	5.7	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
24	SC1	1.	0.	2.25	-50.	-50.	
24	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
24	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
24	W_TRANSV_SIN SC	1.	0.	2.25			27.7
24	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
24	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
24	W_TRANSV_CON SC	1.	0.	2.25			28.4
24	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
24	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
24	FRENADO	1.	0.	2.25	5.7	5.7	
25	SC1	1.	0.	2.25	-50.	-50.	
25	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
25	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
25	W_TRANSV_SIN SC	1.	0.	2.25			27.7
25	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
25	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
25	W_TRANSV_CON SC	1.	0.	2.25			28.4
25	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
25	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
25	FRENADO	1.	0.	2.25	5.7	5.7	
26	SC1	1.	0.	2.25	-50.	-50.	
26	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
26	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
26	W_TRANSV_SIN SC	1.	0.	2.25			27.7
26	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
26	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
26	W_TRANSV_CON SC	1.	0.	2.25			28.4
26	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
26	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
26	FRENADO	1.	0.	2.25	5.7	5.7	
27	SC1	1.	0.	2.25	-50.	-50.	
27	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
27	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
27	W_TRANSV_SIN SC	1.	0.	2.25			27.7
27	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
27	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
27	W_TRANSV_CON SC	1.	0.	2.25			28.4
27	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
27	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
27	FRENADO	1.	0.	2.25	5.7	5.7	
28	SC1	1.	0.	2.25	-50.	-50.	
28	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
28	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
28	W_TRANSV_SIN SC	1.	0.	2.25			27.7

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
28	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
28	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
28	W_TRANSV_CON SC	1.	0.	2.25			28.4
28	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
28	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
28	FRENADO	1.	0.	2.25	5.7	5.7	
29	SC1	1.	0.	2.25	-50.	-50.	
29	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
29	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
29	W_TRANSV_SIN SC	1.	0.	2.25			27.7
29	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
29	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
29	W_TRANSV_CON SC	1.	0.	2.25			28.4
29	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
29	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
29	FRENADO	1.	0.	2.25	5.7	5.7	
30	SC1	1.	0.	2.25	-50.	-50.	
30	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
30	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
30	W_TRANSV_SIN SC	1.	0.	2.25			27.7
30	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
30	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
30	W_TRANSV_CON SC	1.	0.	2.25			28.4
30	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
30	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
30	FRENADO	1.	0.	2.25	5.7	5.7	
31	SC1	1.	0.	2.25	-50.	-50.	
31	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
31	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
31	W_TRANSV_SIN SC	1.	0.	2.25			27.7
31	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
31	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
31	W_TRANSV_CON SC	1.	0.	2.25			28.4
31	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
31	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
31	FRENADO	1.	0.	2.25	5.7	5.7	
32	SC1	1.	0.	2.25	-50.	-50.	
32	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
32	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
32	W_TRANSV_SIN SC	1.	0.	2.25			27.7
32	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
32	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA m	AbsDistB m	FOverLA KN/m	FOverLB KN/m	MOverLA KN-m/m
32	W_TRANSV_CON SC	1.	0.	2.25			28.4
32	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
32	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
32	FRENADO	1.	0.	2.25	5.7	5.7	
33	SC1	1.	0.	2.25	-50.	-50.	
33	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
33	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
33	W_TRANSV_SIN SC	1.	0.	2.25			27.7
33	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
33	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
33	W_TRANSV_CON SC	1.	0.	2.25			28.4
33	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
33	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
33	FRENADO	1.	0.	2.25	5.7	5.7	
34	SC1	1.	0.	2.25	-50.	-50.	
34	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
34	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
34	W_TRANSV_SIN SC	1.	0.	2.25			27.7
34	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
34	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
34	W_TRANSV_CON SC	1.	0.	2.25			28.4
34	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
34	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
34	FRENADO	1.	0.	2.25	5.7	5.7	
35	SC1	1.	0.	2.25	-50.	-50.	
35	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
35	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
35	W_TRANSV_SIN SC	1.	0.	2.25			27.7
35	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
35	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
35	W_TRANSV_CON SC	1.	0.	2.25			28.4
35	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
35	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
35	FRENADO	1.	0.	2.25	5.7	5.7	
36	SC1	1.	0.	2.25	-50.	-50.	
36	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
36	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
36	W_TRANSV_SIN SC	1.	0.	2.25			27.7
36	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
36	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
36	W_TRANSV_CON SC	1.	0.	2.25			28.4
36	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
36	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
36	FRENADO	1.	0.	2.25	5.7	5.7	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA m	AbsDistB m	FOverLA KN/m	FOverLB KN/m	MOverLA KN-m/m
37	SC1	1.	0.	2.25	-50.	-50.	
37	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
37	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
37	W_TRANSV_SIN SC	1.	0.	2.25			27.7
37	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
37	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
37	W_TRANSV_CON SC	1.	0.	2.25			28.4
37	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
37	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
37	FRENADO	1.	0.	2.25	5.7	5.7	
38	SC1	1.	0.	2.25	-50.	-50.	
38	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
38	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
38	W_TRANSV_SIN SC	1.	0.	2.25			27.7
38	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
38	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
38	W_TRANSV_CON SC	1.	0.	2.25			28.4
38	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
38	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
38	FRENADO	1.	0.	2.25	5.7	5.7	
39	SC1	1.	0.	2.25	-50.	-50.	
39	W_TRANSV_SIN SC	1.	0.	2.25	4.98	4.98	
39	W_TRANSV_SIN SC	1.	0.	2.25	-11.72	-11.72	
39	W_TRANSV_SIN SC	1.	0.	2.25			27.7
39	W_TRANSV_CON SC	1.	0.	2.25	11.84	11.84	
39	W_TRANSV_CON SC	1.	0.	2.25	-11.72	-11.72	
39	W_TRANSV_CON SC	1.	0.	2.25			28.4
39	W_LONG_SIN SC	1.	0.	2.25	1.03	1.03	
39	W_LONG_CON SC	1.	0.	2.25	1.35	1.35	
39	FRENADO	1.	0.	2.25	5.7	5.7	
42	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
42	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
42	W_TRANSV_SIN SC	1.	0.	1.5			27.7
42	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
42	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
42	W_TRANSV_CON SC	1.	0.	1.5			28.4
42	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
42	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
42	FRENADO	1.	0.	1.5	5.7	5.7	
43	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
43	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
43	W_TRANSV_SIN SC	1.	0.	1.5			27.7
43	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	



Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
43	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
43	W_TRANSV_CON SC	1.	0.	1.5			28.4
43	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
43	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
43	FRENADO	1.	0.	1.5	5.7	5.7	
44	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
44	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
44	W_TRANSV_SIN SC	1.	0.	1.5			27.7
44	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
44	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
44	W_TRANSV_CON SC	1.	0.	1.5			28.4
44	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
44	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
44	FRENADO	1.	0.	1.5	5.7	5.7	
45	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
45	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
45	W_TRANSV_SIN SC	1.	0.	1.5			27.7
45	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
45	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
45	W_TRANSV_CON SC	1.	0.	1.5			28.4
45	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
45	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
45	FRENADO	1.	0.	1.5	5.7	5.7	
46	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
46	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
46	W_TRANSV_SIN SC	1.	0.	1.5			27.7
46	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
46	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
46	W_TRANSV_CON SC	1.	0.	1.5			28.4
46	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
46	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
46	FRENADO	1.	0.	1.5	5.7	5.7	
47	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
47	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
47	W_TRANSV_SIN SC	1.	0.	1.5			27.7
47	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
47	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
47	W_TRANSV_CON SC	1.	0.	1.5			28.4
47	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
47	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
47	FRENADO	1.	0.	1.5	5.7	5.7	
48	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
48	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
48	W_TRANSV_SIN SC	1.	0.	1.5			27.7
48	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
48	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
48	W_TRANSV_CON SC	1.	0.	1.5			28.4
48	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
48	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
48	FRENADO	1.	0.	1.5	5.7	5.7	
49	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
49	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
49	W_TRANSV_SIN SC	1.	0.	1.5			27.7
49	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
49	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
49	W_TRANSV_CON SC	1.	0.	1.5			28.4
49	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
49	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
49	FRENADO	1.	0.	1.5	5.7	5.7	
50	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
50	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
50	W_TRANSV_SIN SC	1.	0.	1.5			27.7
50	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
50	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
50	W_TRANSV_CON SC	1.	0.	1.5			28.4
50	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
50	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
50	FRENADO	1.	0.	1.5	5.7	5.7	
51	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
51	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
51	W_TRANSV_SIN SC	1.	0.	1.5			27.7
51	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
51	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
51	W_TRANSV_CON SC	1.	0.	1.5			28.4
51	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
51	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
51	FRENADO	1.	0.	1.5	5.7	5.7	
52	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
52	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
52	W_TRANSV_SIN SC	1.	0.	1.5			27.7
52	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
52	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
52	W_TRANSV_CON SC	1.	0.	1.5			28.4
52	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
52	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
52	FRENADO	1.	0.	1.5	5.7	5.7	
53	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
53	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
53	W_TRANSV_SIN SC	1.	0.	1.5			27.7
53	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
53	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
53	W_TRANSV_CON SC	1.	0.	1.5			28.4
53	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
53	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
53	FRENADO	1.	0.	1.5	5.7	5.7	
54	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
54	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
54	W_TRANSV_SIN SC	1.	0.	1.5			27.7
54	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
54	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
54	W_TRANSV_CON SC	1.	0.	1.5			28.4
54	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
54	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
54	FRENADO	1.	0.	1.5	5.7	5.7	
55	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
55	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
55	W_TRANSV_SIN SC	1.	0.	1.5			27.7
55	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
55	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
55	W_TRANSV_CON SC	1.	0.	1.5			28.4
55	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
55	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
55	FRENADO	1.	0.	1.5	5.7	5.7	
56	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
56	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
56	W_TRANSV_SIN SC	1.	0.	1.5			27.7
56	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
56	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
56	W_TRANSV_CON SC	1.	0.	1.5			28.4
56	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
56	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
56	FRENADO	1.	0.	1.5	5.7	5.7	
57	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
57	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
57	W_TRANSV_SIN SC	1.	0.	1.5			27.7
57	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
57	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
57	W_TRANSV_CON SC	1.	0.	1.5			28.4
57	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
57	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
57	FRENADO	1.	0.	1.5	5.7	5.7	
58	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
58	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
58	W_TRANSV_SIN SC	1.	0.	1.5			27.7
58	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
58	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
58	W_TRANSV_CON SC	1.	0.	1.5			28.4
58	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
58	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
58	FRENADO	1.	0.	1.5	5.7	5.7	
59	W_TRANSV_SIN SC	1.	0.	1.5	4.98	4.98	
59	W_TRANSV_SIN SC	1.	0.	1.5	-11.72	-11.72	
59	W_TRANSV_SIN SC	1.	0.	1.5			27.7
59	W_TRANSV_CON SC	1.	0.	1.5	11.84	11.84	
59	W_TRANSV_CON SC	1.	0.	1.5	-11.72	-11.72	
59	W_TRANSV_CON SC	1.	0.	1.5			28.4
59	W_LONG_SIN SC	1.	0.	1.5	1.03	1.03	
59	W_LONG_CON SC	1.	0.	1.5	1.35	1.35	
59	FRENADO	1.	0.	1.5	5.7	5.7	
73	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
73	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
73	W_TRANSV_SIN SC	1.	0.	0.5			27.7
73	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
73	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
73	W_TRANSV_CON SC	1.	0.	0.5			28.4
73	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
73	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
73	FRENADO	1.	0.	0.5	5.7	5.7	
74	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
74	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
74	W_TRANSV_SIN SC	1.	0.	1.75			27.7
74	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
74	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
74	W_TRANSV_CON SC	1.	0.	1.75			28.4
74	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
74	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
74	FRENADO	1.	0.	1.75	5.7	5.7	
96	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
96	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
96	W_TRANSV_SIN SC	1.	0.	1.75			27.7

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
96	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
96	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
96	W_TRANSV_CON SC	1.	0.	1.75			28.4
96	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
96	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
96	FRENADO	1.	0.	1.75	5.7	5.7	
97	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
97	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
97	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	27.7
97	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
97	W_TRANSV_CON SC	1.	0.	0.5			28.4
97	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
97	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
97	FRENADO	1.	0.	0.5	5.7	5.7	
98	SC1	1.	0.	0.5	-50.	-50.	
98	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
98	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
98	W_TRANSV_SIN SC	1.	0.	0.5			27.7
98	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
98	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
98	W_TRANSV_CON SC	1.	0.	0.5			28.4
98	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
98	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
98	FRENADO	1.	0.	0.5	5.7	5.7	
99	SC1	1.	0.	1.75	-50.	-50.	
99	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
99	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
99	W_TRANSV_SIN SC	1.	0.	1.75			27.7
99	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
99	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
99	W_TRANSV_CON SC	1.	0.	1.75			28.4
99	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
99	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
99	FRENADO	1.	0.	1.75	5.7	5.7	
100	SC1	1.	0.	1.75	-50.	-50.	
100	W_TRANSV_SIN SC	1.	0.	1.75	4.98	4.98	
100	W_TRANSV_SIN SC	1.	0.	1.75	-11.72	-11.72	
100	W_TRANSV_SIN SC	1.	0.	1.75			27.7
100	W_TRANSV_CON SC	1.	0.	1.75	11.84	11.84	
100	W_TRANSV_CON SC	1.	0.	1.75	-11.72	-11.72	
100	W_TRANSV_CON SC	1.	0.	1.75			28.4

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
100	W_LONG_SIN SC	1.	0.	1.75	1.03	1.03	
100	W_LONG_CON SC	1.	0.	1.75	1.35	1.35	
100	FRENADO	1.	0.	1.75	5.7	5.7	
101	SC1	1.	0.	0.5	-50.	-50.	
101	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
101	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
101	W_TRANSV_SIN SC	1.	0.	0.5			27.7
101	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
101	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
101	W_TRANSV_CON SC	1.	0.	0.5			28.4
101	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
101	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
101	FRENADO	1.	0.	0.5	5.7	5.7	
102	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
102	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
102	W_TRANSV_SIN SC	1.	0.	0.5			27.7
102	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	
102	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
102	W_TRANSV_CON SC	1.	0.	0.5			28.4
102	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
102	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
102	FRENADO	1.	0.	0.5	5.7	5.7	
103	W_TRANSV_SIN SC	1.	0.	1.	4.98	4.98	
103	W_TRANSV_SIN SC	1.	0.	1.	-11.72	-11.72	
103	W_TRANSV_SIN SC	1.	0.	1.			27.7
103	W_TRANSV_CON SC	1.	0.	1.	11.84	11.84	
103	W_TRANSV_CON SC	1.	0.	1.	-11.72	-11.72	
103	W_TRANSV_CON SC	1.	0.	1.			28.4
103	W_LONG_SIN SC	1.	0.	1.	1.03	1.03	
103	W_LONG_CON SC	1.	0.	1.	1.35	1.35	
103	FRENADO	1.	0.	1.	5.7	5.7	
104	W_TRANSV_SIN SC	1.	0.	1.	4.98	4.98	
104	W_TRANSV_SIN SC	1.	0.	1.	-11.72	-11.72	
104	W_TRANSV_SIN SC	1.	0.	1.			27.7
104	W_TRANSV_CON SC	1.	0.	1.	11.84	11.84	
104	W_TRANSV_CON SC	1.	0.	1.	-11.72	-11.72	
104	W_TRANSV_CON SC	1.	0.	1.			28.4
104	W_LONG_SIN SC	1.	0.	1.	1.03	1.03	
104	W_LONG_CON SC	1.	0.	1.	1.35	1.35	
104	FRENADO	1.	0.	1.	5.7	5.7	
105	W_TRANSV_SIN SC	1.	0.	0.5	4.98	4.98	
105	W_TRANSV_SIN SC	1.	0.	0.5	-11.72	-11.72	
105	W_TRANSV_SIN SC	1.	0.	0.5			27.7
105	W_TRANSV_CON SC	1.	0.	0.5	11.84	11.84	

Table: Frame Loads - Distributed, Part 2 of 3

Frame	LoadPat	RelDistB	AbsDistA	AbsDistB	FOverLA	FOverLB	MOverLA
			m	m	KN/m	KN/m	KN-m/m
105	W_TRANSV_CON SC	1.	0.	0.5	-11.72	-11.72	
105	W_TRANSV_CON SC	1.	0.	0.5			28.4
105	W_LONG_SIN SC	1.	0.	0.5	1.03	1.03	
105	W_LONG_CON SC	1.	0.	0.5	1.35	1.35	
105	FRENADO	1.	0.	0.5	5.7	5.7	

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB	GUID
		KN-m/m	
81	W_LONG_SIN SC		08499e94-115d-4351-96b7-a0acab3130d4
81	W_LONG_CON SC		cb42ad7e-6197-40cc-91ab-024da5bd9b45
94	W_TRANSV_SIN SC		5c9e4cfb-c45f-4333-b040-ed4b0f3ae691
94	W_LONG_SIN SC		07c799f7-96b8-4cf0-a44d-df8d8a4a9b90
94	W_LONG_CON SC		09925d96-d064-4ef0-baa5-0c4cbe3aba55
95	W_TRANSV_SIN SC		215e5833-0f7d-4dec-ae17-edc5cc214b02
95	W_LONG_SIN SC		aea4e6ef-320f-44e7-8b7a-08b6ef773c04
95	W_LONG_CON SC		b3ee8df7-cf87-4457-b399-9ba89c32f311
117	W_LONG_SIN SC		b6639836-cb8b-410f-a7f4-8e4fc3799854
117	W_LONG_CON SC		aefb08c1-dcdd-48bc-a74a-f40b0ebebfb6
118	W_LONG_SIN SC		97ae7ef9-1d3b-4a7b-bb0a-26f9127615b8
118	W_LONG_CON SC		50c31f86-c1b7-4513-a008-995afe28d7b4
125	W_LONG_SIN SC		4a855ed9-c820-4051-8f6a-aad5cc4dd49d
125	W_LONG_CON SC		71985996-0e0d-4209-8f87-c585a87082c4
138	W_TRANSV_SIN SC		ef26d67d-6656-46f7-bacc-ff1ace2a8a97
138	W_LONG_SIN SC		640cc753-0582-4447-be6b-ec925a8e1b69
138	W_LONG_CON SC		2e1ab1d3-0157-4f56-b60e-69bda717cd44
139	W_TRANSV_SIN SC		f32cc90f-b141-4f77-b498-d2e6b3694b42
139	W_LONG_SIN SC		47d974e0-ad57-463c-b651-66262ce8851a
139	W_LONG_CON SC		11ad3f8e-da75-42f1-8d53-d35b33f4d7e8
140	W_LONG_SIN SC		99c5d001-8a55-41e5-b4ca-16bdca09d74a
140	W_LONG_CON SC		f2f37a2f-9619-4a9c-87bc-7011ada9e059

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB	GUID
		KN-m/m	
141	W_LONG_SIN SC		062c5a2b-4a72-4cba-a901-d5dc3149a40d
141	W_LONG_CON SC		2f0efc17-5d7e-43b6-9377-921f65026569
2	W_TRANSV_SIN SC		5e18de43-8c10-4db3-8ea0-c4bc60241db6
2	W_TRANSV_SIN SC		665b91e7-76a1-4d6f-bf9a-df998acc4ffa
2	W_TRANSV_SIN SC	27.7	9d0a511b-aa11-4fd2-bf5c-a5812c136e88
2	W_TRANSV_CON SC		e4b42b70-14be-4102-beae-8f3b79483029
2	W_TRANSV_CON SC		bb7d0b7d-2b89-4659-8d7e-3fe687f6f0b4
2	W_TRANSV_CON SC	28.4	44267e9d-fc1b-4476-8118-66f9a44875b0
2	W_LONG_SIN SC		3ca46034-47f6-4fcf-b0b3-ef3a3b219e6f
2	W_LONG_CON SC		b0905b34-111a-458e-9912-7a951fb6b5af
2	FRENADO		04fbd9e0-1ec6-4b86-845d-03918381a4e0
3	W_TRANSV_SIN SC		95c2f5bf-1c30-4146-bd6c-64cea14cf899
3	W_TRANSV_SIN SC		8aa654bd-728b-4097-9693-664098731ee6
3	W_TRANSV_SIN SC	27.7	c1a48586-a13e-4dea-8f69-78abcf17fff
3	W_TRANSV_CON SC		adcc37fc-f2b7-417e-b8fd-a65f447c85a5
3	W_TRANSV_CON SC		c475204a-a6c1-4e7a-8b9c-340ef54432c2
3	W_TRANSV_CON SC	28.4	2b5f5a3e-d0a6-4c76-a851-70408a1f8690
3	W_LONG_SIN SC		ca459b68-e598-4d35-b643-d7447f9c89fe
3	W_LONG_CON SC		de2c8d0e-5c0c-49dc-807e-d11f49e073b1
3	FRENADO		23c21438-988b-4fb1-9952-2f395a271b1b
4	W_TRANSV_SIN SC		f78c861d-e749-4cbd-af2f-1ab9eff92b5
4	W_TRANSV_SIN SC		fdcb0c36-79f5-4e80-9aa3-46dde25c90bb
4	W_TRANSV_SIN SC	27.7	8b054cf3-713a-46ed-83a0-136aebff81e4
4	W_TRANSV_CON SC		7230a29a-7518-48a7-a99a-86f1f421a4b5
4	W_TRANSV_CON SC		d7e1fb6a-4f32-420f-8d3d-f131ce321535
4	W_TRANSV_CON SC	28.4	a855bbfc-d955-4a29-9da1-7af01f3b4029
4	W_LONG_SIN SC		fc8c08e8-0c82-44da-b2e2-dcbef7ee988e
4	W_LONG_CON SC		22d93f99-7011-4495-bf0c-a38c1dea7034
4	FRENADO		bce8f987-1503-4e0d-976a-093ebb55e920
5	W_TRANSV_SIN SC		b6d44bd1-299f-46eb-820f-6be38f849207

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
5	W_TRANSV_SIN SC		f9d2b5d3-b1dd-467c-a2e b-852c3f0bbabe
5	W_TRANSV_SIN SC	27.7	0d409c44-e7ac-4f97-932 d-83427adb7551
5	W_TRANSV_CON SC		b564a66c-0d05-4a00-a5 8a-601d80a179e8
5	W_TRANSV_CON SC		e940cdf2-3e4a-4064-b36 4-54fc23575351
5	W_TRANSV_CON SC	28.4	1f0cd14b-1b42-43c1-a6b d-c29463c07bfd
5	W_LONG_SIN SC		0647cd76-65a7-4f4f-a60 5-55f4e1209e0d
5	W_LONG_CON SC		caa29aa3-46ec-4607-aa 31-ed1fd31cd61a
5	FRENADO		3097dc79-175c-4eb5-b9 c4-8bc675959231
6	W_TRANSV_SIN SC		e0a50133-5f35-47a4-94c 0-b51a5e9f9b42
6	W_TRANSV_SIN SC		e33108ea-5d33-4576-b5 db-eb6989a14059
6	W_TRANSV_SIN SC	27.7	de48ccd6-5db6-4d87-ab 85-d1233284545f
6	W_TRANSV_CON SC		9689faa9-1ab1-4fb6-88d 2-34ece66b5f9d
6	W_TRANSV_CON SC		f8677c47-13d7-45fe-a5f4 -8c8994792aa9
6	W_TRANSV_CON SC	28.4	150e1fbb-1bdb-48b8-957 e-7d776f093cfb
6	W_LONG_SIN SC		de56850f-dee3-4b4d-8b7 4-9ba6e566bca9
6	W_LONG_CON SC		c18daa42-cf1d-460b-934 b-0ab9e0849e0e
6	FRENADO		1193dbd9-9356-4105-b9 93-e10384fbf9e9
7	W_TRANSV_SIN SC		55f90fcc-f83e-44a9-afed- 2caee7dbfbc
7	W_TRANSV_SIN SC		51863910-2e86-480d-87 7b-187412bc5f6a
7	W_TRANSV_SIN SC	27.7	0d4e6e8b-3cdc-4244-a8 38-2d725d2f8030
7	W_TRANSV_CON SC		135b2951-3643-4746-a0 22-d6ef647b5e56
7	W_TRANSV_CON SC		bdfa8187-a329-47e5-9c1 2-5f02e3ee1d89
7	W_TRANSV_CON SC	28.4	f8cf41f0-31b6-43c0-ba1f- 31ac53ee7a2d
7	W_LONG_SIN SC		f874f394-7ac3-4ead-835 e-9844e7487f46
7	W_LONG_CON SC		f034373a-c50c-4ea6-be3 c-73a94337c97d
7	FRENADO		d0504b29-56ee-46c5-b9 9a-59ded3c1a4b6
8	W_TRANSV_SIN SC		0f735a0e-c9e4-40db-82c 5-0a0ff8a1e627
8	W_TRANSV_SIN SC		39f54a21-7b1d-4da7-98c a-dc7ee7276f67
8	W_TRANSV_SIN SC	27.7	3e85c628-8350-45fc-bb1 d-9511714808a9
8	W_TRANSV_CON SC		3c4e4531-5678-4001-b0 08-788ae24ec563

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
8	W_TRANSV_CON SC		d4548410-9843-4290-8df 5-17f6c93d0c79
8	W_TRANSV_CON SC	28.4	fae13344-8d67-465c-970 1-3a6b66b39619
8	W_LONG_SIN SC		26aa0e6b-621b-4168-8d ad-c17e238076d3
8	W_LONG_CON SC		8e2c9a88-6c05-4ff0-b68 1-f8bc00ffafd
8	FRENADO		0d2f4dcd-77fd-48fe-ae8d -566fab13e4f1
9	W_TRANSV_SIN SC		1a0b2a25-22d1-4f40-b7d 0-1ce4607c47fc
9	W_TRANSV_SIN SC		faeb9e43-7760-4f71-890 b-72217172a4a1
9	W_TRANSV_SIN SC	27.7	0f4f3617-a747-428c-95e 3-deeeac5c8d39
9	W_TRANSV_CON SC		9b9cbc65-6f41-4f51-a17 5-345fb945cde6
9	W_TRANSV_CON SC		52d81066-9c1d-48a0-bd 7c-ffc165cca1e4
9	W_TRANSV_CON SC	28.4	17475b0e-49a3-4e47-81 d4-7a70811b5a2b
9	W_LONG_SIN SC		f5bbfd3c-7e2e-4027-b3a 0-049e89af47da
9	W_LONG_CON SC		e1f7dfda-e362-463e-b8a 1-fe27b9f7fce0
9	FRENADO		49e120b8-f313-44ee-a57 a-3259d5108e29
10	W_TRANSV_SIN SC		30fc0711-85c9-48cf-a8f6- 7c0265290741
10	W_TRANSV_SIN SC		785547f1-3fa4-4ef6-82dd -66ac5480957f
10	W_TRANSV_SIN SC	27.7	615e0362-25dc-45aa-a9 b0-cff9fd489a0b
10	W_TRANSV_CON SC		0bb54869-78d2-44eb-9a d5-05f8f5f6eca9
10	W_TRANSV_CON SC		32cfea11-b141-4102-808 e-a7a50b1e9ab0
10	W_TRANSV_CON SC	28.4	3fa38e1c-90e7-4a19-a41 d-58bb66488e92
10	W_LONG_SIN SC		cca46c0a-1418-408e-90 00-5fb965aec2c8
10	W_LONG_CON SC		3233825d-f9b5-434e-a58 8-2b7c4b246fe7
10	FRENADO		1b42d5dc-d13d-422d-9d 0a-ead82b5af975
11	W_TRANSV_SIN SC		f2f86c97-c5b9-4f3b-abe3 -1f5267560507
11	W_TRANSV_SIN SC		0579c54d-8e6b-4957-88 3d-ceaae3203d0f
11	W_TRANSV_SIN SC	27.7	7e609852-1eed-47a0-b3 ce-d0a57c6800e4
11	W_TRANSV_CON SC		732a0f7f-b2d5-4d56-bb6 e-14fa81dd62a8
11	W_TRANSV_CON SC		2a7e0ae2-e7fd-4abe-9de 6-6cca626c48b2
11	W_TRANSV_CON SC	28.4	fd45760e-5667-4449-919 d-782b7154a485
11	W_LONG_SIN SC		763aeca2-611d-4a33-a5f 5-289f6ef823af

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
11	W_LONG_CON SC		885a477b-d634-4768-aa6d-76e68ead864c
11	FRENADO		9d553785-3272-4987-9c5c-cce22f438e22
12	W_TRANSV_SIN SC		4c499150-060a-4b28-8560-5498fa2a008a
12	W_TRANSV_SIN SC		a3ead859-2833-4727-b127-c731525f1a53
12	W_TRANSV_SIN SC	27.7	64525de8-e41e-4630-8d66-ef1b66913185
12	W_TRANSV_CON SC		5bcb8f30-b652-447e-bd29-9784a74d2ea6
12	W_TRANSV_CON SC		601a18f6-ce4d-408e-8f79-292663a89f97
12	W_TRANSV_CON SC	28.4	d1d5a927-76b6-4337-8675-1bbf11a7ce2d
12	W_LONG_SIN SC		a47f9344-1f39-402f-ad98-feb6ab5b5150
12	W_LONG_CON SC		2b5de71e-0f74-4cb5-9ef3-388003bb1716
12	FRENADO		3a063749-6572-4337-9514-5a3caa52df8f
13	W_TRANSV_SIN SC		78893435-992b-4cbd-b606-d644b55715e0
13	W_TRANSV_SIN SC		6a66e805-39cb-4d84-baac-cabfb31346be
13	W_TRANSV_SIN SC	27.7	6bb32b57-17e2-4831-87e0-312998472a54
13	W_TRANSV_CON SC		d8872b92-a643-4fe0-add0-00076da3052b
13	W_TRANSV_CON SC		f1f5a847-fd2a-451a-9c66-f33b498b3e4d
13	W_TRANSV_CON SC	28.4	815eb7c9-a093-4ba4-b570-e20105464929
13	W_LONG_SIN SC		ab5c6908-fa32-4220-abc6-6ccb8520050
13	W_LONG_CON SC		ad5b248e-b300-412a-9720-f5ba37a80bec
13	FRENADO		b5c3f6ba-a8ea-4cbb-8dfc-d79932d26df1
14	W_TRANSV_SIN SC		9b2e377a-922c-4d5c-a824-6b7b7424b805
14	W_TRANSV_SIN SC		50d6c8bc-eb2a-4d0f-98f4-eb9f6a92ed0d
14	W_TRANSV_SIN SC	27.7	a4d33cf4-de3e-47e6-bc87-218b8b17ba40
14	W_TRANSV_CON SC		fbcdf5e9-79ca-4645-b643-79e0d6969a20
14	W_TRANSV_CON SC		5cd7ed6d-41d4-4e87-a086-4b72ab7619a0
14	W_TRANSV_CON SC	28.4	889204c4-0422-44aa-a8ae-d44cd18bb0df
14	W_LONG_SIN SC		07423993-19ff-4ace-8bdf-da6b131ce2fe
14	W_LONG_CON SC		b723c914-28ed-4d02-bb59-36ff6d8bf44f
14	FRENADO		7a456e64-d962-4617-b2f9-595eee5a7734
15	W_TRANSV_SIN SC		c3a36ff9-9784-458d-a174-4fe9f07423e8

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
15	W_TRANSV_SIN SC		6a3cd14e-08f8-409d-8038-5c8ef220cd49
15	W_TRANSV_SIN SC	27.7	c0a98f78-5fc2-44f8-ac07-54c97853ecd4
15	W_TRANSV_CON SC		98ecaac9-1cc5-42ad-b907-02126c993596
15	W_TRANSV_CON SC		1da2d954-0fec-407b-bba6-6f16f390d9f5
15	W_TRANSV_CON SC	28.4	e9b4f49-d5a8-4c95-afe7-1081253a49e7
15	W_LONG_SIN SC		82fb9aa9-3235-4ed6-84e9-c35f0443c19d
15	W_LONG_CON SC		a182ccd3-a666-47b0-9aa3-25999eddb1de
15	FRENADO		20a7a19d-e2d4-4c7c-9c3e-054529bd6946
16	W_TRANSV_SIN SC		0fc9279a-44da-402a-aae6-bb5cfb97d46c
16	W_TRANSV_SIN SC		e8930a19-d5a4-497f-bc92-79f520961c38
16	W_TRANSV_SIN SC	27.7	f949d2a6-dac8-40d7-896f-80b5b8235a5e
16	W_TRANSV_CON SC		b54446dc-08f3-4d14-ae9-0e53ae236aef
16	W_TRANSV_CON SC		df1ab43e-ede9-4943-a2f5-879d5fabae3
16	W_TRANSV_CON SC	28.4	214841f2-e243-4cd2-9d8f-471d62130c62
16	W_LONG_SIN SC		87cf427c-be22-44c2-b82c-89d5be734554
16	W_LONG_CON SC		1ce857c8-455f-4a58-94cf-aa7a0ff5f30f
16	FRENADO		45aa4921-49a3-4b9e-a12f-555e7eae454d
17	W_TRANSV_SIN SC		4d46d6bf-411b-4550-a113-45afc1dcbcb
17	W_TRANSV_SIN SC		b0949c45-ce23-45d4-b472-4439be66d604
17	W_TRANSV_SIN SC	27.7	3a0abad4-a580-4f15-bec4-d909c4315d25
17	W_TRANSV_CON SC		aec6bbcb-f3c5-48c0-acf1-b79162fc286d
17	W_TRANSV_CON SC		ec35dd6c-da7a-41ae-a1d9-c9b1ba487d3d
17	W_TRANSV_CON SC	28.4	7c413ba7-0ee8-4d76-b5ca-29e1d6e1b928
17	W_LONG_SIN SC		a7329134-b904-4ff0-8ad3-1fc4787b5877
17	W_LONG_CON SC		46af2d88-39c2-42d7-91be-e5e5c903414c
17	FRENADO		7fa519bb-d0e0-4eb8-9035-18b7127d606f
18	W_TRANSV_SIN SC		3afb0297-344c-4166-a0ea-762396f8aa99
18	W_TRANSV_SIN SC		dbef6f501-59db-4b34-8938-9aae643cdee2
18	W_TRANSV_SIN SC	27.7	1f0d9eec-818c-4b72-8dc6-b3029e8598eb8
18	W_TRANSV_CON SC		788ea2cb-9dff-48b7-a0fb-5591253dd9f9

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
18	W_TRANSV_CON SC		6053a9c1-de0c-45fa-9ce7-f8d8e6082aff
18	W_TRANSV_CON SC	28.4	e61998fc-67d0-43b2-9d21-e80a1cd54118
18	W_LONG_SIN SC		0b46e628-2c67-4bee-a8ef-38e91fa189b8
18	W_LONG_CON SC		89ed2ca2-ad02-4179-8cdf-650f10c57214
18	FRENADO		170cf239-c838-4c15-b0ec-347433bf6a7b
19	W_TRANSV_SIN SC		f9aaa684-82d0-4215-ac3c-91d5eab817cb
19	W_TRANSV_SIN SC		067179ac-170e-4c5d-9f7e-a52f1724bfd2
19	W_TRANSV_SIN SC	27.7	bb8ca890-8194-43e8-987a-18b16b759d78
19	W_TRANSV_CON SC		7391144d-e3d8-4b71-b2df-8137e4b4f453
19	W_TRANSV_CON SC		1e9f632b-709e-4e66-8912-4d61b8a08340
19	W_TRANSV_CON SC	28.4	c208f77d-16d7-4efc-8021-887d2bdcaea6
19	W_LONG_SIN SC		b0435253-3658-4b24-94c1-e51557e2e407
19	W_LONG_CON SC		4821af98-4611-4e7c-83a8-ee21743c537
19	FRENADO		e2808ede-7e4c-42f4-a087-383be2b0f4b7
22	SC1		e51efbec-e495-44e1-833a-dcac42eb805c
22	W_TRANSV_SIN SC		71a1fe32-81f2-481c-a87d-ea9c6c7bd306
22	W_TRANSV_SIN SC		7492f5fe-2d54-4bb1-b167-6b13a9664a90
22	W_TRANSV_SIN SC	27.7	a91ae0ca-8c45-4799-84d6-218783f5b822
22	W_TRANSV_CON SC		20238168-d135-4d11-a748-028a8630032d
22	W_TRANSV_CON SC		68bc207d-0c21-41f1-adf9-e542eb635818
22	W_TRANSV_CON SC	28.4	a52ed63e-e1f9-4dbc-92b2-57d65ec3e6a9
22	W_LONG_SIN SC		ebe13ac2-1394-4c53-a6a2-590e70e752ff
22	W_LONG_CON SC		91a08ff7-f997-4c57-a9ba-01ec1afda448
22	FRENADO		18cb0cf0-dbad-4f5c-99db-426896d212d1
23	SC1		fd10e563-211e-4252-9b72-6b3386e7aed4
23	W_TRANSV_SIN SC		7c836a19-b16c-4ef6-97d6-ea679ea0591e
23	W_TRANSV_SIN SC		b8059bd8-8ce8-4fd1-ada3-7788baf74a6a
23	W_TRANSV_SIN SC	27.7	7133771f-cd8b-45e8-bf52-90bf2046a255
23	W_TRANSV_CON SC		9f301110-f60e-47d1-9abc-a71fc65c6600
23	W_TRANSV_CON SC		e3019c64-5488-4b71-9c38-5fcc6325f610

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
23	W_TRANSV_CON SC	28.4	e39e9f0b-a7ac-4f99-82bc-c3405edda969
23	W_LONG_SIN SC		c3375a35-4e73-4031-9598-3ada03ceb903
23	W_LONG_CON SC		ab856aca-7083-4d64-91cc-91609e8fb673
23	FRENADO		5af7e68d-0bb1-42a8-8e1e-6c67bb4105a6
24	SC1		4692c414-69f9-41d6-891e-c14197b4a1f9
24	W_TRANSV_SIN SC		37bbcea5-7e56-4600-908f-d18c8067cc29
24	W_TRANSV_SIN SC		3d80356a-3cfb-4092-bb6e-f703b29e6f47
24	W_TRANSV_SIN SC	27.7	e8a2b775-95cd-4bc0-810c-ae8057dfaf5
24	W_TRANSV_CON SC		0bd3e01d-6a52-413f-a863-1aabc88877da
24	W_TRANSV_CON SC		d779dbce-262e-4959-9ed3-0969527eaa0c6
24	W_TRANSV_CON SC	28.4	60975a1c-6b3c-4ac5-a8fb-c5c1d8ade0fd
24	W_LONG_SIN SC		22a636e4-d8cc-4e81-84f6-d1228da6d8c4
24	W_LONG_CON SC		649764c3-9a6d-4c3c-91e7-7ff6da691d22
24	FRENADO		8807c74a-b2ed-4c38-826b-d7350d5dc473
25	SC1		47978c66-77fb-43f2-9128-e4baf3a1360f
25	W_TRANSV_SIN SC		f0adaa82-c451-4377-b983-2e33f9bd96da
25	W_TRANSV_SIN SC		8ae72ba5-eb86-42d8-953d-2b834f302fb6
25	W_TRANSV_SIN SC	27.7	7bf116e1-9554-4b46-8b02-8db5317e4b13
25	W_TRANSV_CON SC		ff436ac2-e3c1-4f74-b70a-74732f64f709
25	W_TRANSV_CON SC		4ed4fb65-6880-4701-a0d0-c52c40a631f4
25	W_TRANSV_CON SC	28.4	9bb1ac05-57fc-4dc2-a988-e64a49eee2c0
25	W_LONG_SIN SC		8bf74fd8-8b62-494f-bef9-c666da412bcf
25	W_LONG_CON SC		84b1257d-17e0-43ee-b13a-1cd61ce5b5f7
25	FRENADO		23df12fd-d6ea-4d2e-be74-4b60e520264e
26	SC1		896a1010-c92b-46bb-9ece-fe4025ceee24
26	W_TRANSV_SIN SC		a30e9d43-c79d-4a0a-8d82-381683859749
26	W_TRANSV_SIN SC		c2e4627a-937a-432b-9105-70bcad678c55
26	W_TRANSV_SIN SC	27.7	22e5e312-6baa-49cc-809c-a13cbf2942c8
26	W_TRANSV_CON SC		7bd37e9b-7318-4d8c-adad-8476d36d075b
26	W_TRANSV_CON SC		66bbfd75-52b4-470f-b306-4599c52f4f03

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
26	W_TRANSV_CON SC	28.4	dfd10ba8-ea6d-4629-b02d-c4d5b1392cce
26	W_LONG_SIN SC		a94424b8-b149-43ae-abbf-ee491e3fa316
26	W_LONG_CON SC		1ae7ae8f-8d88-4c38-abc d-6e2c2db6f9d77
26	FRENADO		34a93de2-6e1c-469d-8568-9a2588259bad
27	SC1		c4f724d1-f651-47f0-bb14-a26ae1cf4086
27	W_TRANSV_SIN SC		43695257-f626-4eb8-9421-c10329e7966b
27	W_TRANSV_SIN SC		0d37728e-4de6-43c2-8e95-9c7db3a87536
27	W_TRANSV_SIN SC	27.7	3c18ab49-5aeb-42a7-8776-61367f91ae88
27	W_TRANSV_CON SC		ca6d794d-fda7-43cc-9454-f8024e5d2072
27	W_TRANSV_CON SC		dd3a892e-8b8c-47c4-ba5d-be517c2f75b7
27	W_TRANSV_CON SC	28.4	a0978e43-d9ac-453c-8374-5d4f5325dafc
27	W_LONG_SIN SC		d8e7665c-39ed-42be-b9d6-d7a84e02e65a
27	W_LONG_CON SC		5c207e2d-0b5d-433e-b6ee-bb86d26e99da
27	FRENADO		fae76440-1b9e-4393-993f-952043067959
28	SC1		d1595f13-9b4d-4228-92b8-c06ead1fd5c5
28	W_TRANSV_SIN SC		f985fe01-3d82-4b73-bb94-6660d2720844
28	W_TRANSV_SIN SC		36a1c382-19e7-4481-8575-6f7c70e505aa
28	W_TRANSV_SIN SC	27.7	1ff1826d-719e-4827-81dc-c019d57f9af7
28	W_TRANSV_CON SC		0beaa3c5-acda-4bb7-a2da-6f30ec1e29dd
28	W_TRANSV_CON SC		25a35512-57be-4722-84e5-946c21b2f695
28	W_TRANSV_CON SC	28.4	1b8169e3-7e27-4940-8e6d-78c3c9029d77
28	W_LONG_SIN SC		0469cf65-c6c4-4be2-b1b1-b91a11446278
28	W_LONG_CON SC		0e80eeae-4eb9-469b-b537-1d9a884c096a
28	FRENADO		28abd296-f3de-4cab-a15a-8214aeccb199
29	SC1		ada3d29c-bd3c-4938-be55-3bab24235bae
29	W_TRANSV_SIN SC		832926df-8bf4-4736-8169-dbd572f5bfcc
29	W_TRANSV_SIN SC		48c46e44-7236-4f32-9617-0f2f4a7b4bde
29	W_TRANSV_SIN SC	27.7	03c7516f-0364-40ab-a00e-af2c5669de1f
29	W_TRANSV_CON SC		7cfe2786-c47a-47c5-bd98-f9511205705d
29	W_TRANSV_CON SC		9ca06554-5ab4-4324-ac25-bfc1c6621c01

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
29	W_TRANSV_CON SC	28.4	1f9e7f3b-129a-42eb-abac-caa7d793bed5
29	W_LONG_SIN SC		e4d44a2b-08c8-404c-a36b-f7baac3e76bb
29	W_LONG_CON SC		efba160a-e536-4d22-b480-f47ba0872940
29	FRENADO		cfdd4b66-c728-4066-ad84-62c6fb0ecb9d
30	SC1		ac7809fc-497a-4820-a92b-0a98401bae3f
30	W_TRANSV_SIN SC		fb98bfe6-70a4-41d0-b587-9f1062f2ce20
30	W_TRANSV_SIN SC		02b15e8c-b1fd-4919-a02f-262161d703b2
30	W_TRANSV_SIN SC	27.7	3b878e8b-ed0c-4534-a665-4b679c001923
30	W_TRANSV_CON SC		a7642f8b-9ffd-41af-a657-85937fd16c02
30	W_TRANSV_CON SC		686bb25c-b3bc-4f01-b828-5bfb67b3af7d
30	W_TRANSV_CON SC	28.4	4d63ddd8-9e0c-4bac-8499-9aa2f68538c2
30	W_LONG_SIN SC		a8a2b6a3-4261-4a7b-90a3-4906d8dc4e46
30	W_LONG_CON SC		f071e88a-963c-4e81-a13b-8635988ea08d
30	FRENADO		2603281f-e011-4165-a24d-989aef63f90c
31	SC1		81846035-fe6e-4914-9879-8729949ac493
31	W_TRANSV_SIN SC		394bc19b-ba26-4980-ac c4-fa9b61f99469
31	W_TRANSV_SIN SC		6fff9ccf-6540-485c-a86a-24b7e5599e08
31	W_TRANSV_SIN SC	27.7	3e3ebd2d-5998-48fc-93e8-8eaa19dd810f
31	W_TRANSV_CON SC		22ce3620-d513-48bc-9557-574f6f14f94c
31	W_TRANSV_CON SC		91654440-dd23-43f4-a60f-724eb1d27c7f
31	W_TRANSV_CON SC	28.4	d6d6466e-aadb-4f71-a771-42db48ec9bff
31	W_LONG_SIN SC		fc1215b7-bac8-41cf-b079-75bd85f02242
31	W_LONG_CON SC		dc77f87f-7adb-426d-a4d5-975b893a4825
31	FRENADO		4610d36a-20c0-4df8-b4f4-a453066d94ed
32	SC1		2a4c1ae3-65bc-4c80-9d90-85c532103e67
32	W_TRANSV_SIN SC		e7b3136a-205f-4899-b305-83bb30641af1
32	W_TRANSV_SIN SC		18a01bea-53e0-42e9-aaf5-9c62b1ebb63f
32	W_TRANSV_SIN SC	27.7	deb1880f-5f62-4e81-b9e0-92c02e6b416f
32	W_TRANSV_CON SC		be302229-7939-4658-9b4b-c479708a184d
32	W_TRANSV_CON SC		0b6b0aab-a04e-4228-8c3c-50b8e78db442



Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
32	W_TRANSV_CON SC	28.4	bec3e884-6eee-4415-86 ef-365380227397
32	W_LONG_SIN SC		c40a248d-5d3a-4132-bd d6-701edb89fb0f
32	W_LONG_CON SC		b26ec4e5-1d6b-45c5-bd e9-d1ffb600c817
32	FRENADO		1227e821-8825-4e9c-9c 3a-1461948f7dbb
33	SC1		abf196fd-e129-4f82-ba83 -e591fb5fd849
33	W_TRANSV_SIN SC		9ad14f0f-a491-413c-b97 5-d48e7273dd2b
33	W_TRANSV_SIN SC		ba7f70df-3dc0-4808-ac6 2-174ce884644f
33	W_TRANSV_SIN SC	27.7	3693cb2a-d41b-431e-9bf 9-7defccfd6bd2
33	W_TRANSV_CON SC		6140d3c7-b991-43c3-bc 6b-5bb9ae91ca97
33	W_TRANSV_CON SC		2d673cce-e063-43ba-89 1f-acb378188001
33	W_TRANSV_CON SC	28.4	c5a235b0-13db-4fb3-926 e-21584379b70c
33	W_LONG_SIN SC		8a825bfd-f16f-45d5-ab75 -0d3c613a82df
33	W_LONG_CON SC		289eb5be-f338-4dfd-8ae c-0f07f4cffb6e
33	FRENADO		c34fe84f-d61f-4f1c-9579- ebf24edc96a1
34	SC1		24e0bd55-83f5-4d7c-8f0 9-2a8cdab18112
34	W_TRANSV_SIN SC		6f05429a-b770-4d45-b1a f-24cc2ec924c5
34	W_TRANSV_SIN SC		63912772-a83b-42e2-8a 4a-c42274d60dd3
34	W_TRANSV_SIN SC	27.7	4a128422-5e99-475b-a2 07-d887a6958262
34	W_TRANSV_CON SC		cc496be9-537a-456d-83 79-f565df0b5771
34	W_TRANSV_CON SC		a29ea297-5daa-4a7f-832 6-5e3fd39d39fe
34	W_TRANSV_CON SC	28.4	a4725c00-c671-4ec7-82f 5-298afa72ba93
34	W_LONG_SIN SC		1c72a80b-69e5-4044-83 66-81536cd54a01
34	W_LONG_CON SC		d54c1f15-32af-4579-9ff8- 93199406f3c7
34	FRENADO		81fa6119-55ca-4c93-868 0-d20ddbeaec91
35	SC1		397a9355-7f5f-462c-87c a-e23deca2f3b2
35	W_TRANSV_SIN SC		82ed7e0a-7363-4dc0-9b 7c-ab962cb71a61
35	W_TRANSV_SIN SC		c28a9b6a-8c27-44e1-91 c8-f7f102234b77
35	W_TRANSV_SIN SC	27.7	93dbc567-0471-4fd1-972 f-08020d209ebc
35	W_TRANSV_CON SC		34a43f3e-2155-479a-b40 c-f91ce4e37326
35	W_TRANSV_CON SC		45810335-19f4-40c4-b93 a-79e35e86bbe1

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
35	W_TRANSV_CON SC	28.4	e6f4e130-7b05-43e1-b8b b-114d5239449c
35	W_LONG_SIN SC		eaac364d-3c25-40b8-8b c3-2828959f9f15
35	W_LONG_CON SC		8dad126f-867c-4135-a35 8-75573b4ed8fc
35	FRENADO		846e0e72-e42f-4863-ba9 d-5016067747d7
36	SC1		599dbee5-4dfd-4aab-86d 3-a595342d8c0a
36	W_TRANSV_SIN SC		7c784512-3650-46ba-82 b8-ae229896eca1
36	W_TRANSV_SIN SC		89106174-c771-4b2e-ab 81-febeec533769
36	W_TRANSV_SIN SC	27.7	c1453b6a-3cdb-4db2-80 ad-0b96d3a1907c
36	W_TRANSV_CON SC		181f7447-2bb9-42fd-bfc5 -d17bdf96c3c
36	W_TRANSV_CON SC		e1e1c494-c53a-48cb-9cb 3-e5715ee9d0d0
36	W_TRANSV_CON SC	28.4	7c2437a2-eb0d-41ea-82 5c-25d32f06225a
36	W_LONG_SIN SC		3a4c2847-187f-443f-8f7f- 1fed8cb4d743
36	W_LONG_CON SC		fba2045f-e041-4306-909f -2a8b2912079e
36	FRENADO		582d6604-2bf4-4d41-98f 4-481fa3635405
37	SC1		fe8ceba9-a342-4b3c-bbb d-20b82ffce13
37	W_TRANSV_SIN SC		01798438-e0a3-4561-a4 e6-b19aae309711
37	W_TRANSV_SIN SC		1ccd6993-7d1d-4478-a8 7e-5e302da635c2
37	W_TRANSV_SIN SC	27.7	22273583-c280-4e3e-b8 3a-125923b7339f
37	W_TRANSV_CON SC		04c26009-09b1-4cf6-b8d c-c15c3dfbb934
37	W_TRANSV_CON SC		60cce0c1-83f2-4bd3-9e5 d-8ea4d5c796d0
37	W_TRANSV_CON SC	28.4	f215b507-1053-455f-b8a 0-2ec3a7d66ed4
37	W_LONG_SIN SC		0299ce79-6fc0-49a1-aaff -4d740f01a296
37	W_LONG_CON SC		a2b049d7-354f-40db-bb9 c-bf3bc020ec3b
37	FRENADO		4185f1ad-2e31-4488-b91 d-556c987ee368
38	SC1		99f01ce4-f6d3-468f-89d9 -55947eb05b10
38	W_TRANSV_SIN SC		598797fe-1dc7-46ff-a650 -e3a0d54f09a0
38	W_TRANSV_SIN SC		57498a4e-9163-4061-8f6 4-13ec38e1fac1
38	W_TRANSV_SIN SC	27.7	3f8e470a-1fdd-43be-acb 8-aefd0660be37
38	W_TRANSV_CON SC		af42a8c4-79d1-4c3c-ace 2-8ee43f74c72d
38	W_TRANSV_CON SC		75e9a82f-01ba-4174-814 f-7565d5c8233f

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
38	W_TRANSV_CON SC	28.4	711998ba-86fc-4bfd-aae1-e637e76f2075
38	W_LONG_SIN SC		bf665a97-e4cd-4455-8d30-5c158b9a6552
38	W_LONG_CON SC		62a37015-0339-42ae-9495-caafcb5025e9
38	FRENADO		ffb7a94b-e0ee-44a6-9147-14b37b5cd7a5
39	SC1		0761b762-40ab-4ccc-83e2-d030e7c1fc31
39	W_TRANSV_SIN SC		9d984060-ce0b-4914-ba33-267e14492973
39	W_TRANSV_SIN SC		c43ba29d-ff95-40a8-beba-39c5f20f74da
39	W_TRANSV_SIN SC	27.7	040f444b-4a92-4114-881b-c5541c9d334b
39	W_TRANSV_CON SC		2fc280be-2956-4bf5-b198-a97c0ded836e
39	W_TRANSV_CON SC		5ff5cab8-474e-416c-a229-2b5fd4e7fe38
39	W_TRANSV_CON SC	28.4	363081a8-4689-4c87-b3bd-b889d76c67d5
39	W_LONG_SIN SC		b8b14125-0caa-4f93-bb97-b584f090ac9f
39	W_LONG_CON SC		04cb5763-4340-4d4b-9432-79df335844fc
39	FRENADO		bee91be1-c929-4895-9330-f3462ca2f052
42	W_TRANSV_SIN SC		87c2a0af-32da-42ee-976b-fc2fd44fce96
42	W_TRANSV_SIN SC		8a7fb9fc-745f-4063-9c93-f640b728d154
42	W_TRANSV_SIN SC	27.7	05244bce-0704-4e99-832d-8b78b60de9bc
42	W_TRANSV_CON SC		156248f0-85c9-490e-a147-cf966c6dae3f
42	W_TRANSV_CON SC		66420b89-4fbf-4734-a3ef-b67406ce9218
42	W_TRANSV_CON SC	28.4	82873669-69c4-4f91-aa79-2b13a256590a
42	W_LONG_SIN SC		fe382120-35f5-40bf-ba46-441b2b6077dc
42	W_LONG_CON SC		2618af65-d5c8-4da4-b5de-06ce1a402ef2
42	FRENADO		0c57e2a0-d818-49d8-9c46-6e0b16828e8b
43	W_TRANSV_SIN SC		fc87cdf7-92d1-4279-a53c-96239b46ada8
43	W_TRANSV_SIN SC		6126e4b0-22fb-4763-bd7b-1218c6f97695
43	W_TRANSV_SIN SC	27.7	270e5afb-0cc0-4b17-b782-3c617cc0b1a7
43	W_TRANSV_CON SC		eb6a1757-fdcc-4355-a083-8a492e8fade0
43	W_TRANSV_CON SC		2da7c03b-a4c6-48fd-91b7-6f9503b95196
43	W_TRANSV_CON SC	28.4	31cbffc2-3067-473b-9ce3-63da4c56bf97
43	W_LONG_SIN SC		c1758948-9e2d-4e80-83b6-5f482d797ebc

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
43	W_LONG_CON SC		7488a2a5-be99-4cfd-ad50-23c5e7c4361e
43	FRENADO		b3a04b47-44e4-4f53-9cf6-a6c56c1f8c73
44	W_TRANSV_SIN SC		922623eb-a9e6-4768-a5a0-1c417873a3ed
44	W_TRANSV_SIN SC		5fc3fa6b-f439-4744-b63e-1c1a77a279c2
44	W_TRANSV_SIN SC	27.7	f9ba83a2-af7f-429e-82ef-8ab44eb8f54e
44	W_TRANSV_CON SC		8d86ed19-5ced-442e-bdb7-af1268baa763
44	W_TRANSV_CON SC		ac7b0da5-688a-4264-9a15-af90be1e16de
44	W_TRANSV_CON SC	28.4	36241786-e757-47d0-8e88-e187529d8e26
44	W_LONG_SIN SC		17a2bdbf-275b-420a-b834-cd11b9002cf5
44	W_LONG_CON SC		cc94d525-c3c9-4858-bebd-c8d840a4f8bf
44	FRENADO		877323c7-c9e7-42f3-b101-7513e12b6e16
45	W_TRANSV_SIN SC		d5d27df2-b7b0-4d0c-883c-47c64c57dd15
45	W_TRANSV_SIN SC		d5e0df38-6082-4d75-8e6e-d393f5611fd7
45	W_TRANSV_SIN SC	27.7	17440bde-84ef-40ea-9f94-a4a4598cb906
45	W_TRANSV_CON SC		d17d0c9e-de1d-4c2f-99ac-20c10ea0a2e2
45	W_TRANSV_CON SC		745350d3-d884-4d45-96f6-eab982e69ce0
45	W_TRANSV_CON SC	28.4	3fa17fb5-66a4-4298-b7f3-370b792252b2
45	W_LONG_SIN SC		d1de945e-b4bb-4064-985d-3598888be11d
45	W_LONG_CON SC		796f4947-a115-4162-b89d-5f390a75afd7
45	FRENADO		e7fd4101-4424-4fbb-be3e-2662f158edc4
46	W_TRANSV_SIN SC		ed22c27c-31b7-4169-aa09-dd74320f89a8
46	W_TRANSV_SIN SC		22379789-4ce8-4df6-b097-ed486fbdaba6
46	W_TRANSV_SIN SC	27.7	a55a129d-88f2-4fa8-9cf9-0ebf24c26db2
46	W_TRANSV_CON SC		754f46e1-7881-4b97-a1fa-71ab265b0983
46	W_TRANSV_CON SC		e9a8cbe1-fa7b-46b4-8d05-d517f770e470
46	W_TRANSV_CON SC	28.4	cbf76cf2-976b-40ad-b410-6bcf311a39c7
46	W_LONG_SIN SC		f2bdcadd-47cc-4dee-91b6-2cb119a9c518
46	W_LONG_CON SC		6c85afb9-2bff-410b-a2a2-0a755de17664
46	FRENADO		78a6d2ff-dc9f-4d46-acf3-4b12356ed13b
47	W_TRANSV_SIN SC		ac0713f4-c8e0-470f-97bd-06df78bd4e39

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
47	W_TRANSV_SIN SC		78052851-b72b-4110-892c-4e8da4c05eee
47	W_TRANSV_SIN SC	27.7	3c7a6f1c-08b5-41c2-a96c-4d7233b1c3a7
47	W_TRANSV_CON SC		6c64587d-7914-47f9-9426-d2fb072ff45d
47	W_TRANSV_CON SC		695e7bb7-c4e8-4e29-a5a3-dba4b3b733d0
47	W_TRANSV_CON SC	28.4	5a24e1b4-ac0a-4708-acf9-137696f1ac29
47	W_LONG_SIN SC		ac6a450f-aa36-4ee7-90f7-e26130a382dd
47	W_LONG_CON SC		95743cca-33c8-41e5-8dd8-32bea1845897
47	FRENADO		05ab0114-cf22-45f1-adfc-3f056cfa0acd
48	W_TRANSV_SIN SC		63623407-f6ec-4c3d-b8e9-b7611798feb
48	W_TRANSV_SIN SC		e47dc150-53e7-434d-8d75-e9139ac37963
48	W_TRANSV_SIN SC	27.7	38df2646-57aa-4046-a915-bf949ccd9aca
48	W_TRANSV_CON SC		e2a321dd-c46e-4d10-b098-6ff446e46d11
48	W_TRANSV_CON SC		84306c4b-a7e3-4acf-b211-b48ccb5a3dfe
48	W_TRANSV_CON SC	28.4	fdb8dea1-a5ff-455e-b173-6cca27825826
48	W_LONG_SIN SC		a854372f-1ffc-43e6-aece-35b6f5419af8
48	W_LONG_CON SC		7767cb0b-adb3-42af-94e2-1fff6df9eef
48	FRENADO		ac246614-806d-4907-a29c-d43bfe1281f2
49	W_TRANSV_SIN SC		9561ce27-df81-40ad-90aa-ef2eab04922e
49	W_TRANSV_SIN SC		4a7b5afc-28c4-446c-a248-8f9e7ce24e8c
49	W_TRANSV_SIN SC	27.7	bce0d912-ba63-4a3d-bb12-3a68243b4905
49	W_TRANSV_CON SC		c7be9011-82c7-4aa4-8782-09d9659e9380
49	W_TRANSV_CON SC		59f0039e-b29c-49cb-a262-12d3836d78b3
49	W_TRANSV_CON SC	28.4	f8ab23a5-1e3f-42ce-a3b7-2559812c819a
49	W_LONG_SIN SC		bc7ddf32-1cb4-4f77-a601-9d48fe097b16
49	W_LONG_CON SC		2ef3c8be-60ff-41cc-b461-719a1f9663d1
49	FRENADO		81b7a7e3-4dfa-4278-9181-d4d9ced08f4f
50	W_TRANSV_SIN SC		09dec54c-3f82-4750-b5db-333bca56f02c
50	W_TRANSV_SIN SC		73543541-c5dd-49fc-b7a3-96185730a9dd
50	W_TRANSV_SIN SC	27.7	e67dfab2-0519-49ae-a52b-4b3b2b5f4f18
50	W_TRANSV_CON SC		802e84f9-ecb7-4490-bb51-beab97fa6b01

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
50	W_TRANSV_CON SC		9499a334-ec60-4776-b57e-4d17cd315b61
50	W_TRANSV_CON SC	28.4	35b942f2-0505-4f05-af5d-937403f10e1c
50	W_LONG_SIN SC		ec90b140-806e-4aa5-b4da-92dead625a01
50	W_LONG_CON SC		c7ec91ab-81bd-405d-b524-8e3bf4ab5594
50	FRENADO		e37fd232-724c-4fdd-ab3b-b827e11f3371
51	W_TRANSV_SIN SC		2a6691a0-99d4-4156-91e7-af42468e54bc
51	W_TRANSV_SIN SC		958b2091-cf5b-45ee-a65d-d17de29c7438
51	W_TRANSV_SIN SC	27.7	3ebe7eb6-97c1-42c6-b284-04ad32d5900e
51	W_TRANSV_CON SC		b1e17d04-4bed-4e08-8914-35d07670a9ad
51	W_TRANSV_CON SC		0710a608-5f3b-4d1d-b9c0-b8aa453a2a0b
51	W_TRANSV_CON SC	28.4	6c63461e-ab93-4b44-b5c2-5752fb64324d
51	W_LONG_SIN SC		3d5de1bc-ddc4-4391-a4f0-f830bb0a782c
51	W_LONG_CON SC		73e1a727-72df-4c41-8e6b-96aef227c9fb
51	FRENADO		b14f32bd-5a93-4643-b0e0-8e278e2b1b93
52	W_TRANSV_SIN SC		786b794d-f9e6-4b28-8a51-f63f476539cd
52	W_TRANSV_SIN SC		f1a1c93e-3276-457b-8901-0f34082d5770
52	W_TRANSV_SIN SC	27.7	3aec3019-765f-4bc9-8c27-ba303aabe4b1
52	W_TRANSV_CON SC		e70f71e6-fcdd-4707-b9ba-c71d594196a7
52	W_TRANSV_CON SC		e99f28fd-7884-4fdd-9d9b-bc59160e42b4
52	W_TRANSV_CON SC	28.4	c19ac91d-619a-4d1f-94a3-e5c80c5f5bed
52	W_LONG_SIN SC		aa927874-b1ea-42e5-a4e4-c9f40ed68dc1
52	W_LONG_CON SC		6b1a71eb-83f8-4f30-92d6-9d1de9b738d9
52	FRENADO		62ddc0dd-a0ce-498e-b7dd-6d810c66c241
53	W_TRANSV_SIN SC		032b1b60-0eb7-44fe-b3db-b39c97f22822
53	W_TRANSV_SIN SC		322b1245-d8f6-43e9-8989-24794773b650
53	W_TRANSV_SIN SC	27.7	5b52c9a7-2c95-4164-ab22-8edcf562c3eb
53	W_TRANSV_CON SC		6089ea07-46ac-4538-9370-61ae63cb21c4
53	W_TRANSV_CON SC		c28c26aa-59eb-464e-adc4-517ab4f818d9
53	W_TRANSV_CON SC	28.4	78941ad4-1cbe-473c-99df-81e3f7f04ee5
53	W_LONG_SIN SC		6597cc85-fdcb-44de-a54e-8d59c7b07bb7

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
53	W_LONG_CON SC		a305d8df-8981-4b7e-97c9-58178699049b
53	FRENADO		bad8413b-bda0-4957-8980-97efc967f162
54	W_TRANSV_SIN SC		fe340c62-25b2-40c7-89bc-433ee38d6909
54	W_TRANSV_SIN SC		1104ee20-9021-4d32-84f2-7d6d4e772309
54	W_TRANSV_SIN SC	27.7	f035389e-4ecb-4a75-afc1-dbc7e75ad066
54	W_TRANSV_CON SC		9450067b-7d70-4ba1-881a-3e3fd6b48832
54	W_TRANSV_CON SC		e9b26039-7aa2-42e8-88c9-fb81f9793dfd
54	W_TRANSV_CON SC	28.4	b14adecf-a3df-4e17-bfaf-f46493f0f361
54	W_LONG_SIN SC		0fb60719-a829-402e-b6c3-77b0bc0859e3
54	W_LONG_CON SC		c44307d7-d36f-4420-8502-14a6b88f2dfd
54	FRENADO		7fd32efe-0124-45b1-9c0e-ddca06fff207
55	W_TRANSV_SIN SC		548f8a9c-c59f-4ab8-a334-2069e83ae00e
55	W_TRANSV_SIN SC		c89ba06e-0fb8-4cca-9468-cb8be4e8029f
55	W_TRANSV_SIN SC	27.7	c3e32906-fb0f-4966-8c1d-3522c4847ef5
55	W_TRANSV_CON SC		7eea4578-657a-45ba-b473-013d9acc926f
55	W_TRANSV_CON SC		ae432fe6-141d-4900-b3bf-96b4f736f853
55	W_TRANSV_CON SC	28.4	e6f62a38-8cb9-46d0-b5a0-0e4e11141ba9
55	W_LONG_SIN SC		159fdcd2-2b76-4bf2-b979-affc4dd541e7
55	W_LONG_CON SC		15e98234-795f-4796-8e41-958d3df21dda
55	FRENADO		2ff65e85-f6fa-4a2e-b10c-4863b8076338
56	W_TRANSV_SIN SC		4ed95ecc-54aa-41eb-be9f-76123a95f43a
56	W_TRANSV_SIN SC		ec682103-0116-4369-917c-f8b6c556b38b
56	W_TRANSV_SIN SC	27.7	287daf0a-c2c9-4419-a068-8b53f02f64f5
56	W_TRANSV_CON SC		ff122232-878c-428e-b504-55f1a2774d0f
56	W_TRANSV_CON SC		ffb1e41-e2af-4f8b-8bf6-321440e27653
56	W_TRANSV_CON SC	28.4	83e4072d-520f-41b4-a686-c31c7bf99b79
56	W_LONG_SIN SC		e1380077-26fb-47ea-bf07-e07ad8346e65
56	W_LONG_CON SC		bc62358b-ecfb-418e-9d38-0608c1845fc5
56	FRENADO		6f91c5af-38bc-4fd0-8bd5-38a1268cda02
57	W_TRANSV_SIN SC		3a164f6b-2b10-47f9-90f5-fd9008a91fef

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
57	W_TRANSV_SIN SC		f6924047-015b-4546-a4a2-60c88046903e
57	W_TRANSV_SIN SC	27.7	f6162818-ae2d-4345-870a-d84d9e1ef90f
57	W_TRANSV_CON SC		12d08896-cac0-4ac6-8dda-e3df758442f9
57	W_TRANSV_CON SC		434fc496-bc8b-4e9f-90e8-9c29fd5463d5
57	W_TRANSV_CON SC	28.4	73aa62af-7983-4ff9-b18c-9e8a3764f7da
57	W_LONG_SIN SC		9017c6ee-1a69-4527-a285-242f38d5914d
57	W_LONG_CON SC		c183991a-bd8f-4cc7-b907-914bfa95d21b
57	FRENADO		d8f008f3-7fb8-478a-8c78-7dd64497e677
58	W_TRANSV_SIN SC		d14d3a0c-7d2b-49d4-956c-bdc539811db9
58	W_TRANSV_SIN SC		45d4417f-fbca-4fb6-8840-f4ff0a9832b2
58	W_TRANSV_SIN SC	27.7	9db278b5-7eb4-4175-88b2-6e075742b66f
58	W_TRANSV_CON SC		ae79ff8f-a73f-491f-89d4-cd4eb40373c0
58	W_TRANSV_CON SC		b8afe665-466b-45c8-9d6f-ffd84e52151a
58	W_TRANSV_CON SC	28.4	26873acd-8b34-4eb6-8708-82926847cdf8
58	W_LONG_SIN SC		62cc5791-7535-4c2a-8377-3b51a9ee902e
58	W_LONG_CON SC		0a015253-10d9-49bf-99dd-325d5ba63d11
58	FRENADO		d537c25c-97e1-4e99-a0ef-e1577bfe9349
59	W_TRANSV_SIN SC		1c56afcd-66e6-4e38-add6-c660814f5148
59	W_TRANSV_SIN SC		da7c298c-7e4c-47a9-83b6-6378a0f51b61
59	W_TRANSV_SIN SC	27.7	94e6bf3e-bf17-46e0-913d-e7fc973375d5
59	W_TRANSV_CON SC		d22eae68-52cd-4e02-98df-acfd4644426a
59	W_TRANSV_CON SC		40212765-72f5-4787-a3fc-1fe5357710d1
59	W_TRANSV_CON SC	28.4	7d98cda7-8e3a-409d-871a-1cabdd9146be
59	W_LONG_SIN SC		da1794da-0007-4e05-98e4-08ef1f846c3a
59	W_LONG_CON SC		5c6d8a3e-8e3b-4258-a55c-f63f02df45b4
59	FRENADO		97c1b90d-033a-4f87-bfe8-0485927f7f84
73	W_TRANSV_SIN SC		8266508a-2972-498c-a000-11e91f49dea6
73	W_TRANSV_SIN SC		f72be235-30e8-459a-bb3a-61241938232b
73	W_TRANSV_SIN SC	27.7	c1ab5251-48e9-411e-b072-e01801324a5e
73	W_TRANSV_CON SC		0d819f3b-e7d8-4594-98f8-399673ebda8a

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
73	W_TRANSV_CON SC		6f1cc808-5213-44a8-b8d9-0a1b099d354f
73	W_TRANSV_CON SC	28.4	ea727674-7a08-4f85-a10a-35a23ac0c2e6
73	W_LONG_SIN SC		eba3c4bd-edb4-4b62-87b8-0c4a65f5346f
73	W_LONG_CON SC		b04fe868-33c3-4cf9-a9dc-2b51a7353ebb
73	FRENADO		36bb0f18-3185-4c00-a86e-d08501c68296
74	W_TRANSV_SIN SC		9c51c401-dd6d-403a-9f0d-9842a567904a
74	W_TRANSV_SIN SC		d7d69416-7b48-4a6a-86c8-dbd0aa700f23
74	W_TRANSV_SIN SC	27.7	833ca7b5-ead2-4eef-b270-bef188b31c90
74	W_TRANSV_CON SC		68cd978f-7694-4351-8f9f-38cae85434cc
74	W_TRANSV_CON SC		770e1d44-7477-43bf-aa7d-7ca8f11b0a43
74	W_TRANSV_CON SC	28.4	8f123f65-2489-4b3f-aadf-a17342a18d6f
74	W_LONG_SIN SC		f9b80d13-f000-4710-86bd-88a37364558b
74	W_LONG_CON SC		c7d3ed65-4809-48a4-88c4-0ab90708ab61
74	FRENADO		4e41871f-9d60-44a2-be36-e014922a3838
96	W_TRANSV_SIN SC		1b0d774e-170b-42c6-bbc0-46d257cdbedd
96	W_TRANSV_SIN SC		3e825779-d313-4e02-b9ee-eb3afc0cd78e
96	W_TRANSV_SIN SC	27.7	287104cf-77a6-4b8e-aace-0810b9ea6627
96	W_TRANSV_CON SC		e30c483e-aac7-4d3a-9e11-f47372281a5f
96	W_TRANSV_CON SC		f07a98d6-37c8-47b8-9a66-79959a72c0a9
96	W_TRANSV_CON SC	28.4	283ceae7-8bb6-4a1c-87d9-12b992edf6da
96	W_LONG_SIN SC		9a7c742d-a98f-493a-9c22-99732ee1d0e0
96	W_LONG_CON SC		e8e7c2ea-4c41-439f-8049-eeefa1e2ed528
96	FRENADO		bcd92526-2753-4aad-8d80-97e89898822b
97	W_TRANSV_SIN SC		15d9cf97-3850-4e4d-a141-5c324c8d2058
97	W_TRANSV_SIN SC		8ceae58-cf84-474f-bfde-183ac511316b
97	W_TRANSV_SIN SC	27.7	da4b7320-8f3c-48de-963f-0f952505646c
97	W_TRANSV_CON SC		4be493d6-fdb3-46e6-9203-85a6337a6ab0
97	W_TRANSV_CON SC		821268e3-ae80-4fa5-b38c-8a9c05adfb62
97	W_TRANSV_CON SC	28.4	6d68d85d-5f93-4df9-a2e8-50b4ce2dc53b
97	W_LONG_SIN SC		10378375-c947-4459-917c-3a651c2e4189

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
97	W_LONG_CON SC		b01bca40-2a28-4d86-9107-26630bd7a8dc
97	FRENADO		d856a639-d109-43df-a4d4-02a9bdce566d
98	SC1		8e0b8285-364c-40f4-8934-db74a1d553b0
98	W_TRANSV_SIN SC		daf99ea3-2777-4110-97da-292b7b70264f
98	W_TRANSV_SIN SC		beb1251e-7438-409c-973b-1773a57c280f
98	W_TRANSV_SIN SC	27.7	c97b5b46-a3a6-42ed-9772-8442c8194ced
98	W_TRANSV_CON SC		fafce7c-c932-4559-b998-10579e01560f
98	W_TRANSV_CON SC		c016a2b2-bff3-4d7c-8f9e-47d6ab13ba18
98	W_TRANSV_CON SC	28.4	a81b322b-1688-4981-aeaf-e04e9670ea9f
98	W_LONG_SIN SC		6b8c0eb6-08ae-436a-bff8-e2f86f92dcc6
98	W_LONG_CON SC		ec24d5ea-857c-4565-b0e6-f4c327dd0d25
98	FRENADO		6f7a7018-f977-4e7e-bd2a-74312829ad27
99	SC1		8aeef2f-92ce-4b81-aacf-3c7b7d6b80ab
99	W_TRANSV_SIN SC		bdfc6592-0a32-46d2-8db4-7e31bf99651
99	W_TRANSV_SIN SC		2e428289-5dab-49a6-942e-c819840d3035
99	W_TRANSV_SIN SC	27.7	449f804b-6abb-4e75-a458-d9c7df2fcea1
99	W_TRANSV_CON SC		d24d21c4-3857-437f-984b-4339d27b2e6b
99	W_TRANSV_CON SC		96f36422-3f0c-47db-ac2f-fb5aabbfeecf
99	W_TRANSV_CON SC	28.4	ba7c38e7-6ced-4b67-9456-56b300e58c26
99	W_LONG_SIN SC		4ba3d21a-a893-418e-b60e-77fd42bafefc
99	W_LONG_CON SC		b8f5e011-67e4-455b-925b-4d49fcb66e7d
99	FRENADO		c42b8b26-8789-46ca-9c4a-3a0f5604294d
100	SC1		58570537-b225-403a-aedb-4e4e83abb037
100	W_TRANSV_SIN SC		670868a4-720d-40ae-8929-2e50cb5a6882
100	W_TRANSV_SIN SC		817e9657-de69-4149-aa62-817afe091436
100	W_TRANSV_SIN SC	27.7	3be482b5-5c96-4f25-9d07-1b7a3feef609
100	W_TRANSV_CON SC		72fc5756-e91d-4273-a871-a47beee114a4
100	W_TRANSV_CON SC		12eee9e5-0e3e-44f9-92f0-6a4fa0d49ae4
100	W_TRANSV_CON SC	28.4	f824a11a-4c35-4f14-940d-6194f66afcf5
100	W_LONG_SIN SC		b673351e-41b1-4095-89c8-8929c2d3a8e0

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
100	W_LONG_CON SC		0b61daef-449b-49a6-beb2-e310083d228b
100	FRENADO		8daa5789-69c1-4e2f-908e-1df28f4010be
101	SC1		02bb6fef-308c-4a67-bcb2-bdf64be77cf8
101	W_TRANSV_SIN SC		82d92b0e-06bf-42e2-9cf3-1b6cc10f1f8a
101	W_TRANSV_SIN SC		284317a6-46a5-4510-94ab-6a4c5624e95c
101	W_TRANSV_SIN SC	27.7	67f981a0-3f0d-4723-8589-9b8818a47ce2
101	W_TRANSV_CON SC		c582b7e7-715f-420e-978c-d9801fcae17f
101	W_TRANSV_CON SC		2b1291df-e7fc-41ba-8e34-ee70a28aa18b
101	W_TRANSV_CON SC	28.4	3634bb79-4d44-4ede-b5c4-ca098556f6f6
101	W_LONG_SIN SC		12710a6a-8644-46ab-9905-cd8ecd56dca3
101	W_LONG_CON SC		98f401cb-9bde-4a08-8b28-56b3fb9b44a1
101	FRENADO		c6ddd06e-a5a2-448a-9841-5f7eff705e7a
102	W_TRANSV_SIN SC		c4966ba9-b046-4f5a-a3c3-63936a2e4fb0
102	W_TRANSV_SIN SC		58ffe07d-b2c9-494e-bf1b-1cc3e7c688dd
102	W_TRANSV_SIN SC	27.7	fe21cea3-224f-4d4f-b4d0-6e8b404daf98
102	W_TRANSV_CON SC		61cb5020-c8f8-45c9-8be4-021223fc6a35
102	W_TRANSV_CON SC		adc833b9-1322-4750-be76-0b3fd378682c
102	W_TRANSV_CON SC	28.4	d92605b0-344c-467b-9341-05e17c01cfd
102	W_LONG_SIN SC		aba4d168-bbea-4a53-8a55-94d57c59f309
102	W_LONG_CON SC		cf148132-0a62-4fb9-8f01-b92b6e75c6f9
102	FRENADO		23e45e78-bc5b-4716-962a-3d2f69e15331
103	W_TRANSV_SIN SC		7fcfea69-fc6c-4d58-81e9-41ec2fdb4ef
103	W_TRANSV_SIN SC		48428393-f463-4837-841d-ecbd85498270
103	W_TRANSV_SIN SC	27.7	d28ceb40-a96a-452d-8198-fbf503673642
103	W_TRANSV_CON SC		eb61f972-dd56-4fee-9061-661d82340cbd
103	W_TRANSV_CON SC		5f8c1502-bfe9-4e8d-94c9-50bfb5c7c653
103	W_TRANSV_CON SC	28.4	f3c0a443-148f-45a8-af31-aa0825a2a0d4
103	W_LONG_SIN SC		f6109951-ebbe-4e78-81f6-c21ea1be0192
103	W_LONG_CON SC		fb96b534-325d-4ca9-a188-053a965f09f6
103	FRENADO		6c87e04e-2453-4ff7-8732-ae108db5fe38

Table: Frame Loads - Distributed, Part 3 of 3

Frame	LoadPat	MOverLB KN-m/m	GUID
104	W_TRANSV_SIN SC		6b78e4ce-ee42-4751-9d45-c15ef41c2a56
104	W_TRANSV_SIN SC		c144ccfa-b95b-4769-b302-97b80f9efc9e
104	W_TRANSV_SIN SC	27.7	02f77b34-1798-4be3-9510-e3bc46137c04
104	W_TRANSV_CON SC		10f9d3a8-5d8a-41d9-be8c-4aad6f6aee1f
104	W_TRANSV_CON SC		914eb2f2-7a44-42ad-a340-43d5ea0d77a7
104	W_TRANSV_CON SC	28.4	51c248be-a3a5-45dc-b6d7-52852aaba5a4
104	W_LONG_SIN SC		1aa9ba0c-154c-4606-91db-bd0dea53a48e
104	W_LONG_CON SC		dfe05fb5-cfa7-4422-b930-ac014e024dab
104	FRENADO		14bbfc56-6dd3-4542-90e3-38e277227ea1
105	W_TRANSV_SIN SC		9da771c6-8ab4-4e7a-adb5-266e60220a8c
105	W_TRANSV_SIN SC		25bfda4c-f188-4ca2-87a5-023707442e79
105	W_TRANSV_SIN SC	27.7	6ca6b647-6701-45de-bf2a-e72b5be56530
105	W_TRANSV_CON SC		2e1349f6-8220-4a84-b436-b7edb251d98f
105	W_TRANSV_CON SC		915d313c-5376-489b-aaef-044ab433c57d
105	W_TRANSV_CON SC	28.4	015b4c10-47b9-4403-9e1c-3d5a174577ef
105	W_LONG_SIN SC		3d5fe3a5-71ef-4557-86e7-1d0ba8fd31d8
105	W_LONG_CON SC		b79a877a-67cc-46f7-906c-7fb654ae4dc5
105	FRENADO		1773b1c0-a824-432c-9f1a-1729ab73ac7a

Table: Frame Loads - Temperature

Table: Frame Loads - Temperature						
Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern	
2	TEMP+	Temperature	31.		None	
2	TEMP+	Gradient2		-6.	None	
2	TEMP-	Temperature	-20.		None	
2	TEMP-	Gradient2		3.2	None	
2	REOLOGÍA	Temperature	-50.		None	
3	TEMP+	Temperature	31.		None	
3	TEMP+	Gradient2		-6.	None	
3	TEMP-	Temperature	-20.		None	
3	TEMP-	Gradient2		3.2	None	
3	REOLOGÍA	Temperature	-50.		None	
4	TEMP+	Temperature	31.		None	
4	TEMP+	Gradient2		-6.	None	
4	TEMP-	Temperature	-20.		None	
4	TEMP-	Gradient2		3.2	None	
4	REOLOGÍA	Temperature	-50.		None	

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
5	TEMP+	Temperature	31.		None
5	TEMP+	Gradient2		-6.	None
5	TEMP-	Temperature	-20.		None
5	TEMP-	Gradient2		3.2	None
5	REOLOGÍA	Temperature	-50.		None
6	TEMP+	Temperature	31.		None
6	TEMP+	Gradient2		-6.	None
6	TEMP-	Temperature	-20.		None
6	TEMP-	Gradient2		3.2	None
6	REOLOGÍA	Temperature	-50.		None
7	TEMP+	Temperature	31.		None
7	TEMP+	Gradient2		-6.	None
7	TEMP-	Temperature	-20.		None
7	TEMP-	Gradient2		3.2	None
7	REOLOGÍA	Temperature	-50.		None
8	TEMP+	Temperature	31.		None
8	TEMP+	Gradient2		-6.	None
8	TEMP-	Temperature	-20.		None
8	TEMP-	Gradient2		3.2	None
8	REOLOGÍA	Temperature	-50.		None
9	TEMP+	Temperature	31.		None
9	TEMP+	Gradient2		-6.	None
9	TEMP-	Temperature	-20.		None
9	TEMP-	Gradient2		3.2	None
9	REOLOGÍA	Temperature	-50.		None
10	TEMP+	Temperature	31.		None
10	TEMP+	Gradient2		-6.	None
10	TEMP-	Temperature	-20.		None
10	TEMP-	Gradient2		3.2	None
10	REOLOGÍA	Temperature	-50.		None
11	TEMP+	Temperature	31.		None
11	TEMP+	Gradient2		-6.	None
11	TEMP-	Temperature	-20.		None
11	TEMP-	Gradient2		3.2	None
11	REOLOGÍA	Temperature	-50.		None
12	TEMP+	Temperature	31.		None
12	TEMP+	Gradient2		-6.	None
12	TEMP-	Temperature	-20.		None
12	TEMP-	Gradient2		3.2	None
12	REOLOGÍA	Temperature	-50.		None
13	TEMP+	Temperature	31.		None
13	TEMP+	Gradient2		-6.	None
13	TEMP-	Temperature	-20.		None
13	TEMP-	Gradient2		3.2	None
13	REOLOGÍA	Temperature	-50.		None
14	TEMP+	Temperature	31.		None
14	TEMP+	Gradient2		-6.	None
14	TEMP-	Temperature	-20.		None
14	TEMP-	Gradient2		3.2	None
14	REOLOGÍA	Temperature	-50.		None
15	TEMP+	Temperature	31.		None
15	TEMP+	Gradient2		-6.	None
15	TEMP-	Temperature	-20.		None
15	TEMP-	Gradient2		3.2	None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
15	REOLOGÍA	Temperature	-50.		None
16	TEMP+	Temperature	31.		None
16	TEMP+	Gradient2		-6.	None
16	TEMP-	Temperature	-20.		None
16	TEMP-	Gradient2		3.2	None
16	REOLOGÍA	Temperature	-50.		None
17	TEMP+	Temperature	31.		None
17	TEMP+	Gradient2		-6.	None
17	TEMP-	Temperature	-20.		None
17	TEMP-	Gradient2		3.2	None
17	REOLOGÍA	Temperature	-50.		None
18	TEMP+	Temperature	31.		None
18	TEMP+	Gradient2		-6.	None
18	TEMP-	Temperature	-20.		None
18	TEMP-	Gradient2		3.2	None
18	REOLOGÍA	Temperature	-50.		None
19	TEMP+	Temperature	31.		None
19	TEMP+	Gradient2		-6.	None
19	TEMP-	Temperature	-20.		None
19	TEMP-	Gradient2		3.2	None
19	REOLOGÍA	Temperature	-50.		None
22	TEMP+	Temperature	31.		None
22	TEMP+	Gradient2		-6.	None
22	TEMP-	Temperature	-20.		None
22	TEMP-	Gradient2		3.2	None
22	REOLOGÍA	Temperature	-50.		None
23	TEMP+	Temperature	31.		None
23	TEMP+	Gradient2		-6.	None
23	TEMP-	Temperature	-20.		None
23	TEMP-	Gradient2		3.2	None
23	REOLOGÍA	Temperature	-50.		None
24	TEMP+	Temperature	31.		None
24	TEMP+	Gradient2		-6.	None
24	TEMP-	Temperature	-20.		None
24	TEMP-	Gradient2		3.2	None
24	REOLOGÍA	Temperature	-50.		None
25	TEMP+	Temperature	31.		None
25	TEMP+	Gradient2		-6.	None
25	TEMP-	Temperature	-20.		None
25	TEMP-	Gradient2		3.2	None
25	REOLOGÍA	Temperature	-50.		None
26	TEMP+	Temperature	31.		None
26	TEMP+	Gradient2		-6.	None
26	TEMP-	Temperature	-20.		None
26	TEMP-	Gradient2		3.2	None
26	REOLOGÍA	Temperature	-50.		None
27	TEMP+	Temperature	31.		None
27	TEMP+	Gradient2		-6.	None
27	TEMP-	Temperature	-20.		None
27	TEMP-	Gradient2		3.2	None
27	REOLOGÍA	Temperature	-50.		None
28	TEMP+	Temperature	31.		None
28	TEMP+	Gradient2		-6.	None
28	TEMP-	Temperature	-20.		None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
28	TEMP-	Gradient2		3.2	None
28	REOLOGÍA	Temperature	-50.		None
29	TEMP+	Temperature	31.		None
29	TEMP+	Gradient2		-6.	None
29	TEMP-	Temperature	-20.		None
29	TEMP-	Gradient2		3.2	None
29	REOLOGÍA	Temperature	-50.		None
30	TEMP+	Temperature	31.		None
30	TEMP+	Gradient2		-6.	None
30	TEMP-	Temperature	-20.		None
30	TEMP-	Gradient2		3.2	None
30	REOLOGÍA	Temperature	-50.		None
31	TEMP+	Temperature	31.		None
31	TEMP+	Gradient2		-6.	None
31	TEMP-	Temperature	-20.		None
31	TEMP-	Gradient2		3.2	None
31	REOLOGÍA	Temperature	-50.		None
32	TEMP+	Temperature	31.		None
32	TEMP+	Gradient2		-6.	None
32	TEMP-	Temperature	-20.		None
32	TEMP-	Gradient2		3.2	None
32	REOLOGÍA	Temperature	-50.		None
33	TEMP+	Temperature	31.		None
33	TEMP+	Gradient2		-6.	None
33	TEMP-	Temperature	-20.		None
33	TEMP-	Gradient2		3.2	None
33	REOLOGÍA	Temperature	-50.		None
34	TEMP+	Temperature	31.		None
34	TEMP+	Gradient2		-6.	None
34	TEMP-	Temperature	-20.		None
34	TEMP-	Gradient2		3.2	None
34	REOLOGÍA	Temperature	-50.		None
35	TEMP+	Temperature	31.		None
35	TEMP+	Gradient2		-6.	None
35	TEMP-	Temperature	-20.		None
35	TEMP-	Gradient2		3.2	None
35	REOLOGÍA	Temperature	-50.		None
36	TEMP+	Temperature	31.		None
36	TEMP+	Gradient2		-6.	None
36	TEMP-	Temperature	-20.		None
36	TEMP-	Gradient2		3.2	None
36	REOLOGÍA	Temperature	-50.		None
37	TEMP+	Temperature	31.		None
37	TEMP+	Gradient2		-6.	None
37	TEMP-	Temperature	-20.		None
37	TEMP-	Gradient2		3.2	None
37	REOLOGÍA	Temperature	-50.		None
38	TEMP+	Temperature	31.		None
38	TEMP+	Gradient2		-6.	None
38	TEMP-	Temperature	-20.		None
38	TEMP-	Gradient2		3.2	None
38	REOLOGÍA	Temperature	-50.		None
39	TEMP+	Temperature	31.		None
39	TEMP+	Gradient2		-6.	None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
39	TEMP-	Temperature	-20.		None
39	TEMP-	Gradient2		3.2	None
39	REOLOGÍA	Temperature	-50.		None
42	TEMP+	Temperature	31.		None
42	TEMP+	Gradient2		-6.	None
42	TEMP-	Temperature	-20.		None
42	TEMP-	Gradient2		3.2	None
42	REOLOGÍA	Temperature	-50.		None
43	TEMP+	Temperature	31.		None
43	TEMP+	Gradient2		-6.	None
43	TEMP-	Temperature	-20.		None
43	TEMP-	Gradient2		3.2	None
43	REOLOGÍA	Temperature	-50.		None
44	TEMP+	Temperature	31.		None
44	TEMP+	Gradient2		-6.	None
44	TEMP-	Temperature	-20.		None
44	TEMP-	Gradient2		3.2	None
44	REOLOGÍA	Temperature	-50.		None
45	TEMP+	Temperature	31.		None
45	TEMP+	Gradient2		-6.	None
45	TEMP-	Temperature	-20.		None
45	TEMP-	Gradient2		3.2	None
45	REOLOGÍA	Temperature	-50.		None
46	TEMP+	Temperature	31.		None
46	TEMP+	Gradient2		-6.	None
46	TEMP-	Temperature	-20.		None
46	TEMP-	Gradient2		3.2	None
46	REOLOGÍA	Temperature	-50.		None
47	TEMP+	Temperature	31.		None
47	TEMP+	Gradient2		-6.	None
47	TEMP-	Temperature	-20.		None
47	TEMP-	Gradient2		3.2	None
47	REOLOGÍA	Temperature	-50.		None
48	TEMP+	Temperature	31.		None
48	TEMP+	Gradient2		-6.	None
48	TEMP-	Temperature	-20.		None
48	TEMP-	Gradient2		3.2	None
48	REOLOGÍA	Temperature	-50.		None
49	TEMP+	Temperature	31.		None
49	TEMP+	Gradient2		-6.	None
49	TEMP-	Temperature	-20.		None
49	TEMP-	Gradient2		3.2	None
49	REOLOGÍA	Temperature	-50.		None
50	TEMP+	Temperature	31.		None
50	TEMP+	Gradient2		-6.	None
50	TEMP-	Temperature	-20.		None
50	TEMP-	Gradient2		3.2	None
50	REOLOGÍA	Temperature	-50.		None
51	TEMP+	Temperature	31.		None
51	TEMP+	Gradient2		-6.	None
51	TEMP-	Temperature	-20.		None
51	TEMP-	Gradient2		3.2	None
51	REOLOGÍA	Temperature	-50.		None
52	TEMP+	Temperature	31.		None



Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
52	TEMP+	Gradient2		-6.	None
52	TEMP-	Temperature	-20.		None
52	TEMP-	Gradient2		3.2	None
52	REOLOGÍA	Temperature	-50.		None
53	TEMP+	Temperature	31.		None
53	TEMP+	Gradient2		-6.	None
53	TEMP-	Temperature	-20.		None
53	TEMP-	Gradient2		3.2	None
53	REOLOGÍA	Temperature	-50.		None
54	TEMP+	Temperature	31.		None
54	TEMP+	Gradient2		-6.	None
54	TEMP-	Temperature	-20.		None
54	TEMP-	Gradient2		3.2	None
54	REOLOGÍA	Temperature	-50.		None
55	TEMP+	Temperature	31.		None
55	TEMP+	Gradient2		-6.	None
55	TEMP-	Temperature	-20.		None
55	TEMP-	Gradient2		3.2	None
55	REOLOGÍA	Temperature	-50.		None
56	TEMP+	Temperature	31.		None
56	TEMP+	Gradient2		-6.	None
56	TEMP-	Temperature	-20.		None
56	TEMP-	Gradient2		3.2	None
56	REOLOGÍA	Temperature	-50.		None
57	TEMP+	Temperature	31.		None
57	TEMP+	Gradient2		-6.	None
57	TEMP-	Temperature	-20.		None
57	TEMP-	Gradient2		3.2	None
57	REOLOGÍA	Temperature	-50.		None
58	TEMP+	Temperature	31.		None
58	TEMP+	Gradient2		-6.	None
58	TEMP-	Temperature	-20.		None
58	TEMP-	Gradient2		3.2	None
58	REOLOGÍA	Temperature	-50.		None
59	TEMP+	Temperature	31.		None
59	TEMP+	Gradient2		-6.	None
59	TEMP-	Temperature	-20.		None
59	TEMP-	Gradient2		3.2	None
59	REOLOGÍA	Temperature	-50.		None
73	TEMP+	Temperature	31.		None
73	TEMP+	Gradient2		-6.	None
73	TEMP-	Temperature	-20.		None
73	TEMP-	Gradient2		3.2	None
73	REOLOGÍA	Temperature	-50.		None
74	TEMP+	Temperature	31.		None
74	TEMP+	Gradient2		-6.	None
74	TEMP-	Temperature	-20.		None
74	TEMP-	Gradient2		3.2	None
74	REOLOGÍA	Temperature	-50.		None
96	TEMP+	Temperature	31.		None
96	TEMP+	Gradient2		-6.	None
96	TEMP-	Temperature	-20.		None
96	TEMP-	Gradient2		3.2	None
96	REOLOGÍA	Temperature	-50.		None

Table: Frame Loads - Temperature

Frame	LoadPat	Type	Temp C	TempGrad2 C/m	JtPattern
97	TEMP+	Temperature	31.		None
97	TEMP+	Gradient2		-6.	None
97	TEMP-	Temperature	-20.		None
97	TEMP-	Gradient2		3.2	None
97	REOLOGÍA	Temperature	-50.		None
98	TEMP+	Temperature	31.		None
98	TEMP+	Gradient2		-6.	None
98	TEMP-	Temperature	-20.		None
98	TEMP-	Gradient2		3.2	None
98	REOLOGÍA	Temperature	-50.		None
99	TEMP+	Temperature	31.		None
99	TEMP+	Gradient2		-6.	None
99	TEMP-	Temperature	-20.		None
99	TEMP-	Gradient2		3.2	None
99	REOLOGÍA	Temperature	-50.		None
100	TEMP+	Temperature	31.		None
100	TEMP+	Gradient2		-6.	None
100	TEMP-	Temperature	-20.		None
100	TEMP-	Gradient2		3.2	None
100	REOLOGÍA	Temperature	-50.		None
101	TEMP+	Temperature	31.		None
101	TEMP+	Gradient2		-6.	None
101	TEMP-	Temperature	-20.		None
101	TEMP-	Gradient2		3.2	None
101	REOLOGÍA	Temperature	-50.		None
102	TEMP+	Temperature	31.		None
102	TEMP+	Gradient2		-6.	None
102	TEMP-	Temperature	-20.		None
102	TEMP-	Gradient2		3.2	None
102	REOLOGÍA	Temperature	-50.		None
103	TEMP+	Temperature	31.		None
103	TEMP+	Gradient2		-6.	None
103	TEMP-	Temperature	-20.		None
103	TEMP-	Gradient2		3.2	None
103	REOLOGÍA	Temperature	-50.		None
104	TEMP+	Temperature	31.		None
104	TEMP+	Gradient2		-6.	None
104	TEMP-	Temperature	-20.		None
104	TEMP-	Gradient2		3.2	None
104	REOLOGÍA	Temperature	-50.		None
105	TEMP+	Temperature	31.		None
105	TEMP+	Gradient2		-6.	None
105	TEMP-	Temperature	-20.		None
105	TEMP-	Gradient2		3.2	None
105	REOLOGÍA	Temperature	-50.		None

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
			m		
2	MaxStaSpcg		0.5	Yes	Yes
3	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
4	MaxStaSpcg		0.5	Yes	Yes
5	MaxStaSpcg		0.5	Yes	Yes
6	MaxStaSpcg		0.5	Yes	Yes
7	MaxStaSpcg		0.5	Yes	Yes
8	MaxStaSpcg		0.5	Yes	Yes
9	MaxStaSpcg		0.5	Yes	Yes
10	MaxStaSpcg		0.5	Yes	Yes
11	MaxStaSpcg		0.5	Yes	Yes
12	MaxStaSpcg		0.5	Yes	Yes
13	MaxStaSpcg		0.5	Yes	Yes
14	MaxStaSpcg		0.5	Yes	Yes
15	MaxStaSpcg		0.5	Yes	Yes
16	MaxStaSpcg		0.5	Yes	Yes
17	MaxStaSpcg		0.5	Yes	Yes
18	MaxStaSpcg		0.5	Yes	Yes
19	MaxStaSpcg		0.5	Yes	Yes
22	MaxStaSpcg		0.5	Yes	Yes
23	MaxStaSpcg		0.5	Yes	Yes
24	MaxStaSpcg		0.5	Yes	Yes
25	MaxStaSpcg		0.5	Yes	Yes
26	MaxStaSpcg		0.5	Yes	Yes
27	MaxStaSpcg		0.5	Yes	Yes
28	MaxStaSpcg		0.5	Yes	Yes
29	MaxStaSpcg		0.5	Yes	Yes
30	MaxStaSpcg		0.5	Yes	Yes
31	MaxStaSpcg		0.5	Yes	Yes
32	MaxStaSpcg		0.5	Yes	Yes
33	MaxStaSpcg		0.5	Yes	Yes
34	MaxStaSpcg		0.5	Yes	Yes
35	MaxStaSpcg		0.5	Yes	Yes
36	MaxStaSpcg		0.5	Yes	Yes
37	MaxStaSpcg		0.5	Yes	Yes
38	MaxStaSpcg		0.5	Yes	Yes
39	MaxStaSpcg		0.5	Yes	Yes
42	MaxStaSpcg		0.5	Yes	Yes
43	MaxStaSpcg		0.5	Yes	Yes
44	MaxStaSpcg		0.5	Yes	Yes
45	MaxStaSpcg		0.5	Yes	Yes
46	MaxStaSpcg		0.5	Yes	Yes
47	MaxStaSpcg		0.5	Yes	Yes
48	MaxStaSpcg		0.5	Yes	Yes
49	MaxStaSpcg		0.5	Yes	Yes
50	MaxStaSpcg		0.5	Yes	Yes
51	MaxStaSpcg		0.5	Yes	Yes
52	MaxStaSpcg		0.5	Yes	Yes
53	MaxStaSpcg		0.5	Yes	Yes
54	MaxStaSpcg		0.5	Yes	Yes
55	MaxStaSpcg		0.5	Yes	Yes
56	MaxStaSpcg		0.5	Yes	Yes
57	MaxStaSpcg		0.5	Yes	Yes
58	MaxStaSpcg		0.5	Yes	Yes
59	MaxStaSpcg		0.5	Yes	Yes
61	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
62	MaxStaSpcg		0.5	Yes	Yes
63	MinNumSta	3		Yes	Yes
64	MinNumSta	3		Yes	Yes
65	MaxStaSpcg		0.5	Yes	Yes
66	MaxStaSpcg		0.5	Yes	Yes
67	MinNumSta	3		Yes	Yes
68	MinNumSta	3		Yes	Yes
69	MinNumSta	3		Yes	Yes
70	MinNumSta	3		Yes	Yes
71	MinNumSta	3		Yes	Yes
72	MinNumSta	3		Yes	Yes
73	MaxStaSpcg		0.5	Yes	Yes
74	MaxStaSpcg		0.5	Yes	Yes
75	MaxStaSpcg		0.5	Yes	Yes
76	MaxStaSpcg		0.5	Yes	Yes
77	MinNumSta	3		Yes	Yes
78	MinNumSta	3		Yes	Yes
79	MinNumSta	3		Yes	Yes
80	MinNumSta	3		Yes	Yes
81	MaxStaSpcg		0.5	Yes	Yes
82	MinNumSta	3		Yes	Yes
83	MinNumSta	3		Yes	Yes
84	MaxStaSpcg		0.5	Yes	Yes
85	MaxStaSpcg		0.5	Yes	Yes
86	MinNumSta	3		Yes	Yes
87	MinNumSta	3		Yes	Yes
88	MinNumSta	3		Yes	Yes
89	MinNumSta	3		Yes	Yes
90	MaxStaSpcg		0.5	Yes	Yes
91	MaxStaSpcg		0.5	Yes	Yes
92	MaxStaSpcg		0.5	Yes	Yes
93	MaxStaSpcg		0.5	Yes	Yes
94	MinNumSta	3		Yes	Yes
95	MinNumSta	3		Yes	Yes
96	MaxStaSpcg		0.5	Yes	Yes
97	MaxStaSpcg		0.5	Yes	Yes
98	MaxStaSpcg		0.5	Yes	Yes
99	MaxStaSpcg		0.5	Yes	Yes
100	MaxStaSpcg		0.5	Yes	Yes
101	MaxStaSpcg		0.5	Yes	Yes
102	MaxStaSpcg		0.5	Yes	Yes
103	MaxStaSpcg		0.5	Yes	Yes
104	MaxStaSpcg		0.5	Yes	Yes
105	MaxStaSpcg		0.5	Yes	Yes
117	MaxStaSpcg		0.5	Yes	Yes
118	MaxStaSpcg		0.5	Yes	Yes
119	MaxStaSpcg		0.5	Yes	Yes
120	MaxStaSpcg		0.5	Yes	Yes
121	MinNumSta	3		Yes	Yes
122	MinNumSta	3		Yes	Yes
123	MinNumSta	3		Yes	Yes
124	MinNumSta	3		Yes	Yes
125	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Output Station Assignments

Frame	StationType	MinNumSta	MaxStaSpcg	AddAtElmIn t	AddAtPtLoa d
			m		
126	MinNumSta	3		Yes	Yes
127	MinNumSta	3		Yes	Yes
128	MaxStaSpcg		0.5	Yes	Yes
129	MaxStaSpcg		0.5	Yes	Yes
130	MinNumSta	3		Yes	Yes
131	MinNumSta	3		Yes	Yes
132	MinNumSta	3		Yes	Yes
133	MinNumSta	3		Yes	Yes
134	MaxStaSpcg		0.5	Yes	Yes
135	MaxStaSpcg		0.5	Yes	Yes
136	MaxStaSpcg		0.5	Yes	Yes
137	MaxStaSpcg		0.5	Yes	Yes
138	MinNumSta	3		Yes	Yes
139	MinNumSta	3		Yes	Yes
140	MaxStaSpcg		0.5	Yes	Yes
141	MaxStaSpcg		0.5	Yes	Yes

Table: Frame Release Assignments 1 - General, Part 1 of 2

Table: Frame Release Assignments 1 - General, Part 1 of 2

Frame	PI	V2I	V3I	TI	M2I	M3I	PJ	V2J
98	No	Yes	No	No	No	Yes	No	No
102	No	Yes	No	No	No	Yes	No	No

Table: Frame Release Assignments 1 - General, Part 2 of 2

Table: Frame Release Assignments 1 - General, Part 2 of 2

Frame	V3J	TJ	M2J	M3J	PartialFix
98	No	No	No	No	No
102	No	No	No	No	No

Table: Frame Section Assignments

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
2	Section Designer	N.A.	MG	N.A.	Default
3	Section Designer	N.A.	MG	N.A.	Default
4	Section Designer	N.A.	MG	N.A.	Default
5	Section Designer	N.A.	MG	N.A.	Default
6	Section Designer	N.A.	MG	N.A.	Default
7	Section Designer	N.A.	MG	N.A.	Default
8	Section Designer	N.A.	MG	N.A.	Default
9	Section Designer	N.A.	MG	N.A.	Default
10	Section Designer	N.A.	MG	N.A.	Default
11	Section Designer	N.A.	MG	N.A.	Default
12	Section Designer	N.A.	MG	N.A.	Default
13	Section Designer	N.A.	MG	N.A.	Default
14	Section Designer	N.A.	MG	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
15	Section Designer	N.A.	MG	N.A.	Default
16	Section Designer	N.A.	MG	N.A.	Default
17	Section Designer	N.A.	MG	N.A.	Default
18	Section Designer	N.A.	MG	N.A.	Default
19	Section Designer	N.A.	MG	N.A.	Default
22	Section Designer	N.A.	MG	N.A.	Default
23	Section Designer	N.A.	MG	N.A.	Default
24	Section Designer	N.A.	MG	N.A.	Default
25	Section Designer	N.A.	MG	N.A.	Default
26	Section Designer	N.A.	MG	N.A.	Default
27	Section Designer	N.A.	MG	N.A.	Default
28	Section Designer	N.A.	MG	N.A.	Default
29	Section Designer	N.A.	MG	N.A.	Default
30	Section Designer	N.A.	MG	N.A.	Default
31	Section Designer	N.A.	MG	N.A.	Default
32	Section Designer	N.A.	MG	N.A.	Default
33	Section Designer	N.A.	MG	N.A.	Default
34	Section Designer	N.A.	MG	N.A.	Default
35	Section Designer	N.A.	MG	N.A.	Default
36	Section Designer	N.A.	MG	N.A.	Default
37	Section Designer	N.A.	MG	N.A.	Default
38	Section Designer	N.A.	MG	N.A.	Default
39	Section Designer	N.A.	MG	N.A.	Default
42	Section Designer	N.A.	MG	N.A.	Default
43	Section Designer	N.A.	MG	N.A.	Default
44	Section Designer	N.A.	MG	N.A.	Default
45	Section Designer	N.A.	MG	N.A.	Default
46	Section Designer	N.A.	MG	N.A.	Default
47	Section Designer	N.A.	MG	N.A.	Default
48	Section Designer	N.A.	MG	N.A.	Default
49	Section Designer	N.A.	MG	N.A.	Default
50	Section Designer	N.A.	MG	N.A.	Default
51	Section Designer	N.A.	MG	N.A.	Default
52	Section Designer	N.A.	MG	N.A.	Default
53	Section Designer	N.A.	MG	N.A.	Default
54	Section Designer	N.A.	MG	N.A.	Default
55	Section Designer	N.A.	MG	N.A.	Default
56	Section Designer	N.A.	MG	N.A.	Default
57	Section Designer	N.A.	MG	N.A.	Default
58	Section Designer	N.A.	MG	N.A.	Default
59	Section Designer	N.A.	MG	N.A.	Default
61	General	N.A.	BIELA	N.A.	Default
62	General	N.A.	BIELA	N.A.	Default
63	General	N.A.	BIELA	N.A.	Default
64	General	N.A.	BIELA	N.A.	Default
65	General	N.A.	BIELA	N.A.	Default
66	General	N.A.	BIELA	N.A.	Default
67	General	N.A.	BIELA	N.A.	Default
68	General	N.A.	BIELA	N.A.	Default
69	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
70	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
71	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
72	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
73	Section Designer	N.A.	MG	N.A.	Default
74	Section Designer	N.A.	MG	N.A.	Default
75	General	N.A.	BIELA	N.A.	Default
76	General	N.A.	BIELA	N.A.	Default
77	General	N.A.	BIELA	N.A.	Default
78	General	N.A.	BIELA	N.A.	Default
79	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
80	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
81	Rectangular	N.A.	DINTEL	DINTEL	Default
82	General	N.A.	BIELA	N.A.	Default
83	General	N.A.	BIELA	N.A.	Default
84	General	N.A.	BIELA	N.A.	Default
85	General	N.A.	BIELA	N.A.	Default
86	General	N.A.	BIELA	N.A.	Default
87	General	N.A.	BIELA	N.A.	Default
88	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
89	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
90	General	N.A.	BIELA	N.A.	Default
91	General	N.A.	BIELA	N.A.	Default
92	General	N.A.	BIELA	N.A.	Default
93	General	N.A.	BIELA	N.A.	Default
94	Circle	N.A.	PILARES	PILARES	Default
95	Circle	N.A.	PILARES	PILARES	Default
96	Section Designer	N.A.	MG	N.A.	Default
97	Section Designer	N.A.	MG	N.A.	Default
98	Section Designer	N.A.	MG	N.A.	Default
99	Section Designer	N.A.	MG	N.A.	Default
100	Section Designer	N.A.	MG	N.A.	Default
101	Section Designer	N.A.	MG	N.A.	Default
102	Section Designer	N.A.	MG	N.A.	Default
103	Section Designer	N.A.	MG	N.A.	Default
104	Section Designer	N.A.	MG	N.A.	Default
105	Section Designer	N.A.	MG	N.A.	Default
117	Rectangular	N.A.	DINTEL	DINTEL	Default
118	Rectangular	N.A.	DINTEL	DINTEL	Default
119	General	N.A.	BIELA	N.A.	Default
120	General	N.A.	BIELA	N.A.	Default
121	General	N.A.	BIELA	N.A.	Default
122	General	N.A.	BIELA	N.A.	Default
123	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
124	Rectangular	N.A.	NZ_600.500.(144/104)	N.A.	Default
125	Rectangular	N.A.	DINTEL	DINTEL	Default
126	General	N.A.	BIELA	N.A.	Default
127	General	N.A.	BIELA	N.A.	Default
128	General	N.A.	BIELA	N.A.	Default
129	General	N.A.	BIELA	N.A.	Default
130	General	N.A.	BIELA	N.A.	Default
131	General	N.A.	BIELA	N.A.	Default
132	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default

Table: Frame Section Assignments

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
133	Rectangular	N.A.	NZ_500.400.(129/93)	N.A.	Default
134	General	N.A.	BIELA	N.A.	Default
135	General	N.A.	BIELA	N.A.	Default
136	General	N.A.	BIELA	N.A.	Default
137	General	N.A.	BIELA	N.A.	Default
138	Circle	N.A.	PILARES	PILARES	Default
139	Circle	N.A.	PILARES	PILARES	Default
140	Rectangular	N.A.	DINTEL	DINTEL	Default
141	Rectangular	N.A.	DINTEL	DINTEL	Default

Table: Frame Section Properties 01 - General, Part 1 of 6

Table: Frame Section Properties 01 - General, Part 1 of 6

SectionName	Material	Shape	t3 m	t2 m	Area m2	TorsConst m4
BIELA	BIELA	General	0.1	0.1	100.	100.
DINTEL	HA-30	Rectangular	1.2	2.	2.4	0.721247
MG	HA-50	SD Section			4.86448	3.594913
MG_GENERAL	HA-50	General	0.4572	0.254	4.8601	30.
NZ_500.400.(129/93)	NEOPRENO	Rectangular	0.4	0.5	0.2	0.005474
NZ_600.500.(144/104)	NEOPRENO	Rectangular	0.5	0.6	0.3	0.012402
PILARES	HA-30	Circle	1.		0.785398	0.098175

Table: Frame Section Properties 01 - General, Part 2 of 6

Table: Frame Section Properties 01 - General, Part 2 of 6

SectionName	I33 m4	I22 m4	I23 m4	AS2 m2	AS3 m2	S33 m3	S22 m3
BIELA	100.	100.	0.	0.	0.	1.	1.
DINTEL	0.288	0.8	0.	2.	2.	0.48	0.8
MG	4.102445	30.141251	0.	1.637659	3.078773	2.550938	6.481989
MG_GENERAL	4.0999	29.9244	0.	0.	0.	1.	1.
NZ_500.400.(129/93)	0.002667	0.004167	0.	0.166667	0.166667	0.013333	0.016667
NZ_600.500.(144/104)	0.00625	0.009	0.	0.25	0.25	0.025	0.03
PILARES	0.049087	0.049087	0.	0.706858	0.706858	0.098175	0.098175

Table: Frame Section Properties 01 - General, Part 3 of 6

Table: Frame Section Properties 01 - General, Part 3 of 6

SectionName	Z33 m3	Z22 m3	R33 m	R22 m	EccV2 m	ConcCol	ConcBeam
BIELA	1.	1.	1.	1.	0.	No	No
DINTEL	0.72	1.2	0.34641	0.57735		Yes	No
MG	3.406723	9.202041	0.918339	2.489215		No	No
MG_GENERAL	1.	1.	1.	1.	0.	No	No
NZ_500.400.(129/93)	0.02	0.025	0.11547	0.144338		No	No
NZ_600.500.(144/104)	0.0375	0.045	0.144338	0.173205		No	No
PILARES	0.166667	0.166667	0.25	0.25		Yes	No

**Table: Frame Section Properties 01 - General, Part 4 of 6**

Table: Frame Section Properties 01 - General, Part 4 of 6							
SectionName	Color	TotalWt KN	TotalMass KN-s2/m	FromFile	AMod	A2Mod	A3Mod
BIELA	Yellow	0.	0.	No	1.	1.	1.
DINTEL	Blue	720.	73.42	No	1.	1.	1.
MG	Blue	15681.	1599.02	No	1.	1.	1.
MG_GENERAL	Magenta	0.	0.	No	1.	1.	1.
NZ_500.400.(129/93)	Magenta	0.	0.	No	1000.	1.	1.
NZ_600.500.(144/104)	Cyan	0.	0.	No	1000.	1.	1.
PILARES	Red	439.823	44.85	No	1.	1.	1.

**Table: Frame Section Properties 01 - General, Part 5 of 6**

Table: Frame Section Properties 01 - General, Part 5 of 6						
SectionName	JMod	I2Mod	I3Mod	MMod	WMod	GUID
BIELA	1.	1.	1.	1.	1.	
DINTEL	1.	1.	1.	1.	1.	
MG	1.	1.	1.	1.	1.	
MG_GENERAL	1.	1.	1.	1.	1.	
NZ_500.400.(129/93)	1.	1.	1.	1.	1.	
NZ_600.500.(144/104)	1.	1.	1.	1.	1.	
PILARES	1.	1.	1.	1.	1.	

**Table: Frame Section Properties 01 - General, Part 6 of 6**

Table: Frame Section Properties 01 - General, Part 6 of 6	
SectionName	Notes
BIELA	Added 12/06/2020 11:13:38
DINTEL	Added 12/06/2020 11:15:33
MG	Added 12/06/2020 11:03:20
MG_GENERAL	Added 12/06/2020 11:56:56
NZ_500.400.(129/93)	Added 15/06/2020 15:16:22
NZ_600.500.(144/104)	Added 12/06/2020 11:22:57
PILARES	Added 12/06/2020 11:12:41

**Table: Frame Section Properties 02 - Concrete Column, Part 1 of 2**

Table: Frame Section Properties 02 - Concrete Column, Part 1 of 2								
SectionName	RebarMatL	RebarMatC	ReinfConfig	LatReinf	Cover m	NumBars3D ir	NumBars2D ir	NumBarsCir c
DINTEL	A615Gr60	A615Gr60	Rectangular	Ties	0.04	3	3	
PILARES	A615Gr60	A615Gr60	Circular	Ties	0.04			8

**Table: Frame Section Properties 02 - Concrete Column, Part 2 of 2**

Table: Frame Section Properties 02 - Concrete Column, Part 2 of 2						
SectionName	BarSizeL	BarSizeC	SpacingC m	NumCBars2	NumCBars3	ReinfType
DINTEL	#9	#4	0.15	3	3	Design
PILARES	#9	#4	0.15			Design

**Table: Frame Section Properties 13 - Time Dependent**

Table: Frame Section Properties 13 - Time Dependent					
SectionName	TypeSize	AutoValSize m	AutoSFSize	UserValSize m	
BIELA	None				
DINTEL	Auto	0.75		1.	
MG	Auto	0.27692		1.	
MG_GENERAL	None				
NZ_500.400.(129/93)	Auto	0.22222		1.	
NZ_600.500.(144/104)	Auto	0.27273		1.	
PILARES	Auto	0.5		1.	

**Table: Function - Response Spectrum - User**

Table: Function - Response Spectrum - User			
Name	Period Sec	Accel	FuncDamp
UNIFRS	0.	1.	0.05
UNIFRS	1.	1.	
ESPECTRO	0.	0.1092	0.05
ESPECTRO	0.1517	0.2731	
ESPECTRO	0.6068	0.2731	
ESPECTRO	0.7523	0.2202	
ESPECTRO	0.8978	0.1846	
ESPECTRO	1.0433	0.1588	
ESPECTRO	1.1888	0.1394	
ESPECTRO	1.3344	0.1242	
ESPECTRO	1.4799	0.112	
ESPECTRO	1.6254	0.1019	
ESPECTRO	1.7709	0.0936	
ESPECTRO	1.9164	0.0865	
ESPECTRO	2.0619	0.0804	
ESPECTRO	2.2074	0.0751	
ESPECTRO	2.3529	0.0704	
ESPECTRO	2.4984	0.0663	
ESPECTRO	2.6439	0.0627	
ESPECTRO	2.7895	0.0594	
ESPECTRO	2.935	0.0565	
ESPECTRO	3.0805	0.0538	
ESPECTRO	3.226	0.0514	
ESPECTRO	3.3715	0.0491	
ESPECTRO	3.517	0.0471	
ESPECTRO	3.667	0.0433	
ESPECTRO	3.817	0.04	
ESPECTRO	3.967	0.037	

Table: Function - Response Spectrum - User

Name	Period Sec	Accel	FuncDamp
ESPECTRO	4.117	0.0344	
ESPECTRO	4.267	0.032	
ESPECTRO	4.417	0.0299	
ESPECTRO	4.567	0.0279	
ESPECTRO	4.717	0.0262	
ESPECTRO	4.867	0.0246	
ESPECTRO	5.017	0.0232	
ESPECTRO	5.167	0.0218	
ESPECTRO	5.317	0.0206	
ESPECTRO	5.467	0.0195	
ESPECTRO	5.617	0.0185	
ESPECTRO	5.767	0.0175	
ESPECTRO	5.917	0.0166	
ESPECTRO	6.067	0.0158	
ESPECTRO	6.217	0.0151	
ESPECTRO	6.367	0.0144	
ESPECTRO	6.517	0.0137	
ESPECTRO	6.667	0.0131	
ESPECTRO	6.817	0.0125	
ESPECTRO	6.967	0.012	
ESPECTRO	7.117	0.0115	
ESPECTRO	7.267	0.011	
ESPECTRO	7.417	0.0106	
ESPECTRO	7.567	0.	

Table: Joint Coordinates, Part 1 of 2

Joint	CoordSys	CoordType	XorR m	Y m	Z m	SpecialJt	GlobalX m
1	GLOBAL	Cartesian	2.25	0.	0.	No	2.25
2	GLOBAL	Cartesian	4.5	0.	0.	No	4.5
3	GLOBAL	Cartesian	6.75	0.	0.	No	6.75
4	GLOBAL	Cartesian	9.	0.	0.	No	9.
5	GLOBAL	Cartesian	11.25	0.	0.	No	11.25
6	GLOBAL	Cartesian	13.5	0.	0.	No	13.5
7	GLOBAL	Cartesian	15.75	0.	0.	No	15.75
8	GLOBAL	Cartesian	18.	0.	0.	No	18.
9	GLOBAL	Cartesian	20.25	0.	0.	No	20.25
10	GLOBAL	Cartesian	22.5	0.	0.	No	22.5
11	GLOBAL	Cartesian	24.75	0.	0.	No	24.75
12	GLOBAL	Cartesian	27.	0.	0.	No	27.
13	GLOBAL	Cartesian	29.25	0.	0.	No	29.25
14	GLOBAL	Cartesian	31.5	0.	0.	No	31.5
15	GLOBAL	Cartesian	33.75	0.	0.	No	33.75
16	GLOBAL	Cartesian	36.	0.	0.	No	36.
17	GLOBAL	Cartesian	38.25	0.	0.	No	38.25
18	GLOBAL	Cartesian	40.5	0.	0.	No	40.5
19	GLOBAL	Cartesian	42.75	0.	0.	No	42.75
20	GLOBAL	Cartesian	47.25	0.	0.	No	47.25
21	GLOBAL	Cartesian	49.5	0.	0.	No	49.5
22	GLOBAL	Cartesian	51.75	0.	0.	No	51.75
23	GLOBAL	Cartesian	54.	0.	0.	No	54.

Table: Joint Coordinates, Part 1 of 2

Joint	CoordSys	CoordType	XorR m	Y m	Z m	SpecialJt	GlobalX m
24	GLOBAL	Cartesian	56.25	0.	0.	No	56.25
25	GLOBAL	Cartesian	58.5	0.	0.	No	58.5
26	GLOBAL	Cartesian	60.75	0.	0.	No	60.75
27	GLOBAL	Cartesian	63.	0.	0.	No	63.
28	GLOBAL	Cartesian	65.25	0.	0.	No	65.25
29	GLOBAL	Cartesian	67.5	0.	0.	No	67.5
30	GLOBAL	Cartesian	69.75	0.	0.	No	69.75
31	GLOBAL	Cartesian	72.	0.	0.	No	72.
32	GLOBAL	Cartesian	74.25	0.	0.	No	74.25
33	GLOBAL	Cartesian	76.5	0.	0.	No	76.5
34	GLOBAL	Cartesian	78.75	0.	0.	No	78.75
35	GLOBAL	Cartesian	81.	0.	0.	No	81.
36	GLOBAL	Cartesian	83.25	0.	0.	No	83.25
37	GLOBAL	Cartesian	85.5	0.	0.	No	85.5
38	GLOBAL	Cartesian	87.75	0.	0.	No	87.75
39	GLOBAL	Cartesian	91.5	0.	0.	No	91.5
40	GLOBAL	Cartesian	93.	0.	0.	No	93.
41	GLOBAL	Cartesian	94.5	0.	0.	No	94.5
42	GLOBAL	Cartesian	96.	0.	0.	No	96.
43	GLOBAL	Cartesian	97.5	0.	0.	No	97.5
44	GLOBAL	Cartesian	99.	0.	0.	No	99.
45	GLOBAL	Cartesian	100.5	0.	0.	No	100.5
46	GLOBAL	Cartesian	102.	0.	0.	No	102.
47	GLOBAL	Cartesian	103.5	0.	0.	No	103.5
48	GLOBAL	Cartesian	105.	0.	0.	No	105.
49	GLOBAL	Cartesian	106.5	0.	0.	No	106.5
50	GLOBAL	Cartesian	108.	0.	0.	No	108.
51	GLOBAL	Cartesian	109.5	0.	0.	No	109.5
52	GLOBAL	Cartesian	111.	0.	0.	No	111.
53	GLOBAL	Cartesian	112.5	0.	0.	No	112.5
54	GLOBAL	Cartesian	114.	0.	0.	No	114.
55	GLOBAL	Cartesian	115.5	0.	0.	No	115.5
56	GLOBAL	Cartesian	117.	0.	0.	No	117.
57	GLOBAL	Cartesian	118.5	0.	0.	No	118.5
63	GLOBAL	Cartesian	0.	0.	0.	No	0.
64	GLOBAL	Cartesian	45.	0.	0.	No	45.
65	GLOBAL	Cartesian	0.5	0.	0.	No	0.5
66	GLOBAL	Cartesian	0.5	2.25	0.	No	0.5
67	GLOBAL	Cartesian	0.5	-2.25	0.	No	0.5
68	GLOBAL	Cartesian	0.5	2.25	-1.896	No	0.5
69	GLOBAL	Cartesian	0.5	-2.25	-1.896	No	0.5
70	GLOBAL	Cartesian	44.5	0.	0.	No	44.5
71	GLOBAL	Cartesian	44.5	2.25	0.	No	44.5
72	GLOBAL	Cartesian	44.5	-2.25	0.	No	44.5
73	GLOBAL	Cartesian	44.5	2.25	-1.896	No	44.5
74	GLOBAL	Cartesian	44.5	-2.25	-1.896	No	44.5
75	GLOBAL	Cartesian	0.5	2.25	-2.	No	0.5
76	GLOBAL	Cartesian	0.5	-2.25	-2.	No	0.5
77	GLOBAL	Cartesian	44.5	2.25	-2.	No	44.5
78	GLOBAL	Cartesian	44.5	-2.25	-2.	No	44.5
79	GLOBAL	Cartesian	90.	0.	0.	No	90.
80	GLOBAL	Cartesian	120.	0.	0.	No	120.
81	GLOBAL	Cartesian	119.5	0.	0.	No	119.5
82	GLOBAL	Cartesian	119.5	2.25	0.	No	119.5

Table: Joint Coordinates, Part 1 of 2

Joint	CoordSys	CoordType	XorR m	Y m	Z m	SpecialJt	GlobalX m
83	GLOBAL	Cartesian	119.5	-2.25	0.	No	119.5
84	GLOBAL	Cartesian	119.5	2.25	-1.907	No	119.5
85	GLOBAL	Cartesian	119.5	-2.25	-1.907	No	119.5
86	GLOBAL	Cartesian	119.5	2.25	-2.	No	119.5
87	GLOBAL	Cartesian	119.5	-2.25	-2.	No	119.5
88	GLOBAL	Cartesian	45.	2.25	-2.6	No	45.
89	GLOBAL	Cartesian	45.	-2.25	-2.6	No	45.
90	GLOBAL	Cartesian	45.	2.25	-2.	No	45.
91	GLOBAL	Cartesian	45.	-2.25	-2.	No	45.
92	GLOBAL	Cartesian	45.5	0.	0.	No	45.5
93	GLOBAL	Cartesian	45.5	2.25	0.	No	45.5
94	GLOBAL	Cartesian	45.5	-2.25	0.	No	45.5
95	GLOBAL	Cartesian	45.5	2.25	-1.896	No	45.5
96	GLOBAL	Cartesian	45.5	-2.25	-1.896	No	45.5
97	GLOBAL	Cartesian	45.5	2.25	-2.	No	45.5
98	GLOBAL	Cartesian	45.5	-2.25	-2.	No	45.5
99	GLOBAL	Cartesian	45.	2.25	-8.2	No	45.
100	GLOBAL	Cartesian	45.	-2.25	-8.2	No	45.
121	GLOBAL	Cartesian	45.	3.	-2.6	No	45.
122	GLOBAL	Cartesian	45.	-3.	-2.6	No	45.
123	GLOBAL	Cartesian	89.5	0.	0.	No	89.5
124	GLOBAL	Cartesian	89.5	2.25	0.	No	89.5
125	GLOBAL	Cartesian	89.5	-2.25	0.	No	89.5
126	GLOBAL	Cartesian	89.5	2.25	-1.896	No	89.5
127	GLOBAL	Cartesian	89.5	-2.25	-1.896	No	89.5
128	GLOBAL	Cartesian	89.5	2.25	-2.	No	89.5
129	GLOBAL	Cartesian	89.5	-2.25	-2.	No	89.5
130	GLOBAL	Cartesian	90.	2.25	-2.6	No	90.
131	GLOBAL	Cartesian	90.	-2.25	-2.6	No	90.
132	GLOBAL	Cartesian	90.	2.25	-2.	No	90.
133	GLOBAL	Cartesian	90.	-2.25	-2.	No	90.
134	GLOBAL	Cartesian	90.5	0.	0.	No	90.5
135	GLOBAL	Cartesian	90.5	2.25	0.	No	90.5
136	GLOBAL	Cartesian	90.5	-2.25	0.	No	90.5
137	GLOBAL	Cartesian	90.5	2.25	-1.907	No	90.5
138	GLOBAL	Cartesian	90.5	-2.25	-1.907	No	90.5
139	GLOBAL	Cartesian	90.5	2.25	-2.	No	90.5
140	GLOBAL	Cartesian	90.5	-2.25	-2.	No	90.5
141	GLOBAL	Cartesian	90.	2.25	-8.2	No	90.
142	GLOBAL	Cartesian	90.	-2.25	-8.2	No	90.
143	GLOBAL	Cartesian	90.	3.	-2.6	No	90.
144	GLOBAL	Cartesian	90.	-3.	-2.6	No	90.

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
4	0.	0.	a9013c89-dbf-4b2b-99c6-cc80182f97b1
5	0.	0.	4a3b1642-9eaf-4d87-a5af-238fb21b2982
6	0.	0.	fc578de3-3348-4ebb-ae6e-62a1057893bc
7	0.	0.	66b7f8d9-b21c-4ce0-b410-4ef956feaf27
8	0.	0.	32876635-c301-4016-a530-d049b0f8d10b
9	0.	0.	d235ce2c-52a3-477d-b17a-9abd32f022c8
10	0.	0.	9a98ec2b-ac06-48ee-831d-534667c2e888
11	0.	0.	98ed7f86-7495-477a-8a3a-61ab7a54d8c5
12	0.	0.	871a6dc-6ce5-487d-a155-cf3f5a255009
13	0.	0.	7635b6a4-92df-4704-ae42-959b4cbe6469
14	0.	0.	e9a8d4df-c55a-4377-921c-87b34fd827a8
15	0.	0.	5f829b75-541a-48cb-9848-de0b71b2afe6
16	0.	0.	d5a0d785-e6ee-44b4-8139-6e39190cbece
17	0.	0.	e69e4ea0-7be7-4d55-b9c9-e33c770f1dc0
18	0.	0.	497dce26-ca0b-44f0-9cec-61d239aa3c5f
19	0.	0.	d1e4c800-b737-4d42-a867-07d327c3d8d3
20	0.	0.	417d9934-d277-43e0-883a-37af943f170f
21	0.	0.	90814c07-4c4b-40d7-930a-7bb17332d41a
22	0.	0.	fcdb18db-7f29-4679-81bf-37cea09ea4b6
23	0.	0.	6b743b80-9e14-482d-a17c-c94288a48954
24	0.	0.	c8a7a035-064f-40c9-8d3d-f3997c475b8a
25	0.	0.	2df2926f-5e2e-4da7-93e1-2340483a5f1d
26	0.	0.	d46ff447-ed03-4d98-aef0-7deb042189d6
27	0.	0.	408066d4-ab04-4314-9a47-6f4fc3b029c6
28	0.	0.	3ddcf968-e3b7-406b-8a85-0e7bc0aa8ee4
29	0.	0.	428745f1-9596-4296-9dbc-97339a795c22
30	0.	0.	d6dc0b01-2da8-4ae4-b9bf-0326f38af18d
31	0.	0.	1860d09f-8460-45e3-8c45-7fa3dd874659
32	0.	0.	0dc8ad44-08f2-4db2-878c-835fdb326f1
33	0.	0.	eb94545d-9655-4bdf-a424-f67a3754bfe3

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
1	0.	0.	d05c1164-173c-415b-9edb-728a6a0a730f
2	0.	0.	6b97d9a2-2f9d-4689-ac94-324560f226a2
3	0.	0.	acf74b23-2cc2-4bfe-aa15-1594cfcff718

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
34	0.	0.	18b7d30f-faff-4578-b04e-834f59ec3bf6
35	0.	0.	5195c399-f90c-4169-9722-f8f282651716
36	0.	0.	91156e7a-461d-4c00-9c49-09e5388617d7
37	0.	0.	5bd268c4-5dc6-46ab-afee-806b86f90e2d
38	0.	0.	d2abb0f6-64a6-47d9-a6d9-fe4ad8c7d5b2
39	0.	0.	00f19098-796a-4dfe-b4b3-f78e745d4c5a
40	0.	0.	731f194f-a4f6-4467-b7e6-91843c5df28e
41	0.	0.	79016158-deed-41bf-8f98-507756433012
42	0.	0.	68fbc3c-fc69-4270-9c36-86e78a6f9a04
43	0.	0.	a9aca5c0-b6d1-4f8a-8aab-e48baf945f6b
44	0.	0.	8a04af72-63fc-401f-b8f8-76d4d208daa2
45	0.	0.	967c8307-c53e-47a9-9653-46afbb80cc1b
46	0.	0.	e44c3665-3739-4da5-9d04-55f427a9ff0a
47	0.	0.	53fe6bc1-6bdf-4c56-b6a7-7c976ce91539
48	0.	0.	caee6e8d-92d4-414d-9769-c3fbed314cca
49	0.	0.	f845e042-5a18-4116-8b16-a88256f4b1b6
50	0.	0.	f908ee04-80d5-443f-8f15-5343d666cf90
51	0.	0.	4140b362-1260-4cd4-a6be-b1960ae2767f
52	0.	0.	2a3d43c3-b90f-40db-9269-f1c3aa55f18b
53	0.	0.	cfb63d06-d213-48b8-91b7-1ea14509388f
54	0.	0.	eea9f207-4e5a-47df-96a0-e3befddcc31d
55	0.	0.	e4fd0778-692e-407a-8704-19437a7f8445
56	0.	0.	59120438-6696-44b4-95a6-fb419628dc50
57	0.	0.	31db3622-d5a2-4623-a210-e1d4ca0a2710
63	0.	0.	778b8359-c542-4970-bb04-0e2466f04172
64	0.	0.	72a0a5cf-d98e-4f86-9807-174b824a2f47
65	0.	0.	02569b19-4746-4372-a0d6-f85ca95dbacf
66	2.25	0.	1acb5cf3-68dd-4140-bb34-9ae2dbb72f70
67	-2.25	0.	b63877d5-6f6c-4f81-9deb-82b9f6e36605
68	2.25	-1.896	b764142d-a67f-4e2c-a1b0-7f1e69470f9b

Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
69	-2.25	-1.896	4026250a-6c85-47f8-b5fe-b6db58a3ee61
70	0.	0.	38e38e73-b62f-4afa-8c40-af5b386985e7
71	2.25	0.	1fd3b37d-a212-4cad-aa4f-4ab38baeeb35
72	-2.25	0.	168f0ceb-f349-4fd8-ae9e-76e0d7793104
73	2.25	-1.896	017db964-0852-4937-97f0-328d7dde21af
74	-2.25	-1.896	40206c6b-bbcd-478d-b743-d1b2268b5b5c
75	2.25	-2.	372e93a8-b5e0-4889-920c-dbb711a93695
76	-2.25	-2.	c1609882-fc71-48cb-9211-5c6b0199d615
77	2.25	-2.	9e7e0c61-7fc9-480c-bd1a-e47b906dc226
78	-2.25	-2.	2701f0e7-6c25-4e4f-811f-ccad6a4c9edd
79	0.	0.	103791de-ee5f-42d0-a6e9-c19b519ccd6b
80	0.	0.	4010d0fb-db46-44bf-a45a-07fd2d677ff1
81	0.	0.	d9c593c6-9a41-4511-8968-50f2f85ad944
82	2.25	0.	dd529566-4ca5-41c4-8add-e3256064ca57
83	-2.25	0.	804d6b02-5968-4f34-86d0-7c6ebd85e057
84	2.25	-1.907	e025dedf-0fbc-44c9-9c5d-e6961086b0c7
85	-2.25	-1.907	89dcfaab-3337-44f5-b712-2ff4336db618
86	2.25	-2.	2389ccc1-106e-4c8a-a90a-c04c76e6a970
87	-2.25	-2.	eeeed4fa-f499-4c1e-aa9d-48cd922c898b
88	2.25	-2.6	1f85d779-a95e-45ab-8bd8-6ec6d6079879
89	-2.25	-2.6	c225297e-21ad-4f5d-b1fe-92747b8814ff
90	2.25	-2.	eee195e8-7bb4-4af0-bd20-5c10d84b6b03
91	-2.25	-2.	75a15670-9f09-4cee-9ad3-746d14e719d6
92	0.	0.	b06883b4-c8ce-4805-ba7a-4680efbb5436
93	2.25	0.	4c77200e-51ae-48db-915b-750d9dd7df6d
94	-2.25	0.	c6438240-fe03-4549-bb9d-681befe2fcf5
95	2.25	-1.896	f7f98bd6-adc0-4f8a-8cab-d9838d1f3e28
96	-2.25	-1.896	8f482254-d8f1-4aff-a492-f06b6b84abd1
97	2.25	-2.	e94781d2-4ab1-4996-9d12-8167d236bb24
98	-2.25	-2.	3b469e70-5b25-4f1b-8f4a-3c7babb3e24f



Table: Joint Coordinates, Part 2 of 2

Joint	GlobalY m	GlobalZ m	GUID
99	2.25	-8.2	a9e3a99d-ffc9-4fd9-bc14-d86a29d8780b
100	-2.25	-8.2	e82cb81c-cad7-456a-a3-ee-dda95db3b605
121	3.	-2.6	7c760473-fb50-4987-b9f-6-c14514d1c173
122	-3.	-2.6	4ffb61a5-6a78-4235-beb-5-03519d04b2e8
123	0.	0.	6d03bd39-f3ce-4c3e-896-9-d850407e9813
124	2.25	0.	54862123-d2d5-459a-a3-ad-4e04fc966468
125	-2.25	0.	e0abe029-2364-4479-97-bf-c22c4a89144d
126	2.25	-1.896	d4b4d562-27bc-450a-a6-b1-d8291ea6ceea
127	-2.25	-1.896	8c93a67a-64b3-4dcf-a39-a-c93aa09b54a5
128	2.25	-2.	ed41c844-c1cb-48ee-a7-15-48c896cbd5cd
129	-2.25	-2.	09d25980-8080-494d-bff-8-534596d1bf4c
130	2.25	-2.6	9c7c0472-c476-46d6-b2-03-764e7ffdb3f3
131	-2.25	-2.6	f3b86aee-6390-48b7-b2a-4-0413bb69f30d
132	2.25	-2.	9df79ab8-e796-47ba-bc3-6-158e3e85469d
133	-2.25	-2.	311e2150-3f0c-4cf7-90e-0-db058bde84c7
134	0.	0.	564a3aa9-fe19-4117-854-7-5325d58378e2
135	2.25	0.	daab7865-4e67-4379-ac-96-b6676c4f7635
136	-2.25	0.	1967730c-fe35-46a6-9dd-e-4bb76843d894
137	2.25	-1.907	05610b3a-5643-4fce-ac7-f-4f7a198f8d66
138	-2.25	-1.907	cf1ff3d4-5f6b-453a-8866-b1c78f971c73
139	2.25	-2.	f337a219-95a5-4186-9c3-d-8369b7f2241c
140	-2.25	-2.	02f7aaee-8b36-48fe-b4e-c-160628939abf
141	2.25	-8.2	66a6ea8b-6448-45e0-95-36-d7d83062170b
142	-2.25	-8.2	55ab1661-7666-4e52-b3-c9-f0f47f0ac3ec
143	3.	-2.6	65e79e86-0126-47da-aa-8c-fdcf84b779e1
144	-3.	-2.6	82d83ce0-939d-492b-83-90-ed7904edd586

Table: Load Case Definitions, Part 1 of 3

Table: Load Case Definitions, Part 1 of 3							
Case	Type	InitialCond	ModalCase	BaseCase	MassSource	DesTypeOpt	DesignType
DEAD	LinStatic	Zero				Prog Det	Dead
MODAL	LinModal	Zero				Prog Det	Other
SC1	LinStatic	Zero				Prog Det	Dead
TEMP+	LinStatic	Zero				Prog Det	Dead
TEMP-	LinStatic	Zero				Prog Det	Dead
W_TRANSV _SIN SC	LinStatic	Zero				Prog Det	Dead
W_TRANSV _CON SC	LinStatic	Zero				Prog Det	Dead
W_LONG_SI N SC	LinStatic	Zero				Prog Det	Dead
W_LONG_C ON SC	LinStatic	Zero				Prog Det	Dead
FRENADO	LinStatic	Zero				Prog Det	Dead
REOLOGÍA	LinStatic	Zero				Prog Det	Dead
SISMO_LON G	LinRespSpec		MODAL			Prog Det	Quake
SISMO_TRA NSV	LinRespSpec		MODAL			Prog Det	Quake
SISMO_VER T	LinRespSpec		MODAL			Prog Det	Quake

Table: Load Case Definitions, Part 2 of 3

Table: Load Case Definitions, Part 2 of 3						
Case	DesActOpt	DesignAct	AutoType	RunCase	CaseStatus	GUID
DEAD	Prog Det	Non-Composite	None	Yes	Not Run	64ea085f-ebef-4d83-aec-1-7e51b1edec8f
MODAL	Prog Det	Other	None	Yes	Not Run	775678b0-e134-464a-a5-44-d2c08f2ea5d4
SC1	Prog Det	Non-Composite	None	Yes	Not Run	5810e76e-1c93-4ab5-91-84-735e9af8ccd3
TEMP+	Prog Det	Non-Composite	None	Yes	Not Run	af872b97-1eb1-45f3-bac-c-34fc8f719cd6
TEMP-	Prog Det	Non-Composite	None	Yes	Not Run	a220224f-d2af-439a-a4f4-5f830b4fce85
W_TRANSV _SIN SC	Prog Det	Non-Composite	None	Yes	Not Run	d75a9e16-04e5-4e08-9c-15-c2cda619292d
W_TRANSV _CON SC	Prog Det	Non-Composite	None	Yes	Not Run	13d13855-d2ba-467a-a2-8e-82dd3b0bf5de
W_LONG_SI N SC	Prog Det	Non-Composite	None	Yes	Not Run	e5549487-0dcb-4ced-b0f-0-1a60b816c63c
W_LONG_C ON SC	Prog Det	Non-Composite	None	Yes	Not Run	13364c90-3700-4a35-8b-10-05d3bb4d5fab
FRENADO	Prog Det	Non-Composite	None	Yes	Not Run	8a42a991-2449-4db2-af7-7-5895c1c2aace
REOLOGÍA	Prog Det	Non-Composite	None	Yes	Not Run	048e039b-f057-4efa-a39-d-cd3cfb3db4fb
SISMO_LON G	Prog Det	Short-Term Composite	None	Yes	Not Run	67b791bb-ddd7-44e3-a7-0f-52ef8f187f3a
SISMO_TRA NSV	Prog Det	Short-Term Composite	None	Yes	Not Run	67b791bb-ddd7-44e3-a7-0f-52ef8f187f3a
SISMO_VER T	Prog Det	Short-Term Composite	None	Yes	Not Run	67b791bb-ddd7-44e3-a7-0f-52ef8f187f3a

**Table: Load Case Definitions, Part 3 of 3**

Table: Load Case Definitions, Part 3 of 3

Case	Notes
DEAD	
MODAL	
SC1	
TEMP+	
TEMP-	
W_TRANSV_SIN SC	
W_TRANSV_CON SC	
W_LONG_SIN SC	
W_LONG_CON SC	
FRENADO	
REOLOGÍA	
SISMO_LONG	
SISMO_TRA NSV	
SISMO_VERT	

**Table: Load Pattern Definitions**

Table: Load Pattern Definitions

LoadPat	DesignType	SelfWtMult	AutoLoad	GUID	Notes
DEAD	Dead	1.		a9e2fea9-93e8-49d6-b0f6-338e97ca801a	
SC1	Dead	0.		c59d7960-2ca7-4ca3-a5aa-71f567492f6c	Added 15/06/2020 12:33:30
TEMP+	Dead	0.		43a4a0e7-88fd-4bb5-83dc-ec65585f9560	Added 15/06/2020 12:38:31
TEMP-	Dead	0.		5e45a8ce-bb1a-4b77-88f8-c6ac6a7a0f3c	Added 15/06/2020 12:38:34
W_TRANSV_SIN SC	Dead	0.		2eb56e50-3f33-4e82-a3e7-4b12c1c0c407	Added 15/06/2020 12:55:36
W_TRANSV_CON SC	Dead	0.		d4fed5d6-7e7c-4049-aa41-574b0f53f740	Added 15/06/2020 12:55:42
W_LONG_SIN SC	Dead	0.		bc0614ff-9b2f-4253-b5c2-3e15f8af34a3	Added 15/06/2020 12:55:51
W_LONG_CON SC	Dead	0.		535016a5-11e8-4823-8dcc-a1131cbd1d85	Added 15/06/2020 12:55:57
FRENADO	Dead	0.		301a0c84-2cdc-44b2-89d5-e51b6c896a52	Added 15/06/2020 14:30:35
REOLOGÍA	Dead	0.		1565bdd3-4a3b-4569-b5dc-173f3ee35783	Added 15/06/2020 15:06:42

**Table: Material Properties 01 - General, Part 1 of 2**

Table: Material Properties 01 - General, Part 1 of 2

Material	Type	Grade	SymType	TempDepend	Color	GUID
4000Psi	Concrete	f'c 4000 psi	Isotropic	No	Cyan	0ee38a9d-920b-43cf-9334-12c5db91b7b3
A416Gr270	Tendon	Grade 270	Uniaxial	No	Cyan	f56f99fa-f32e-4d8b-b06b-b1a0c1b6e42b
A615Gr60	Rebar	Grade 60	Uniaxial	No	Green	270d7b43-b969-46a1-8d3f-1c660b25bedd
A992Fy50	Steel	Grade 50	Isotropic	No	Green	cb94cf6a-fd36-4a3d-bb38-123428e852d3
BIELA	Other		Isotropic	No	Blue	67705611-4a9b-4669-850b-41f5b3801dc6
HA-30	Concrete	HA-30	Isotropic	No	Red	5af6b717-a167-4c89-91a7-5c8208540b91
HA-50	Concrete	HA-50	Isotropic	No	Magenta	1e50f14f-43bf-4a81-8867-0c4657b67308
NEOPRENO	Other		Isotropic	No	Gray8Dark	b6f2e659-fea0-4825-9c2e-35e212bba294

**Table: Material Properties 01 - General, Part 2 of 2**

Table: Material Properties 01 - General, Part 2 of 2

Material	Notes
4000Psi	Customary f'c 4000 psi 12/06/2020 9:54:29
A416Gr270	ASTM A416 Grade 270 12/06/2020 12:24:16
A615Gr60	ASTM A615 Grade 60 12/06/2020 11:03:30
A992Fy50	ASTM A992 Grade 50 12/06/2020 12:24:16
BIELA	MAT added 12/06/2020 11:13:13
HA-30	Spain EHE - Instrucción de Hormigón Estructural HA-30 added 12/06/2020 10:02:10
HA-50	Spain EHE - Instrucción de Hormigón Estructural HA-50 added 12/06/2020 10:02:17
NEOPRENO	MAT added 12/06/2020 11:18:02

**Table: Material Properties 02 - Basic Mechanical Properties**

Table: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight KN/m3	UnitMass KN-s2/m4	E1 KN/m2	G12 KN/m2	U12	A1 1/C
4000Psi	2.3563E+01	2.4028E+00	24855578.06	10356490.86	0.2	9.9000E-06
A416Gr270	7.6973E+01	7.8490E+00	196500599.9			1.1700E-05
A615Gr60	7.6973E+01	7.8490E+00	199947978.8			1.1700E-05
A992Fy50	7.6973E+01	7.8490E+00	199947978.8	76903068.77	0.3	1.1700E-05
BIELA	0.0000E+00	0.0000E+00	999900000.	384576923.	0.3	1.1700E-05
HA-30	2.5000E+01	2.5493E+00	33577729.38	13990720.58	0.2	1.0000E-05
HA-50	2.5000E+01	2.5493E+00	38660380.45	16108491.85	0.2	1.0000E-05
NEOPRENO	0.0000E+00	0.0000E+00	3861.	1485.	0.3	1.1700E-05

**Table: Material Properties 03a - Steel Data, Part 1 of 2**

Table: Material Properties 03a - Steel Data, Part 1 of 2								
Material	Fy	Fu	EffFy	EffFu	SSCurveOpt	SSHysType	SHard	SMax
	KN/m2	KN/m2	KN/m2	KN/m2				
A992Fy50	344737.89	448159.26	379211.68	492975.19	Simple	Kinematic	0.015	0.11

**Table: Material Properties 03a - Steel Data, Part 2 of 2**

Table: Material Properties 03a - Steel Data, Part 2 of 2		
Material	SRup	FinalSlope
A992Fy50	0.17	-0.1

**Table: Material Properties 03b - Concrete Data, Part 1 of 2**

Table: Material Properties 03b - Concrete Data, Part 1 of 2								
Material	Fc	eFc	LtWtConc	SSCurveOpt	SSHysType	SFc	SCap	FinalSlope
	KN/m2	KN/m2						
4000Psi	27579.03	27579.03	No	Mander	Takeda	0.002219	0.005	-0.1
HA-30	30000.	30000.	No	Mander	Takeda	0.00179	0.0037	-0.1
HA-50	50000.	50000.	No	Mander	Takeda	0.0026	0.003	-0.1

**Table: Material Properties 03b - Concrete Data, Part 2 of 2**

Table: Material Properties 03b - Concrete Data, Part 2 of 2		
Material	FAngle	DAngle
	Degrees	Degrees
4000Psi	0.	0.
HA-30	0.	0.
HA-50	0.	0.

**Table: Material Properties 03e - Rebar Data, Part 1 of 2**

Table: Material Properties 03e - Rebar Data, Part 1 of 2								
Material	Fy	Fu	EffFy	EffFu	SSCurveOpt	SSHysType	SHard	SCap
	KN/m2	KN/m2	KN/m2	KN/m2				
A615Gr60	413685.47	620528.21	455054.02	682581.03	Simple	Kinematic	0.01	0.09

**Table: Material Properties 03e - Rebar Data, Part 2 of 2**

Table: Material Properties 03e - Rebar Data, Part 2 of 2		
Material	FinalSlope	UseCTDef
A615Gr60	-0.1	No

**Table: Material Properties 03f - Tendon Data**

Table: Material Properties 03f - Tendon Data					
Material	Fy	Fu	SSCurveOpt	SSHysType	FinalSlope
	KN/m2	KN/m2			
A416Gr270	1689905.16	1861584.63	270 ksi	Kinematic	-0.1

**Table: Material Properties 03g - Other Data**

Table: Material Properties 03g - Other Data			
Material	SSHysType	FAngle	DAngle
		Degrees	Degrees
BIELA	Takeda	0.	0.
NEOPRENO	Takeda	0.	0.

**Table: Material Properties 04 - User Stress-Strain Curves**

Table: Material Properties 04 - User Stress-Strain Curves				
Material	Point	Strain	Stress	PointID
			KN/m2	
BIELA	1	-1.000E-09	-1.	
BIELA	2	0.	0.	A
BIELA	3	1.000E-09	1.	
NEOPRENO	1	-0.000259	-1.	
NEOPRENO	2	0.	0.	A
NEOPRENO	3	0.000259	1.	

**Table: Material Properties 06 - Damping Parameters**

Table: Material Properties 06 - Damping Parameters					
Material	ModalRatio	VisMass	VisStiff	HysMass	HysStiff
		1/Sec	Sec	1/Sec2	
4000Psi	0.	0.	0.	0.	0.
A416Gr270	0.	0.	0.	0.	0.
A615Gr60	0.	0.	0.	0.	0.
A992Fy50	0.	0.	0.	0.	0.
BIELA	0.	0.	0.	0.	0.
HA-30	0.	0.	0.	0.	0.
HA-50	0.	0.	0.	0.	0.
NEOPRENO	0.	0.	0.	0.	0.

**Table: Program Control, Part 1 of 2**

Table: Program Control, Part 1 of 2							
ProgramName	Version	ProgLevel	LicenseNum	LicenseOS	LicenseSC	LicenseHT	CurrUnits
SAP2000	21.2.0	Plus	2010*1548B3D7Y5ZN4CR	No	No	No	KN, m, C



Table: Section Designer Properties 16 - Shape Polygon, Part 2 of 2

SectionName	ShapeName	Reinforcing	RebarMat	BarMatType	ConcCover
MG	Polygon3	No			
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				
MG	Polygon3				

Table: Section Designer Properties 21 - Shape Reference Line

Table: Section Designer Properties 21 - Shape Reference Line

SectionName	ShapeName	X1	Y1	X2	Y2
		m	m	m	m
MG	RefLine1	4.65	-0.093	0.	0.
MG	RefLine2	0.	0.	-4.65	-0.093
MG	RefLine3	4.65	-0.093	4.65	-0.343
MG	RefLine4	4.65	-0.343	3.7875	-0.343
MG	RefLine5	0.7125	-0.343	-0.7125	-0.343
MG	RefLine6	-0.7125	-0.343	-3.7875	-0.343
MG	RefLine7	-3.7875	-0.343	-4.65	-0.343
MG	RefLine8	-4.65	-0.343	-4.65	-0.093
MG	RefLine9	-2.25	-2.543	-3.092208	-2.543
MG	RefLine10	-3.092208	-2.543	-3.342859	-0.594657
MG	RefLine11	-3.342859	-0.594657	-3.7675	-0.443
MG	RefLine12	-3.7675	-0.443	-3.7875	-0.343
MG	RefLine13	-3.224	-0.343	-2.979568	-2.243
MG	RefLine14	-2.979568	-2.243	-1.520432	-2.243
MG	RefLine15	-1.520432	-2.243	-1.276	-0.343
MG	RefLine16	-0.7125	-0.343	-0.7325	-0.443
MG	RefLine17	-0.7325	-0.443	-1.157141	-0.594657
MG	RefLine18	-1.157141	-0.594657	-1.407792	-2.543
MG	RefLine19	-1.407792	-2.543	-2.25	-2.543
MG	RefLine20	0.7125	-0.343	3.7875	-0.343
MG	RefLine21	2.25	-2.543	3.092208	-2.543
MG	RefLine22	3.092208	-2.543	3.342859	-0.594657
MG	RefLine23	3.342859	-0.594657	3.7675	-0.443
MG	RefLine24	3.7675	-0.443	3.7875	-0.343
MG	RefLine25	3.224	-0.343	2.979568	-2.243
MG	RefLine26	2.979568	-2.243	1.520432	-2.243
MG	RefLine27	1.520432	-2.243	1.276	-0.343
MG	RefLine28	0.7125	-0.343	0.7325	-0.443
MG	RefLine29	0.7325	-0.443	1.157141	-0.594657
MG	RefLine30	1.157141	-0.594657	1.407792	-2.543
MG	RefLine31	1.407792	-2.543	2.25	-2.543

Table: Section Designer Properties 30 - Fiber General, Part 1 of 2

Table: Section Designer Properties 30 - Fiber General, Part 1 of 2

SectionName	NumFibersD2	NumFibersD3	CoordSys	GridAngle	LumpRebar	FiberPMM
MG	5	5	Cartesian	0	No	No

Table: Section Designer Properties 30 - Fiber General, Part 2 of 2

Table: Section Designer Properties 30 - Fiber General, Part 2 of 2

SectionName	FiberMC
MG	No



## **Càlcul de la prova de càrrega**

45 metros:

30 metros

Nombre del proyecto : 20200611 tablero\_45.

Nombre del proyecto : 20200611 tablero\_30.

Hipotesis: 1

Hipotesis: 1

Vano 1 Viga 1

Vano 1 Viga 1

s (m)	fPC (mm)	Mf (mT)	K1	V (T)	K2
-0.500	0.000	0.000	0.000	0.000	0.000
0.000	-0.001	1.461	0.008	32.815	0.204
22.250	-18.006	580.107	0.399	-5.392	0.078
44.500	-0.002	12.988	0.075	-81.803	0.508
45.000	0.000	0.000	0.000	0.000	0.000

s (m)	fPC (mm)	Mf (mT)	K1	V (T)	K2
-0.500	0.000	0.000	0.000	0.000	0.000
0.000	-0.001	-0.659	0.000	35.528	0.268
14.750	-4.178	277.886	0.302	-2.503	0.042
29.500	-0.001	-0.099	0.000	-40.542	0.306
30.000	0.000	0.000	0.000	0.000	0.000

fPC(mm) : flecha debida a la prueba de carga.

fPC(mm) : flecha debida a la prueba de carga.

Mf(mT) : momento flector en la viga debido a la prueba de carga.

Mf(mT) : momento flector en la viga debido a la prueba de carga.

V(T) : cortante en la viga debido a la prueba de carga.

V(T) : cortante en la viga debido a la prueba de carga.

K1(tanto por uno): fracción del momento flector por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K1(tanto por uno): fracción del momento flector por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K2(tanto por uno): fracción del cortante por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K2(tanto por uno): fracción del cortante por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

Vano 1 Viga 2

Vano 1 Viga 2

s (m)	fPC (mm)	Mf (mT)	K1	V (T)	K2
-0.500	0.000	0.000	0.000	0.000	0.000
0.000	-0.001	-0.471	0.000	32.788	0.204
22.250	-18.053	576.709	0.398	-5.368	0.078
44.500	-0.002	-11.887	0.000	-81.766	0.508
45.000	0.000	0.000	0.000	0.000	0.000

s (m)	fPC (mm)	Mf (mT)	K1	V (T)	K2
-0.500	0.000	0.000	0.000	0.000	0.000
0.000	-0.001	0.606	0.005	35.521	0.268
14.750	-4.179	277.504	0.302	-2.503	0.042
29.500	-0.001	0.152	0.001	-40.533	0.306
30.000	0.000	0.000	0.000	0.000	0.000

fPC(mm) : flecha debida a la prueba de carga.

fPC(mm) : flecha debida a la prueba de carga.

Mf(mT) : momento flector en la viga debido a la prueba de carga.

Mf(mT) : momento flector en la viga debido a la prueba de carga.

V(T) : cortante en la viga debido a la prueba de carga.

V(T) : cortante en la viga debido a la prueba de carga.

K1(tanto por uno): fracción del momento flector por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K1(tanto por uno): fracción del momento flector por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K2(tanto por uno): fracción del cortante por la prueba de carga respecto del debido al carro más la sobrecarga repartida.

K2(tanto por uno): fracción del cortante por la prueba de carga respecto del debido al carro más la sobrecarga repartida.



## **Annex 12. Senyalització, abalisament i defensa**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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**ÍNDEX**

1	INTRODUCCIÓ .....	1	6.1	CAPTAFARS RETRORREFLECTANTS .....	8
2	NORMATIVA UTILITZADA .....	1	7	DEFENSES .....	9
3	SENYALITZACIÓ HORIZZONTAL.....	2	7.1	CRITERIS D'IMPLANTACIÓ .....	9
3.1	MATERIALS I TIPOLOGIA DE MARQUES VIALS A EMPRAR .....	2	7.2	CRITERIS DE COL·LOCACIÓ .....	9
3.2	MARQUES VIALS PROJECTADES .....	2	7.2.1	Posició longitudinal .....	9
4	SENYALITZACIÓ VERTICAL.....	3	7.2.2	Posició transversal .....	10
4.1	TIPUS DE SENYALS DE CIRCULACIÓ .....	3	7.2.3	Transicions .....	10
4.2	DIMENSIONS .....	3	7.3	TIPOLOGIA DE SISTEMES DE CONTENCIÓ ADOPTATS .....	10
4.3	COLOR.....	4			
4.4	NIVELL DE REFLECTÀNCIA .....	5			
4.5	CRITERIS D'IMPLANTACIÓ, POSICIÓ I MATERIALS .....	5			
4.5.1	Visibilitat .....	5			
4.5.2	Posició longitudinal .....	6			
4.5.3	Posició transversal .....	6			
4.5.4	Distàncies, alçades, orientació i materials .....	6			
4.6	POBLACIONS SENYALITZADES .....	7			
4.7	SUPORT DE PANELLS LATERALS .....	8			
5	FITES QUILOMÈTRIQUES .....	8			
6	ABALISAMENT .....	8			

## 1 INTRODUCCIÓ

En aquest annex es recullen els criteris i normatives emprades per a la definició de la senyalització horitzontal i vertical, l'abalisament i les barreres de protecció necessàries.

Per a la definició de les senyals i marques vials s'ha considerat una velocitat de projecte de 60 km/h, tal com es recull en el Plec de Prescripcions Tècniques per a la redacció del Projecte Constructiu.

En els corresponents plànols de Plantes de senyalització, a escala 1:500 (Document núm. 2 del present Projecte Constructiu), es representen gràficament les diferents marques viàries, e senyals verticals, els sistemes de contenció de vehicles i abalisament, així com la seva posició al llarg de la traça.

## 2 NORMATIVA UTILITZADA

La normativa per a definir la senyalització horitzontal és la següent:

- Normativa de carreteres 8.2.-IC "Marcas Viales", publicada per la Direcció General de Carreteres del Ministeri d'Obres Públiques i Urbanisme (O.M. de 16 de juliol de 1987, B.O.E. del 4 d'agost i 29 de setembre).
- O.C. 304/89 MV de 21 de juliol sobre projectes de marques vials, de la Subdirecció General de Construcció i Explotació de la D.G.C. del M.O.P.U.
- O.C. 325/97 T. sobre senyalització, balisament i defensa de les carreteres en allò que fa referència als materials constitutius, de la D.G.C. del Ministeri de Foment, publicada el 30 de desembre de 1997.
- Nota tècnica sobre esborrat de marques vials, de 5 de febrer de 1991, de la Subdirecció General de Tecnologia i Projectes del Ministeri d'Obres Públiques i Transports.
- Article 700 "Marcas viales" de la Part 7ª "Elementos de señalización, balizamiento y defensa de las carreteras" del PG-3.

La senyalització vertical s'ha projectat tot seguint la següent normativa:

- Instrucció de Carreteres Norma 8.1-IC "Señalización Vertical", General de Carreteras del Ministerio de Fomento, aprovada per ordre de 20 de març de 2014 (BOE de 05 d'abril de 2014).
- Recomanacions per al Projecte d'Enllaços, de juny de 1968, de la Divisió de Plans i Trànsit de la Direcció General de Carreteres i Camins Veïnals del M.O.P..
- Recomanacions per al Projecte d'Interseccions, de gener de 1967, de la D.G.C. del M.O.P.U..

- Catàleg de senyals verticals de circulació (tom I "Características de las Señales" de març de 1992 i tom II "Catálogo y Significado de las Señales" de juny de 1992), publicat per la D.G.C. del M.O.P.T.
- Article 701 "Señales y carteles verticales de circulación retrorreflectantes" de la Part 7ª "Elementos de señalización, balizamiento y defensa de las carreteras" del PG-3.
- "Manual per a la senyalització viària d'orientació de Catalunya" de la Direcció General de Carreteres del Departament de Política Territorial i Obres Públiques de la Generalitat de Catalunya.

Per a la senyalització de les diferents fases d'execució de les obres s'ha tingut en compte la Norma 8.3. -IC. "Senyalització d'Obres" de la D.G.C. del M.O.P.U., aprovada per O.M. sobre senyalització, abalisament, defensa, neteja i acabament d'obres fixes en vies fora de poblament, de 31 d'agost de 1987; modificada parcialment pel R.D. 208/1989 de 3 de febrer. Així mateix es contemplen les ordres circulars 300/89 PÀG. i PÀG. i 301/89 T de la D.G.C. del M.O.P.U. (de 20 de març i 27 d'abril, respectivament).

Respecte a la matriculació de la carretera i als noms de destins i localitzacions de poblacions i nusos de la xarxa viària a inscriure en la cartelleria, aquests s'han pres tenint en compte el Mapa Oficial de Carreteres (del Ministeri de Foment, edició 38 del 2003).

Les barreres de seguretat es projectaran conforme al disposat a la següent normativa:

- O.C. 35/2014: sobre "Criterios de Aplicación de sistemas de contención de vehículos".
- O.C. 321/95 T. y P. "Recomendaciones sobre Sistemas de Contención de Vehículos" de la D.G.C., Secretaria d'Estat de Política Territorial i Obres Públiques del M.O.P.T.M.A.
- O.C. 28/2009: "Criterios de aplicación de barreras de Seguridad metálicas".
- O.C. 18/04 sobre "Criterios de empleo de sistemas para protección de motociclistas".
- Article 704 "Barreras de seguridad" de la Part 7ª "Elementos de señalización, balizamiento y defensa de las carreteras" del PG-3.
- UNE 135-121-99 "Barreras metálicas. Valla de perfil de doble onda. Materiales, dimensiones, formas de fabricación y ensayos".
- UNE 135-122-99 "Sistemas viales de contención de vehículos. Barreras metálicas. Elementos accesorios de las barreras metálicas. Materiales, dimensiones, formas de fabricación y ensayos".

### 3 SENYALITZACIÓ HORIZONTAL

#### 3.1 MATERIALS I TIPOLOGIA DE MARQUES VIALS A EMPRAR

Al Plec de Condicions es determinen les qualitats de la pintura i de la pel·lícula seca, així com els assaigs a que s'ha de sotmetre.

El tipus de pintura a utilitzar a la present obra serà de tipus acrílica per les marques viàries longitudinals, i de dos components en fred per les línies de parada, inscripcions i zebrats.

Tenint en compte les prescripcions contingudes a la Norma 8.2-IC, cal apuntar que totes les marques projectades seran de color blanc, de referència B-118 de la UNE 48-103, i reflectants. La reflectància s'aconsegueix barrejant les microesferes de vidre amb la pintura. La granulometria de les microesferes està definida al Plec de Condicions.

#### 3.2 MARQUES VIALS PROJECTADES

Totes les característiques i detalls de les marques vials es defineixen en el document número 3: Plec de prescripcions i en el document 2: Plànols en els detalls de senyalització. No s'ha considerat procedent aquí entrar en un estudi exhaustiu d'aquestes dades.

- **Línia de separació de carrils normals:** La seva funció és la separació de sentits en calçades de dos carrils i doble sentit de circulació amb possibilitat d'avançament. (Marca M-1.3, per  $VM \leq 60$  km/h). Es tracta d'una línia discontinua blanca, formada per trams de 10 cm de gruix i 2,0 m de longitud, separats per intervals de 5,5 m.
- **Línia de separació per a l'ordenació de l'avançament en calçades de dos carrils i doble sentit de circulació:** La seva funció és la de prohibir l'avançament per no disposar de la visibilitat necessària. (Marca M-2.2). Es tracta d'una línia continua blanca de 10 cm de gruix.
- **Línia per a marge de calçada (continua).** Delimita el marge de la calçada. (Marca M-2.6, per  $VM \leq 100$  km/h). Es tracta d'una línia contínua blanca de 10 cm de gruix per vorals inferiors a 1,5 m.
- **Línia per a marge de calçada (discontinua per accessos).** Marca vial discontinua que haurà de substituir a la continua quan es permeti creuar-la per tal de canviar de direcció o utilitzar un accés. (Marca M-1.12, per  $VM \leq 100$  km/h i vorals inferiors a 1,5 m). Es tracta d'una línia discontinua blanca formada per trams de 15 cm de gruix i 1,0 m de longitud, separats per intervals de 2,0 metres.

- **Línia de detenció.** (Marca M-4.1). Una línia contínua disposada a tot l'ample d'un o diversos carrils del mateix sentit de circulació, indica que cap vehicle o animal ni la seva càrrega no deurà franquejar-la, en compliment de l'obligació imposada per: una senyal de detenció obligatòria, una marca viària de STOP, una senyal de prohibició de passar sense aturar-se, un pas de vianants, indicat per la marca M-4.3 o per una senyal vertical, una senyal de pas a nivell, un semàfor o una senyal de detenció efectuada per un agent de la circulació. Es tracta d'una línia contínua blanca de 40 cm d'amplada.
- **Línia de cedi el pas.** (Marca M-4.2). Una línia discontinua disposada a tot l'ample d'un o diversos carrils indica que, excepte en circumstàncies anormals que redueixin la visibilitat, cap vehicle o animal ni la seva càrrega no deurà franquejar-la, quan tinguin que cedir el pas en compliment de l'obligació imposada per un senyal o marca de cedi el pas, per una fletxa verda de gir en un semàfor o quan no hi hagi ninguna senyal de prioritat, per aplicació de les normes que regeixen aquesta. Es tracta d'una línia discontinua blanca, formada per trams de 40 cm d'ample i 80 cm de longitud, separats per intervals de 40 cm.
- **Línia de preavis de marca contínua o de perill.** (Marca M-1.10, per  $VM \leq 60$  km/h). La seva funció és anunciar al conductor que s'aproxima a una marca longitudinal continua i la prohibició que aquesta marca implica o la proximitat d'un tram de via que presenta un risc especial. Es tracta d'una línia discontinua blanca, formada per trams de 10 cm de gruix i 2,0 m de longitud, separats per intervals de 1,0 m.
- **Zebrats.** Zones excloses del trànsit. (Marca M-7.1). Es marcarà un zebrat constituït per línies, paral·leles, en angle o no, inclinades  $45^\circ$  respecte els eixos respectius. Aquest zebrat es representarà esquemàticament en els plànols de planta i el seu detall consta en els corresponents plànols de detalls de senyalització del present projecte. La seva funció és incrementar la visibilitat en la zona de paviment exclosa a la circulació de vehicles i, al mateix temps, indicar-ne, per mitjà de la inclinació de les bandes que els constitueixen, de quin costat hauran de desviar-se els vehicles per evitar possibles obstacles o per realitzar una maniobra de divergència o convergència.
- **Pintat de STOP** (Marca M-6.3, per  $VM \geq 60$  km/h). Aquesta marca indica al conductor l'obligació que té d'aturar el seu vehicle davant d'una pròxima línia de detenció, o si aquesta no existís, immediatament abans de la calçada a la que s'aproxima, i de cedir el pas als vehicles que circulin per aquesta calçada.

- **Pintat de cedi el pas** (Marca M-6.5). Aquesta marca indica al conductor l'obligació que té de cedir el pas als vehicles que circulin per la calçada a la que s'aproxima i detenir-se si és necessari abans de la línia de cedi el pas.

#### 4 SENYALITZACIÓ VERTICAL

Pel que fa a la senyalització vertical s'ha procurat establir una senyalització clara, uniforme i senzilla, amb la finalitat de que aquests moviments siguin fluids, i, sobretot, segurs.

##### 4.1 TIPUS DE SENYALS DE CIRCULACIÓ

D'acord amb la normativa 8.1-I.C i amb el Reglament General de Circulació, els senyals i cartells, segons la seva funcionalitat, es classifiquen en:

\* Senyals d'advertència de perill. Generalment triangulars i la seva designació comença per la lletra "P" (P-1 a P-50).

\* Senyals de reglamentació. Generalment circulars i la seva designació comença per la lletra "R".  
Alhora es classifiquen en:

- De prioritat (R-1 a R-6)
- De prohibició d'entrada (R-100 a R-117)
- De restricció de pas (R-200 a R-205)
- Altres de prohibició o restricció (R-300 a R-310)
- D'obligació (R-400 a R-417)
- De fi de prohibició o restricció (R-500 a R-506)

\* Senyals o cartells d'indicació. Generalment rectangulars i la seva designació comença per la lletra "S". Alhora es classifiquen en:

- D'indicacions generals (S-1 a S-29)
- Relatives a carrils (S-50 a S-63)
- De serveis (S-100 a S-126)
- D'orientació que, alhora, es classifiquen en:

\* Segons la 8.1-IC i el catàleg de senyals (Ministerio de Fomento):

- De presenyalització (S-200 a S-270)
- De direcció (S-300 a S-375)
- D'identificació de carreteres (S-400 a S-460)
- De localització (S-500 a S-574)

- De confirmació (S-600 a S-610)
- D'ús específic en zona urbana (S-700 a S-770)
- Panells complementaris (S-800 a S-870)
- Altres senyals (S-900 a S-940)

\* Segons l'esborrany "Manual per la senyalització viària d'orientació de Catalunya (Direcció General de Carreteres de la Generalitat):

- D'alerta llunyana (OR10)
- De presenyalització (OR20)
- De direcció pròpia (OR30)
- De direcció avançada (OR40)
- De direcció final (OR50)
- De confirmació (OR60)
- De senyalització d'orientació en població (OR700)

En els plànols de planta s'han dibuixat cadascun dels senyals, així com la seva denominació corresponent als respectius documents. Els panells laterals i fletxa, per ser específics del projecte, s'han definit en els plànols de detalls de senyalització.

##### 4.2 DIMENSIONS

Les dimensions dels senyals del tronc i ramals d'enllaços que corresponen a carreteres convencionals amb voral, seran les següents:

- Senyals triangulars: 135 cm de costat.
- Senyals circulars: 90 cm de diàmetre.

Als camins d'accés:

- Senyals triangulars: 90 cm de costat.
- Senyals circulars: 60 cm de diàmetre.

Al Document núm. 4 Pressupost, els amidaments reflecteixen el tipus de senyal i la mida corresponent.

Els cartells tindran dimensions que són funció de les seves inscripcions, quedant reflectides als plànols de detall i als amidaments.

Les inscripcions s'efectuen amb les lletres d'ample normal en general i reduït en els casos en que la longitud de la llegenda així ho aconsella. L'alçada de les lletres ve donada per el paràmetre Hb

Projecte de condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol

que caracteritza totes les diverses alçades de lletra que hi pot haver en un plafó d'orientació.

L'alçada de base de lletra,  $H_b$ , es defineix seguint els següents criteris, ordenats jeràrquicament:

- Tipus de via.
- Pertinència a una xarxa determinada (bàsica, comarcal, local).
- Velocitat de pas dels vehicles en el punt on s'instal·la el plafó.
- Tipus de senyalització implantada (presenyalització, direcció final, confirmació...).
- Tipus de suport sobre el qual reposa el plafó (lateral, banderola, pòrtic...).

La gamma de mides de lletra  $H_b$ , queda definida a la taula següent:

TIPUS DE PLAFÓ		TIPUS DE VIA				
		A , VP2	CC4*	CC2		
				I	II	III
Presenyalització	Lateral	360	200	200	150	150
	Elevat	400	250	250	250	250
Presenyalització de rotonda	Lateral	-	150	120	120	120
Direcció Avançada	Lateral	-	150	150	120	100
	Elevat	400	250	250	250	250
Direcció final	Lateral	360	150	150	120	120
Confirmació	Lateral	270	150	150	120	120
Localització:						
Comunitat	Lateral	260	200	200	150	120
Comarca	Lateral	200	150	150	150	120
Província	Lateral	200	150	150	150	120
Població (**)	Lateral	200/150	200/150	200/150	200/150	200/150
Altres	Lateral	200	150	150	150	120

\*\*200 per als pols primaris o de nivell superior, 150 per a la resta de pols.

\*Utilització dels tipus I, II i III:

-En xarxa bàsica: Tipus I (general de referència) i Tipus II (quan l'amplada de plataforma <6 m. en trams significativament llargs).

-En xarxa comarcal: Tipus II (general de referència), Tipus III (quan l'amplada de plataforma  $\leq 6$  m. en trams significativament llargs) i Tipus I (si  $V > 80$  km/h en trams significativament llargs).

-En xarxa local: Tipus III (si  $V \leq 50$  km/h o amplada de plataforma  $\leq 6$  m.), Tipus II, si  $50 < V \leq 80$  km/h) i Tipus I (si  $V > 80$  km/h).

L'alçada a aplicar a cada caràcter vindrà definida per  $H_c$  que és l'alçada de composició. Les regles per a escollir  $H_c$  són les següents:

- En general  $H_c = H_b$ , tant sobre fons blau com sobre fons blanc.
- Subplafons i finestres blaves en plafons de fons blanc:  $H_c = H_b + 1$
- Panellets ( de color variable):  $H_c = H_b - 1$
- Segona línia d'una menció:  $H_c = H_b - 1$
- Mòdul de sortida:  $H_c = H_b - 1$
- En pòrtics d'autopista o VP2,  $H_c$  de plafons de direcció avançada de fons blanc:  $H_c = H_b - 1$
- Mot *Direcció* en plafons de presenyalització de rotondes:  $H_c = H_b - 1$
- Distàncies quilomètriques no enteres: números decimals amb  $H_c = H_b - 1$

L'alfabet utilitzat és el "CCRIGE" per a la retolació que indica a inscripcions pròpies o accessos de carretera convencional i "AUTOPISTAS" per a la retolació que indica accessos a Autopistes, Autovies o Vies ràpides tal com queda reflectit en els plànols de detalls de senyalització. L'alfabet cursiu s'usarà en distàncies mètriques en plafons de presenyalització i en qualificatius de destinacions, tant sobre fons blanc com fons blau tal i com ha fixat el Departament de la Direcció General de Carreteres de Senyalització i seguretat viària (Àrea de Tecnologia i Sistemes d'informació). L'alfabet utilitzat als cartells urbans és l'helvètic condensat segons la norma IGSE abans esmentada.

El color dels textos, orles, fons i pictogrames queden perfectament reflectits en els plànols de detall, així com la resta de dades necessàries per a la completa execució de tots els senyals.

#### 4.3 COLOR

El color dels textos, orles, fons i pictogrames queden perfectament reflectits en els plànols de detall coincidint amb la taula de coordenades cromàtiques del diagrama de cromaticitat CIE presentat en el tom de característiques de senyals verticals de circulació de la Direcció General de Carreteres.

La Norma UNE 48073-2 defineix l'assaig per a la determinació de les coordenades cromàtiques i factor de lluminària, emprant un espectroclorímetre de geometria 45/0, i un il·luminant patró tipus CIE D65.

Els caixetins, fites i demés senyals d'identificació de les carreteres tindran els següents colors en funció de la categoria de la carretera:

- D'itinerari europeu: Fons verd, i lletra blanca.
- D'autopista o autovia: Fons blau, i lletra blanca.
- De carretera de la R.I.G.E.(Xarxa de l'Estat): Fons vermell, i lletra blanca.



Projecte de condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol

- De la xarxa bàsica que no sigui autopista: Fons vermell, i lletra blanca.
- De la xarxa comarcal: Fons verd i lletra blanca.
- De la xarxa local: Fons groc i lletra negra.

Els colors dels senyals de destí i dels cartells d'orientació tindran, en el cas d'autopista i d'autovia, fons blau i els caràcters, orles i fletxes color blanc, i en els demés casos de carretera convencional tindran fons blanc i els caràcters, orles i fletxes color negre.

COLORS EN CARTELLS FLETXA I CARTELLS D'ORIENTACIÓ		
CLASSE DE CARRETERA	FONS	CARÀCTERS, ORLES I FLETXES
Autopista	Blau	Blanc
Via preferent de calçades separades (Autovia)	Blau	Blanc
Via preferent de calçada única (Via Ràpida)	Blanc	Negre
<b>C. Convencional</b>	<b>Blanc</b>	<b>Negre</b>

Com a excepció els cartells de direcció avançada i direcció final (si la classe de carretera a la que s'accedís per la sortida fos superior a la de la carretera pròpia) portaran els colors de la carretera a la que es dirigirà l'esmentada sortida. El color dels cartells d'orientació queden segons el quadre següent:

Origen		Destí			
		Cartell	A/VP2	Cartell	CC4/CC2
Origen	A/VP2	Presenyaltzació	Blau	Presenyaltzació	Blau
		Direcció Pròpia	Blau	Direcció Pròpia	Blau
		Direcció Avançada	Blau	Direcció Avançada	Blanc
		Direcció Final	Blau	Direcció Final	Blanc
		Confirmació	Blau	Confirmació	Blau
	CC4/CC2	Presenyaltzació	Blau	Presenyaltzació	Blanc
		Direcció Pròpia	Blanc	Direcció Pròpia	Blanc
		Direcció Avançada	Blau	Direcció Avançada	Blanc
		Direcció Final	Blau	Direcció Final	Blanc
		Confirmació	Blanc	Confirmació	Blanc

Els colors dels cartells de localització seguiran els criteris de la següent taula:

COLORS EN CARTELLS DE LOCALITZACIÓ						
	Poblat		Límit territorial		Altres punts característics	
	Entrada	Sortida	C. Autònoma	Província	D'un altra ctra.	Fora de la ctra.
Fons	<b>Blanc</b>	<b>Blanc</b>	Verd	Verd	Marró	Var. (*)
Lletra	<b>Negre</b>	<b>Negre</b>	Blanca	Blanca	Blanca	Blanca
Orla	<b>Vermella</b>	<b>Negre</b>	Blanca	Blanca	Blanca	Blanca
Franja	-	<b>Vermella</b>	-	-	-	-

(\*) El que correspongui (S-700 a S-770), segons el Catàleg de senyals de circulació publicat per la Direcció General de Carreteres, llevat modificació de la Instrucció 8.1-I.C. de Senyalització Vertical.

#### 4.4 NIVELL DE REFLECTÀNCIA

Tots els elements (fons, caràcters, símbols fletxes i pictogrames) d'un senyal, cartell o panell complementari excepte els de color negre o blau fosc, hauran de ser retrorreflexius en el seu color.

Les senyals i cartells seran retrorreflexius de classe RA2.

#### 4.5 CRITERIS D'IMPLANTACIÓ, POSICIÓ I MATERIALS

S'ha procurat establir una senyalització clara, uniforme i senzilla, amb l'objecte de què els moviments que es realitzin siguin fluïts i, sobretot segurs, tot això d'acord amb l'estipulat en la Instrucció 8.1-IC. i en l'esborrany "Manual per a la senyalització viària d'orientació de Catalunya" de la Direcció General de Carreteres de Catalunya.

Tots els senyals han estat dissenyats i situats d'acord amb les normatives indicades referent a convergències, divergències, interseccions, glories, velocitat màxima, avançaments, etc.

Als plànols de planta s'han dibuixat cadascun dels senyals, així com especificat la denominació corresponent al catàleg del "Ministerio de Fomento". Els cartells, per ser específics del projecte, s'han definit als plànols de detalls.

##### 4.5.1 Visibilitat

Tot senyal o cartell necessita una distància mínima de visibilitat geomètrica en la que la visual dirigida pel conductor cap a la mateixa estigui lliure d'obstacles que la interceptin, i així mateix

totes les seves visuals intermèdies del recorregut, mentre no es formi un angle superior de 10° amb el rumb del vehicle. Aquesta distància no haurà de ser inferior a la de percepció del conductor que circuli a la velocitat màxima establerta.

#### 4.5.2 Posició longitudinal

##### Senyals d'advertència de perill

Els senyals d'advertència de perill (P-1 a P-50) s'han col·locat entre 150 i 250 m abans de la secció a on es troba el perill anunciat, en funció de la velocitat de recorregut, de la visibilitat disponible, de la naturalesa del perill i, si escau, de la maniobra necessària. Quan es refereixin a un advertiment que afecti un tram de la carretera, s'acompanyaran amb un panell complementari que indiqui la longitud del tram afectat per l'advertència.

##### Senyals de reglamentació

Els senyals de reglamentació (R-1 a R-506) han estat ubicats en la secció a on comença la seva aplicació, reiterant-se a intervals corresponents a un temps de recorregut de l'ordre d'un minut, en el cas de considerar-se necessari, excepte en trams homogenis de velocitat, en els quals l'espaiament d'aquests senyals podrà ser major. També es col·locaran després d'una entrada o convergència si és convenient.

Com a mínim, els senyals estaran separats entre si 50 m per a que el conductor tingui temps de percebre-les, analitzar-les, decidir i actuar en conseqüència.

##### Senyals o cartells d'indicació

Els senyals o cartells d'indicació (S-1 a S-940) estan ubicats segons el cas:

- Els cartells de presenyalització i de destí d'accés a gloriets en carreteres convencionals:

Pels cartells d'orientació d'accés a gloriets en carretera convencional, els accessos principals (especialment els que suposen continuïtat d'itinerari) s'han disposat cartells tipus OR-25a (S-200), 100 m abans de la marca de cedi el pas. En les sortides s'han disposat cartells fletxa en les illetes perimetrals, llevat els camins agrícoles o altres destins no principals.

- Els cartells de presenyalització i de destí de sortida immediata per a cruïlles simples en carreteres convencionals:

La senyalització es fa mitjançant cartells laterals o disposats sobre la calçada, situats:

- En carreteres convencionals de dos o tres carrils de la xarxa comarcal, com és el cas que ens

correspon, a una longitud de 200 m abans del "nas" de la divergència i amb una separació d'1 m. entre les línies blanques interiors.

La divergència es marca mitjançant un cartell fletxa situat al principi de la illeta, i excepcionalment en el marge oposat a aquell pel que s'accedeix a una altra carretera.

- Els cartells de confirmació en carretera convencional:

En cruïlles complexes, com es el cas de les rotondes, el panell de confirmació en carreteres convencionals de dos o tres carrils del tipus II, se situarà entre 80 i 120 m de l'anell exterior en el cas de rotondes, i del centre de la intersecció en el cas de cruïlla simple.

#### 4.5.3 Posició transversal

##### En carreteres convencionals

En carreteres convencionals els senyals de circulació es col·locaran en el marge dret de la plataforma, o inclòs en el marge esquerre, si el tràfic pogués obstruir la visibilitat de les situades a la dreta.

Es duplicaran sempre en el marge esquerre:

- Els senyals R-305, R-306, P-7, P-8, P-9a, P-9b, P-9ca, P-10a, P-10b i P-10c.
- Tota senyalització en punts amb índex de perillositat elevat.

Els senyals i cartells situats en els marges de la plataforma es col·locaran de manera que la seva vora més propera estigui almenys a:

- 2,5 m de la vora exterior de la calçada, o 1,5 m on no hi hagués voral, que es podran reduir a 1 m prèvia justificació.
- 0,5 m de la vora exterior del voral.

Quan hi hagi restriccions d'espai la vora més propera del senyal o cartell lateral es podrà col·locar a un mínim de 0,5 m de la vora de la restricció més pròxima a la calçada, sempre que amb això no es disminueixi la visibilitat disponible.

S'evitarà que uns senyals o cartells laterals pertorbin la visibilitat d'altres, o que ho facin altres elements situats prop de la vora de la plataforma.

#### 4.5.4 Distàncies, alçades, orientació i materials

La diferència de cota entre la vora inferior del senyal o cartell i la vora de la calçada situat en correspondència amb aquells serà la següent:

- Carreteres convencionals amb voral 1,5 m: 1,8 m.
- Carreteres convencionals amb voral <1,5 m o sense voral: 1,5 m.

Els cartells fletxa utilitzats se situaran a una altura d'almenys 2,20 m per no entorpir la visió del trànsit, excepte quan hi hagi diversos apilats, que es podran col·locar deixant lliure una alçada de 1,70 m.

Els senyals o cartells situats en els marges de la plataforma (excepte els cartells fletxa) es giraran lleugerament cap a fora, amb un angle de 3º (aproximadament 5 cm / m) respecte de la normal a la línia que uneix la vora de la calçada front a ells, amb el punt de la mateixa vora situat 150 m abans.

Els cartells fletxa s'orientaran perpendiculars a la visual del conductor a qui vagi destinat el seu missatge, situat 50 m abans d'ells. Si orientessin a conductors procedents de trams diferents, es disposaran perpendiculars a la bisectriu del major angle que formin les visuals, sense que l'angle entre el senyal i aquestes resulti menor de 45º; si per complir aquest requisit fos necessari, es podrà repetir el senyal tantes vegades com calgui.

La senyalització vertical serà d'alumini en els tipus següents de plafó:

TIPUS	Sèrie del catàleg de senyals de 1992
Presenyalització	S-200
Direcció	S-300
Identificació de carreteres, situats en conjunts d'alumini	S-400
Localització	S-500 (*)
Confirmació	S-600
Ús específic en població	S- 700
Caixetins de nom de carretera	

(\*) Excloses les fites quilomètriques (S-570 a S-574)

També serà d'alumini la resta de senyalització vertical que s'incorpori a un conjunt de les sèries abans esmentades.

També seran d'alumini els plafons de pòrtics i banderoles, en aquests casos els plafons seran amb

lamel·les. Seran amb lamel·les els panells d'amplada major de 3500 mm. i els pòrtics i banderoles. També podran ser de lamel·les els panells majors de 6 m<sup>2</sup>. La resta de panells seran de plaques.

Les lamel·les seran modulars de 175 mm d'alçada, formant panell continu.

Els senyals de trànsit seran d'acer galvanitzat en calent segons es descriu en el Plec de Condicions.

#### 4.6 POBLACIONS SENYALITZADES

Els criteris seguits pel disseny de les inscripcions en els cartells d'orientació es recolzen en la publicació de la "Direcció General de Carreteres" titulada "Pla director de senyalització d'orientació" que basa els principis metodològics en els següents punts:

- *Jerarquització de pols:* Els punts característics de la xarxa (nuclis de població, llocs d'interès turístic, centres industrials o de serveis, etc.) es classifiquen en funció de criteris objectius. Aquesta classificació permetrà jerarquitzar els itineraris entre pols i servirà de base per a seleccionar les mencions que hauran d'aparèixer en la senyalització.
- *Globalitat:* L'estudi abordarà la senyalització direccional de forma global en el territori considerat per a aconseguir la uniformitat de la senyalització.
- *Estructuració de la xarxa:* La xarxa es considerarà com una malla contínua; la senyalització així concebuda facilitarà als usuaris el seguiment del itineraris entre pols.
- *Continuïtat:* La senyalització es concebrà amb la condició de que existeixi continuïtat al seguit de l'itinerari des de que una menció apareix fins que assoleix el seu destí.
- *Legibilitat:* El nombre de mencions que han d'aparèixer es limitarà per a facilitar la seva lectura.

Dins del marc d'aquests principis metodològics, les informacions relatives a les localitats, llocs i itineraris es seleccionen, classifiquen i jerarquitzen amb la finalitat de determinar els noms que cal indicar en la senyalització.

Tenint en compte els criteris de Globalitat i Continuïtat s'han considerat les següents poblacions: Besalú, Olot, Figueres i Borrassà. Els cartells dissenyats i les destinacions indicades es corresponen amb el criteri de continuïtat d'itinerari, ja que corresponen a les destinacions indicades als enllaços contigus.



#### 4.7 SUPORT DE PANELLS LATERALS

Els suports d'aquest apartat fan referència a la senyalització que no es disposi en pòrtics i banderoles.

Els aliatges admesos d'alumini seran aquells que garanteixin tant la resistència com l'extrusió dels perfils, basats en la sèrie 6000. També seran admesos altres aliatges que compleixin la normativa al respecte indicada en el present plec.

Els pals utilitzats per a suports dels panells seran tubs d'alumini extrusionats de secció constant o telescòpics. La superfície exterior serà cilíndrica amb acabat estriat. La part superior dels suport es tancarà amb un tap d'alumini de la mateixa qualitat que el suport o ABS, i amb un disseny que garanteixi la seva fixació. L'acabat serà del tipus anoditzat color plata amb un mínim de 15 µ o lacat amb un mínim de 50 µ color gris RAL 9006.

Les característiques resistents dels suports en funció del moment flector admissible es classifiquen segons els següent quadre:

Categoria	MA	MB	MC	MD	ME	MF	MG	MH
Moment admissible (kN x m) (*)	1,0	2,5	5,0	10,0	15,0	25,0	35,0	50,0

Per a establir les característiques d'aquests suports s'estableixen les següents definicions:

$R_{p 0.2}$  Límit elàstic característic (límit amb una deformació remanent del 0,2%).  
Aquest valor serà el garantit pels fabricants amb un nivell de confiança mínim del 95% i ratificat pels assaigs de l'obra o els corresponents certificats.

$M_{adm}$  Moment admissible

$\sigma_{adm}$  Tensió admissible

W Mòdul resistent (per a seccions tubulars serà la inèrcia dividida pel radi).

Així, queda establert el moment admissible en funció de la geometria i el material segons la fórmula clàssica:

$$M_{adm} = \sigma_{adm} \times W$$

Pel càlcul dels esforços s'adoptaran, segons la Norma UNE 135311, els següents coeficients de majoració:

- Accions constants, càrregues permanents i sobrecàrregues: 1,33

- Vent: 1,50

Les dimensions dels pals s'ajustaran a les de la taula que s'adjunta de normalització, essent el gruix mínim de 3,5 mm.

DIÀMETRE	CATEGORIA RESISTENT
90 mm	MC
114 mm	MD ME
140 mm	ME MF MG
168 mm	MH

Als suports s'encunyarà la categoria resistent amb les corresponents lletres i l'anagrama o identificació del fabricant.

El Director de l'obra haurà de fer una comprovació de les dimensions resultants d'aquesta taula per a les condicions definitives d'implantació.

Els panells fins a 6 m<sup>2</sup> portaran un únic suport, havent-hi de col·locar dos pels de més de 6 m<sup>2</sup>. Excepcionalment es disposarà de dos suports en panells inferiors a 6 m<sup>2</sup> quan els esforços no pugin ser absorbits per un únic suport de la taula anterior. En el cas que sigui necessari col·locar tres suports, es col·locarà un de central i els altres a un terç de cadascun dels extrems.

## 5 FITES QUILOMÈTRIQUES

Les fites quilomètriques es disposaran als punts quilomètrics del nou traçat que corresponen amb els senyals de codi S-572.

## 6 ABALISAMENT

### 6.1 CAPTAFARS RETRORREFLECTANTS

- **Sobre barreres de seguretat:**

S'instal·laran captafars d'alumini permanents a les barreres de seguretat, fixats a aquestes mitjançant el pern d'unió de la barrera al pal.

Els captafars en barreres metàl·liques aniran col·locats cada 8 m (grau d'abalisament GA3) en situacions normals i cada 4 m (grau d'abalisament GA4) en trams singulars o perillosos. La seva localització queda definida en el document de plànols.

## 7 DEFENSES

### 7.1 CRITERIS D'IMPLANTACIÓ

Segons allò especificat en l'Ordre circular 35/2014, la instal·lació de sistemes de contenció de vehicles estarà justificada en els següents casos:

- Zones en què es detecti, com a conseqüència de la presència d'obstacles, desnivells o elements de risc propers a la calçada, la probabilitat que es produeixi un accident normal, greu o molt greu i calgui descartar en no ser possibles, tècnica o econòmicament, altres alternatives.
- Zones on la protecció ha estat inclosa entre les mesures correctores derivades d'una Declaració d'Impacte Ambiental (com llacs, aiguamolls, cursos d'aigua, jaciments arqueològics, etc.), tot i que no hi hagi un obstacle o desnivell en les proximitats de la vora de la calçada.

Per al primer dels casos, es considerarà el risc d'accident relacionat amb la probabilitat del succés i la magnitud dels danys i lesions previsibles, seguint els supòsits marcats per l'Ordre circular 35/2014.

La implantació de la barrera de seguretat estarà justificada quan la distància d'un obstacle o desnivell a la vora de la calçada sigui inferior al que s'indica a la taula 1 de l'Ordre circular 35/2014. Per a aquest projecte s'han considerat les següents situacions:

- Existència a nivell inferior de qualsevol tipus d'infraestructura del transport terrestre.
- Accessos a ponts, túnels i passos estrets.
- En emplaçaments singulars en o junt a la coronació d'obres de fàbrica, nusos complexos en els quals pugui resultar més probable que es produeixi un error per part del conductor.
- Caiguda de terraplens de més d'1 metre d'alçada.

Es considera que s'ha d'instal·lar sempre barrera de seguretat en els ponts o altres obres de fàbrica, en las vies pròximes i paral·leles a cursos d'aigua, talús d'altura superior a 1 m i altres obstacles tals como elements de senyalització, piles de pas superior, etc.

A l'efecte de determinar la barrera a implantar en cada zona, s'ha considerat un risc d'accident molt greu per als passos i ponts; s'ha considerat un risc greu per als trams del tronc principal pròxims als passos i ponts; i finalment, s'ha considerat un risc normal per a zones amb presència de terraplens de més d'1m d'altura.

### 7.2 CRITERIS DE COL·LOCACIÓ

#### 7.2.1 Posició longitudinal

Les barreres de seguretat se situaran com a norma general paral·leles a l'eix de la carretera.

A continuació s'estableixen les longituds d'anticipació del començament i de prolongació de l'acabament de les barreres de seguretat. Aquestes longituds tenen per objecte evitar que el vehicle pugui arribar a l'obstacle o desnivell del qual el sistema de contenció el pretén protegir. D'altra banda, les barreres de seguretat precisen una longitud mínima d'instal·lació per poder funcionar adequadament davant a l'impacte d'un vehicle:

##### a) Anticipació de l'inici

Quan una barrera de seguretat o barana paral·lela a la carretera tingui per objecte evitar que un vehicle arribi a un desnivell o un obstacle de grans dimensions es recomana iniciar el sistema de contenció de vehicles abans de la secció en què comença l'obstacle o desnivell, a una distància mínima que s'ha considerat per a aquest projecte de 100 m per als trams on se situa barrera per tal d'evitar que un vehicle assoleixi un desnivell o obstacle de grans dimensions, i de 48 m per als trams de barrera que pretenen evitar que un vehicle intercepti un obstacle aïllat.

##### b) Prolongació de l'acabament

En carreteres de calçada única, la prolongació de l'acabament del sistema de contenció de vehicles per un sentit de circulació, haurà de ser igual en longitud a la d'anticipació del seu començament per al sentit contrari.

En carreteres amb calçades separades, la prolongació de l'acabament del sistema de contenció de vehicles serà com a mínim de 4 m de longitud.

##### c) Extrems

A l'extrem frontal en carreteres amb calçades separades i en tots els extrems en carreteres de calçada única, es disposarà d'abatiments fins al terreny o encastaments de l'extrem del sistema de contenció al talús del desmunt. Tots els abatiments considerats al projecte, consisteixen en abatiments de 8 metres de longitud amb suports cada 2 m.

Per a l'extrem final, s'abatran fins el terreny els últims 4,32 m de barrera, mitjançant una peça especial d'angle, amb pals cada 2 m.

### 7.2.2 Posició transversal

Les barreres es col·locaran fora del voral, de manera que quan l'amplada del voral sigui inferior a 0,50m o no hi hagi voral, les barreres es situaran a una distància transversal a la vora de la calçada de, almenys, 0,50 m. Com els vorals són majors o iguals a 0,50 m a tots els vials, es compleix en tot cas aquesta prescripció.

Es recomana, en qualsevol cas, col·locar-les sempre que sigui possible, separades de la vora pavimentada, sense sobrepassar les distàncies màximes indicades a la taula 9 de l'Ordre circular 35/2014, ni afectar la zona prevista per al seu funcionament en cas d'impacte. La zona compresa entre el voral i el sistema de contenció de vehicles haurà de ser plana, estar compactada i desproveïda d'obstacles.

La distància entre la vora anterior més propera al trànsit d'una barrera de seguretat o barana i l'obstacle o desnivell a protegir, no serà inferior a l'amplada de treball o deflexió dinàmica, respectivament, del sistema a emprar, segons el que indica l'Ordre circular 35/2014.

### 7.2.3 Transicions

Les transicions entre els diferents tipus de barreres de seguretat i ampits es disposaran d'acord amb les indicacions que es recullen en la descripció tècnica del sistema, aportada pel titular del marcatge CE, i sempre de forma semblant a la instal·lació emprada en els assaigs de impacte, realitzats segons la norma UNE-EN 1317, amb els quals s'ha obtingut el marcatge CE.

## 7.3 TIPOLOGIA DE SISTEMES DE CONTENCIÓ ADOPTATS

Amb l'objectiu de minimitzar el nombre de tipologies diferents possibles, els sistemes de contenció adoptats han estat els següents:

a) Barreres metàl·liques:

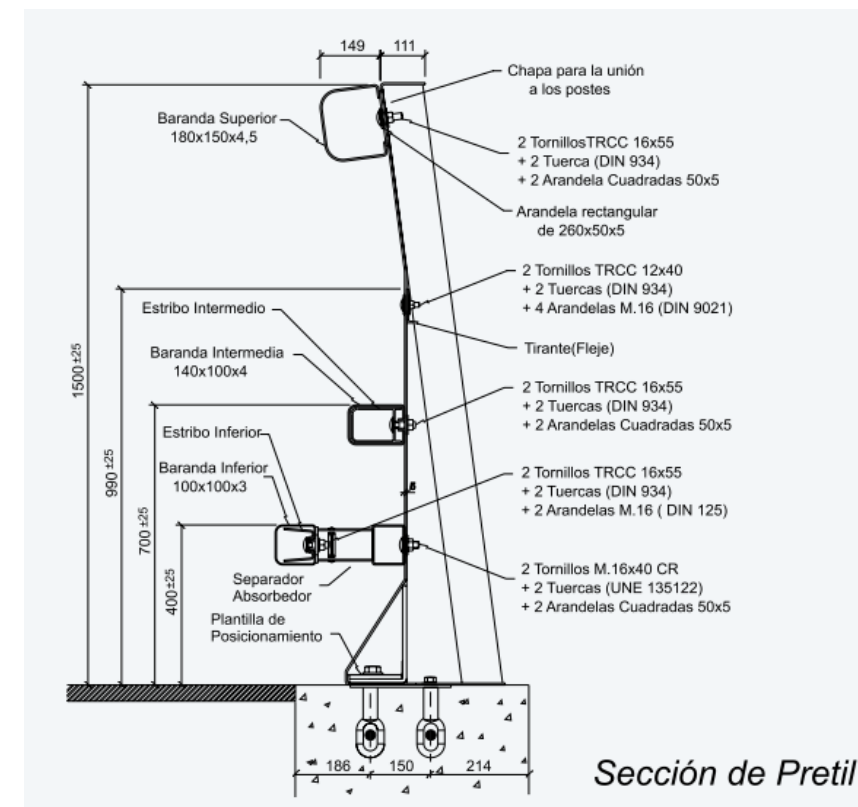
- **BMS N2 W5 D≤1,6 A:** Barrera de seguretat metàl·lica simple, amb nivell de contenció N2, amplària de treball W5, índex de severitat A i deflexió dinàmica 1,6 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent tanca de secció doble ona, i recolzada sobre pals de perfil C-120 cada 4m (BMSNA4/C).

Aquesta tipologia de barrera es col·locarà als marges exteriors de la via en aquelles zones amb risc d'accident, principalment terraplens de més d'1 metre d'alçada.

- **BMS H1 W4 D≤1,1 A:** Barrera de seguretat metàl·lica simple, amb separador, amb dues tanques sobreposades de secció doble ona, recolzada sobre pals de perfil tubular de 120x55 mm cada 2,00 m. Aquesta tipologia de barrera es col·locarà als marges exteriors de la via com a transició de l'ampit metàl·lic.

b) Ampits metàl·lics:

- **Ampit metàl·lic H2 W2 D≤0,5 B:** Ampit metàl·lic homologat d'acord amb la Norma UNE EN-1317, classe M i nivell H2, d'1,205 m d'alçada amb muntants cada 2,00 m, amb tres (3) travessers de perfil tubular, tot galvanitzat en calent. S'emprarà com a barrera de seguretat en la nova obra de fàbrica projectada sobre el riu Manol.





**Annex 13. Estudi de l'organització i desenvolupament de les obres**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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**ÍNDEX**

1	TREBALLS DESENVOLUPATS. DESCRIPCIÓ I GENERALITATS.....	1
2	DESENVOLUPAMENT DE L'OBRA.....	1
2.1	Característiques generals.....	1
3	FASES D'OBRA.....	1
3.1	FASE 1.....	2
3.2	FASE 2.....	2
3.3	FASE 3.....	2
4	SENYALITZACIÓ I ABALISAMENT.....	2
4.1	Dimensions dels elements de senyalització .....	3
4.2	Elements d'abalisament .....	3
4.3	Senyalització de carrils provisionals .....	4
5	SERVEIS AFECTATS .....	4
6	PRESSUPOST .....	4

**APÈNDIX 1. PLÀNOLS DE FASES D'OBRA**

## 1 TREBALLS DESENVOLUPATS. DESCRIPCIÓ I GENERALITATS

El present Annex té per objectiu exposar les mesures que es consideren necessàries per al correcte desenvolupament de les obres, mantenint en servei els vials afectats per les obres, de tal manera que la interferència entre aquestes i el trànsit sigui la mínima possible.

Els objectius fonamentals a complir són:

- Informar a l'usuari de la presència d'obres.
- Ordenar la circulació en la zona afectada per aquestes.
- Modificar el comportament de l'usuari, adaptant-lo a una situació no habitual representada per les obres i les seves circumstàncies específiques.
- Aconseguir el màxim nivell de seguretat.

Les obres projectades consisteixen en el condicionament de la carretera GIP-5129 de Vilafant a Borrassà, des de l'enllaç amb la N-260 fins al PK 1+240 de la carretera actual. Aquestes obres tenen la finalitat de suprimir el gual existent sobre el riu Manol i lliurar Vilafant del trànsit de pas. Les principals obres a projectar són la variant de Vilafant que substitueix l'actual travessia de la GIP-5129 i el pont sobre el riu Manol per tal de substituir el gual existent.

Bàsicament s'exposen, a mode seqüencial, aquells aspectes que garanteixin que el vial en estudi i les carreteres properes puguin continuar mantenint el seu servei, tot i que en certes fases seran necessaris desviaments de trànsit.

Es garantirà durant l'execució de les obres l'accés a tots els itineraris actuals. En el cas que sigui necessari, es donarà accés alternariu per altres carreteres.

L'execució de les obres i la senyalització provisional haurà de tenir en compte el caràcter de la zona d'actuació a efectes de disposar la senyalització i les proteccions necessàries per garantir la seguretat tant dels conductors com dels treballadors de l'obra.

## 2 DESENVOLUPAMENT DE L'OBRA

### 2.1 CARACTERÍSTIQUES GENERALS

S'ha previst l'execució dels treballs segons dos fases principals. En totes elles busquem diferenciar clarament els espais ocupats per les obres, i els destinats a la circulació de vehicles, que seran convenientment senyalitzats.

Per al disseny de les marques vials i la senyalització vertical s'han seguit les instruccions de la "Norma de Carreteras 8.3.-I.C. Señalización de Obras", amb data de setembre de 1987, i el "Manual de ejemplos de señalización de obras fijas" de l'any 1997.

Les marques horitzontals seran de color groc i, en cada una de les fases de l'obra, seran eliminades mitjançant microfressat.

Els senyals verticals seran retrorreflectants amb nivell 2. Les seves dimensions seran les corresponents a carreteres convencionals amb voral, segons queden definides a la vigent "Norma 8.1-IC señalización vertical de la Instrucción de Carreteras".

Les barreres seran tipus New Jersey de plàstic. Es programarà la revisió diària del nivell d'aigua de les barreres per tal d'evitar que es moguin per l'efecte del vent, del trànsit o de les operacions de construcció.

## 3 FASES D'OBRA

Les diferents activitats definides en el present projecte són les següents:

- Replanteig i treballs previs
- Enderrocs
- Moviment de terres
- Estructures
- Drenatge
- Afermat i pavimentació
- Senyalització, abalisament i proteccions
- Serveis afectats

A continuació es proposa una seqüència de fases per a l'execució de les obres, de forma que es minimitzi l'afectació a la GIP-5129 i a la resta de camins existents a la zona, mantenint el nivell de servei necessari. Tot i ser una zona amb molt poc trànsit, existeixen diverses finques particulars pel que es mantindrà l'accés a aquestes en tot moment.

Serà d'especial importància garantir que la capa de trànsit tingui característiques totalment homogènies a les zones de transició entre fases així com amb als extrems de l'actuació en la transició amb el ferm existent.

A l'apèndix 1 (Plànols) del present document es representen les fases previstes en l'execució de les obres.

### 3.1 FASE 1

A la primera fase es durà a terme el gruix de l'actuació. Els treballs que es realitzaran durant la fase 1 seran:

- Execució dels ramals nord i sud de la rotonda a la GIP-5129:
  - o S'executaran els ramals nord i sud de la rotonda i les corresponents parts de la calçada anular. D'aquesta manera, els dos carrils de la N-260 quedaran oberts al trànsit (tant sentit Vilafant com sentit Besalú).
  - o S'executarà la llosa de protecció per a la canalització soterrada del servei existent 202 propietat de Telefònica.
- Tram del tronc de la variant entre el PK 0+564 i el PK 0+990:
  - o S'inclou moviments de terres, elements de drenatge, estesa de les capes de mesclures bituminoses a excepció de la capa de rodadura i el nou pont sobre el riu Manol.
- Tram del tronc de la variant entre el PK 0+207 i el PK 0+540:
  - o S'inclou el moviment de terres, elements de drenatge i estesa de les capes de mesclures bituminoses a excepció de la capa de rodadura.
- Execució de la meitat dreta del tronc de la variant sentit Vilafant del PK 0+000 al PK 0+207:
  - o El carril sentit Vilafant de la carretera GIP-5129 quedarà tancat en aquest tram, pel que es preveu la reconducció del trànsit d'ambdós sentits pel carril sentit Borrassà. Serà necessari la ubicació de personal d'obra per la ordenació del trànsit en aquest tram.
- Execució d'un camí provisional de 6 m d'amplada, amb una secció de 25 cm de tot-ú més un reg bicapa, col·locat una vegada excavada la terra vegetal, que connecti la nova variant amb l'antiga carretera GIP-5129, del PK 0+510 de la nova variant al PK 0+574 de la GIP-5129.
- Reposició del servei existent 102 de la companyia Endesa.
- Reposició del servei existent 103 de la companyia Endesa.
- Reposició del servei existent 104 de la companyia Endesa.
- Reposició del servei existent 201 de la companyia Telefònica.

La circulació del trànsit de vehicles en aquesta fase es preveu per la carretera actual GIP-5129 passant pel centre del nucli, ja que les obres només interaccionen amb la carretera al tram comprès entre els PPKK 0+000 i 0+207, on es deixarà mitja calçada per a la circulació del trànsit. Pel que fa a les parcel·les del marge esquerre, aquestes tindran accés per la GIP-5129.

### 3.2 FASE 2

Els treballs que es realitzaran durant la fase 2 seran:

- Execució de la part central de la rotonda a la GIP-5129:
  - o S'executarà la part central de la rotonda i el trànsit serà desviat pels trams de la rotonda executats a la fase prèvia. D'aquesta manera, no s'interromp la circulació en cap dels dos sentits de la N-260.
- Execució de l'enllaç de la variant amb la carretera GIP-5129, al PK 0+560:
  - o S'inclou el moviment de terres, elements de drenatge i estesa de les capes de mesclures bituminoses a excepció de la capa de rodadura.
- Execució de la meitat esquerra del tronc de la variant sentit Vilafant del PK 0+000 al PK 0+207:
  - o El carril sentit Borrassà de la carretera GIP-5129 quedarà tancat en aquest tram, pel que es preveu la reconducció del trànsit d'ambdós sentits pel carril sentit Vilafant. Serà necessari la ubicació de personal d'obra per la ordenació del trànsit en aquest tram.

La circulació del trànsit de vehicles en aquesta fase es preveu pel tram de la variant ja executat a la fase anterior fins al PK 0+530, on es desviarà el trànsit pel camí provisional cap a la GIP-5129. Pel que fa a les parcel·les del marge esquerre, aquestes tindran accés per la nova variant.

### 3.3 FASE 3

Els treballs a realitzar a la fase 3 seran:

- Reposició dels camins existents que es vegin afectats per les obres.
- Afermat de la totalitat de la nova variant, seguit de la instal·lació de senyalització i les defenses.
- Demolició del vial provisional executat durant la fase 1.

## 4 SENYALITZACIÓ I ABALISAMENT

Quan l'execució de les obres aquí exposades derivin en la modificació de plataformes de vies existents o en les seves proximitats i que puguin representar un perill per a la circulació, interferint amb el desenvolupament normal de les obres, s'haurà de senyalitzar correctament mitjançant la senyalització, l'abalisament i les defenses a establir amb caràcter provisional. Es regirà per l'establert en la Instrucció de Carreteres 8.3I.C. "SEÑALIZACION DE OBRAS", aprovada per Ordre Ministerial de 31 d'Agost de 1.987 sobre "Señalización, balizamiento, limpieza, defensa y terminación de obras fijas en vías fuera de poblado".



## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Quan sigui precís limitar la circulació a un únic carril, donant pas alternatiu, es disposaran equips de personal per tal d'ordenar aquestes operacions de forma que es pugui garantir la seguretat i fluïdesa del trànsit en ambdós sentits.

Durant la nit i seguint les indicacions de la Direcció d'Obra, es situaran sempre que sigui precís, la il·luminació, senyalització i abalisament lluminós, que sigui necessari.

En els plànols de l'annex de seguretat i salut, es presenten a mode d'exemple diferents tipus de senyalització i abalisament d'obra depenent de les actuacions a realitzar. Aquests exemples son a títol orientatiu i s'han de considerar com a mínims. En qualsevol cas la senyalització i abalisament a implantar en la zona d'obres en la nit o festius haurà de ser definida pel contractista i acceptada per la D.O. Sent en cas contrari, responsabilitat del contractista les conseqüències d'una deficient senyalització.

Els desviaments provisionals de trànsit que es derivin de l'execució de les obres aquí exposades, la senyalització, l'abalisament i les defenses a establir amb caràcter provisional, es regiran per allò establert en la Norma 8.3-IC "Señalización de obras", aprovada per Ordre Ministerial de 31 d'agost de 1987 i modificada pel Reial Decret 208/1989.

Per tal que l'aplicació de la norma 8.3-IC "Señalización de obras" es pugui efectuar amb més facilitat, s'ha publicat una sèrie d'exemples que segueixen les pautes i especificacions de la norma i que estan recollits en el "Manual de ejemplos de señalización de obras fijas" publicat per la Direcció General de Carreteres del Ministerio de Fomento.

Els objectius fonamentals que es persegueixen amb la senyalització de les obres són:

- Informar a l'usuari de la presència de les obres.
- Ordenar la circulació en la zona afectada per les obres.
- Modificar el seu comportament, adaptant-lo a la situació no habitual representada per les obres i les seves circumstàncies específiques.

En definitiva, l'objectiu és assolir el màxim nivell de seguretat, tant pels usuaris, com pels treballadors de l'obra, i limitar el deteriorament del nivell de servei de la via afectada.

A la norma 8.3-IC es recull, a mode de catàleg, els diferents elements de senyalització, abalisament i defensa a emprar. Aquests són:

- Senyals de perill

- Senyals de reglamentació i prioritat
- Senyals d'indicació
- Senyals manuals
- Elements d'abalisament reflectants
- Elements lluminosos
- Elements de defensa

Els senyals seran els assenyalats als Plànols, per advertir l'existència d'obres i obligar a la reducció de velocitat i, si s'escau, la detenció del trànsit. Els senyals i panells direccionals seran de fons groc, i aniran traslladant-se segons es desenvolupi l'obra.

Cada tram de carretera que es lliuri al trànsit després de col·locar capes asfàltiques cobrint les marques viàries existents, deurà tenir aquestes refetes amb color groc o taronja, mentre no es tracti de la capa final de rodatge.

Als desviaments provisionals, les marques viàries seran també grogues o taronja.

### **4.1 DIMENSIONS DELS ELEMENTS DE SENYALITZACIÓ**

A l'hora de determinar quines han de ser les dimensions mínimes dels elements de senyalització, la taula 5 de la norma 8.3-IC "Señalización de Obras" permet qualsevol dels tres tipus de mida (des de molt gran a normal). Tenint en compte la tipologia de l'obra, el tipus de via i la velocitat de projecte (60 km/h) s'ha escollit la categoria dimensional "normal".

Aquestes dimensions mínimes estan recollides a la taula 4 de l'esmentada norma.

### **4.2 ELEMENTS D'ABALISAMENT**

Els elements d'abalisament es col·locaran per marcar les zones vedades a la circulació. En el cas d'ordenació del trànsit en sentit únic alternatiu, els elements d'abalisament poden ser:

- a) El tancament d'un carril:

El tancament d'un carril a la circulació defineix un límit recte i inclinat, materialitzat mitjançant un abalisament, que consta de:

- Un plafó TB-1, situat, sempre que sigui possible, en el voral que la secció en que comença la inclinació de la vora per a tancar el carril i un altre igual en la secció en què finalitza aquesta



inclinació i el carril ha quedat tancat. Els plafó TB-1 podrà completar-se amb senyals TR-400 o TR-401 de sentit i pas obligatori.

- Una sèrie de cons TB-6 sobre el cantell inclinat i entre els plafons TB-1 extrems, a una separació entre 5 i 20 m, de manera que resulti uniforme. Quan la durada del tancament sigui superior a una setmana, es considerarà la conveniència de completar els cons amb una marca d'abalisament TB-12 pintada sobre el paviment.

b) Vora longitudinal de la zona d'obres:

L'abalisament que marqui el cantell de la zona vedada a la circulació amb motiu de les obres dependrà de la probabilitat de produir-se un accident, i de la probabilitat que, en cas de produir-se, resulti greu. Es tindran en compte les següents situacions:

- Quan es tracti únicament d'impedir el pas de vehicles sense que existeixi una probabilitat elevada de que es produeixi un accident greu, es disposaran plafons TB-1 perpendicularment a la direcció de circulació (mai paral·leles a ella) a distància suficient per a dissuadir l'entrada a la zona vedada.
- Quan l'entrada d'un vehicle a la zona vedada tingui una probabilitat elevada de produir un accident greu, l'abalisament consistirà en piquets TB-7 o preferentment, fites de cantell TB-11, quan es puguin clavar sense deteriorament de la superfície, o amb balises TB-8 o TB-9 en cas contrari. La distància entre elements contigus estarà compresa entre 5 i 20 m.

#### **4.3 SENYALITZACIÓ DE CARRILS PROVISIONALS**

Els carrils provisionals (sempre que el seu traçat i/o amplada no coincideixin amb els de carril d'ús normal) s'hauran d'abalisar. En el cas, que algun carril es trobi aïllat, s'hauran d'abalisar els dos cantells.

L'abalisament afectarà als cantells i es realitzarà d'una de les següents maneres:

- Cons TB-6 amb una separació màxima de 5 a 10 m en corba i el doble en recta i/o
- Marca vial taronja TB-12, pintada o adherida sobre el paviment i/o
- Ulls de gat TB-10 amb la mateixa separació que els cons.

## **5 SERVEIS AFECTATS**

En l'àmbit del projecte es troben diversos serveis existents que es veuran afectats degut a les obres a executar.

Els serveis existents són els següents:

- Línies elèctriques (ENDESA)
- Línies de telefonia (TELEFONICA)

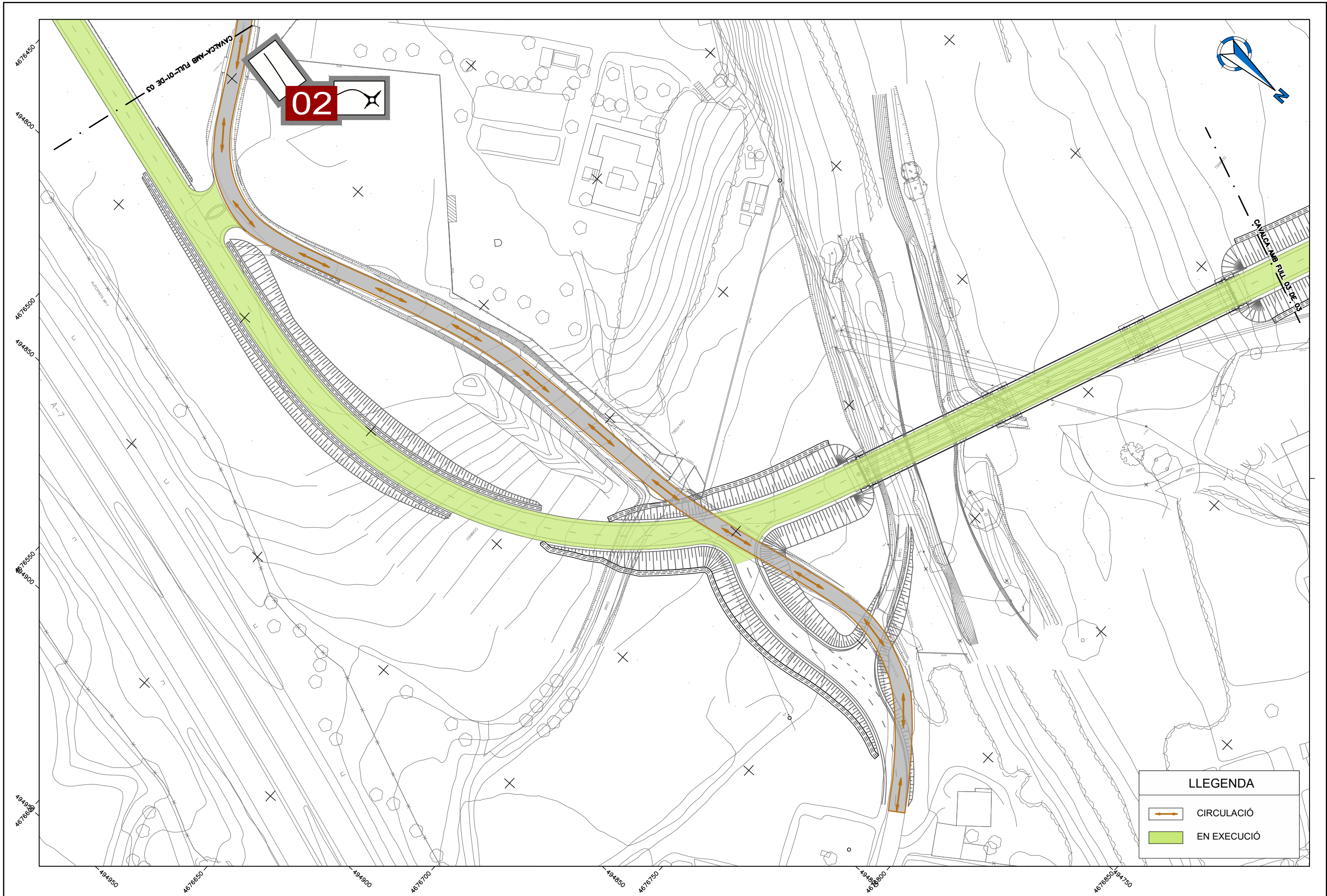
## **6 PRESSUPOST**

En el Pressupost del projecte s'inclou una Partida alçada de cobrament íntegre per a la seguretat viària, la senyalització, l'abalisament i els desviaments provisionals durant l'execució de les obres.

## APÈNDIX 1. Plànols de fases d'obra

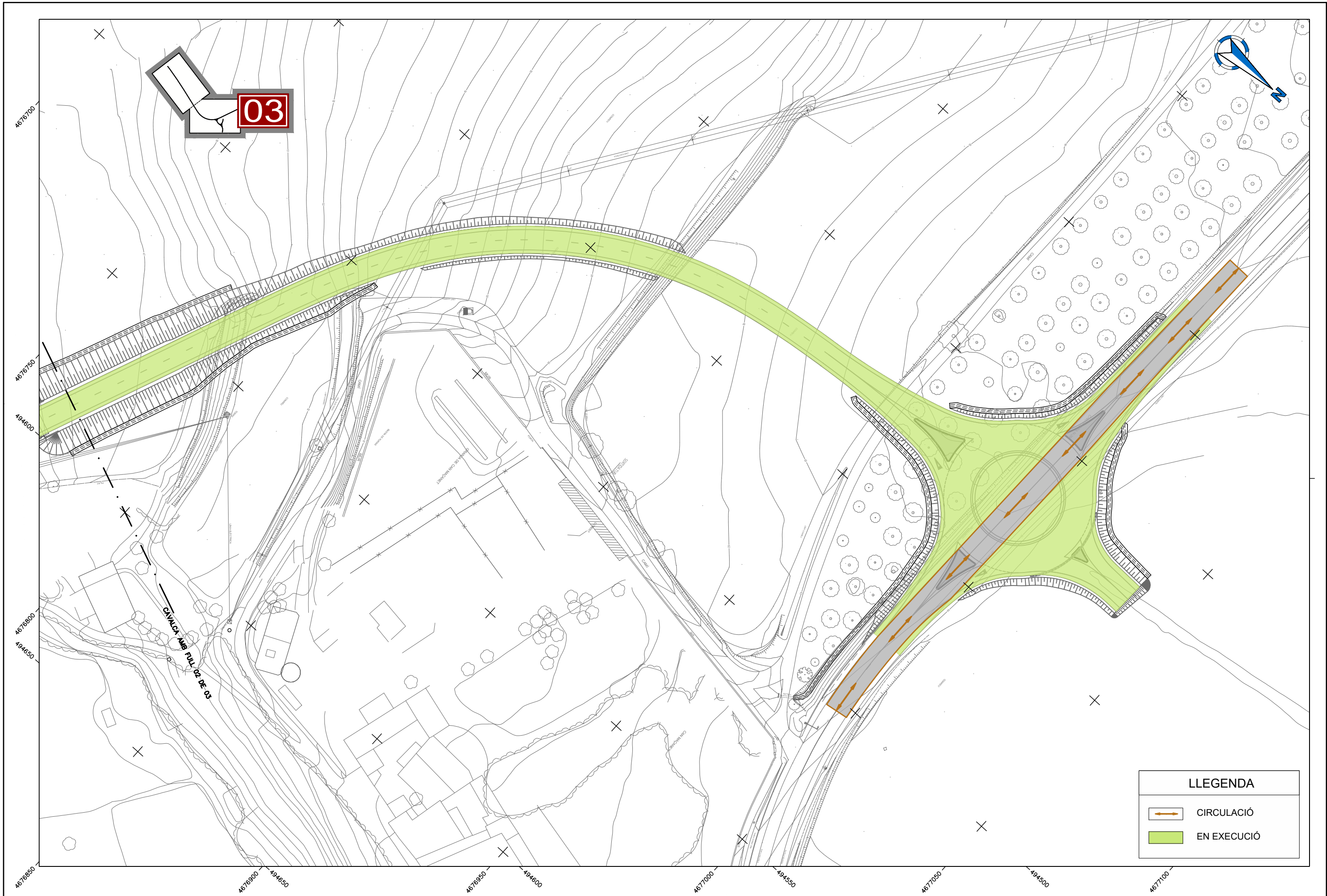


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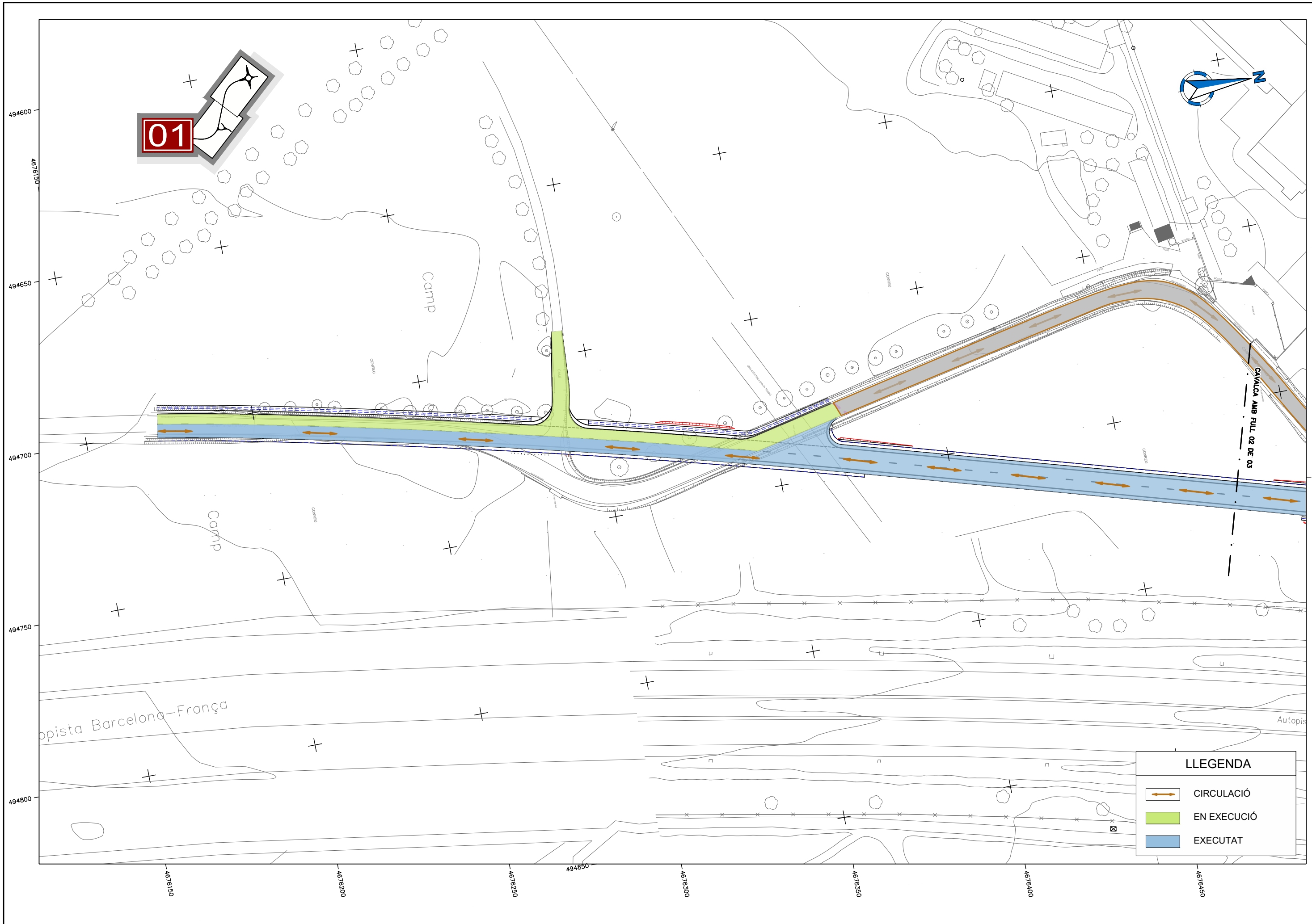


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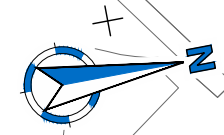




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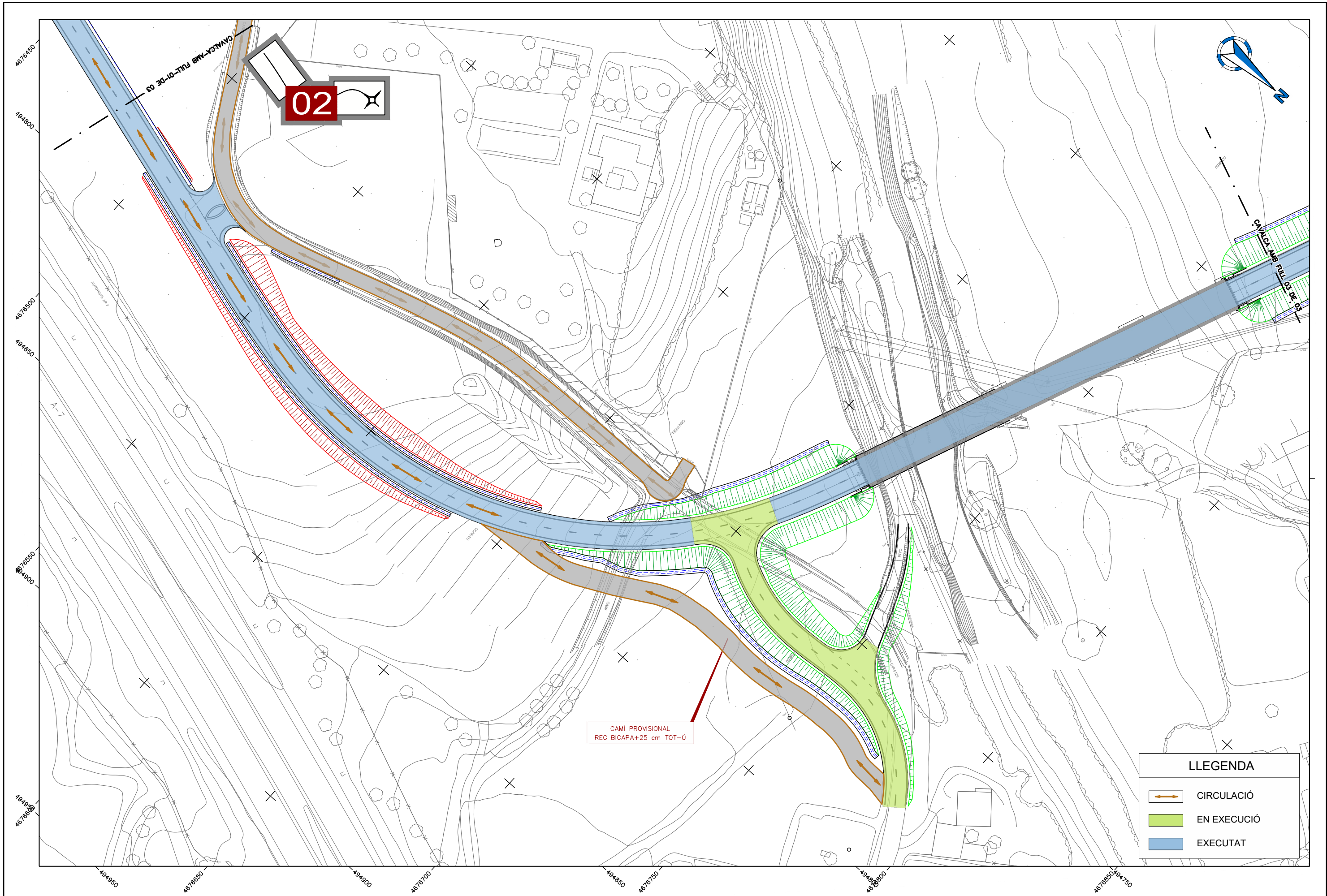


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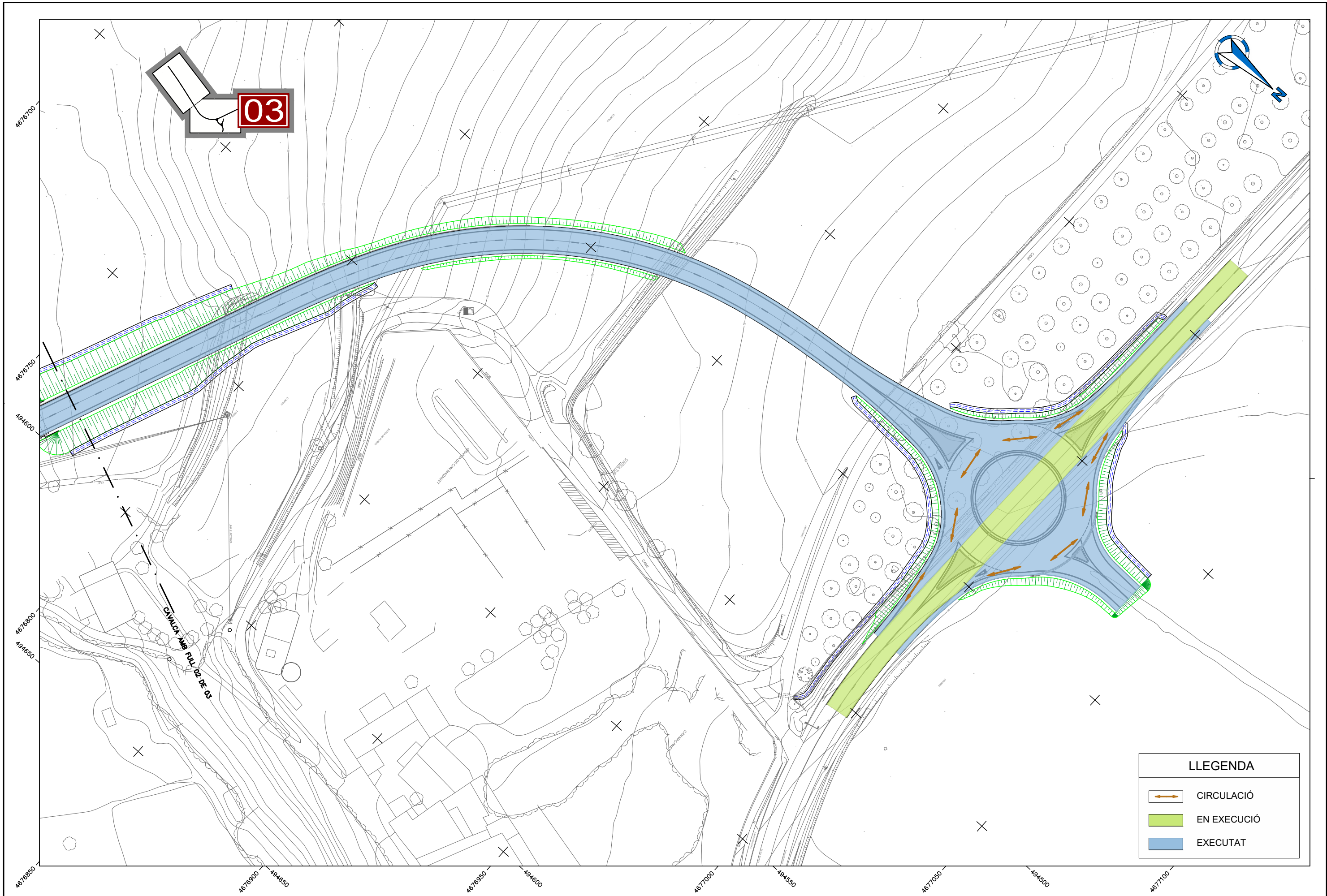
LLEGGENDA	
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	EN EXECUCIÓ
	EXECUTAT





LLEGGENDA	
	CIRCULACIÓ
	EN EXECUCIÓ
	EXECUTAT





**03**

CAVALCA AMB FULL DE QS

LLEGENDA	
	CIRCULACIÓ
	EN EXECUCIÓ
	EXECUTAT





#### **Annex 14. Pla de treball**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **ÍNDEX**

1	PLA DE TREBALLS.....	1
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APÈNDIX 1. DIAGRAMA DE BARRES

## 1 PLA DE TREBALLS

L'objectiu del present annex és justificar i presentar un pla de treballs per a la realització del projecte constructiu.

Pel disseny del pla d'obres s'ha tingut en compte l'ordre cronològic de realització de les diferents tasques.

Donada la tipologia d'obra projectada es distingeixen les següents tasques d'obra, dividides en les 3 fases principals:

- Treballs d'instal·lació d'obra i replanteig
- Treballs previs i demolicions
- Moviment de terres
- Estructures
- Drenatge
- Afermats
- Seguretat viària
- Mesures correctores d'impacte ambiental
- Obres complementàries

Un altre paràmetre a tenir en compte per realitzar el pla d'obres és la durada de les diferents tasques. Un cop calculada la durada de les tasques de forma independent segons el solapament en el temps s'ha calculat la durada total de l'obra que es preveu de 12 mesos.

Per tal de determinar la durada de les diferents tasques i el nombre de tasques coincidents en el temps s'ha tingut en compte la previsió de mà d'obra, en aquest cas 15 persones.

L'apèndix conté el Diagrama de barres del planejament de les obres.

## APÈNDIX 1. Diagrama de barres



PLA D'OBRA

CONCEPTE	INVERSIÓ PER CAPÍTOLS	MESOS											
		1	2	3	4	5	6	7	8	9	10	11	12
<b>FASE 1</b>	<b>1.639.868,52 €</b>												
Treballs previs i enderrocs	8.343,50 €												
Moviment de terres	60.333,31 €												
Drenatge	22.679,31 €												
Estructures	1.101.019,14 €												
Afermats	243.791,77 €												
Seguretat viària	94.817,32 €												
Gestió de residus	64.860,10 €												
Seguretat i Salut	25.941,41 €												
Pla de Control de Qualitat	0,00 €												
Partides alçades	18.082,68 €												
<b>FASE 2</b>	<b>181.348,57 €</b>												
Treballs previs i enderrocs	5.562,33 €												
Moviment de terres	18.099,99 €												
Drenatge	13.607,58 €												
Afermats	81.263,92 €												
Seguretat viària	37.926,93 €												
Gestió de residus	14.825,17 €												
Seguretat i Salut	5.929,47 €												
Pla de Control de Qualitat	0,00 €												
Partides alçades	4.133,18 €												
<b>FASE 3</b>	<b>155.734,11 €</b>												
Afermats	60.947,94 €												
Mesures correctores	24.910,70 €												
Obres complementàries	54.320,59 €												
Gestió de residus	9.265,73 €												
Seguretat i Salut	3.705,92 €												
Pla de Control de Qualitat	0,00 €												
Partides alçades	2.583,24 €												
<b>PRESSUPOST D'EXECUCIÓ MATERIAL: 1.976.951,21 €</b>													

TERMINI D'EXECUCIÓ DE LES OBRES	12 MESOS												
% CERTIFICACIONS MENSUALS D'OBRES		1,66%	1,85%	8,11%	12,23%	11,77%	15,88%	15,88%	12,23%	3,65%	4,43%	5,63%	6,69%
% CERTIFICACIÓ TOTAL ACUMULADA		1,66%	3,51%	11,62%	23,85%	35,61%	51,49%	67,37%	79,60%	83,25%	87,68%	93,31%	100,00%



## **Annex 15. Serveis afectats**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **Annex 16. Terrenys afectats**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **Annex 17. Estudi de seguretat i salut**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **INDEX**

- 1. Memòria**
- 2. Plec de Condicions**
- 3. Pressupost**
- 4. Documentació gràfica**



## **1.-Memòria**

## ÍNDEX

<b>1</b>	<b>OBJECTE DE L'ESTUDI DE SEGURETAT I SALUT.....</b>	<b>1</b>	10.1	SERVEIS AFECTATS.....	9
1.1	IDENTIFICACIÓ DE LES OBRRES.....	1	10.2	SERVITUDS.....	9
1.2	OBJECTE.....	1	10.3	CARACTERÍSTIQUES METEOROLÒGIQUES.....	10
<b>2</b>	<b>PROMOTOR - PROPIETARI .....</b>	<b>1</b>	10.4	CARACTERÍSTIQUES DEL TERRENY .....	10
<b>3</b>	<b>AUTOR/S DE L'ESTUDI DE SEGURETAT I SALUT .....</b>	<b>1</b>	10.5	CARACTERÍSTIQUES DE L'ENTORN .....	10
<b>4</b>	<b>DADES DEL PROJECTE .....</b>	<b>1</b>	<b>11</b>	<b>UNITATS CONSTRUCTIVES .....</b>	<b>10</b>
4.1	AUTOR/S DEL PROJECTE .....	1	<b>12</b>	<b>DETERMINACIÓ DEL PROCÉS CONSTRUCTIU .....</b>	<b>11</b>
4.2	COORDINADOR DE SEGURETAT DURANT L'ELABORACIÓ DEL PROJECTE.....	1	12.1	PROCEDIMENTS D'EXECUCIÓ .....	11
4.3	TIPOLOGIA DE L'OBRA.....	1	12.2	ORDRE D'EXECUCIÓ DELS TREBALLS.....	11
4.4	SITUACIÓ .....	1	12.3	DETERMINACIÓ DEL TEMPS EFECTIU DE DURACIÓ. PLA D'EXECUCIÓ .....	11
4.5	COMUNICACIONS.....	2	<b>13</b>	<b>SISTEMES I/O ELEMENTS DE SEGURETAT I SALUT INHERENTS O INCORPORATS AL MATEIX PROCÉS CONSTRUCTIU.....</b>	<b>11</b>
4.6	SUBMINISTRAMENT I SERVEIS.....	2	<b>14</b>	<b>MEDIAMBIENT LABORAL .....</b>	<b>12</b>
4.7	LOCALITZACIÓ DE SERVEIS ASSISTENCIALS, SALVAMENT I SEGURETAT I MITJANS D'EVACUACIÓ .....	2	14.1	AGENTS ATMOSFÈRICS .....	12
4.8	PRESSUPOST D'EXECUCIÓ MATERIAL DEL PROJECTE .....	2	14.2	ENLLUMENAT.....	12
4.9	TERMINI D'EXECUCIÓ.....	2	14.3	SOROLL.....	12
4.10	MÀ D'OBRA PREVISTA.....	2	14.4	POLS .....	12
4.11	OFICIS QUE INTERVENEN EN EL DESENVOLUPAMENT DE L'OBRA .....	2	14.5	ORDRE I NETEJA.....	13
4.12	TIPOLOGIA DELS MATERIALS A UTILITZAR A L'OBRA.....	2	14.6	RADIACIONS NO IONITZANTS .....	13
4.13	MAQUINÀRIA PREVISTA PER A EXECUTAR L'OBRA.....	3	14.7	RADIACIONS IONITZANTS .....	15
<b>5</b>	<b>INSTAL·LACIONS PROVISIONALS .....</b>	<b>4</b>	<b>15</b>	<b>MANIPULACIÓ DE MATERIALS.....</b>	<b>16</b>
5.1	INSTAL·LACIÓ ELÈCTRICA PROVISIONAL D'OBRA .....	4	<b>16</b>	<b>MITJANS AUXILIARS D'UTILITAT PREVENTIVA (MAUP) .....</b>	<b>17</b>
5.2	INSTAL·LACIÓ D'AIGUA PROVISIONAL D'OBRA .....	5	<b>17</b>	<b>SISTEMES DE PROTECCIÓ COL·LECTIVA (SPC).....</b>	<b>17</b>
5.3	INSTAL·LACIÓ DE SANEJAMENT .....	5	<b>18</b>	<b>CONDICIONS DELS EQUIPS DE PROTECCIÓ INDIVIDUAL (EPI).....</b>	<b>17</b>
5.4	ALTRES INSTAL·LACIONS. PREVENCIÓ I PROTECCIÓ CONTRA INCENDIS.....	6	<b>19</b>	<b>RECURSOS PREVENTIUS.....</b>	<b>18</b>
<b>6</b>	<b>SERVEIS DE SALUBRITAT I CONFORT DEL PERSONAL.....</b>	<b>6</b>	<b>20</b>	<b>SENYALITZACIÓ I ABALISAMENT.....</b>	<b>19</b>
6.1	SERVEIS HIGIÈNICS .....	6	<b>21</b>	<b>CONDICIONS D'ACCÉS I AFECTACIONS DE LA VIA PÚBLICA .....</b>	<b>19</b>
6.2	VESTUARIS .....	6	21.1	NORMES DE POLICIA .....	19
6.3	MENJADOR .....	6	21.2	ÀMBIT D'OcupACIÓ DE LA VIA PÚBLICA .....	20
6.4	LOCAL DE DESCANS .....	7	21.3	TANCAMENTS DE L'OBRA QUE AFECTEN L'ÀMBIT PÚBLIC .....	20
6.5	LOCAL D'ASSISTÈNCIA A ACCIDENTATS.....	7	21.4	OPERACIONS QUE AFECTEN L'ÀMBIT PÚBLIC .....	20
<b>7</b>	<b>ÀREES AUXILIARS.....</b>	<b>7</b>	21.5	NETEJA I INCIDÈNCIA SOBRE L'AMBIENT QUE AFECTEN L'ÀMBIT PÚBLIC.....	21
7.1	CENTRALS I PLANTES .....	7	21.6	RESIDUS QUE AFECTEN A L'ÀMBIT PÚBLIC.....	22
7.2	TALLERS .....	7	21.7	CIRCULACIÓ DE VEHICLES I VIANANTS QUE AFECTEN L'ÀMBIT PÚBLIC.....	22
7.3	ZONES D'APILAMENT. MAGATZEMS .....	8	21.8	PROTECCIÓ I TRASLLAT D'ELEMENTS EMPLAÇATS A LA VIA PÚBLICA.....	23
<b>8</b>	<b>TRACTAMENT DE RESIDUS.....</b>	<b>8</b>	<b>22</b>	<b>RISCOS DE DANYS A TERCERS I MESURES DE PROTECCIÓ .....</b>	<b>23</b>
<b>9</b>	<b>TRACTAMENT DE MATERIALS I/O SUBSTÀNCIES PERILLOSES.....</b>	<b>8</b>	22.1	RISCOS DE DANYS A TERCERS .....	23
9.1	MANIPULACIÓ .....	8	22.2	MESURES DE PROTECCIÓ A TERCERS.....	23
9.2	DELIMITACIÓ / CONDICIONAMENT DE ZONES D'APILAMENT.....	8	<b>23</b>	<b>PREVENCIÓ DE RISCOS CATASTRÒFICS .....</b>	<b>24</b>
<b>10</b>	<b>CONDICIONS DE L'ENTORN.....</b>	<b>9</b>	<b>24</b>	<b>PREVISIONS DE SEGURETAT PELS TREBALLS POSTERIORS.....</b>	<b>24</b>
			<b>25</b>	<b>FORMACIÓ DEL PERSONAL EN MATERIA DE SEGURETAT I SALUT .....</b>	<b>24</b>

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

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25.1	CAPS D'OBRA I ENCARREGATS .....	24
25.2	PER A TOT EL PERSONAL CONTRACTISTA I TREBALLADORS.....	24
<b>26</b>	<b>VIGILANCIA DE LA SALUT .....</b>	<b>24</b>
<b>27</b>	<b>SEGUIMENT I VIGILANCIA DE LA SEGURETAT I SALUT .....</b>	<b>24</b>
27.1	BRIGADA DE SEGURETAT, NETEJA I TREBALLS AUXILIARS.....	24
27.2	REUNIONS DELS RESPONSABLES EN PREVENCIÓ DE RISCOS .....	25
27.3	COORDINACIÓ D'ACTIVITATS EMPRESARIALS .....	25
<b>28</b>	<b>GESTIÓ DE LA DOCUMENTACIÓ .....</b>	<b>25</b>
28.1	DOSSIER DE PERSONAL I LA SEVA IDENTIFICACIÓ.....	26
28.2	DOSSIER DE MAQUINARIA I EQUIPS .....	26
28.3	DOSSIER D'EINES I MITJANS AUXILIARS .....	26
<b>29</b>	<b>INFORMES I RESULTATS DE LA GESTIÓ .....</b>	<b>26</b>
29.1	COMUNICAT DE RISCOS .....	26
29.2	INFORME D'ACCIDENT/INCIDENT .....	26
29.3	ÍNDEX DE SINISTRALITAT .....	26
<b>30</b>	<b>TREBALLS EN ALÇADA EN PONTS I VIADUCTES .....</b>	<b>26</b>
30.1	FASES DE MUNTATGE .....	26
30.2	FORMACIÓ I INFORMACIÓ DELS TREBALLADORS .....	29
30.3	RELACIÓ I QUANTITAT D'EQUIPAMENT DE SEGURETAT NECESSÀRIA .....	29
30.4	CONSIDERACIONS SOBRE L'OCUPACIÓ D'I.P.I. CONTRA CAIGUDES .....	29
<b>31</b>	<b>TREBALLS AMB INSTAL·LACIONS ELÈCTRIQUES O EN LES SEVES PROXIMITATS.....</b>	<b>30</b>
<b>32</b>	<b>TREBALLS NOCTURNS .....</b>	<b>31</b>
<b>33</b>	<b>SIGNATURES.....</b>	<b>31</b>

APÈNDIX 1: FITXES D'ACTIVITATS RISC-AVALUACIÓ-MESURES

APÈNDIX 2: JUSTIFICACIÓ DE PREUS

## **MEMÒRIA**

### **1 OBJECTE DE L'ESTUDI DE SEGURETAT I SALUT**

#### **1.1 IDENTIFICACIÓ DE LES OBRRES**

Projecte Constructiu "Condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol".

#### **1.2 OBJECTE**

El present E.S.S. té com a objectiu establir les bases tècniques, per fixar els paràmetres de la prevenció de riscos professionals durant la realització dels treballs d'execució de les obres del Projecte objecte d'aquest estudi, així com complir amb les obligacions que es desprenen de la Llei 31 / 1995 i del RD 1627 / 1997, amb la finalitat de facilitar el control i el seguiment dels compromisos adquirits al respecte per part del/s Contractista/es.

En el present Estudi de Seguretat i Salut s'ha dut a terme un estudi aprofundit dels riscos inherents a l'execució de l'obra i de les mesures preventives i cautelars consegüents per garantir la seguretat de les persones en l'execució de les obres en compliment del que determina la Llei 3/2007 del 4 de juliol de l'obra pública en el seu article 18.3.h).

D'aquesta manera, s'integra en el Projecte Executiu/Constructiu, les premisses bàsiques per a les quals el/s Contractista/es constructor/s pugui/n preveure i planificar, els recursos tècnics i humans necessaris per a l'acompliment de les obligacions preventives en aquest centre de treball, de conformitat al seu Pla d'Acció Preventiva propi d'empresa, la seva organització funcional i els mitjans a utilitzar, havent de quedar tot allò recollit al Pla de Seguretat i Salut, que haurà/n de presentar-se al Coordinador de Seguretat i Salut en fase d'Execució, amb antelació a l'inici de les obres, per a la seva aprovació i l'inici dels tràmits de Declaració d'Obertura davant l'Autoritat Laboral.

En cas de què sigui necessari implementar mesures de seguretat no previstes en el present Estudi, a petició expressa del coordinador de seguretat i salut en fase d'execució de l'obra, el contractista elaborarà el corresponent annex al Pla de Seguretat i Salut de l'obra que desenvoluparà i determinarà les mesures de seguretat a dur a terme amb la memòria, plec de condicions, amidaments, preus i pressupost que li siguin d'aplicació si n'és el cas.

### **2 PROMOTOR - PROPIETARI**

Promotor : Diputació de Girona  
NIF : 1700000A  
Adreça : Pujada Sant Martí, 4-5  
Població : Girona  
Representant :  
NIF :

### **3 AUTOR/S DE L'ESTUDI DE SEGURETAT I SALUT**

Redactor E.S.S. : Sebastià Ribot Florit / Julio Alcobendas García  
Titulació/ns : E.C.C.P / E. Civil i E.T.O.P.

Col·legiat núm. : 10.792 / 15.218  
Despatx professional : AYESA  
Població : Barcelona

### **4 DADES DEL PROJECTE**

#### **4.1 AUTOR/S DEL PROJECTE**

Autors del projecte : Sebastià Ribot Florit / Julio Alcobendas García  
Titulació/ns : E.C.C.P / E. Civil i E.T.O.P.  
Col·legiat núm. : 10.792 / 15.218  
Despatx professional : AYESA  
Població : Barcelona

#### **4.2 COORDINADOR DE SEGURETAT DURANT L'ELABORACIÓ DEL PROJECTE**

Coordinador de S&S  
designat pel promotor : Sebastià Ribot Florit  
Titulació/ns : E.C.C.P  
Col·legiat núm. : 10.792  
Despatx professional : AYESA  
Població : Barcelona

#### **4.3 TIPOLOGIA DE L'OBRA**

La carretera GIP-5129 uneix els nuclis urbans de Vilafant i Borrassà. Té el seu inici a la carretera N-260 i creua el nucli urbà de Vilafant i el riu Manol mitjançant un gual que sovint ha de ser tancat per inundació. Actualment, la carretera disposa d'una única calçada d'uns 5 metres d'amplada, amb dos sentits de circulació sense delimitar i sense vorals.

L'obra projectada consisteix en el condicionament de la via, projectant una nova variant de la GIP-5129 entre l'inici de la carretera al PK 0+000 on es projecta una nova intersecció amb la N-260 i el PK 1+240 de la carretera existent. A més, es preveu l'execució d'un nou punt sobre el riu Manol que substitueixi l'existent gual que creua el curs d'aigua. Dins dels treballs a executar a l'obra es trobarà amb:

- Instal·lació d'obra i replanteig
- Replanteig i treballs previs
- Enderrocs
- Moviment de terres
- Estructures
- Drenatge
- Ferms i paviments
- Senyalització, abalisament i proteccions
- Serveis afectats
- Mesures correctores d'impacte ambiental
- Treballs posteriors

#### **4.4 SITUACIÓ**

Emplaçament : Carretera GIP-5129  
Carrer, plaça :  
Número : PK 0+000 a PK 1+240  
Codi Postal :

Població : Vilafant

#### 4.5 COMUNICACIONS

Carretera : GIP-5129 / N-260  
Ferrocarril :  
Línia Metro :  
Línia Autobús :  
Telèfon :  
Fax :  
E - mail :  
Altres :

#### 4.6 SUBMINISTRAMENT I SERVEIS

Aigua :  
Gas :  
Electricitat : FECSA-ENDESA  
Telefonia : Telefònica S.A.  
Sanejament :  
Reg i drenatges :  
Altres :

#### 4.7 LOCALITZACIÓ DE SERVEIS ASSISTENCIALS, SALVAMENT I SEGURETAT I MITJANS D'EVACUACIÓ

##### SERVEIS ASSISTENCIALS

CAP Vilafant  
Carrer Maria Torres, 89, Els Aspres  
17740 Vilafant, Girona  
Telèfon: 972 514 349

Hospital de Figueres  
Ronda del Rector Arolas, s/n  
17600 Figueres, Girona  
Telèfon: 972 501 400

##### TELÈFONS D'INTERÈS

Central d'emergències	112
Ambulàncies	061
Bombers	112
Bombers de Figueres: Carrer del Compositor Serra, 0 17600 Figueres, Girona	
Mossos d'Esquadra	112
Mossos d'Esquadra Figueres: 972 541 800 Carrer Ter, 9 17600 Figueres, Girona	
Polícia Nacional	091 / 112

Guàrdia municipal Vilafant: 972 909 090

#### 4.8 PRESSUPOST D'EXECUCIÓ MATERIAL DEL PROJECTE

El Pressupost d'Execució Material (PEM) estimat de referència per aquest projecte, exclosa la Seguretat i Salut complementària, Despeses Generals i Benefici Industrial, és de 1.976.951,21 € (un milió nou-cents setanta-sis mil nou-cents cinquanta-un euros amb vint-i-un cèntims).

#### 4.9 TERMINI D'EXECUCIÓ

El termini estimat de duració dels treballs d'execució de l'obra és de 12 mesos.

#### 4.10 MÀ D'OBRA PREVISTA

L'estimació de mà d'obra en punta d'execució és de 15 persones.

#### 4.11 OFICIS QUE INTERVENEN EN EL DESENVOLUPAMENT DE L'OBRA

Cap de colla  
Oficial 1a  
Oficial 2a  
Manobre  
Ajudant  
Manobre especialista  
Oficial 1a jardiner

#### 4.12 TIPOLOGIA DELS MATERIALS A UTILITZAR A L'OBRA

ABALISAMENT DE SEGURETAT LABORAL  
ACCESSORIS PER A TUBS I CANALS  
ACER EN BARRES CORRUGADES  
ACERS PER A ARMADURES ACTIVES O PASSIVES  
ADDITIUS I ADDICIONS PER A FORMIGONS, MORTERS I BEURADES  
ARBUSTS DE FULLA CADUCA  
ARMADURES PER A MICROPILONS  
BARANES DE PROTECCIÓ  
BARREGES DE CESPITLOSES  
BARRERES  
CIMENTS  
CONDUCTORS DE COURE DE 0,6/1 KV  
CONDUCTORS DE COURE NUS  
CLAUS  
DISPOSICIÓ DE RESIDUS  
ENCOFRATS ESPECIALS I CINDRIS

FILFERROS  
FORMIGONS ESTRUCTURALS EN MASSA  
FORMIGONS ESTRUCTURALS PER ARMAR  
FORMIGONS SENSE ADDITIUS  
GEOTÈXTILS  
GRANULATS PER A PAVIMENTS  
GRANULATS PER A PAVIMENTS AMB LIGANTS HIDROCARBONATS  
GRANULATS PER A TRACTAMENTS SUPERFICIALS  
GRAPES  
GRAVES  
JÀSSERES PREFABRICADES DE FORMIGÓ  
LLIGANTS HIDROCARBONATS  
LLOTS TIXOTRÒPICS I ENTUBAMENTS  
LLUMS D'ABALISAMENT  
MATERIALS AUXILIARS APARELLS DE RECOLZAMENT  
MATERIALS AUXILIARS PER A DRENATGES  
MATERIALS AUXILIARS PER A ENCOFRATS I APUNTALAMENTS  
MATERIALS AUXILIARS PER A PERICONS DE CANALITZACIONS  
MATERIALS AUXILIARS PER A POUS DE REGISTRE  
MATERIALS AUXILIARS PER A PREFABRICATS DE FORMIGÓ  
MATERIALS AUXILIARS PER A PROTECCIONS DE VIALITAT  
MATERIALS PER A LA FORMACIÓ DE JUNTS  
MATERIALS PER A PERICONS DE CANALITZACIONS  
MATERIALS PER A PROTECCIONS D'ARBRES  
MESCLES BITUMINOSES CONTÍNUES EN CALENT  
MORTERS  
NEUTRES  
PECES PREFABRICADES DE FORMIGÓ  
PECES RECTES DE FORMIGÓ PER A VORADES  
PEDRES PER A ESCULLERES I FORMIGÓ CICLOPI  
PINTURES PER A SENYALITZACIÓ  
PLAFONS  
PLANXES I PERFILS D'ACER  
PLAQUES DE POLIESTIRÈ  
PUNTALS  
SAULONS  
SEGELLANTS  
SENYALS I CARTELLS D'ACER GALVANITZAT

SENYALS I CARTELLS D'ALUMINI EXTRUSIONAT  
SORRES  
TAULERS  
TAULONS  
TELES METÀL·LIQUES I PLASTIQUES  
TERRES  
TERRES I SUBSTRATS PER A JARDINERIA  
TOT-U  
TUBS CIRCULARS DE FORMIGÓ  
TUBS DE POLIETILÈ PER A CONDUCCIÓ DE CABLES I FIBRA ÒPTICA  
TUBS DE PVC PER A DRENATGES  
TUBS FLEXIBLES I CORBABLES NO METÀL·LICS  
TUBS RÍGIDS NO METÀL·LICS

#### **4.13 MAQUINÀRIA PREVISTA PER A EXECUTAR L'OBRA**

Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg  
Retroexcavadora de 95 hp, amb martell de 800 kg a 1500 kg  
Compressor portàtil, amb dos martells pneumàtics de 20 kg a 30 kg  
Equip de màquina de serra de disc de diamant per a tallar  
Equip complet de maquinària de perforació en desmunt  
Equip complet de perforació per ancoratge de perns  
Equip de màquina de serra de disc de diamant per a tallar  
Equip i elements auxiliars per a tall oxiacetilènic  
Fresadora de paviment  
Pala carregadora de 110 hp, tipus CAT-926 o equivalent  
Pala carregadora de 170 hp, tipus CAT-950 o equivalent  
Pala carregadora sobre pneumàtics de 8 a 14 t  
Pala carregadora sobre pneumàtics de 15 a 20 t  
Minicarregadora sobre pneumàtics, amb accessori retroexcavador de 60 cm d'amplària  
Excavadora-carregadora de 110 hp, tipus CAT-212 o equivalent  
Excavadora-carregadora de 250 hp, tipus CAT-235 o equivalent  
Excavadora-carregadora de 385 hp, tipus CAT-245 o equivalent  
Retroexcavadora de 50 hp, tipus CAT-416 o equivalent  
Retroexcavadora de 74 hp, tipus CAT-428 o equivalent  
Retroexcavadora de 95 hp, tipus CAT-446 o equivalent  
Retroexcavadora sobre pneumàtics de 8 a 10 t  
Excavadora sobre erugues amb escarificador (D-7)

Excavadora sobre erugues amb escarificador (D-9)  
Motoanivelladora de 125 hp  
Motoanivelladora de 150 hp  
Corró vibratori autopropulsat de 6 a 8 t  
Corró vibratori autopropulsat de 12 a 14 t  
Corró vibratori autopropulsat de 14 a 18 t  
Picó vibrant dúplex de 1300 kg  
Picó vibrant amb placa de 30 cm d'amplària  
Picó vibrant amb placa de 60 cm d'amplària  
Camión cisterna amb bomba d'alta pressió  
Camión de 150 hp, de 12 t (5,8 m3)  
Camión de 200 hp, de 15 t (7,3 m3)  
Camión de 250 hp, de 20 t (9,6 m3)  
Camión de 400 hp, de 32 t (15,4 m3)  
Camión tractor de 450 hp, de 36 t (17,5 m3)  
Camión de 15 t articulat, de tracció integral (per a grans pendents)  
Camión cisterna de 6000 l  
Camión cisterna de 10000 l  
Camión grua de 5 t  
Camión grua de 10 t  
Camión grua de 20 t  
Grua autopropulsada de 12 t  
Grua autopropulsada de 24 t  
Grua autopropulsada de 40 t  
Grua autopropulsada de 100 t  
Furgoneta de 3500 kg  
Equip per a execució de junts en fresc de paviment de formigó  
Vibrador intern de formigó  
Camión amb bomba de formigonar  
Bituminadora automotriu per a reg asfàltic  
Estenedora per a paviments de mescla bituminosa  
Estenedora de granulat  
Estenedora de paviments de formigó  
Enllestidora de paviments de formigó  
Escombradora autopropulsada  
Piconadora autopropulsada de 14 a 16 t  
Corró vibratori autopropulsat pneumàtic  
Planta de formigó per a 60 m3/h

Equip d'ancoratge i injecció per a perns  
Màquina per a pintar marques vials, amb pintura termoplàstica  
Màquina per a clavar muntants metàl·lics  
Compressor portàtil amb accessoris per a pintar marques vials  
Equip de camió de 13 t amb calderes per a pintura termoplàstica  
Subministrament de contenidor metàl·lic de 9 m3 de capacitat i recollida amb residus inerts o no especials  
Subministrament de contenidor metàl·lic de 12 m3 de capacitat i recollida amb residus inerts o no especials  
Regle vibratori per a formigonat de soleres  
Equip i elements auxiliars per a soldadura elèctrica  
Equip i elements auxiliars per a tall oxiacetilènic  
Motoserra per a la tala d'arbres  
Màquina per a doblegar rodó d'acer  
Cisalla elèctrica  
Màquina taladradora  
Equip de personal i maquinària per a perforació i extracció, inclòs trepant, llots tixotròpics, encamisat i formigonat de piló complet  
Tractor amb equip per a tractament del subsòl  
Hidrosembradora muntada sobre camió  
Grup electrògen de 45/60 kVA, amb consums inclosos  
Grup electrògen de 80/100 kVA, amb consums inclosos  
Compressor portàtil de 7/10 m3/min de cabal

## 5 INSTAL·LACIONS PROVISIONALS

### 5.1 INSTAL·LACIÓ ELÈCTRICA PROVISIONAL D'OBRA

Es faran els tràmits adients, per tal que la companyia subministradora d'electricitat o una acreditada faci la connexió des de la línia subministradora fins els quadres on s'ha d'instal·lar la caixa general de protecció i els comptadors, des dels quals els Contractistes procediran a muntar la resta de la instal·lació elèctrica de subministrament provisional a l'obra, conforme al Reglament Electrotècnic de Baixa Tensió, segons el projecte d'un instal·lador autoritzat.

Es realitzarà una distribució sectoritzada, que garanteixi l'adient subministrament a tots els talls i punts de consum de l'obra, amb conductor tipus V -750 de coure de seccions adequades canalitzades en tub de PVC, rígid blindat o flexible segons el seu recorregut, però sempre amb l'apantallament suficient per a resistir al pas de vehicles i trànsit normal d'una obra.

La instal·lació elèctrica tindrà una xarxa de protecció de terra mitjançant cable de coure nu que estarà connectat a una javelina, plaques de connexió al terra, segons càlcul del projectista i comprovació de l'instal·lador.



**Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol**

Les mesures generals de seguretat en la instal·lació elèctrica són les següents:

• **Connexió de servei**

- Es realitzarà d'acord amb la companyia de subministrament.
- La seva secció vindrà determinada per la potència instal·lada.
- Existirà un mòdul de protecció (fusibles i limitadors de potència).
- Estarà situada sempre fora de l'abast de la maquinària d'elevació i les zones sense pas de vehicles.

• **Quadre General**

- Disposarà de protecció vers als contactes indirectes mitjançant diferencial de sensibilitat mínima de 300 mA. Per a enllumenat i eines elèctriques de doble aïllament la seva sensibilitat caldrà que sigui de 30 mA.
- Disposarà de protecció vers als contactes directes per tal que no hi existeixin parts en tensió al descobert (embornals, cargols de connexió, terminals automàtics, etc.).
- Disposarà d'interruptors de tall magnetotèrmics per a cadascú dels circuits independents. Els dels aparells d'elevació hauran de ser de tall omnipolar (tallaran tots els conductors, inclòs el neutre).
- Anirà connectat a terra (resistència màxima 78  $\Omega$ ). A l'inici de l'obra es realitzarà una connexió al terra provisional que haurà d'estar connectada a l'anell de terres, tot seguit després de realitzats els fonaments.
- Estarà protegida de la intempèrie.
- És recomanable l'ús de clau especial per a la seva obertura.
- Se senyalitzarà amb senyal normalitzada d'advertència de risc elèctric (R.D. 485/97).

• **Conductors**

- Disposaran d'un aïllament de 1000 v de tensió nominal, que es pot reconèixer per la seva impressió sobre el mateix aïllament.
- Els conductors aniran soterrats, o grapats als paraments verticals o sostres allunyats de les zones de pas de vehicles i / o persones.
- Les empiuladures hauran de ser realitzades mitjançant „jocs“ d'endolls, mai amb regletes de connexió, retorçaments i embetats.

• **Quadres secundaris**

- Seguiran les mateixes especificacions establertes pel quadre general i hauran de ser de doble aïllament.
- Cap punt de consum pot estar a més de 25 m d'un d'aquests quadres.
- Encara que la seva composició variarà segons les necessitats, l'aparellatge més convencional dels equips secundaris per planta és el següent:

1	Magnetotèrmic general de 4P	:	30 A.
1	Diferencial de 30 A	:	30 mA.
1	Magnetotèrmic 3P	:	20 mA.
4	Magnetotèrmics 2P	:	16 A.
1	Connexió de corrent 3P + T	:	25 A.
1	Connexió de corrent 2P + T	:	16 A.
2	Connexió de corrent 2P	:	16 A.
1	Transformador de seguretat	:	(220 v./ 24 v.).
1	Connexió de corrent 2P	:	16 A.

• **Connexions de corrent**

- Aniran proveïdes d'embornals de connexió al terra, excepció feta per a la connexió d'equips de doble aïllament.
- S'empararan mitjançant un magnetotèrmic que faciliti la seva desconexió.
- Es faran servir els següents colors:

Connexió de 24 v	:	Violeta.
Connexió de 220 v	:	Blau.
Connexió de 380 v	:	Vermell.

- No s'empraran connexions tipus „lladre“.

• **Maquinària elèctrica**

- Disposarà de connexió a terra.
- Els aparells d'elevació aniran proveïts d'interruptor de tall omnipolar.
- Es connectaran a terra el guiament dels elevadors i els carrils de grua o d'altres aparells d'elevació fixos.
- L'establiment de connexió a les bases de corrent, es farà sempre amb clavilla normalitzada.

• **Enllumenat provisional**

- El circuit disposarà de protecció diferencial d'alta sensibilitat, de 30 mA.
- Els portalàmpades haurà de ser de tipus aïllant.
- Es connectarà la fase al punt central del portalàmpades i el neutre al lateral més pròxim a la violla.
- Els punts de llum a les zones de pas s'instal·laran als sostres per tal de garantir-ne la inaccessibilitat a les persones.

• **Enllumenat portàtil**

- La tensió de subministrament no ultrapassarà els 24 v o alternativament disposarà de doble aïllament, Classe II de protecció intrínseca en previsió de contactes indirectes.
- Disposarà de mànec aïllant, carcassa de protecció de la bombeta amb capacitat anticops i suport de sustentació.

**5.2 INSTAL·LACIÓ D'AIGUA PROVISIONAL D'OBRA**

Per part del Contractista Principal, es realitzaran les gestions adients davant de la companyia subministradora d'aigua, perquè instal·lin una derivació des de la canonada general al punt on s'ha de col·locar el corresponent comptador i puguin continuar la resta de la canalització provisional per l'interior de l'obra.

La distribució interior d'obra podrà realitzar-se amb canonada de PVC flexible amb els ronsals de distribució i amb canya galvanitzada o coure, dimensionat segons les Normes Bàsiques de l'Edificació relatives a fontaneria en els punts de consum, tot allò garantit en una total estanquitat i aïllament dielèctric en les zones necessàries.

**5.3 INSTAL·LACIÓ DE SANEJAMENT**

Des del començament de l'obra, es connectaran a la xarxa de clavegueram públic, les instal·lacions provisionals d'obra que produeixin abocaments d'aigües brutes.

Si es produís algun retard en l'obtenció del permís municipal de connexió, s'haurà de realitzar, a càrrec del contractista, una fossa sèptica o pou negre tractat amb bactericides.

#### 5.4 ALTRES INSTAL·LACIONS. PREVENCIÓ I PROTECCIÓ CONTRA INCENDIS

Per als treballs que comportin la introducció de flama o d'equip productor d'espurnes a zones amb risc d'incendi o d'explosió, caldrà tenir un permís de forma explícita, fet per una persona responsable, on al costat de les dates inicial i final, la naturalesa i la localització del treball, i l'equip a usar, s'indicaran les precaucions a adoptar respecte als combustibles presents (sòlids, líquids, gasos, vapors, pols), neteja prèvia de la zona i els mitjans addicionals d'extinció, vigilància i ventilació adequats.

Les precaucions generals per la prevenció i la protecció contra incendis seran les següents:

- La instal·lació elèctrica haurà d'estar d'acord amb allò establert a la Instrucció M.I.B.T. 026 del vigent Reglament Electrotècnic de Baixa Tensió per a locals amb risc d'incendis o explosions.
- Es limitarà la presència de productes inflamables en els llocs de treball a les quantitats estrictament necessàries perquè el procés productiu no s'aturi. La resta es guardarà en locals diferents al de treball, i en el cas que això no fos possible es farà en recintes aïllats i condicionats. En tot cas, els locals i els recintes aïllats compliran allò especificat a la Norma Tècnica „MIE-APQ-001 Almacenamiento de líquidos inflamables y combustibles“ del Reglament sobre Emmagatzematge de Productes Químics.
- S'instal·laran recipients contenidors hermètics i incombustibles en què s'hauran de dipositar els residus inflamables, retalls, etc.
- Es col·locaran vàlvules antirretorn de flama al bufador o a les mànegues de l'equip de soldadura oxiacetilènica.
- L'emmagatzematge i ús de gasos líquids compliran amb tot allò establert a la instrucció MIE-AP7 del vigent Reglament d'Aparells a pressió en la norma 9, apartats 3 i 4 en allò referent a l'emmagatzematge, la utilització, l'inici del servei i les condicions particulars de gasos inflamables.
- Els camins d'evacuació estaran lliures d'obstacles. Existirà una senyalització indicant els llocs de prohibició de fumar, situació d'extintors, camins d'evacuació, etc.
- Han de separar-se clarament els materials combustibles els uns dels altres, i tots ells han d'evitar qualsevol tipus de contacte amb equips i canalitzacions elèctriques.
- La maquinària, tant fixa com mòbil, accionada per energia elèctrica, ha de tenir les connexions de corrent ben realitzades, i en els emplaçaments fixos, se l'haurà de proveir d'aïllament al terra. Tots els devessalls, engegats i deixalles que es produeixin pel treball han de ser retirats amb regularitat, deixant nets diàriament els voltants de les màquines.
- Les operacions de transvasament de combustible han d'efectuar-se amb bona ventilació, fora de la influència d'espurnes i fonts d'ignició. Han de preveure's també les conseqüències de possibles vessaments durant l'operació, pel que caldrà tenir a mà, terra o sorra.
- La prohibició de fumar o encendre qualsevol tipus de flama ha de formar part de la conducta a seguir en aquests treballs.
- Quan es transvasin líquids combustibles o s'omplin dipòsits hauran de parar-se els motors accionats amb el combustible que s'està transvasant.
- Quan es fan regates o forats per permetre el pas de canalitzacions, han d'obturar-se ràpidament per evitar el pas de fum o flama d'un recinte de l'edifici a un altre, evitant-se així la propagació de l'incendi. Si aquests forats s'han practicat en parets tallafocs o en sostres, la mencionada obturació haurà de realitzar-se de forma immediata i amb productes que assegurin l'estanquitat contra fum, calor i flames.
- En les situacions descrites anteriorment (magatzems, maquinària fixa o mòbil, transvasament de combustible, muntatge d'instal·lacions energètiques) i en aquelles, altres en què es manipuli una font d'ignició, cal col·locar extintors, la càrrega i capacitat dels quals estigui en consonància amb la naturalesa del material combustible i amb el seu volum, així com sorra i terra a on es maneguin líquids inflamables, amb l'eina pròpia per estendre-la. En el cas de grans quantitats d'aplecs, emmagatzement o concentració d'emballatges o devessalls, han de completar-se els mitjans de protecció amb mànegues de rec que proporcionin aigua abundant.

- **Emplaçament i distribució dels extintors a l'obra**

Els principis bàsics per l'emplaçament dels extintors, són:

- Els extintors manuals es col·locaran, senyalitzats, sobre suports fixats a paraments verticals o pilars, de forma que la part superior de l'extintor quedi com a màxim a 1,70 m del sòl.
- En àrees amb possibilitats de focs „A“, la distància a recórrer horitzontalment, des de qualsevol punt de l'àrea protegida fins a aconseguir l'extintor adequat més pròxim, no excedirà de 25 m.
- En àrees amb possibilitats de focs „B“, la distància a recórrer horitzontalment, des de qualsevol punt de l'àrea protegida fins a aconseguir l'extintor adequat més pròxim, no excedirà de 15 m.
- Els extintors mòbils hauran de col·locar-se en aquells punts on s'estimi que existeix una major probabilitat d'originar-se un incendi, a ser possible, pròxims a les sortides i sempre en llocs de fàcil visibilitat i accés. En locals grans o quan existeixin obstacles que dificultin la seva localització, s'assenyalarà convenientment la seva ubicació.

## 6 SERVEIS DE SALUBRITAT I CONFORT DEL PERSONAL

Les instal·lacions provisionals d'obra s'adaptaran a les característiques especificades als articles 15 i del R.D. 1627/97, de 24 d'octubre, relatiu a les DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT A LES OBRES DE CONSTRUCCIÓ.

Per al servei de neteja d'aquestes instal·lacions higièniques, es responsabilitzarà a una persona o un equip, els quals podran alternar aquest treball amb altres propis de l'obra.

Per l'execució d'aquesta obra, es disposarà de les instal·lacions del personal que es defineixen i detallen tot seguit:

### 6.1 SERVEIS HIGIÈNICS

- **Lavabos**

Com a mínim un per a cada 10 persones.

- **Cabines d'evacuació**

S'ha d'instal·lar una cabina d'1,5 m<sup>2</sup> x 2,3 m d'altura, dotada de placa turca, com a mínim, per a cada 25 persones.

- **Local de dutxes**

Cada 10 treballadors, disposaran d'una cabina de dutxa de dimensions mínimes d'1,5 m<sup>2</sup> x 2,3 m d'altura, dotada d'aigua freda-calenta, amb terra antilliscant.

### 6.2 VESTUARIS

Superfície aconsellable 2 m<sup>2</sup> per treballador contractat.

### 6.3 MENJADOR

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Diferent del local de vestuari. A efectes de càlcul haurà de considerar-se entre 1,5 i 2 m<sup>2</sup> per treballador que mengi a l'obra.

Equipat amb banc allargat o cadires, proper a un punt de subministrament d'aigua (1 aixeta i pica rentaplats per a cada 10 comensals), mitjans per a escalfar menjars (1 microones per a cada 10 comensals), i cubell hermètic (60 l de capacitat, amb tapa) per a dipositar les escombraries.

### 6.4 LOCAL DE DESCANS

En aquelles obres que s'ocupen simultàniament més de 50 treballadors durant més de 3 mesos, és recomanable que s'estableixi un recinte destinat exclusivament al descans del personal, situat el més pròxim possible al menjador i serveis.

A efectes de càlcul haurà de considerar-se 3 m<sup>2</sup> per usuari habitual.

### 6.5 LOCAL D'ASSISTÈNCIA A ACCIDENTATS

En aquells centres de treball que ocupin simultàniament més de 50 treballadors durant més d'un mes, s'establirà un recinte destinat exclusivament a les cures del personal d'obra. Els locals de primers auxilis disposaran, com a mínim, de:

- una farmaciola
- una llitera
- una font d'aigua potable

El material i els locals de primers auxilis hauran d'estar senyalitzats clarament i situats a prop dels llocs de treball.

El terra i les parets del local d'assistència a accidentats, han de ser impermeables, pintats preferiblement en colors clars. Luminós, caldejat a l'estació freda, ventilat si fos necessari de manera forçada en cas de dependències subterrànies. Haurà de tenir a la vista el quadre d'adreces i telèfons dels centres assistencials més pròxims, ambulàncies i bombers.

En obres a les quals el nivell d'ocupació simultani estigui entre els 25 i els 50 treballadors, el local d'assistència a accidentats podrà ser substituït per un armari farmaciola emplaçat a l'oficina d'obra. L'armari farmaciola, custodiat pel socorrista de l'obra, haurà d'estar dotat com a mínim de: alcohol, aigua oxigenada, pomada antisèptica, gases, benes sanitàries de diferents grandàries, benes elàstiques compressives autoadherents, esparadrap, tiretes, mercurocrom o antisèptic equivalent, analgèsics, bicarbonat, pomada per a picades d'insectes, pomada per a cremades, tisoires, pinces, dutxa portàtil per a ulls, termòmetre clínic, caixa de guants esterilitzats i torniquet.

Per a contractacions inferiors, podrà ser suficient disposar d'una farmaciola de butxaca o portàtil, custodiada per l'encarregat.

El Servei de Prevenció de l'empresa contractista establirà els medis materials i humans addicionals per tal d'efectuar la Vigilància de la Salut d'acord al que estableix la llei 31/95.

A més, es disposarà d'una farmaciola portàtil amb el contingut següent:

- desinfectants i antisèptics autoritzats
- gases estèrils
- cotó hidròfil
- benes
- esparadrap
- apòsits adhesius
- estisoires

- pinces
- guants d'un sol ús

El material de primers auxilis es revisarà periòdicament, i es reposarà de manera immediata el material utilitzat o caducat.

## 7 ÀREES AUXILIARS

### 7.1 CENTRALS I PLANTES

Estaran ubicades estratègicament en funció de les necessitats de l'obra. En el trànsit de vehicles als seus accessos es tindrà molta cura pel que fa a l'ordre, abalisament i senyalització, amb una amplada mínima de la zona de rodadura de 6 m i pòrtic de gàlib de limitació en altura, mínima de 4 m.

L'accés a la instal·lació resta restringida exclusivament al personal necessari per a la seva explotació, restant expressament abalisada, senyalitzada i prohibida la presència de tota persona en el radi de gir de la dragalina. Tots els accessos o passarel·les situats a altures superiors a 2 m sobre el sòl o plataforma de nivell inferior, disposarà de barana reglamentària d'1 m d'altura.

Els elements mòbils i transmissions estaran apantallats a les zones de treball o de pas susceptibles de possibilitar atrapaments o en el seu defecte es trobaran degudament senyalitzats. Els buits horitzontals estaran condemnats i, si no fos possible com en el cas de la fossa del skip, es disposarà de baranes laterals reglamentàries d'1 m d'altura i topall per a rodadura de vehicles.

La construcció de l'estacada destinada a la contenció i separació d'àrids, serà ferma i arriostrada en previsió de bolcades.

Les sitges de ciment no seran hermètiques, per evitar l'efecte de la pressió. La boca de recepció de la sitja estarà condemnada amb un sòlid engrallat o relliga metàl·lica. La tapa disposarà de barana perimetral reglamentària d'1 m d'altura. L'accés mitjançant escala „de gat“ estarà protegida mitjançant argolles metàl·liques (Ø 0,80 m) a partir de 2 m de l'arrancada.

La instal·lació elèctrica complirà amb les especificacions del Reglament Electrotècnic de Baixa Tensió.

Les operacions de manteniment preventiu es realitzaran de conformitat a les instruccions del fabricant o importador.

### 7.2 TALLERS

Estaran ubicats estratègicament en funció de les necessitats de l'obra.

De forma general els locals destinats a tallers, tindran les següents dimensions mínimes (descomptats els espais ocupats per màquines, aparells, instal·lacions i/o materials): 3 m d'altura de pis a sostre, 2 m<sup>2</sup> de superfície i 10 m<sup>3</sup> de volum per treballador.

La circulació del personal i els materials estarà ordenada amb molta cura, abalisada i senyalitzada, amb una amplada mínima de la zona de pas de personal (sense càrrega) d'1,20 m<sup>2</sup> per a passadissos principals (1 m en passadissos secundaris) independent de les vies de manutenció mecànica de materials. En zones de pas, la separació entre màquines i/o equips mai no serà inferior a 0,80 m (comptat des del punt més sortint del recorregut de l'òrgan mòbil més pròxim). Al voltant dels equips que generin calor radiant, es mantindrà un espai lliure no inferior a 1,50 m, estaran apantallats i disposaran de mitjans portàtils d'extinció adequats. Les instal·lacions provisionals

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

suspeses sobre zones de pas estaran canalitzades a una altura mínima d'1,90 m sobre el nivell del paviment.

La intensitat mínima d'il·luminació, en els llocs d'operació de les màquines i equips, serà de 200 lux. La il·luminació d'emergència serà capaç de mantenir, al menys durant una hora, una intensitat de 5 lux, i la seva font d'energia serà independent del sistema normal d'il·luminació.

L'accés, als diferents tallers provisionals d'obra, ha de restar restringit exclusivament al personal adscrit a cada un d'ells, restant expressament abalisada, senyalitzada i prohibida la presència de tota persona en el radi d'actuació de càrregues suspeses, així com en els de desplaçament i servituds de màquines i/o equips. Tots els accessos o passarel·les situades a altures superiors a 2 m sobre el sòl o plataforma de nivell inferior, disposarà de barana reglamentària d'1 m d'altura.

Els elements mòbils i transmissions estaran apantallats a les zones de treball o de pas susceptibles de possibilitar atrapaments o en el seu defecte es trobaran degudament senyalitzats. Els buits horitzontals seran condemnats.

La instal·lació elèctrica complirà amb les especificacions del Reglament Electrotècnic de Baixa Tensió.

Les operacions de manteniment preventiu de la maquinària es realitzaran de conformitat a les instruccions del fabricant o importador.

Les emanacions de pols, fibres, fums, gasos, vapors o boirines disposaran d'extracció localitzada, en la mesura del possible, evitant la seva difusió per l'atmosfera. En els tallers tancats, el subministrament d'aire fresc i net per hora i ocupant serà, al menys, de 30 a 50 m<sup>3</sup>, llevat que s'efectuï una renovació total d'aire diversos cops per hora (no inferior a 10 cops).

### 7.3 ZONES D'APILAMENT. MAGATZEMS

Els materials emmagatzemats a l'obra, hauran de ser els compresos entre els valors „mínims-màxims”, segons una adequada planificació, que impedeixi estacionaments de materials i/o equips inactius que puguin ésser causa d'accident.

Els Mitjans Auxiliars d'Utilitat Preventiva, necessaris per a complementar la manipulació manual o mecànica dels materials apilats, hauran estat previstos en la planificació dels treballs.

Les zones d'apilament provisional estaran balisades, senyalitzades i il·luminades adequadament.

De forma general el personal d'obra (tant propi com subcontractat) haurà rebut la formació adequada respecte als principis de manipulació manual de materials. De forma més singularitzada, els treballadors responsables de la realització de maniobres amb mitjans mecànics, tindran una formació qualificada de les seves comeses i responsabilitats durant les maniobres.

## 8 TRACTAMENT DE RESIDUS

El Contractista és responsable de gestionar els sobrants de l'obra de conformitat amb les directrius del D. 201/1994, de 26 de juliol, i del R.D. 105/2008, d'1 de febrer, regulador dels enderrocs i d'altres residus de construcció, a fi i efecte de minimitzar la producció de residus de construcció com a resultat de la previsió de determinats aspectes del procés, que cal considerar tant en la fase de projecte com en la d'execució material de l'obra i/o l'enderroc o desconstrucció.

Al projecte s'ha avaluat el volum i les característiques dels residus que previsiblement s'originaran i les instal·lacions de reciclatge més properes per tal que el Contractista triï el lloc on portarà els seus residus de construcció.

Els residus es lliuraran a un gestor autoritzat, finançant el contractista, els costos que això comporti. Si a les excavacions i buidats de terres apareixen antics dipòsits o canonades, no detectades prèviament, que continguin o hagin pogut contenir productes tòxics i contaminants, es buidaran prèviament i s'aïllaran els productes corresponents de l'excavació per ser evacuats independentment de la resta i es lliuraran a un gestor autoritzat.

## 9 TRACTAMENT DE MATERIALS I/O SUBSTÀNCIES PERILLOSES

El Contractista es responsable d'assegurar-se per mediació de l'Àrea d'Higiene Industrial del seu Servei de Prevenció, la gestió del control dels possibles efectes contaminants dels residus o materials emprats a l'obra, que puguin generar potencialment malalties o patologies professionals als treballadors i/o tercers exposats al seu contacte i/o manipulació.

L'assessoria d'Higiene Industrial comprendrà la identificació, quantificació, valoració i propostes de correcció dels factors ambientals, físics, químics i biològics, dels materials i/o substàncies perilloses, per a fer-los compatibles amb les possibilitats d'adaptació de la majoria (gairebé totalitat) dels treballadors i/o tercers aliens exposats. Als efectes d'aquest projecte, els paràmetres de mesura s'establirà mitjançant la fixació dels valors límit TLV (Threshold Limits Values) que fan referència als nivells de contaminació d'agents físics o químics, per sota dels quals els treballadors poden estar exposats sense perill per a la seva salut. El TLV s'expressa amb un nivell de contaminació mitjana en el temps, per a 8 h/dia i 40 h/setmana.

### 9.1 MANIPULACIÓ

En funció de l'agent contaminant, del seu TLV, dels nivells d'exposició i de les possibles vies d'entrada a l'organisme humà, el Contractista haurà de reflectir en el seu Pla de Seguretat i Salut les mesures correctores pertinents per a establir unes condicions de treball acceptables per als treballadors i el personal exposat, de forma singular a:

- Amiant
- Plom. Crom, Mercuri, Níquel
- Sílice
- Vinil
- Urea formol
- Ciment
- Soroll
- Radiacions
- Productes tixotròpics (bentonita)
- Pintures, dissolvents, hidrocarburs, coles, resines epoxi, greixos, olis
- Gasos líquids del petroli
- Baixos nivells d'oxigen respirable
- Animals
- Entorn de drogodependència habitual

### 9.2 DELIMITACIÓ / CONDICIONAMENT DE ZONES D'APILAMENT

Les substàncies i/o els preparats es rebran a l'obra etiquetats de forma clara, indeleble i com a mínim amb el text en idioma espanyol.

L'etiqueta ha de contenir:

- a) Denominació de la substància d'acord amb la legislació vigent o en el seu defecte nomenclatura de la IUPAC. Si és un preparat, la denominació o nom comercial.
- b) Nom comú, si és el cas.



- c) Concentració de la substància, si és el cas. Si és tracta d'un preparat, el nom químic de les substàncies presents.
- d) Nom, direcció i telèfon del fabricant, importador o distribuïdor de la substància o preparat perillós.
- e) Pictogrames i indicadors de perill, d'acord amb la legislació vigent.
- f) Riscos específics, d'acord amb la legislació vigent.
- g) Consells de prudència, d'acord amb la legislació vigent.
- h) El número CEE, si en té.
- i) La quantitat nominal del contingut (per preparats).

El fabricant, l'importador o el distribuïdor haurà de facilitar al Contractista destinatari, la fitxa de seguretat del material i/o la substància perillosa, abans o en el moment del primer lliurament.

Les condicions bàsiques d'emmagatzematge, apilament i manipulació d'aquests materials i/o substàncies perilloses, estaran adequadament desenvolupades en el Pla de Seguretat del Contractista, partint de les següents premisses:

- **Explosius**

L'emmagatzematge es realitzarà en polvorins/minipolvorins que s'ajustin als requeriments de les normes legals i reglaments vigents. Estarà adequadament senyalitzada la presència d'explosius i la prohibició de fumar.

- **Comburents, extremadament inflamables i fàcilment inflamables**

Emmagatzematge en lloc ben ventilat. Estarà adequadament senyalitzada la presència de comburents i la prohibició de fumar.

Estaran separats els productes inflamables dels comburents.

El possible punt d'ignició més pròxim estarà suficientment allunyat de la zona d'apilament.

- **Tòxics, molt tòxics, nocius, carcinògens, mutagènics, tòxics per a la reproducció**

Estarà adequadament senyalitzada la seva presència i disposarà de ventilació eficaç.

Es manipularà amb Equips de Protecció Individual adequats que assegurin l'estanquitat de l'usuari, en previsió de contactes amb la pell.

- **Corrosius, Irritants, sensibilitzants**

Estarà adequadament senyalitzada la seva presència.

Es manipularan amb Equips de Protecció Individual adequats (especialment guants, ulleres i màscara de respiració) que assegurin l'estanquitat de l'usuari, en previsió de contactes amb la pell i les mucoses de les vies respiratòries.

## 10 CONDICIONS DE L'ENTORN

### Ocupació del tancament de l'obra

S'entén per àmbit d'ocupació el realment afectat, incloent tanques, elements de protecció, baranes, bastides, contenidors, casetes, etc.

Cal tenir en compte que, en aquest tipus d'obres, l'àmbit pot ser permanent al llarg de tota l'obra o que pot ser necessari distingir entre l'àmbit de l'obra (el de projecte) i l'àmbit dels treballs en les seves diferents fases, a fi de permetre la circulació de vehicles i vianants o l'accés a edificis i quals.

En el PLA DE SEGURETAT I SALUT EN EL TREBALL s'especificarà la delimitació de l'àmbit d'ocupació de l'obra i es diferenciarà clarament si aquest canvia en les diferents fases de l'obra. L'àmbit o els àmbits d'ocupació quedaran clarament dibuixats en plànols per fases i interrelacionats amb el procés constructiu.

### Situació de casetes i contenidors

Es col·locaran, preferentment, a l'interior de l'àmbit delimitat pel tancament de l'obra.

Si per les especials característiques de l'obra no és possible la ubicació de les casetes a l'interior de l'àmbit delimitat pel tancament de l'obra, ni és possible el seu trasllat dins d'aquest àmbit, ja sigui durant tota l'obra o durant alguna de les seves fases, s'indicaran al PLA DE SEGURETAT I SALUT les àrees previstes per aquest fi.

Les casetes, els contenidors, els tallers provisionals i l'aparcament de vehicles d'obra, es situaran segons s'indica en l'apartat "Àmbit d'ocupació de la via pública".

### 10.1 SERVEIS AFECTATS

Els serveis que són afectats per les obres del projecte d'execució són les següents:

- Línies elèctriques: FECSA-ENDESA
- Telefonia: Telefònica, S.A.

Les solucions adoptades són les que es contemplen a l'annex "Serveis Afectats".

Els Plànols i d'altra documentació que el Projecte incorpora relatius a l'existència i la situació de serveis, cables, canonades, conduccions, arquetes, pous i en general, d'instal·lacions i estructures d'obra soterrades o aèries tenen un caràcter informatiu i no garanteixen l'exhaustivitat ni l'exactitud i per tant no seran objecte de reclamació per mancances i/o omissions. El Contractista ve obligat a la seva pròpia investigació per a la qual cosa sol·licitarà dels titulars d'obres i serveis, plànols de situació i localitzarà i descobrirà les conduccions i obres enterrades, per mitjà del detector de conduccions o per cales. Les adopcions de mesures de seguretat o la disminució dels rendiments es consideraran inclosos en els preus i, per tant, no seran objecte d'abonament independent.

### 10.2 SERVITUDS

Per a l'execució de les obres contemplades al Projecte existiran una sèrie de afeccions, que es classifiquen en:

- Expropiació: aquella superfície que pel seu futur ús no permeti més l'ús actual.
- Superfície de servitud de pas: aquella que un cop realitzades les obres pot tornar a tenir l'ús inicial, però que conserva dins seu alguna infraestructura que limita d'alguna manera les seves possibilitats i ha de permetre el pas en casos de necessitat.
- Superfície d'ocupació temporal: aquella que, durant l'execució de les obres, s'ocuparà per tal de poder realitzar els treballs de forma correcta, bé pel pas de vehicles i maquinària com per l'acopi de materials o altres elements de les obres. Tanmateix, després de la realització de les obres, quedarà lliure de cap afecció.

Aquestes afeccions queden definides i valorades a l'annex "Expropiacions".

En la documentació del Projecte i en la facilitada pel Promotor, s'incorporen els aspectes relatius a l'existència de possibles servituds en matèria d'aigües, de pas, de mitgera de llums i vistes, de

desguàs dels edificis o de les distàncies i les obres intermèdies per a certes construccions i plantacions, tenen un caràcter informatiu i no asseguren l'exhaustivitat ni l'exactitud i per tant no podran ser objecte de reclamacions per carències i/o omissions. Com amb els indicats per als serveis afectats, el Contractista està obligat a consultar en el Registre de la Propietat els esmentats extrems. Les despeses generades, les mesures suplementàries de seguretat o la disminució dels rendiments es consideraran inclosos en els preus i, per tant, no seran objecte d'abonament independent.

### 10.3 CARACTERÍSTIQUES METEOROLÒGIQUES

La zona de projecte té un clima Mediterrani de tipus Prelitoral Nord. La distribució de la precipitació és irregular amb un total anual escàs d'aproximadament 700 mm. A l'estiu són freqüents les tempestes que provenen des del Pirineu Oriental i s'acosten cap a la tarda. Aquestes tempestes són de gran intensitat horària i diària i poden causar grans inundacions a la zona compresa entre els rius Manol, Muga i Llobregat d'Empordà.

Pel que fa a les temperatures, els estius són força calorosos i els hiverns relativament freds i ventosos. Les temperatures màximes es produeixen als mesos de juliol i agost amb una temperatura màxima mitjana de prop de 29°C. Per altra banda, el mes més fred de l'any és gener amb una temperatura mínima mitjana de 4°C. D'aquesta manera, l'amplitud tèrmica es pot considerar alta.

La tramuntana és el vent predominant a l'àmbit d'estudi. Aquest vent del nord, fred i sec bufa al llarg de tot l'any, tot i que es presenta amb particular incidència entre els mesos de novembre i març. Quan la tramuntana es presenta a l'estiu, especialment al mes de juny, pot comportar-se com un vent sec i caldejat, que es coneix amb el nom de Tramuntana calenta i pot contribuir a importants episodis d'incendis forestals.

### 10.4 CARACTERÍSTIQUES DEL TERRENY

La zona d'estudi del present projecte es troba situada a la província de Girona, a la comarca de l'Alt Empordà, afectant únicament al terme municipal de Vilafant.

Des del punt de vista geològic, la zona d'estudi queda emmarcada dintre de la Depressió tectònica de l'Empordà, a cavall del marge est de la conca de l'Ebre o Depressió Central Catalana. La Depressió de l'Empordà correspon a una fossa tectònica, producte de l'etapa distensiva que afectà al marge mediterrani durant el Neogen i que produí l'enfonsament i el vasculament relatiu dels diferents blocs que han originat el sistema de fosses alineades a la costa.

A la zona estudiada, els materials que formen el rebliment de la Depressió de l'Empordà corresponen bàsicament a lutites vermelles amb gresos i conglomerats.

Els relleus de la zona d'estudi son suaus amb morfologies planes o ondulades, aprofitades com a camps de conreu.

A continuació es descriuen les característiques geològiques principals dels materials existents al llarg de la traça:

- Quaternari
  - o Qt1. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites (Holocè).
  - o Qt2. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites. Plistocè terminal (Holocè basal).
  - o Qt3. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites. Plistocè superior.

- o Qc. Dipòsit col·luvial. Argiles, sorres i llims. (Holocè).
- Terciari
  - o NPLg. Fàcies de ventall al·luvial proximal del ventall al·luvial de Llers. Graves i sorres amb trams d'argiles. (Pliocè).
  - o NPFa. Fàcies de plana al·luvial del Fluvià. Lutites ocre i vermelles amb trams de gresos i conglomerats. (Pliocè superior).

Les característiques geològiques del terreny es desenvolupen de forma extensa a l'annex 7 "Geologia i Geotècnia" del present projecte.

En el mateix annex s'analitza l'estructura projectada, realitzant reconeixements geotècnics, perfils geotècnics locals i recomanacions de fonamentació i paràmetres geotècnics per al seu dimensionament estructural.

Pel que fa als terraplens, els assentaments esperables venen condicionats bàsicament pel terreny on recolza el terraplè especialment si es compon de sòls cohesius tous o molt tous, la posició del nivell freàtic (lligat a la presència d'assentaments de consolidació), la sobrecàrrega de trànsit, l'alçada i el talús del terraplè.

### 10.5 CARACTERÍSTIQUES DE L'ENTORN

Les obres per a l'execució de la variant de la GIP-5129 es situen en un entorn interurbà i es localitzen entre el PK 0+000 i el PK 1+240 de la carretera existent, íntegrament al terme municipal de Vilafant.

Aquestes obres tenen la finalitat de suprimir el gual existent sobre el riu Manol i lliurar Vilafant del trànsit de pas, gràcies a una nova carretera que millori el la seguretat viària, el temps de recorregut i el nivell de servei de la via.

Les principals obres a projectar són la variant de Vilafant que substitueix l'actual travessia de la GIP-5129 i el pont sobre el riu Manol per tal de substituir el gual existent

## 11 UNITATS CONSTRUCTIVES

### ENDERROCS

ENDERROCS D'ELEMENTS SOTERRATS A POCA FONDÀRIA  
ENDERROCS O ARRENCADA D'ELEMENTS

### MOVIMENTS DE TERRES

REBAIX DE TERRENY SENSE I AMB TALUSSOS, I PRETALL EN TALUSSOS I  
REPOSICIÓ EN DESMUNT  
EXCAVACIÓ DE RASES I POUS  
REBLIMENTS SUPERFICIALS, TERRAPLENS / PEDRAPLENS  
CÀRREGA I TRANSPORT DE TERRES O RUNES

### FONAMENTS

SUPERFICIALS (RASES, POUS, LLOSES, ENCEPS, BIGUES DE LLIGAT, MURS  
GUIA)  
PROFUNDES (PILOTS, MICROPILOTS, PANTALLES, CONSOLIDACIÓ DE  
TERRENY AMB INJECCIONS )  
GABIONS / ESCULLERES  
ESTREBADES I APUNTALAMENTS

### ESTRUCTURES

ESTRUCTURES D'ACER  
ESTRUCTURES DE FORMIGÓ IN SITU (ENCOFRATS, ARMADURES,

FORMIGONAMENT, ANCORATGES I TESAT)  
TRANSPORT I MUNTATGE D'ESTRUCTURES PREFABRICADES  
IMPERMEABILITZACIONS - AÏLLAMENTS I JUNTS  
IMPERMEABILITZACIÓ DE MURS DE CONTENCIÓ O SUPERFÍCIES PLANES  
JUNTS (FORMACIÓ, REBLERTS, SEGELLATS)  
REVESTIMENTS  
PINTATS - ENVERNISSATS  
PAVIMENTS  
PAVIMENTS AMORFS (FORMIGÓ, SUBBASES, TERRA, SAULÓ, BITUMINOSOS I REGS)  
PECES (PEDRA, CERÀMICA, MORTER, ETC. )  
PROTECCIONS I SENYALITZACIÓ  
COL.LOCACIÓ DE BARANES I SENYALS AMB SUPORTS METÀL.LICS  
INSTAL.LACIONS DE DRENATGE, D'EVACUACIÓ I CANALITZACIONS  
ELEMENTS COL.LOCATS SUPERFICIALMENT (DESGUASSOS, EMBORNALS, BUNERES, ETC.)  
ELEMENTS SOTERRATS (CLAVEGUERONS, POUS, DRENATGES)  
CANONADES PER A GASOS I FLUIDS  
TUBS MUNTATS SUPERFICIALMENT  
INSTAL.LACIONS ELÈCTRIQUES  
INSTAL.LACIONS ELÈCTRIQUES BAIXA TENSIÓ  
INSTAL.LACIONS DE TENSIÓ MITJANA O ALTA - MUNTATGE D'ESTACIONS I SUBESTACIONS TRANSFORMADORES  
INSTAL.LACIONS DE TENSIÓ MITJANA O ALTA - MUNTATGE DE LÍNIES SOTERRADES  
JARDINERIA  
MOVIMENTS DE TERRES I PLANTACIÓ

## 12 DETERMINACIÓ DEL PROCÉS CONSTRUCTIU

El Contractista amb antelació suficient a l'inici de les activitats constructives n'haurà de perfilar l'anàlisi de cada una d'acord amb els „Principios de la Acción Preventiva“ (Art. 15 L. 31/1995 de 8 de novembre) i els „Principios Aplicables durante la Ejecución de las Obras“ (Art. 10 RD. 1627/1997 de 24 d'octubre).

### 12.1 PROCEDIMENTS D'EXECUCIÓ

Les diferents activitats definides que s'han d'executar en el present projecte són les següents:

- Instal·lació d'obra i replanteig
- Replanteig i treballs previs
- Enderrocs
- Moviment de terres
- Estructures
- Drenatge
- Fers i paviments
- Senyalització, abalisament i proteccions
- Serveis afectats
- Mesures correctores d'impacte ambiental
- Treballs posteriors

Els aspectes a examinar per a configurar cadascun dels procediments d'execució, hauran de ser desenvolupats pel Contractista i descrits en el Pla de Seguretat i Salut de l'obra.

### 12.2 ORDRE D'EXECUCIÓ DELS TREBALLS

L'execució dels treballs corresponents al present projecte es realitzaran en fases determinades de treballs, que es llisten a continuació:

- Fase 1: Execució de la part sud de la rotonda de la N-260, treballs de nova calçada al tronc de la variant entre el PK 0+564 i 0+990, i entre el PK 0+207 i 0+540, a més de realitzar la meitat de la calçada del tronc entre el PK 0+000 i 0+207. També es realitzarà la reposició dels serveis afectats d'electricitat (MT i BT) i de telefonia.
- Fase 2: Execució de la part nord de la rotonda de la N-260, execució de la intersecció entre la variant i l'antiga traça de la carretera GIP-5129, i execució de la meitat esquerra del tronc entre el PK 0+000 i 0+207 que no ha estat realitzat a la fase anterior.
- Fase 3: Reposició dels camins existents que es vegin afectats per les obres, afermat de la totalitat de la nova variant, seguit de la instal·lació de la senyalització i les defenses.

En l'annex 13 "Organització i desenvolupament de les obres" s'exposen en profunditat aquestes fases i la seva organització en el temps.

Complementant els plantejaments previs realitzats en el mateix sentit per l'autor del projecte, a partir dels suposats teòrics en fase de projecte, el Contractista haurà d'ajustar, durant l'execució de l'obra, l'organització i planificació dels treballs a les seves especials característiques de gestió empresarial, de forma que resti garantida l'execució de les obres amb criteris de qualitat i de seguretat per a cadascuna de les activitats constructives a realitzar, en funció del lloc, la successió, la persona o els mitjans a emprar.

### 12.3 DETERMINACIÓ DEL TEMPS EFECTIU DE DURACIÓ. PLA D'EXECUCIÓ

Per a la programació del temps material, necessari per al desenvolupament dels diferents talls de l'obra, s'han tingut en compte els següents aspectes:

LLISTA D'ACTIVITATS	:	Relació d'unitats d'obra.
RELACIONS DE DEPENDÈNCIA	:	Prelació temporal de realització material d'unes unitats respecte a altres.
DURADA DE LES ACTIVITATS	:	Mitjançant la fixació de terminis temporals per a l'execució de cadascuna de les unitats d'obra.

De les dades així obtingudes, s'ha establert, en fase de projecte, un programa general orientatiu, en el qual s'ha tingut en compte, en principi, tan sols les grans unitats (activitats significatives), i un cop encaixat el termini de durada, s'ha realitzat la programació previsible, reflectida en un cronograma de desenvolupament.

El Contractista en el seu Pla de Seguretat i Salut haurà de reflectir, les variacions introduïdes respecte, al procés constructiu inicialment previst en el Projecte Executiu/Constructiu i en el present Estudi de Seguretat i Salut.

## 13 SISTEMES I/O ELEMENTS DE SEGURETAT I SALUT INHERENTS O INCORPORATS AL MATEIX PROCÉS CONSTRUCTIU

Tot projecte constructiu o disseny d'equip, mitjà auxiliar, màquina o ferramenta a utilitzar a l'obra, objecte del present Estudi de Seguretat i Salut, s'integrarà en el procés constructiu, sempre d'acord

amb els "Principios de la Acción Preventiva" (Art. 15 L. 31/1995 de 8 de novembre), els "Principios Aplicables durante la Ejecución de las Obras" (Art. 10 RD. 1627/1997 de 24 d'octubre) "Reglas generales de seguridad para máquinas" (Art.18 RD. 1495/1986 de 26 de maig de 1986), i Normes Bàsiques de l'Edificació, entre altres reglaments connexos, i atenent les Normes Tecnològiques de l'Edificació, Instruccions Tècniques Complementàries i Normes UNE o Normes Europees, d'aplicació obligatòria i/o aconsellada.

## 14 MEDIAMBIENT LABORAL

### 14.1 AGENTS ATMOSFÈRICS

Tot i que en la zona de projecte a l'hivern poden haver dies molt freds i alguns inclòs amb aparició de gelades i nevades, en general els condicionants atmosfèrics pel mediambient laboral en aquest projecte no presenten cap restricció que no siguin les més evidents en la pràctica normal de l'execució d'obres públiques.

De totes manetes en el Pla de seguretat i salut caldrà indicar quins són els possibles agents atmosfèrics que poden afectar a l'obra i quines condicions s'hauran de tenir en compte per prevenir els riscos que se'n derivin.

### 14.2 ENLLUMENAT

Encara que la generalitat dels treballs de construcció es realitzen amb llum natural, hauran de tenir-se presents en el Pla de Seguretat i Salut algunes consideracions respecte a la utilització d'enllumenat artificial, necessari en talls, tallers, treballs nocturns o sota rasant.

Es procurarà que la intensitat lluminosa en cada zona de treball sigui uniforme, evitant els reflexos i enlluernaments al treballador així com les variacions brusques d'intensitat.

En els locals amb risc d'explosió pel gènere de les seves activitats, substàncies emmagatzemades o ambients perillosos, l'enllumenat elèctric serà antideflagrant.

En els llocs de treball en els que una fallida de l'enllumenat normal suposi un risc per als treballadors, es disposarà d'un enllumenat d'emergència d'evacuació i de seguretat.

Les intensitats mínimes d'enllumenat artificial, segons els distints treballs relacionats amb la construcció, seran els següents:

25-50 lux	: En patis de llums, galeries i altres llocs de pas en funció de l'ús ocasional - habitual.
100 lux	: Operacions en les quals la distinció de detalls no sigui essencial, tals com la manipulació de mercaderies a granel, l'apilament de materials o l'amassat i lligat de conglomerats hidràulics. Baixes exigències visuals.
100 lux	: Quan sigui necessària una petita distinció de detalls, com en sales de màquines i calderes, ascensors, magatzems i dipòsits, vestuaris i banys petits del personal. Baixes exigències visuals.
200 lux	: Si és essencial una distinció moderada de detalls com en els muntatges mitjans, en treballs senzills en bancs de taller, treballs en màquines, fratasat de paviments i tancament mecànic. Moderades exigències visuals.
300 lux	: Sempre que sigui essencial la distinció mitjana de detalls, com treballs mitjans en bancs de taller o en màquines i treballs d'oficina en general.

500 lux	: Operacions en les que sigui necessària una distinció mitja de detalls, tals com treballs d'ordre mitjà en bancs de taller o en màquines i treballs d'oficina en general. Altes exigències visuals.
1000 lux	: En treballs on sigui indispensable una fina distinció de detalls sota condicions de constant contrast, durant llargs períodes de temps, tals com muntatges delicats, treballs fins en banc de taller o màquina, màquines d'oficina i dibuix artístic lineal. Exigències visuals molt altes.

Els serveis de prevenció seran els encarregats d'estimar la magnitud o nivells del risc, les situacions en les que aquest es produeix, així com controlar periòdicament les condicions, l'organització dels mètodes de treball i la salut dels treballadors amb la finalitat de prendre les decisions per a eliminar, controlar o reduir el risc mitjançant mesures de prevenció a l'origen, organitzatives, de prevenció col·lectiva, de protecció individual, formatives i informatives.

### 14.3 SOROLL

Per a facilitar el seu desenvolupament al Pla de Seguretat i Salut del contractista, es reproduïu un quadre sobre els nivells sonors generats habitualment en la indústria de la construcció:

Compressor	.....	82-94 dB
Equip de clavar pilots (a 15 m de distància)	.....	82 dB
Formigonera petita < 500 lts.	.....	72 dB
Formigonera mitjana > 500 lts.	.....	60 dB
Martell pneumàtic (en recinte angost)	.....	103 dB
Martell pneumàtic (a l'aire lliure)	.....	94 dB
Esmeriladora de peu	.....	60-75 dB
Camions i dumpers	.....	80 dB
Excavadora	.....	95 dB
Grua autoportant	.....	90 dB
Martell perforador	.....	110 dB
Mototrailla	.....	105 dB
Tractor d'orugues	.....	100 dB
Pala carregadora d'orugues	.....	95-100 dB
Pala carregadora de pneumàtics	.....	84-90 dB
Pistoles fixaclus d'impacte	.....	150 dB
Esmeriladora radial portàtil	.....	105 dB
Tronçadora de taula per a fusta	.....	105 dB

Les mesures a adoptar, que hauran de ser adequadament tractades al Pla de Seguretat i Salut pel contractista, per a la prevenció dels riscos produïts pel soroll seran, en ordre d'eficàcia:

- 1er.- Supressió del risc en origen.
- 2on.- Aïllament de la part sonora.
- 3er.- Equip de Protecció Individual (EPI) mitjançant taps o orelles.

Els serveis de prevenció seran els encarregats d'estimar la magnitud o els nivells de risc, les situacions en les que aquest es produeix, així com controlar periòdicament les condicions, l'organització dels mètodes de treball i la salut dels treballadors amb la finalitat de prendre les decisions per a eliminar, controlar o reduir el risc mitjançant mesures de prevenció a l'origen, organitzatives, de prevenció col·lectiva, de protecció individual, formatives i informatives.

### 14.4 POLS

La permanència d'operaris en ambients polsergens, pot donar lloc a les següents afeccions:



- Rinitis
- Asma bronquial
- Bronquitis destructiva
- Bronquitis crònica
- Efisemes pulmonars
- Neumoconiosis
- Asbestosis (asbest – fibrociment - amiant)
- Càncer de pulmó (asbest – fibrociment - amiant)
- Mesotelioma (asbest – fibrociment - amiant)

La patologia serà d'un o d'altre tipus, segons la naturalesa de la pols, la seva concentració i el temps d'exposició.

En la construcció és freqüent l'existència de pols amb contingut de sílice lliure (Si O<sub>2</sub>) que és el component que ho fa especialment nociu, com a causant de la neumoconiosis. El problema de presència massiva de fibres d'amiant en suspensió, necessitarà d'un Pla específic de desamiantat que excedeix a les competències del present Estudi de Seguretat i Salut, i que haurà de ser realitzat per empreses especialitzades.

La concentració de pols màxima admissible en un ambient al qual els operaris es trobin exposats durant 8 hores diàries, 5 dies a la setmana, és en funció del contingut de sílice en suspensió, el que ve donat per la fórmula:

$$C = \frac{10}{\% \text{ Si O}_2 + 2} \text{ mg / m}^3$$

Tenint en compte que la mostra recollida haurà de respondre a la denominada "fracció respirable", que correspon a la pols realment inhalada, ja que, de l'existent en l'ambient, les partícules més grosses són retingudes per la pituitària i les més fines són expeses amb l'aire respirat, sense haver-se fixat en els pulmons.

Els treballs en els quals és habitual la producció de pols, són fonamentalment els següents:

- Escombrat i neteja de locals
- Manutenció de runes
- Demolicions
- Treballs de perforació
- Manipulació de ciment
- Raig de sorra
- Tall de materials ceràmics i lítics amb serra mecànica
- Pols i serradures per tronçat mecànic de fusta
- Esmerilat de materials
- Pols i fums amb partícules metàl·liques en suspensió, en treballs de soldadura
- Plantes de matxuqueix i classificació
- Moviments de terres
- Circulació de vehicles
- Polit de paraments
- Plantes asfàltiques

A més a més dels Equips de Protecció Individual necessaris, com màscares i ulleres contra la pols, convé adoptar les següents mesures preventives:

ACTIVITAT	MESURA PREVENTIVA
Neteja de locals	Ús d'aspiradora i regat previ
Manutenció de runes	Regat previ

Demolicions	Regat previ
Treballs de perforació	Captació localitzada en carros perforadors o injecció d'aigua
Manipulació de ciment	Filtres en sitges o instal·lacions confinades
Raig de sorra o granalla	Equips semiautònoms de respiració
Tall o polit de materials ceràmics o lítics	Addició d'aigua micronitzada sobre la zona de tall
Treballs de la fusta, desbarbat i soldadura elèctrica	Aspiració localitzada
Circulació de vehicles	Regat de pistes
Plantes de matxuqueix i plantes asfàltiques	Aspiració localitzada

Els serveis de prevenció seran els encarregats d'estimar la magnitud o nivells del risc, les situacions en les que aquest es produeix, així com controlar periòdicament les condicions, l'organització dels mètodes de treball i la salut dels treballadors amb la finalitat de prendre les decisions per a eliminar, controlar o reduir el risc mitjançant mesures de prevenció a l'origen, organitzatives, de prevenció col·lectiva, de protecció individual, formatives i informatives.

#### 14.5 ORDRE I NETEJA

El Pla de Seguretat i Salut del contractista haurà d'indicar com pensa fer front a les actuacions bàsiques d'ordre i neteja en la materialització d'aquest projecte, especialment pel que fa a:

- 1er.- Retirada dels objectes i coses innecessàries.
- 2on.- Emplaçament de les coses necessàries en el seu respectiu lloc d'apilament.
- 3er.- Normalització interna d'obra dels tipus de recipients i plataformes de transport de materials a granel. Pla de manutenció intern d'obra.
- 4art.- Ubicació dels baixants de runes i recipients per a apilament de residus i la seva utilització. Pla d'evacuació de residus.
- 5è.- Neteja de claus i restes de material d'encofrat.
- 6è.- Desallotjament de les zones de pas, de cables, mànegues, fleixos i restes de matèria. Il·luminació suficient.
- 7è.- Retirada d'equips i ferramentes, descansant simplement sobre superfícies de suport provisionals.
- 8è.- Drenatge de vessaments en forma de tolls de carburants o greixos.
- 9è.- Senyalització dels riscos puntuals per falta d'ordre i neteja.
- 10è.- Manteniment diari de les condicions d'ordre i neteja. Brigada de neteja.
- 11è.- Informació i formació exigible als gremis o als diferents participants en els treballs directes i indirectes de cada partida inclosa en el projecte en el que és relatiu al manteniment de l'ordre i neteja inherents a l'operació realitzada.

En els punts de radiacions el consultor hauria d'identificar els possibles treballs on es poden donar aquest tipus de radiacions i indicar les mesures protectores a prendre.

#### 14.6 RADIACIONS NO IONITZANTS

Són les radiacions amb la longitud d'ona compresa entre 10-6 cm i 10 cm, aproximadament.

Normalment, no provoquen la separació dels electrons dels àtoms dels que formen part, però no per això deixen de ser perilloses. Comprenen: Radiació ultraviolada (UV), infraroja (IR), làser, microones, ultrasònica i de freqüència de ràdio.

Les radiacions no ionitzants són aquelles regions de l'espectre electromagnètic on l'energia dels fotons emesos és insuficient. Es considera que el límit més baix de longitud d'ona per a aquestes

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

radiacions no ionitzants és de 100 nm (nanòmetre) inclosos en aquesta categoria estan les regions comunament conegudes com bandes infraroja, visible i ultraviolada.

Els treballadors més freqüents i intensament sotmesos a aquests riscos són els soldadors, especialment els de soldadura elèctrica.

### Radiacions infraroges

Aquest tipus de radiació és ràpidament absorbida per els teixits superficials, produint un efecte d'escalfament. En el cas dels ulls, a l'absorbir-se la calor pel cristal·lí i no dispersar-se ràpidament, pot produir cataractes. Aquest tipus de lesió s'ha considerat la malaltia professional més probable en ferrers, bufadors de vidre i operaris de forns.

Totes les fonts de radiació IR intensa hauran d'estar dotades de sistemes de protecció tant propers a la font com sigui possible, per aconseguir la màxima absorció de calor i prevenir que la radiació penetri als ulls dels operaris. En cas d'utilització d'ulleres normalitzades, haurà d'incrementar-se adequadament la il·luminació del recinte, de manera que s'eviti la dilatació de la pupil·la de l'ull.

A les obres de construcció, els treballadors que estan més freqüentment exposats a aquestes radiacions són els soldadors, especialment quan realitzen soldadures elèctriques. Així mateix, s'ha de considerar l'entorn de l'obra, com a possible font de les radiacions.

La resposta primària a aquestes absorcions d'energia és de tipus tèrmic, afectant principalment a la pell en forma de: cremades agudes, augment de la dilatació dels vasos capil·lars i un increment de la pigmentació que pot ser persistent.

De forma general, tots aquells processos industrials realitzats en calent fins a l'extrem de desprendre llum, generen aquest tipus de radiació.

### Radiacions visibles

L'òrgan afectat més important és l'ull, sent transmeses aquestes longituds d'ona, a través dels mitjans oculars sense apreciable absorció abans d'aconseguir la retina.

### Radiacions ultraviolades

La radiació UV és aquella que té una longitud d'ona entre els 400 nm (nanometres) i els 10 nm. Queda inclosa dins de la radiació solar, i es genera artificialment per a molts propòsits en indústries, laboratoris i hospitals. Es divideix convencionalment en tres regions:

- UVA: 315 - 400 nm de longitud d'ona.
- UVB: 280 - 315 nm de longitud d'ona.
- UVC: 200 - 280 nm de longitud d'ona.

La radiació a la regió UVA, la més propera a l'espectre UV, és emprada àmpliament a la indústria i representa poc risc, pel contrari les radiacions UVB i UVC, són més perilloses. La norma més completa és nord americana i està, acceptada per la WHO (World Health Organization).

Les radiacions a les regions UVB i UVC tenen efectes biològics que varien marcadament amb la longitud d'ona, sent màxims entorn als 270 nm (la llàntia de quars amb vapor de mercuri a baixa pressió té una emissió a 254 nm aproximadament). També varien amb el temps d'exposició i amb la intensitat de la radiació. La exposició radiant d'ulls o pell no protegits, per a un període de vuit hores haurà d'estar limitada.

La protecció contra la sobreexposició de fonts potents que poden constituir riscos, haurà de dur-se a terme mitjançant la combinació de mesures organitzatives, d'apantallaments o resguards i de

protecció personal. Sense oblidar que s'ha d'intentar substituir el que és perillós pel que comporta poc o cap risc, d'acord a la llei de prevenció de riscos laborals.

S'haurà de posar especial èmfasi en els apantallaments i en les mesures de substitució, per a minimitzar el tercer, que implica la necessitat de protecció personal. Tots els usuaris de l'equip generador de radiació UV han de conèixer perfectament la naturalesa dels riscos involucrats. En l'equip, o prop d'ell, s'han de disposar senyals d'advertència adequades al cas. La limitació d'accés a la instal·lació, la distància de l'usuari respecte a la font i la limitació del temps d'exposició, constitueixen mesures organitzatives a tenir en compte.

No es poden emetre de forma indiscriminada radiacions UV en l'espai de treball, per exemple realitzant l'operació en un recinte confinat o en una àrea adequadament protegida. Dins de l'àrea de protecció, s'ha de reduir la intensitat de la radiació reflexada, emprant pintures de color negre mate. En el cas de fonts potents, on se sospiti que sigui possible una exposició per sobre del valor límit admissible, haurà de disposar-se de mitjans de protecció que dificultin i facin impossible el flux radiant lliure, directe i reflexat. Quant la naturalesa del treball requereixi que l'usuari operi junt a una font de radiació UV no protegida, haurà de fer-se ús dels mitjans de protecció personal. Els ulls estaran protegits amb ulleres o màscara de protecció facial, de manera que s'absorbeixin les radiacions que sobre ells incideixin. Anàlogament, hauran de protegir-se les mans, utilitzant guants de cotó, i la cara, emprant qualsevol tipus de protecció facial.

L'exposició dels ulls i pell no protegits a la radiació UV pot conduir a una inflamació dels teixits, temporal o prolongada, amb riscos variables. En el cas de la pell, pot donar lloc a un eritema similar a una cremada solar i, en el cas dels ulls, a una conjuntivitis i queratitis (o inflamació de la còrnia), de resultats imprevisibles.

La font és bàsicament el sol però també es troben en les activitats industrials de la construcció: llums fluorescents, incandescents i de descàrrega gasosa, operacions de soldadura (TIG-MIG), bufador d'arc elèctric i làsers.

Les mesures de control per a prevenir exposicions indègudes a les radiacions no ionitzants se centren en l'emprament de pantalles, blindatges i Equips de Protecció Individual (per exemple pantalla de soldadura amb visor de cèl·lula fotosensible), procurant mantenir distàncies adequades per a reduir, tenint en compte l'efecte de proporcionalitat inversa al quadrat de la distància, la intensitat de l'energia radiant emesa des de fonts que es propaguen en diferent longitud d'ona.

### Làser

La missió d'un làser és la de produir un raig d'alta densitat i s'ha emprat en camps tan diversos com cirurgia, topografia o comunicació. Es construeixen unitats amb força polsant o continua de radiació, tant visible com invisible. Aquestes unitats, si són suficientment potents, poden danyar la pell i, en particular, els ulls si estan exposats a la radiació. La unitat polsant d'alta energia és particularment perillosa quan el polze curt de radiació impacte en el teixit causant una àmplia lesió al voltant del mateix. Els làsers d'ona continua també poden causar danys en els ulls i la pell. Els de radiació IR i V presentaran perill per a la retina, en forma de cremades; els de radiació UV e IR poden suposar un risc per a la còrnia i el cristal·lí. D'una manera general, la pell és menys sensible a la radiació làser i en el cas d'unitats de radiació V i IR de grans potències, poden ocasionar cremades.

Els làsers s'han classificat, d'acord amb els riscos associats al seu ús, en els dos grups i quatre classes següents:

- a) Grup A: unitats intrínsecament segures i aquelles que cauen dins de les classes I y II.
  - Classe I: els nivells d'exposició màxima permissibles no poden ser excedits.
  - Classe II: de risc baix; emissió limitada a 1 mW en menys de 0,25 s, entre 400 nm i 700 nm; es preveuen els riscos per desviament de la radiació reflexada incloent la resposta de centelles.

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

- b) Grup B: tots els làsers presents o de ona continua amb potencia major d'1 mW, com es defineix a les classes IIIa, IIIb i IV respectivament.
- Classe IIIa: risc baix; emissió limitada a 5 vegades la corresponent a la classe II; l'ús d'instruments òptics pot resultar perillós.
  - Classe IIIb: risc mitjà; major límit d'emissió; l'impacte sobre l'ull pot resultar perillós, però no respecte a la reflexió difusa.
  - Classe IV: risc alt; major límit d'emissió; l'impacte per reflexió difusa pot ser perillós; poden causar foc i cremar la pell. El grau de protecció necessari depèn de la longitud d'ona i de l'energia emesa per la radiació. Qualsevol equip base s'ha de dissenyar d'acord amb mesures de seguretat apropiades, com per exemple, encaixonament protector, obturador d'emissió, senyal automàtica de emissió, etc.

Els làsers poden produir llum visible (400-700 nm), alguna radiació UV (200-400 nm), o comunament radiació IR (700 nm – 1 m).

A continuació, es presenta una guia de riscos associats amb unitats concretes de raigs làser:

- Amb làsers de la classe IIIa (< 5 mW), s'ha de prevenir únicament la visió directa del raig.
- Amb els de la classe IIIb i potències compreses entre 5 mW y 500 mW, s'ha de prevenir l'impacte de la radiació directa i de reflexió especular, en els ulls no protegits, que pot resultar perillós.
- Amb làsers de la classe IV i potències majors de 500 mW, s'ha de prevenir l'impacte de la radiació directa, de les reflexions secundàries i de les reflexions difuses, que pot resultar perillós.
- A més dels riscos associats a aquest tipus de radiació, s'ha de tenir en compte els deguts a les unitats d'energia elèctrica emprats per a subministrar energia a l'equip làser. A continuació, es dóna un codi de pràctica que cobreix personal, àrea de treball, equip i operació, respectivament, en l'ús de làsers.  
Tots els usuaris s'han de sotmetre a un examen oftalmològic periòdicament, fent èmfasi especial en les condicions de la retina. Les persones que treballen amb la classe IIIb i IV, tindran al mateix temps un examen mèdic d'inspecció de danys a la pell.
- Amb prioritat a qualsevol autorització, el contractista s'assegurarà que els operaris autoritzats estan degudament entrenats tant en procediment de treball segur com en el coneixement dels riscos potencials associats amb la radiació i equip que la genera.
- Qualsevol exposició accidental que suposi impacte en els ulls, haurà de ser registrada i comunicada al departament mèdic.
- La pràctica amb làser del grup B requereix la mesura general de protecció ocular, però que mai serà utilitzada per visió directa del raig.

- Àrea de treball:

- L'equip làser s'instal·larà en una àrea o recinte degudament controlats. La il·luminació del recinte haurà de ser tal manera que eviti la dilatació de la pupil·la de l'ull i així disminuir la possibilitat de lesió.
- Els raigs làser reflectits poden ser tant perillosos com els directes, i per tant, hauran d'eliminar-se les superfícies reflectants i polides.
- A l'àrea de treball s'haurà d'investigar periòdicament la presència de qualsevol gas tòxic que pugui generar-se durant el treball, per exemple, l'ozó.
- S'han de col·locar senyals lluminoses d'advertència en totes les zones d'entrada als recintes en els que els làsers funcionin. Quant la senyal estigui en acció, haurà de prohibir-se l'accés al mateix. L'equip de subministrament de potència al làser ha de disposar de protecció especial.
- Allà on sigui necessari, s'ha de prevenir la possibilitat de desviament del raig fora de l'àrea de control, mitjançant proteccions i blindatges. En el cas de radiació IR, ha d'emprar-se materials no inflamables per a proporcionar aquestes barreres físiques al voltant del làser. En aquests casos, s'ha d'evitar la proximitat de materials inflamables o explosius.

- Equip:

- Qualsevol operació de manteniment haurà de dur-se solament si la força està desconnectada.
- Tots els làsers, hauran de disposar de rètols d'advertència que tindran en compte la classe de làser a que correspon i el tipus de radiació visible o invisible que genera l'aparell.
- Quan els aparells que pertanyen al grup B no s'utilitzin, s'hauran de treure les claus de control d'engegada, així com la de control de força, que quedaran custodiades per la persona responsable autoritzada per el treball amb làser en el laboratori.
- Les ulleres protectores normalitzats, hauran de comprovar-se regularment i han de seleccionar-se d'acord amb la longitud d'ona de la radiació emesa per el làser en ús.
- Qualsevol protector de pantalla que s'utilitzi, haurà de ser de material absorbent que previngui la reflexió especular.

- Operació:

- Únicament el mínim nombre de persones requerides en l'operació es trobaran dins de l'àrea de control; no obstant, en el cas de làser de la classe IV, al menys dos persones estaran sempre presents durant l'operació.
- Únicament personal autoritzat tindrà permís per a muntar, ajustar i operar l'equip de làser.
- L'equip de làser haurà d'operar el temps mínim requerit per a la realització dels treballs, no es deixarà en funcionament sense estar vigilat.
- Com a procediment de protecció general, hauran d'utilitzar-se ulleres que previnguin el risc de dany ocular.
- L'equip de làser haurà de ser muntat a una alçada que mai superi la corresponent al pit de l'operador.
- S'ha de tenir especial cura en la radiació làser invisible, essent essencial la utilització d'un escut protector al llarg de tota la trajectòria.
- Donat que els làsers polsants presenten un risc incrementat per l'operador, com a guia d'alineació del raig, han d'emprar-se làsers de baixa potència d'heli o neó que pertanyin a la classe II, i no conformar-se amb una indicació somera de la direcció que adoptarà el raig. En aquests casos, sempre s'ha d'utilitzar la protecció ocular.

Els serveis de prevenció seran els encarregats d'estimar la magnitud o nivells del risc, les situacions en les que aquest es produeix, així com controlar periòdicament les condicions, l'organització dels mètodes de treball i la salut dels treballadors amb la finalitat de prendre les decisions per a eliminar, controlar o reduir el risc mitjançant mesures de prevenció en l'origen, organitzatives, de prevenció col·lectiva, de protecció individual, formatives i informatives.

En construcció acostuma a emprar-se monogràficament en l'establiment d'alineacions i nivells topogràfics.

Per la seva extrema perillositat, quan el làser estigui enfocat paral·lel al sòl, l'àrea de perill s'haurà d'acordonar. L'Equip de Protecció Individual contra el làser són les ulleres de protecció completa, amb el visor dotat del filtre adequat al tipus de làser que es tracti.

#### 14.7 RADIACIONS IONITZANTS

Dins de l'àmbit de la construcció existeixen pocs treballs propis en els que es generen aquests tipus de riscos, malgrat que si existeixen situacions on es puguin donar aquest tipus de radiació, com són:

- Detecció de defectes de soldadura o esquerdes en canonades, estructures i edificis.
- Control de densitats "in situ" pel mètode nuclear.
- Control d'irregularitats en el nivell d'emplenat de recipients o grans dipòsits.
- Identificació de trajectòries, emprant traçadors en corrents hidràuliques, sediments, moviment de granel, etcètera.

Serà obligació del contractista amb la col·laboració del seu servei de prevenció determinar un procediment de treball segur per a realitzar les esmentades operacions.

També es pot considerar una possible generació de riscos en treballs realitzats dintre d'un entorn o en proximitat de determinades instal·lacions, com poden ser:

- Les instal·lacions on es realitzin exàmens de maletes i embalums en els aeroports; detecció de cartes bomba.
- Les instal·lacions mèdiques on es realitzin pràctiques de teràpia, mitjançant radiacions ionitzants.
- Les instal·lacions mèdiques on es realitzen pràctiques de diagnòstic amb raigs X amb equips amb un potencial d'operació per disseny, sigui major de 70 Kilovolts.
- Les instal·lacions mèdiques on es manipula o es tracti material radioactiu, en forma de fonts no segellades, per a ús en teràpia o diagnòstic amb tècniques "in vivo".
- Les instal·lacions d'ús industrial on es tracti o manipuli material radioactiu.
- Els acceleradors de partícules o d'investigació o d'ús industrial.
- Les instal·lacions i equips per a gammagrafia o radiografia industrial, sigui mitjançant l'ús de fonts radioactius o equips emissors de raig X.
- Els dipòsits de residus radioactius, tant transitoris com definitius.
- Les instal·lacions on es produeixin, fabriqui, repari o es faci manteniment de fonts o equips generadors de radiacions ionitzants.
- Control d'irregularitats en l'espessor de blocs de paper, làmines de plàstic i fulles de metall o en el nivell d'emplenat de recipients o grans dipòsits.
- Estimació de l'antiguitat de substàncies, emprant el carboni-14 o altres isòtops, com l'argó-40 o el fòsfor-32.
- Il·luminació passiva de rellotges o de sortides d'emergència.

Les funcions de protecció radiològica són responsabilitat del titular de la instal·lació, essent el Consell de Seguretat Nuclear el qui decidirà si han de ser encomanades a un Servei de Protecció Radiològica propi del titular o a una Unitat Tècnica de Protecció Radiològica contractada a l'efecte. La reacció d'un individu a l'exposició a les radiacions depèn de la dosi, del volum i del tipus dels teixits irradiats.

Encara que poden ocórrer en combinació, correntment es fa una distinció entre dues classes fonamentals d'accidents per radiació, és dir: a) Irradiació externa accidental (per exemple en treballs de radiografiat de soldadura). b) Contaminació radioactiva accidental.

Els nivells màxims de dosi permesa han estat fixats tenint en compte que el cos humà pot tolerar una certa quantitat de radiació sense perjudicar el funcionament del seu organisme en general. Aquests nivells són, per a persones que treballen en Zones Controlades (per exemple edifici de contenció de central nuclear) i tenint en compte l'efecte acumulatiu de les radiacions sobre l'organisme, 5 rems per any o 300 milirems per setmana. Per a detectar i amidar els nivells de radiació, s'empren els comptadors Geiger.

Per al control de la dosi rebuda, s'ha de tenir en compte tres factors: a) temps de treball. b) distància de la font de radiació. c) Apantallament. El temps de treball permès s'obté dividint la dosi màxima autoritzada per la dosi rebuda en un moment donat. La dosi rebuda és inversament proporcional al quadrat de la distància a la font de radiació. Els materials que s'empren habitualment com barreres d'apantallament són el formigó i el plom, encara que també se n'usen d'altres com l'acer, totxos massissos de fang, granit, calcària, etc., en general, l'espessor necessari està en funció inversa de la densitat del material.

Per a verificar les dosis de radiació rebudes s'utilitzen dosímetres individuals, que poden consistir en una pel·lícula dosimètrica o un estildosímetre integrador de butxaca. Sempre que no s'especifiqui el contrari, el dosímetre individual es durà a la butxaca o davanter de la roba de treball, tenint especial cura en no col·locar els dosímetres sobre cap objecte que absorbeixi radiació (per exemple objectes metàl·lics).

Haurà de dur-se un Llibre de registre, on figurarà les dosis rebudes per cadascun dels treballadors professionalment exposats a radiacions.

## 15 MANIPULACIÓ DE MATERIALS

Tota manteniment de material comporta un risc, per tant, des del punt de vista preventiu, s'ha de tendir a evitar tota manipulació que no sigui estrictament necessària, en virtut del conegut axioma de seguretat que diu que "el treball més segur és aquell que no es realitza".

Per a manipular materials és preceptiu prendre les següents precaucions elementals:

- Començar per la càrrega o material que apareix més superficialment, és dir el primer i més accessible.
- Lliurar el material, no tirar-lo.
- Col·locar el material ordenat i en cas d'apilats estratificats, que aquest es realitzi en piles estables, lluny de passadissos o llocs on pugui rebre cops o desgastar-se.
- Utilitzar guants de treball i calçat de seguretat amb puntera metàl·lica i embuatada en empenya i turmells.
- En el maneigament de càrregues llargues entre dues o més persones, la càrrega pot mantenir-se en la mà, amb el braç estirat al llarg del cos, o bé sobre l'espatlla.
- S'utilitzaran les ferramentes i mitjans auxiliars adequats per al transport de cada tipus de material.
- En les operacions de càrrega i descàrrega, es prohibirà col·locar-se entre la part posterior del camió i una plataforma, pal, pilar o estructura vertical fixa.
- Si durant la descàrrega s'utilitzen ferramentes, com braços de palanca, uncles, potes de cabra o similar, disposar la maniobra de tal manera que es garanteixi el que no es vingui la càrrega damunt i que no rellisqui.

En el relatiu a la manipulació de materials el contractista en l'elaboració del Pla de Seguretat i Salut haurà de tenir en comte les següents premisses:

Intentar evitar la manipulació manual de càrregues mitjançant:

- Automatització i mecanització dels processos.
- Mesures organitzatives que eliminin o minimitzin el transport.

Adoptar Mesures preventives quan no es pugui evitar la manipulació com:

- Utilització d'ajudes mecàniques.
- Reducció o redisseny de la càrrega.
- Actuació sobre l'organització del treball.
- Millora de l'entorn de treball.

Dotar als treballadors de la formació i informació en temes que incloguin:

- Ús correcte de les ajudes mecàniques.
- Ús correcte dels equips de protecció individual.
- Tècniques segures per a la manipulació de càrregues.
- Informació sobre el pes i centre de gravetat.

### Els principis bàsics de la manteniment de materials

- 1er.- El temps dedicat a la manipulació de materials és directament proporcional a l'exposició al risc d'accident derivat de dita activitat.



- 2on.- Procurar que els diferents materials, així com la plataforma de suport i de treball de l'operari, estiguin a la mateixa alçada en què s'ha de treballar amb ells.
- 3er.- Evitar el dipositar els materials directament sobre el terra, fer-ho sempre sobre catúfols o contenidors que permetin el seu trasllat a dojo.
- 4art.- Escurçar tant com sigui possible les distàncies a recórrer pel material manipulat, evitant estacionaments intermedis entre el lloc de partida del material manipulat evitant estacionaments intermedis entre el lloc de partida del material i l'emplaçament definitiu de la seva posada en obra.
- 5è.- Traginar sempre els materials a dojo, mitjançant paloniers, catúfols, contenidors o palets, en lloc de portar-los d'un en un.
- 6è.- No tractar de reduir el nombre d'ajudants que recullin i traguin els materials, si això comporta ocupar els oficials o caps d'equip en operacions de manutenció, coincidint en franges de temps perfectament aprofitables per l'avanç de la producció.
- 7è.- Mantenir esclerits, senyalitzats i enllumenats, els llocs de pas dels materials a manipular.

#### **Manejament de càrregues sense mitjans mecànics**

Per a l'hissat manual de càrregues la totalitat del personal d'obra haurà rebut la formació bàsica necessària, comproment-se a seguir els següents passos:

- 1er.- Apropar-se el més possible a la càrrega.
- 2on.- Assentar els peus fermament.
- 3er.- Ajupir-se doblegant els genolls.
- 4art.- Mantenir l'esquena dreta.
- 5è.- Subjectar l'objecte fermament.
- 6è.- L'esforç d'aixecar l'han de realitzar els músculs de les cames.
- 7è.- Durant el transport, la càrrega haurà de romandre el més a prop possible del cos.
- 8è.- Per al maneigament de peces llargues per una sola persona s'actuarà segons els següents criteris preventius:
- Durà la càrrega inclinada per un dels seus extrems, fins l'altura de l'espatlla.
  - Avançarà desplaçant les mans al llarg de l'objecte, fins arribar al centre de gravetat de la càrrega.
  - Es col·locarà la càrrega en equilibri sobre l'espatlla.
  - Durant el transport, mantindrà la càrrega en posició inclinada, amb l'extrem davant aixecat.
- 9è.- És obligatòria la inspecció visual de l'objecte pesat a aixecar, per a eliminar arestes afilades.
- 10è.- Està prohibit aixecar més de 50 kg de forma individual. El valor límit de 30 Kg per homes, pot superar-se puntualment a 50 Kg quan es tracti de descarregar un material per a col·locar-lo sobre un mitjà mecànic de manutenció. En el cas de tractar-se de dones, es redueixen aquests valors a 15 i 25 Kg respectivament.
- 11è.- És obligatori la utilització d'un codi de senyals quan s'ha d'aixecar un objecte entre uns quants, per a suportar l'esforç al mateix temps. Pot ser qualsevol sistema a condició que sigui conegut o convingut per l'equip.

#### **16 MITJANS AUXILIARS D'UTILITAT PREVENTIVA (MAUP)**

Als efectes del present Estudi de Seguretat i Salut, tindran la consideració de MAUP, tot Mitjà Auxiliar dotat de Protecció, Resguard, Dispositiu de Seguretat, Operació seqüencial, Seguretat positiva o Sistema de Protecció Col·lectiva, que originàriament ve integrat, de fàbrica, en l'equip, màquina o sistema, de forma solidària i indissociable, de tal manera que s'interposi, o apantalli els riscos d'abast o simultaneïtat de l'energia fora de control, i els treballadors, personal aliè a l'obra i/o materials, màquines, equips o ferramentes pròximes a la seva àrea d'influència, anul·lant o reduint les conseqüències d'accident. La seva operativitat resta garantida pel fabricant o distribuïdor

de cadascun dels components, en les condicions d'utilització i manteniment per ell prescrites. El contractista resta obligat a la seva adequada elecció, seguiment i control d'ús.

Els MAUP més rellevants, previstos per a l'execució del present projecte són els indicats a continuació:

Codi	UA	Descripció
HX11X003	u	Bastida modular amb estructura tubular i sistema de seguretat amb tots els requisits reglamentaris en previsió de caigudes per a la realització d'estructures, tancaments, cobertes, i altres treballs en alçada
HX11X004	u	Barana definitiva, prevista en projecte, per a protecció de caigudes a diferent nivell
HX11X005	u	Escala modular d'estructura porticada, per accedir a cotes de diferent nivell, superiors a 7 m amb sistema de seguretat integrat
HX11X019	m	Marquesina de protecció en voladiu en bastida tubular amb sistema de seguretat amb tots els requisits reglamentaris, normalitzada i incorporada UNE-EN 12810-1 (HD-1000)
HX11X021	u	Passadís de protecció prefabricat metàl·lic amb sistema de seguretat amb tots els requisits reglamentaris, de llargària 2,5 m, d'amplària 1,1 m, amb paviment de entramat de platines metàl·liques i rampes articulades, baranes metàl·liques reglamentàries, muntants de 2 m d'alçada, sostre de xapa d'acer de 3 mm de gruix
HX11X022	u	Passadís de protecció prefabricat metàl·lic amb sistema de seguretat amb tots els requisits reglamentaris, de llargària 2,5 m, d'amplària 1,1 m, amb paviment de entramat de platines metàl·liques i rampes articulades, baranes metàl·liques reglamentàries

#### **17 SISTEMES DE PROTECCIÓ COL·LECTIVA (SPC)**

Als efectes del present Estudi de Seguretat i Salut, tindran la consideració de Sistemes de Protecció Col·lectiva, el conjunt d'elements associats, incorporats al sistema constructiu, de forma provisional i adaptada a l'absència de protecció integrada de major eficàcia (MAUP), destinats a apantallar o condonar la possibilitat de coincidència temporal de qualsevol tipus d'energia fora de control, present en l'ambient laboral, amb els treballadors, personal aliè a l'obra i/o materials, màquines, equips o ferramentes pròximes a la seva àrea d'influència, anul·lant o reduint les conseqüències d'accident. La seva operativitat garanteix la integritat de les persones o objectes protegits, sense necessitat d'una participació per a assegurar la seva eficàcia. Aquest últim aspecte és el que estableix la seva diferència amb un Equip de Protecció Individual (EPI).

En absència d'homologació o certificació d'eficàcia preventiva del conjunt d'aquests Sistemes instal·lats, el contractista fixarà en el seu Pla de Seguretat i Salut, referència i relació dels Protocols d'Assaig, Certificats o Homologacions adoptades i/o requerits als instal·ladors, fabricants i/o proveïdors, per al conjunt dels esmentats Sistemes de Protecció Col·lectiva.

Els SPC més rellevants previstos per a l'execució del present projecte són els indicats en l'annex d'aquesta memòria que contindrà les fitxes amb RISC-AVALUACIÓ-MESURES

#### **18 CONDICIONS DELS EQUIPS DE PROTECCIÓ INDIVIDUAL (EPI)**

Als efectes del present Estudi de Seguretat i Salut, tindran la consideració d'Equips de Protecció Individual, aquelles peces de treball que actuen a mode de coberta o pantalla portàtil, individualitzada per a cada usuari, destinats a reduir les conseqüències derivades del contacte de la zona del cos protegida, amb una energia fora de control, d'intensitat inferior a la previsible resistència física de l'EPI.

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

La seva utilització haurà de quedar restringida a l'absència de garanties preventives adequades, per inexistència de MAUP, o en el seu defecte SPC d'eficàcia equivalent.

Tots els equips de protecció individual estaran degudament certificats, segons normes harmonitzades CE. Sempre de conformitat als R.D. 1407/92, R.D.159/95 i R.D. 773/97.

El Contractista Principal portarà un control documental del seu lliurament individualitzat al personal (propri o subcontractat), amb el corresponent avís de recepció signat pel beneficiari.

En els casos en què no existeixin normes d'homologació oficial, els equips de protecció individual seran normalitzats pel constructor, per al seu ús en aquesta obra, triats d'entre els que existeixin en el mercat i que reuneixin una qualitat adequada a les respectives prestacions. Per aquesta normalització interna s'haurà de comptar amb el vist-i-plau del tècnic que supervisa el compliment del Pla de Seguretat i Salut per part de la Direcció d'Obra o Direcció Facultativa/Direcció d'Execució.

Al magatzem d'obra hi haurà permanentment una reserva d'aquests equips de protecció, de manera que pugui garantir el subministrament a tot el personal sense que se'n produeixi, raonablement, la seva carència.

En aquesta previsió cal tenir en compte la rotació del personal, la vida útil dels equips i la data de caducitat, la necessitat de facilitar-los a les visites d'obra, etc.

Els EPI més rellevants, previstos per a l'execució material del present projecte són els indicats en l'annex d'aquesta memòria que contindrà les fitxes amb RISC-AVALUACIÓ-MESURES

### 19 RECURSOS PREVENTIUS

La legislació que s'ha de complir respecte a la presència de recursos preventius a les obres de construcció està contemplada a la llei 54/2003. D'acord amb aquesta llei, la presència dels recursos preventius a les obres de construcció serà preceptiva en els següents casos:

- Quan els riscos es puguin veure agreujats o modificats en el desenvolupament del procés o l'activitat, per la concurrència d'operacions diverses que es desenvolupen successivament o simultàniament i que facin precís el control de la correcta aplicació dels mètodes de treball. La presència de recursos preventius de cada contractista serà necessari quan, durant l'obra, es desenvolupin treballs amb riscos especials, com es defineixen en el real decret 1627/97.*
- Quan es realitzin activitats o processos que reglamentàriament es considerin perillosos o amb riscos especials.*
- Quan la necessitat d'aquesta presència sigui requerida per la Inspecció de Treball i Seguretat Social, si les circumstàncies del cas ho exigissin degut a les condicions de treball detectades.*

Quan a les obres de construcció coexisteixen contractistes i subcontractistes que, de forma successiva o simultània, puguin constituir un risc especial per interferència d'activitats, la presència dels "Recursos preventius" és, en aquests casos, necessària.

Els recursos preventius són necessaris quan es desenvolupin treballs amb riscos especials, definits a l'annex II del RD 1627/97:

- Treballs amb riscos especialment greus d'enterrament, enfonsament o caiguda d'altura, per les particulars característiques de l'activitat desenvolupada, els procediments aplicats, o l'entorn del lloc de treball.*

- Treballs en els quals l'exposició a agents químics o biològics suposi un risc d'especial gravetat, o pels que la vigilància específica de la salut dels treballadors sigui legalment exigible.*
- Treballs amb exposició a radiacions ionitzants pels que la normativa específica obliga a la delimitació de zones controlades o vigilades.*
- Treballs a la proximitat de línies elèctriques d'alta tensió.*
- Treballs que exposin a risc d'ofegament per immersió.*
- Obres d'excavació de túnels, pous i altres treballs que suposin moviments de terra subterranis.*
- Treballs realitzats en immersió amb equip subaquàtic.*
- Treballs realitzats en caixons d'aire comprimit.*
- Treballs que impliquin l'ús d'explosius.*
- Treballs que requereixin muntar o desmuntar elements prefabricats pesats.*

A continuació es detallen, de forma orientativa, les activitats de l'obra del present estudi de seguretat i salut, en base a l'avaluació de riscos d'aquest, que requereixen la presència de recurs preventiu:

#### ENDERROCS

ENDERROCS D'ELEMENTS SOTERRATS A POCA FONDÀRIA  
ENDERROCS O ARRENCADA D'ELEMENTS

#### MOVIMENTS DE TERRES

REBAIX DE TERRENY SENSE I AMB TALUSSOS, I PRETALL EN TALUSSOS I  
REPOSICIÓ EN DESMUNT  
EXCAVACIÓ DE RASES I POUS  
REBLIMENTS SUPERFICIALS, TERRAPLENS / PEDRAPLENS  
CÀRREGA I TRANSPORT DE TERRES O RUNES

#### FONAMENTS

SUPERFICIALS (RASES, POUS, LLOSES, ENCEPS, BIGUES DE LLIGAT, MURS  
GUIA)  
PROFUNDES (PILOTS, MICROPILOTS, PANTALLES, CONSOLIDACIÓ DE  
TERRENY AMB INJECCIONS )  
GABIONS / ESCULLERES  
ESTREBADES I APUNTALAMENTS

#### ESTRUCTURES

ESTRUCTURES D'ACER  
ESTRUCTURES DE FORMIGÓ IN SITU (ENCOFRATS, ARMADURES,  
FORMIGONAMENT, ANCORATGES I TESAT)  
TRANSPORT I MUNTATGE D'ESTRUCTURES PREFABRICADES

#### IMPERMEABILITZACIONS - AÏLLAMENTS I JUNTS

IMPERMEABILITZACIÓ DE MURS DE CONTENCIÓ O SUPERFÍCIES PLANES  
JUNTS (FORMACIÓ, REBLERTS, SEGELLATS)

#### REVESTIMENTS

PINTATS - ENVERNISSATS

#### PAVIMENTS

PAVIMENTS AMORFS (FORMIGÓ, SUBBASES, TERRA, SAULÓ, BITUMINOSOS  
I REGS)  
PECES (PEDRA, CERÀMICA, MORTER, ETC. )

#### PROTECCIONS I SENYALITZACIÓ

COL.LOCACIÓ DE BARANES I SENYALS AMB SUPORTS METÀL.LICS

#### INSTAL.LACIONS DE DRENATGE, D'EVACUACIÓ I CANALITZACIONS

ELEMENTS COL.LOCATS SUPERFICIALMENT (DESGUASSOS, EMBORNALS,  
BUNERES, ETC.)

ELEMENTS SOTERRATS (CLAVEGUERONS, POUS, DRENATGES)

#### CANONADES PER A GASOS I FLUIDS

TUBS MUNTATS SUPERFICIALMENT

#### INSTAL.LACIONS ELÈCTRIQUES

INSTAL·LACIONS ELÈCTRIQUES BAIXA TENSIÓ  
INSTAL·LACIONS DE TENSIÓ MITJANA O ALTA - MUNTATGE D'ESTACIONS I  
SUBESTACIONS TRANSFORMADORES  
INSTAL·LACIONS DE TENSIÓ MITJANA O ALTA - MUNTATGE DE LÍNIES  
SOTERRADES  
JARDINERIA  
MOVIMENTS DE TERRES I PLANTACIÓ

## 20 SENYALITZACIÓ I ABALISAMENT

Quant a la senyalització de l'obra, és necessari distingir entre la que es refereix a la que demanda de l'atenció per part dels treballadors i aquella que correspon al tràfic exterior afectat per l'obra. En el primer cas són d'aplicació les prescripcions establertes per el Reial Decret 485/1997, de 14 d'abril. La senyalització i el abalisament de tràfic venen regulats, entre altra normativa, per la Norma 8.3-I.C. de la Direcció General de Carreteres i no és objecte de l'Estudi de Seguretat i Salut. Aquesta distinció no exclou la possible complementació de la senyalització de tràfic durant l'obra quan aquesta mateixa es faci exigible per a la seguretat dels treballadors que treballin a la immediació d'aquest tràfic.

S'ha de tenir en compte que la senyalització per si mateixa no elimina els riscos, malgrat això la seva observació quan és l'apropiada i està ben col·locada, fa que l'individu adopti conductes segures. No és suficient amb col·locar un plafó a les entrades de les obres, si després en la pròpia obra no se senyalitza l'obligatorietat d'utilitzar cinturó de seguretat al col·locar les mires per a realitzar el tancament de façana. La senyalització abundant no garanteix una bona senyalització, ja que el treballador acaba fent cas omís de qualsevol tipus de senyal.

El R.D.485/97 estableix que la senyalització de seguretat i salut en el treball haurà d'utilitzar-se sempre que l'anàlisi dels riscos existents, les situacions d'emergència previsible i les mesures preventives adoptades, posin de manifest la necessitat de:

- Cridar l'atenció dels treballadors sobre l'existència de determinats riscos, prohibicions o obligacions.
- Alertar als treballadors quan es produeixi una determinada situació d'emergència que requereixi mesures urgents de protecció o evacuació.
- Facilitar als treballadors la localització i identificació de determinats mitjans o instal·lacions de protecció, evacuació, emergència o primers auxilis.
- Orientar o guiar als treballadors que realitzin determinades maniobres perilloses.

La senyalització no haurà de considerar-se una mesura substitutiva de les mesures tècniques i organitzatives de protecció col·lectiva i haurà d'utilitzar-se quan, mitjançant aquestes últimes, no hagi estat possible eliminar els riscos o reduir-los suficientment.

Tampoc haurà de considerar-se una mesura substitutiva de la formació i informació dels treballadors en matèria de seguretat i salut en el treball.

Així mateix, segons s'estableix en el R.D. 1627/97, s'haurà de complir que:

1. Les vies i sortides específiques d'emergència hauran de senyalitzar-se conforme al R.D. 485/97, tenint en compte que aquesta senyalització haurà de fixar-se en els llocs adequats i tenir la resistència suficient.
2. Els dispositius no automàtics de lluita contra incendis hauran d'estar senyalitzats conforme al R.D. 485/97, tenint en compte que aquesta senyalització haurà de fixar-se en els llocs adequats i tenir la resistència suficient.
3. El color utilitzat per a la il·luminació artificial no podrà alterar o influir en la percepció de les senyals o panells de senyalització.
4. Les portes transparents hauran de tenir una senyalització a l'altura de la vista.

5. Quan existeixin línies d'estesa elèctrica àrees, en el cas que vehicles l'obra haguessin de circular sota l'estesa elèctrica s'utilitzarà una senyalització d'advertència.

La implantació de la senyalització i abalisament s'ha de definir en els plànols de l'Estudi de Seguretat i Salut i s'ha de tenir en compte en les fitxes d'activitats, al menys respecte els riscos que no s'hagin pogut eliminar.

## 21 CONDICIONS D'ACCÉS I AFECTACIONS DE LA VIA PÚBLICA

En el PLA DE SEGURETAT I SALUT el Contractista definirà les desviacions i passos provisionals per a vehicles i vianants, els circuits i trams de senyalització, la senyalització, les mesures de protecció i detecció, els paviments provisionals, les modificacions que comporti la implantació de l'obra i la seva execució, diferenciant, si és cas, les diferents fases d'execució. A aquests efectes, es tindrà en compte el que determina la Normativa per a la informació i senyalització d'obres al municipi i la Instrucció Municipal sobre la instal·lació d'elements urbans a l'espai públic de la ciutat que correspongui.

Quan correspongui, d'acord amb les previsions d'execució de les obres, es diferenciarà amb claredat i per cadascuna de les distintes fases de l'obra, els àmbits de treball i els àmbits destinats a la circulació de vehicles i vianants, d'accés a edificis i guals, etc., i es definiran les mesures de senyalització i protecció que correspongui a cadascuna de les fases.

És obligatori comunicar l'inici, l'extensió, la naturalesa dels treballs i les modificacions de la circulació de vehicles provocades per les obres, a la Guàrdia Municipal i als Bombers o a l'Autoritat que correspongui.

Quan calgui prohibir l'estacionament en zones on habitualment és permès, es col·locarà el cartell de "SENYALITZACIÓ EXCEPCIONAL" (1050 X 600 mm), amb 10 dies d'antelació a l'inici dels treballs, tot comunicant-ho a la Guàrdia Municipal o l'Autoritat que correspongui.

En la desviació o estrenyiment de passos per a vianants es col·locarà la senyalització corresponent.

No es podrà començar l'execució de les obres sense haver procedit a la implantació dels elements de senyalització i protecció que corresponguin, definits al PLA DE SEGURETAT aprovat.

El contractista de l'obra serà responsable del manteniment de la senyalització i elements de protecció implantats.

Els accessos de vianants i vehicles, estaran clarament definits, senyalitzats i separats.

### 21.1 NORMES DE POLICIA

#### • Control d'accessos

Una vegada establerta la delimitació del perímetre de l'obra, conformats els tancaments i accessos per els vianants i de vehicles, el contractista amb la col·laboració del seu servei de prevenció definirà, dins del Pla de Seguretat i Salut, el procés per al control d'entrada i sortida de vehicles en general (inclosa la maquinària com grues mòbils, retroexcavadores) i de personal de manera que garanteixi l'accés únicament a persones autoritzades.

Quan la delimitació de l'obra no es pugui portar a terme, per les pròpies circumstàncies de l'obra, el contractista, al menys haurà de garantir, l'accés controlat a les instal·lacions d'ús comú de l'obra, i haurà d'assegurar que les entrades a l'obra estiguin senyalitzades, i que quedin tancades les zones que puguin presentar riscos.

- **Coordinació d'interferències i seguretat a peu d'obra**

El contractista, quan sigui necessari, donat el volum d'obra, el valor dels materials emmagatzemats i altres circumstàncies que així ho aconsellin, definirà un procés per garantir l'accés controlat a les instal·lacions que suposin risc personal i/o comú per a l'obra i l'intrusisme a l'interior de l'obra en tallers, magatzems, vestuaris i d'altres instal·lacions d'ús comú o particular.

## 21.2 ÀMBIT D'OCUPACIÓ DE LA VIA PÚBLICA

- **Ocupació del tancament de l'obra**

S'entén per àmbit d'ocupació el realment ocupat, incloent tanques, elements de protecció, baranes, bastides, contenidors, casetes, etc.

En el PLA DE SEGURETAT I SALUT EN EL TREBALL s'especificarà la delimitació de l'àmbit d'ocupació de l'obra i es diferenciarà clarament si aquest canvia en les diferents fases de l'obra. L'àmbit o els àmbits d'ocupació quedaran clarament dibuixats en plànols per fases i interrelacionats amb el procés constructiu.

L'amplada màxima a ocupar serà proporcional a l'amplada de la vorera. L'espai lliure per a pas de vianants no serà inferior a un terç (1/3) de l'amplada de la vorera existent.

En cap cas es podrà ocupar una amplada superior a tres (3) metres mesurats des de la línia de façana, ni més de dos terços (2/3) de l'amplada de la vorera, si no queda al menys una franja d'amplada mínima d'un metre i quaranta centímetres (1,40 m) per a pas de vianants.

Quan, per l'amplada de la vorera, no sigui possible deixar un pas per a vianants d'un metre i quaranta centímetres (1,40 m) es permetrà, durant l'execució dels treballs a planta baixa, la col·locació de tanques amb un sortint màxim de seixanta centímetres (60 cm) deixant un pas mínim per a vianants d'un metre (1 m). Per a l'enderrocament de les plantes superiors a la planta baixa, es col·locarà una tanca a la línia de façana i es farà una protecció volada per la retenció d'objectes despresos de les cotes superiors. Si la vorera és inferior a un metre seixanta centímetres (1,60 cm) durant els treballs a la planta baixa, el pas per a vianants d'un metre (1 m) d'amplada podrà ocupar part de la calçada en la mesura que calgui. En aquest cas, s'haurà de delimitar i protegir amb tanques l'àmbit del pas de vianants.

- **Situació de casetes i contenidors**

S'indicaran en el PLA DE SEGURETAT I SALUT les àrees previstes per aquest fi.

- Les casetes, contenidors, tallers provisionals i aparcament de vehicles d'obra, se situaran en una zona propera a l'obra que permeti aplicar els següents criteris:
- Preferentment, a la vorera, deixant un pas mínim d'un metre i quaranta centímetres (1,40 m) per a pas de vianants per la vorera.
- A la vorera, deixant un pas mínim d'un metre i quaranta centímetres (1,40 m) per a pas de vianants per la zona d'aparcament de la calçada sense envair cap carril de circulació.
- Si no hi ha prou espai a la vorera, es col·locaran a la zona d'aparcament de la calçada procurant no envair cap carril de circulació i deixant sempre com a mínim un metre (1m) per a pas de vianants a la vorera.
- Es protegirà el pas de vianants i es col·locarà la senyalització corresponent.

- **Situació de grues-torre i muntacàrregues**

Només podran estar emplaçats a l'àmbit de l'obra.

- **Canvis de la Zona Ocupada**

Qualsevol canvi en la zona ocupada que afecti l'àmbit de domini públic es considerarà una modificació del PLA DE SEGURETAT I SALUT EN EL TREBALL i s'haurà de documentar i tramitar d'acord amb el R.D. 1627/97.

## 21.3 TANCAMENTS DE L'OBRA QUE AFECTEN L'ÀMBIT PÚBLIC

- **Tanques**

Situació Delimitaran el perímetre de l'àmbit de l'obra o, en ordenació entre mitgeres, tancaran el front de l'obra o solar i els laterals de la part de vorera ocupada.

Tipus de tanques Es formaran amb xapa metàl·lica opaca o a base de plafons prefabricats o d'obra de fàbrica arrebossada i pintada.

Les empreses promotores podran presentar a l'Ajuntament per a la seva homologació, si s'escau, el seu propi model de tanca per tal d'emprar-lo en totes les obres que facin.

Les tanques metàl·liques de 200 x 100 cm només s'admeten per a proteccions provisionals en operacions de càrrega, desviacions momentànies de trànsit o similars.

En cap cas s'admet com a tanca el simple abalisat amb cinta de PVC, malla electrosoldada de ferrallista, xarxa tipus tennis de polipropilè (habitualment de color taronja), o elements tradicionals de delimitacions provisionals de zones de risc.

Complements Totes les tanques tindran balisament lluminós i elements reflectants en tot el seu perímetre.

Manteniment El Contractista vetllarà pel correcte estat de la tanca, eliminant graffitis, publicitat il·legal i qualsevol altre element que deteriori el seu estat original.

- **Accés a l'obra**

Portes Les tanques estaran dotades de portes d'accés independent per a vehicles i per al personal de l'obra.

No s'admet com a solució permanent d'accés la retirada parcial del tancament.

## 21.4 OPERACIONS QUE AFECTEN L'ÀMBIT PÚBLIC

- **Entrades i sortides de vehicles i maquinària**

Vigilància Personal responsable de l'obra s'encarregarà de dirigir les operacions d'entrada i sortida, avisant els vianants a fi d'evitar accidents.



Aparcament	Fora de l'àmbit del tancament de l'obra no podran estacionar-se vehicles ni maquinària de l'obra, excepte a la reserva de càrrega i descàrrega de l'obra quan existeixi zona d'aparcament a la calçada.
Camions en espera	Si no hi ha espai suficient dins de l'àmbit del tancament de l'obra per acollir els camions en espera, caldrà preveure i habilitar un espai adequat a aquest fi fora de l'obra.  El PLA DE SEGURETAT preveurà aquesta necessitat, d'acord amb la programació dels treballs i els mitjans de càrrega, descàrrega i transport interior de l'obra.

• **Càrrega i descàrrega**

Les operacions de càrrega i descàrrega s'executaran dintre l'àmbit del tancament de l'obra. Quan això no sigui possible, s'estacionarà el vehicle en el punt més proper a la tanca de l'obra, es desviaràn els vianants fora de l'àmbit d'actuació, s'ampliarà el perímetre tancat de l'obra i es prendran les següents mesures:

- S'habilitarà un pas per als vianants. Es deixarà un pas mínim d'un metre i quaranta centímetres (1,40 m) d'ample per a la vorera o per a la zona d'aparcament de la calçada, sense envair cap carril de circulació. Si no és suficient i/o si cal envair el carril de circulació que correspongui i contactar prèviament amb la Guàrdia Urbana.
- Es protegirà el pas de vianants amb tanques metàl·liques de 200 x 100 cm, delimitant el camí pels dos costats i es col·locarà la senyalització que correspongui.
- La separació entre les tanques metàl·liques i l'àmbit d'operacions o el vehicle, formarà una franja de protecció l'amplada de la qual dependrà del tipus de productes a carregar o descarregar i que establirà el Cap d'Obra prèvia consulta al Coordinador de Seguretat de l'obra.
- Acabades les operacions de càrrega i descàrrega, es retiraran les tanques metàl·liques es netejarà el paviment.
- Es controlarà la descàrrega dels camions formigonera a fi d'evitar abocaments sobre la calçada.

• **Descàrrega, apilament i evacuació de terres i runa**

Descàrrega	La descàrrega de runa des dels diferents nivells de l'obra, aprofitan de la gravetat, serà per canonades (cotes superiors) o mecàric (cotes sota rasant), fins els contenidors o tremuges, que haurà cobertes amb lones o plàstics opacs a fi d'evitar pols. Les cantes d'elevació i transport de material es col·locaran sempre per del recinte de l'obra.
Apilament.	No es poden acumular terres, runa i deixalles en l'àmbit de domini públic, excepte si és per a un termini curt i si s'ha obtingut un permís especial de l'Ajuntament, i sempre s'ha de dipositar en tremuges o en contenidors homologats.  Si no es disposa d'aquesta autorització ni d'espais adequats, les terres es carregaran directament sobre camions per a la seva evacuació immediata.  A manca d'espai per a col·locar els contenidors en l'àmbit del tancament de l'obra, es col·locaran sobre la vorera en el punt

més proper a la tanca, deixant un pas per als vianants d'un metre i quaranta centímetres (1,40 m) d'amplada com a mínim.

S'evitarà que hi hagi productes que sobresurtin del contenidor.

Es netejarà diàriament la zona afectada i després de retirat el contenidor.

Els contenidors, quan no s'utilitzin, hauran de ser retirats.

Evacuació

Si la runa es carrega sobre camions, aquests hauran de portar la caixa tapada amb una lona o un plàstic opac a fi d'evitar la producció de pols, i el seu transport ho serà a un abocador autoritzat. El mateix es farà en els transports dels contenidors.

• **Proteccions per a evitar la caiguda d'objectes a la via pública**

Al PLA DE SEGURETAT s'especificaran, per cada fase d'obra, les mesures i proteccions previstes per a garantir la seguretat de vianants i vehicles i evitar la caiguda d'objectes a la via pública, tenint en compte les distàncies, en projecció vertical, entre els treballs en altura, el tancament de l'obra i la vorera o zona de pas de vianants o vehicles.

Bastides

Es col·locaran bastides perimetrals a tots els paraments exteriors a la construcció a realitzar. Les bastides seran metàl·liques i modulares. Tindran una protecció de la caiguda de materials i elements formant un entarimat horitzontal a 2,80 m d'alçada, preferentment de peces metàl·liques, fixat a l'estructura vertical i horitzontal de la bastida, així com una marquesina inclinada en voladís que sobresurti 1,50 m, com a mínim, del pla de la bastida. Les bastides seran tapades perimetralment i a tota l'alçada de l'obra, des de l'entarimat de visera, amb una xarxa o lones opaques que eviti la caiguda d'objectes i la propagació de pols.

Xarxes

Sempre que s'executin treballs que comportin perill per als vianants, pel risc de caiguda de materials o elements, es col·locaran xarxes de protecció entre les plantes, amb sistemes homologats, de forjat, perimetrals a totes les façanes.

Grues torre

En el PLA DE SEGURETAT s'indicarà l'àrea de funcionament del braç i les mesures que es prendran en el cas de superar els límits del solar o del tancament de l'obra. El carro del qual penja el ganxo de la grua no podrà sobrepassar aquests límits. Si calgués fer-ho, en algun moment, es prendran les mesures indicades per a càrregues i descàrregues.

**21.5 NETEJA I INCIDÈNCIA SOBRE L'AMBIENT QUE AFECTEN L'ÀMBIT PÚBLIC**

• **Neteja**

Els contractistes netejaran i regaran diàriament l'espai públic afectat per l'activitat de l'obra i especialment després d'haver efectuat càrregues i descàrregues o operacions productores de pols o deixalles.

Es vigilarà especialment l'emissió de partícules sòlides (pols, ciment, etc.).

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Caldrà prendre les mesures pertinents per evitar les roderes de fang sobre la xarxa viària a la sortida dels camions de l'obra. A tal fi, es disposarà, abans de la sortida del tancament de l'obra, una solera de formigó o planxes de „relliga” de 2 x 1 m, com a mínim, sobre la qual s'aturaran els camions i es netejaran per reg amb mànega cada parella de rodes.

Està prohibit efectuar la neteja de formigoneres al clavegueram públic.

- **Sorolls. Horari de treball**

Les obres es realitzaran entre les 8,00 i les 20,00 hores dels dies feiners.

Fora d'aquest horari, només es permet realitzar activitats que no produeixin sorolls més enllà d'allò que estableixen les OCAF. Les obres realitzades fora d'aquest horari hauran de ser específicament autoritzades per l'Ajuntament.

Excepcionalment i amb l'objecte de minimitzar les molèsties que determinades operacions poden produir sobre l'àmbit públic i la circulació o per motius de seguretat, l'Ajuntament podrà obligar que alguns treballs s'executin en dies no feiners o en un horari específic.

- **Pols**

Es regaran les pistes de circulació de vehicles.

Es regaran els elements a enderrocar, la runa i tots els materials que puguin produir pols.

En el tall de peces amb disc s'hi afegirà aigua.

Les sitges de ciment estaran dotades de filtre.

### 21.6 RESIDUS QUE AFECTEN A L'ÀMBIT PÚBLIC

El contractista, dins del Pla de Seguretat i Salut, definirà amb la col·laboració del seu servei de prevenció, els procediments de treball per a l'emmagatzematge i retirada de cadascun dels diferents tipus de residus que es puguin generar a l'obra.

El contractista haurà de donar les oportunes instruccions als treballadors i subcontractistes, comprovant que ho comprenen i ho compleixen.

### 21.7 CIRCULACIÓ DE VEHICLES I VIANANTS QUE AFECTEN L'ÀMBIT PÚBLIC

- **Senyalització i protecció**

Si el pla d'implantació de l'obra comporta la desviació del trànsit rodat o la reducció de vials de circulació, s'aplicaran les mesures definides a la Norma de Senyalització d'Obres 8.3- Està prohibida la col·locació de senyals no autoritzades pels Serveis Municipals.

- **Dimensions mínimes d'itineraris i passos per a vianants**

Es respectaran les següents dimensions mínimes:

- En cas de restricció de la vorera, l'amplada de pas per a vianants no serà inferior a un terç (1/3) de l'amplada de la vorera existent.
- L'amplada mínima d'itineraris o de passos per a vianants serà d'un metre i quaranta centímetres (1,40 m).

- **Elements de protecció**

Pas vianants	Tots els passos de vianants que s'hagin d'habilitar es protegiran, pels dos costats, amb tanques o baranes resistents, ancorades o enganxades a terra, d'una alçada mínima d'un metre (1 m) amb travesser intermedi i entornpeus de vint centímetres (0,20 m) a la base. L'alçada de la passarel·la no sobrepasarà els quinze centímetres (0,15 m). Els elements que formin les tanques o baranes seran preferentment continus. Si són calats, les separacions mínimes no podran ser superiors a quinze centímetres (0,15 m).
Forats i rases	Si els vianants han de passar per sobre els forats o les rases, es col·locaran xapes metàl·liques fixades, de resistència suficient, totalment planes i sense ressalts. Si els forats o les rases han de ser evitats, les baranes o tanques de protecció del pas es col·locaran a 45° en el sentit de la marxa.

- **Enllumenat i abalisament lluminós**

Els senyals i els elements d'abalisament aniran degudament il·luminats encara que hi hagi enllumenat públic.

S'utilitzarà pintura i material reflectant o fotoluminiscent, tant per a la senyalització vertical i horitzontal, com per als elements d'abalisament.  
Els itineraris i passos de vianants estaran convenientment il·luminats al llarg de tot el tram (intensitat mínima 20 lux).

Les bastides de paraments verticals que ocupin vorera o calçada tindran abalisament lluminós i elements reflectants a totes les potes en tot el seu perímetre exterior.

La delimitació d'itineraris o passos per a vianants formada amb tanques metàl·liques de 200 x 100 cm, tindran abalisament lluminós en tot el seu perímetre.

- **Abalisament i defensa**

Els elements d'abalisament i defensa a emprar per passos per a vehicles seran els designats com tipus TB, TL i TD a la Norma de carreteres 8.3 - IC. amb el següent criteri d'ubicació d'elements d'abalisament i defensa:

- a) En la delimitació de la vora del carril de circulació de vehicles contigu al tancament de l'obra.
- b) En la delimitació de vores de passos provisionals de circulació de vehicles contigus a passos provisionals per a vianants.
- c) Per impedir la circulació de vehicles per una part d'un carril, per tot un carril o per diversos carrils, en estrenyiments de pas i/o disminució del número de carrils.
- d) En la delimitació de vores en la desviació de carrils en el sentit de circulació, per salvar l'obstacle de les obres.
- e) En la delimitació de vores de nous carrils de circulació per a passos provisionals o per a establir una nova ordenació de la circulació, diferent de la que hi havia abans de les obres.

Es col·locaran elements de defensa TD - 1 quan, en vies d'alta densitat de circulació, en vies ràpides, en corbes pronunciades, etc., la possible desviació d'un vehicle de l'itinerari assenyalat pugui produir accidents a vianants o a treballadors (desplaçament o enderroc del tancament de l'obra o de baranes de protecció de pas de vianants, xoc contra objectes rígids, bolcar el vehicle per l'existència de desnivells, etc..).

Quan l'espai disponible sigui mínim, s'admetrà la col·locació d'elements de defensa TD – 2.

- **Paviments provisionals**

El paviment serà dur, no lliscant i sense reguixos diferents dels propis del gravat de les peces. Si és de terres, tindrà una compactació del 90% PM (Pròctor Modificat).

Si cal ampliar la vorera per a pas de vianants per la calçada, es col·locarà un entarimat sobre la part ocupada de la calçada formant un pla horitzontal amb la vorera i una barana fixa de protecció.

- **Accessibilitat de persones amb mobilitat reduïda**

Si la via o vies de l'entorn de l'obra estan adaptades d'acord amb el que disposa el Decret 135/1995 de 24 de març, i no hi ha itinerari alternatiu, els passos o itineraris provisionals compliran les següents condicions mínimes:

- Alçada lliure d'obstacles de 2,10 m.
- En els canvis de direcció, l'amplada mínima de pas haurà de permetre inscriure un cercle d'1,5 m de diàmetre.
- No podran haver-hi escales ni graons aïllats.
- El pendent longitudinal serà com a màxim del 8% i el pendent transversal del 2%.
- El paviment serà dur, no lliscant i sense reguixos diferents als propis del gravat de peces. Si és de terres tindrà una compactació del 90% PM (Pròctor Modificat).
- Els guals tindran una amplada mínima d'un metre i vint centímetres (1,20 m) i un pendent màxim del 12%.

Si hi ha itinerari alternatiu, s'indicarà, en els punts de desviació cap a l'itinerari alternatiu, col·locant un senyal tipus D amb el símbol internacional d'accessibilitat i una fletxa de senyalització.

- **Manteniment**

La senyalització i els elements d'abalisament es fixaran de tal manera que impedeixi el seu desplaçament i dificulti la seva subtracció.

La senyalització, l'abalisament, els paviments, l'enllumenat i totes les proteccions dels itineraris, desviacions i passos per a vehicles i vianants es conservaran en perfecte estat durant la seva vigència, evitant la pèrdua de condicions perceptives o de seguretat.

Els passos i itineraris es mantindran nets.

- **Retirada de senyalització i abalisament**

Acabada l'obra es retiraran tots els senyals, elements, dispositius i abalisament implantats.

El termini màxim per a l'execució d'aquestes operacions serà d'una setmana, un cop acabada l'obra o la part d'obra que exigís la seva implantació.

## **21.8 PROTECCIÓ I TRASLLAT D'ELEMENTS EMPLAÇATS A LA VIA PÚBLICA**

- **Arbres i jardins**

Al PLA DE SEGURETAT s'assenyalaran tots els elements vegetals i l'arbrat existent a la via pública que estiguin a la zona de les obres i al seu llinard. L'Entitat Municipal responsable de Parcs i Jardins emetrà un informe previ preceptiu.

Mentre durin les obres es protegirà l'arbrat, els jardins i les espècies vegetals que puguin quedar afectades, deixant al seu voltant una franja d'un (1) metre de zona no ocupada. El contractista vetllarà, perquè els escossells i les zones ajardinades estiguin sempre lliures d'elements estranys, deixalles, escombraries i runa. S'hauran de regar periòdicament, sempre que això no es pugui fer normalment des de l'exterior de la zona d'obres.

Els escossells que quedin inclosos dins l'àmbit d'estrenyiment de pas per a vianants s'hauran de tapar de manera que la superfície sigui contínua i sense ressalts.

- **Parades d'autobús, quioscos, bústies**

A causa de la implantació del tancament de l'obra, ja sigui, perquè queden al seu interior o per quedar en zona de pas restringit, caldrà preveure el trasllat provisional de parades d'autobús, quioscos, bústies de Correus o elements similars emplaçats a l'espai públic.

En aquest cas, caldrà indicar-ho en el PLA DE SEGURETAT, preveure el seu emplaçament durant el temps que durin les obres i contactar amb els serveis corresponents per tal de coordinar les operacions.

## **22 RISCOS DE DANYS A TERCERS I MESURES DE PROTECCIÓ**

### **22.1 RISCOS DE DANYS A TERCERS**

Els riscos que durant les successives fases d'execució de l'obra podrien afectar persones o objectes annexos que en depenguin són els següents:

- Caiguda al mateix nivell.
- Atropellaments.
- Col·lisions amb obstacles a la vorera.
- Caiguda d'objectes.

### **22.2 MESURES DE PROTECCIÓ A TERCERS**

Es consideraran les següents mesures de protecció per a cobrir el risc de les persones que transiten pels voltants de l'obra:

1. Muntatge de tanca metàl·lica a base d'elements prefabricats de 2 m. d'alçada, separant el perímetre de l'obra, de les zones de trànsit exterior.
2. Per a la protecció de persones i vehicles que transitin pels carrers limítrofs, s'instal·larà un passadís d'estructura consistent en l'assenyalament, que haurà de ser òptic i lluminós a la nit, per a indicar el gàlib de les proteccions al tràfic rodant. Ocasionalment es podrà instal·lar en el perímetre de la façana una marquesina en voladís de material resistent.
3. Si fos necessari ocupar la vorera durant l'aplec de materials a l'obra, mentre duri la maniobra de descàrrega, es canalitzarà el trànsit de vianants per l'interior del passadís de vianants i el de vehicles fora de les zones d'afectació de la maniobra, amb protecció a base de reixes metàl·liques de separació d'àrees i es col·locaran llums de gàlib nocturns i senyals de trànsit que avisin als vehicles de la situació de perill.
4. En funció del nivell d'intromissió de tercers a l'obra, es pot considerar la conveniència de contractar un servei de control d'accessos a l'obra, a càrrec d'un Servei de Vigilància patrimonial, expressament per a aquesta funció.

## 23 PREVENCIÓ DE RISCOS CATASTRÒFICS

Els principals riscos catastròfics considerats com remotament previsibles per aquesta obra són:

- Incendi, explosió i/o deflagració.
- Inundació.
- Col·lapse estructural per maniobres fallides.
- Atemptat patrimonial contra la Propietat i/o contractistes.
- Enfosament de càrregues o aparells d'elevació.

Per a cobrir las eventualitats pertinents, el Contractista redactarà i inclourà com annex al seu Pla de Seguretat i Salut un „Pla d'Emergència Interior”, cobrin les següents mesures mínimes:

1. Ordre i neteja general.
2. Accessos i vies de circulació interna de l'obra.
3. Ubicació d'extintors i d'altres agents extintors.
4. Nomenament i formació de la Brigada de Primera Intervenció.
5. Punts de trobada.
6. Assistència Primers Auxilis.

## 24 PREVISIONS DE SEGURETAT PELS TREBALLS POSTERIORIS

Segons l'art. 5.6 del R.D. 1627/97 per a posteriors treballs de manteniment i reparacions, en aquesta obra degut a l'abast dels treballs, és a dir, en carretera, únicament es recomana:

- Per a treballs de manteniment, seguir els protocols de l'empresa encarregada del mateix.
- Per a treballs de manteniment en elements amb risc de caiguda en alçada com enllumenat i treballs a estructures, s'utilitzaran mitjans auxiliars amb elements de protecció individual, com l'ús de cistelles o plataformes elevadores amb ús d'arnés de seguretat.

La Constructora, un cop acabats els treballs haurà de facilitar un document que reflecteixi el procediment de manteniment i reparacions.

## 25 FORMACIÓ DEL PERSONAL EN MATERIA DE SEGURETAT I SALUT

El Contractista haurà de presentar un Pla de Formació específic per a aquesta obra, al principi de la mateixa, al Coordinador de Seguretat i Salut per a la seva aprovació. S'han d'incloure en ell els formats necessaris (registre de formació, fitxes per a la formació en els talls pels encarregats, etc.) i es detallaran els continguts de la formació.

### 25.1 CAPS D'OBRA I ENCARREGATS

Tant el Cap d'Obra com els encarregats han de complir, com a mínim, els requisits següents:

- Curs equivalent a NIVELL BÀSIC (60 hores).
- Formació en els riscos específics dels treballs i de l'entorn en què es realitzarà l'obra així.
- Formació específica en la realització d'Observacions Preventives de Seguretat.

### 25.2 PER A TOT EL PERSONAL CONTRACTISTA I TREBALLADORS

El CONTRACTISTA haurà d'acreditar, per al seu personal i els seus subcontractistes, abans de l'inici de l'obra, la formació mínima en matèria de seguretat:

- Prevenció dels riscos propis del seu ofici.
- Riscos particulars de l'obra i la seva prevenció.
- Equips de protecció personal
- Permisos de Treball
- Procediments de treball, bones pràctiques de l'ofici i normativa de seguretat, necessaris per realitzar cada treball amb seguretat i qualitat.
- Pla de Seguretat i Salut i Pla d'actuació en cas d'emergència

S'impartirà formació en matèria de seguretat i salut en el treball, el personal de l'obra fent una exposició dels mètodes de treball, els riscos que poden comportar i les mesures de seguretat que s'hauran d'emprar, s'ha de fixar amb el Cap d'Obra la necessitat i freqüència d'aquests ensenyaments.

Abans del començament de cada capítol se li entregarà una còpia de l'apartat del Pla de Seguretat, referit al seu tall a cada subcontractista, quedant aquest en el compromís d'informar a tot el seu personal dels riscos, normes preventives i proteccions personals a tenir en compte. En aquest s'han d'indicar les adreces d'Urgències, Bombers, Policia, Inspecció Provisional, etc. a més del recorregut al Centre Hospitalari, i totes les actes de reunió del Comitè de Seguretat, així com els diferents nomenaments, amonestacions, etc. D'aquesta entrega quedarà constància per escrit. Tot el personal rebrà, en ingressar a l'obra, una exposició de l'organització de la seguretat i les normes generals d'actuació en aquest centre de treball.

A l'inici de cada jornada laboral es realitzaran unes xerrades de seguretat de durada mínima de 5 minuts que contemplin els treballs a executar, la seva organització, sistemes de treball, mesures preventives, sistemes de protecció col·lectives i equips de protecció personal que en cada cas li siguin aplicables.

L'acreditació de les xerrades de seguretat impartides s'arxivarà dins de la carpeta de Seguretat.

## 26 VIGILANCIA DE LA SALUT

En compliment de la "Ley 31/1995 Prevención de Riesgos Laborales", tot el personal que treballi a l'obra haurà de disposar de l'apte mèdic en curs, és a dir, haurà de passar un reconeixement mèdic que tindrà una vigència anual, sent aquest obligatori ja que degut als treballs a desenvolupar en obra es considera que existeixen riscos específics i activitats perilloses.

Aquest reconeixement mèdic serà específic, seguint protocols mèdics adequats als riscos derivats del seu lloc de treball.

A obra s'haurà de disposar dels documents de registre conforme han passat la revisió mèdica (apte), amb el protocol segons el lloc de treball, i amb la data de la mateixa

## 27 SEGUIMENT I VIGILANCIA DE LA SEGURETAT I SALUT

### 27.1 BRIGADA DE SEGURETAT, NETEJA I TREBALLS AUXILIARS

D'acord amb l'establert al Plec de Condicions, el contractista disposarà durant el desenvolupament de les obres d'una brigada de seguretat amb dedicació parcial o total i amb el personal que requereixi per a cada moment de l'obra, que s'encarregarà de la col·locació, desplaçament, reposició i reparació de les proteccions col·lectives i senyalitzacions, el cost del qual anirà dins de les seves despeses generals.



### 27.2 REUNIONS DELS RESPONSABLES EN PREVENCIÓ DE RISCOS

Tenint en compte lo establert al Plec de Prescripcions, un cop al mes es reuniran els responsables de seguretat de les empreses intervinents a l'obra. A aquestes reunions serà convenient que assisteixin els responsables de producció d'aquestes empreses, i podran assistir els Delegats de Prevenció de les empreses, en el cas que existeixin.

Aquestes reunions poden tenir una freqüència inferior segons les necessitats de l'obra.

### 27.3 COORDINACIÓ D'ACTIVITATS EMPRESARIALS

En compliment de l'article 24 de la Llei 31/1995 de Prevenció de Riscos Laborals i el Reial Decret 171/2004 pel qual és desenvolupa l'esmentat article de la Llei de Prevenció, cal preveure l'organització de la coordinació d'activitats empresarials per tal d'establir les bases de col·laboració en matèria de prevenció de riscos laborals.

Al Pla de Seguretat i Salut s'exposaran les Condicions mínimes de Treball que caldrà complir a l'interior de totes les zones d'obra, entenen per condicions de treball aquells mecanismes, criteris, regles internes de comportament i de relació entre els treballadors de l'obra que s'estableixin per aconseguir una bona coordinació, de les activitats empresarials.

Mensualment, i sempre que s'incorpori a obra un nou subcontractista, treballador autònom i/o treballador intensiu, es convocarà una reunió de coordinació, encapçalada pel tècnic de prevenció de riscos laborals de l'obra, i amb assistència obligatòria del mateix tècnic de prevenció de riscos laborals, els recursos preventius de les activitats d'obra en curs, i de tots els encarregats de seguretat de cadascun dels subcontractistes que estiguin treballant a l'obra (primer, segon i tercer nivell, autònoms i treballadors intensius). En aquesta reunió s'hi convidarà a la Direcció Facultativa que hi podrà assistir sempre que vulgui i podran aportar tota la informació que creguin convenient.

A les reunions de Coordinació d'Activitats Empresarials caldrà informar com a mínim del següent:

- De l'organigrama funcional en quan a seguretat i del/s supervisor/s amb el qual es relacionaran així com dels controls als quals estaran sotmesos els seus treballs.
- De la planificació de l'obra per a que en tot moment es tingui coneixement de les activitats coexistents, i per tant dels principals riscos als que estan exposats els treballadors.
- De la organització general de l'obra i sempre que hi hagi actualitzacions i/o modificacions de la organització general. Això inclou informar dels accessos a obra, del control establert per l'accés a obra, de les limitacions de circulació, de la senyalització interior d'obra, de les formes d'accés a les diferents àrees, de les sectoritzacions entre zones en obres i zones exteriors o en ús, dels horaris de Treball, etc.
- Del seguiment del Pla de Seguretat i Salut.
- De les mesures de prevenció i correctores en obra en quan a la seguretat i salut.
- De les proteccions de seguretat a utilitzar i de les mesures de seguretat a respectar.
- Del treball a desenvolupar i de la maquinària, equips i mitjans que s'han d'utilitzar, incloent-hi les condicions de l'estat pel seu ús i el manteniment de cada un.
- De les condicions d'ús dels mitjans d'elevació de materials i de les plataformes de treball (càrrega autoritzada, ocupació màxima ,...).
- De les autoritzacions necessàries per l'accés a algunes parts de l'obra o per l'ús de mitjans auxiliars específics.
- De les condicions de treball establertes així com de les condicions de subcontractació i/o d'incorporació de treballadors autònoms i / o intensius.
- De les observacions i/o decisions sobre comportaments incorrectes o incompliments detectats.
- De la forma d'actuar en cas de risc greu i imminent.
- De la manera de comunicar les incidències detectades en obra, de les incidències que interfereixin en les dates previstes d'inici i/o finalització de treballs, de les incidències en

quan al tipus d'equips, maquinària o mitjans auxiliars a utilitzar, o de qualsevol altra incidència que suposicions alteracions de les pautes establertes amb anterioritat.

L'Empresa Constructora aixeca acta dels temes Tractats a cadascuna de les reunions de Coordinació d'Activitats Empresarials. Aquesta acta és facilitarà a la major brevetat possible a tots els assistents. Caldrà que l'acta vagi acompanyada de totes les signatures, amb nom i DNI, de tots els assistents.

En el cas que una empresa que no formi part de la línia de contractació de l'empresa adjudicatària de les obres hagi d'entrar a treball dins el recinte d'obra, prèvia a l'inici dels treballs és farà una reunió amb la Coordinació de Seguretat i Salut de l'empresa que ha d'entrar a treball al centre de treball, on caldrà presentar, i aprovar mitjançant una acta, l'avaluació de riscos i planificació preventiva dels treballs a realitzar. En aquesta reunir també és lliurarà a la CSS de l'empresa externa una còpia del pla de Seguretat i Salut de l'obra principal i s'informarà dels següents condicionants a complement:

- Respectar els Disposicions establertes al Pla de Seguretat i Salut de l'obra principal, tant pel que fa a les feines a executar com per els mesures preventives.
- S'avisarà per escrit al Tècnic de Prevenció de Riscos Laborals de l'obra i al Coordinador de Seguretat i Salut de l'obra principal, l'inici de les feines.
- S'avisarà per escrit al Tècnic de Prevenció de Riscos Laborals de l'obra i al Coordinador de Seguretat i Salut de l'obra principal, de la fi de les feines.
- S'avisarà per escrit al Tècnic de Prevenció de Riscos Laborals de l'obra i al Coordinador de Seguretat i Salut de l'obra principal, el nombre i Identificació de les persones que desenvolupa les feines.

S'aixecarà una acta de la reunió i s'hi s'adjuntarà un annex on s'informi del següent:

- Cada empresa farà ús dels seus propis mitjans auxiliars i serà responsable del seu estat i utilització.
- Els operaris de cada empresa faran ús dels Equips de Protecció Individual corresponents als seus riscos i als generats per els treballs de l'altra empresa.
- L'accés a l'obra és farà segons les indicacions establertes a l'obra principal. L'horari de Treball serà el mateix que està establert a l'obra principal.
- En el cas que alguna de les empreses modificar o eliminar qualsevol protecció col·lectiva, haurà de comunicar-ho amb anterioritat als recursos preventius, Tècnic de Prevenció de Riscos Laborals de l'obra i al Coordinador de Seguretat i Salut de l'obra principal, sent responsable l'empresa que la modifica de les mesures preventives adequades per a eliminar els riscos, i de la reposició de la protecció.
- Cada empresa ha de donar a conèixer i informar dels riscos de les seves activitats i mesures preventives, lliurant còpia del Pla de Seguretat i Salut i Avaluació de riscos.

## 28 GESTIÓ DE LA DOCUMENTACIÓ

El registre de la informació de seguretat es centralitzarà en el responsable de seguretat de la constructora, i hi han les següents fonts d'informació:

- Registre d'accidents de treball i incidents, en el qual haurà de constar la recerca i les mesures correctives.
- Registre de malalties ocupacionals.
- Registre d'exàmens mèdics ocupacionals.
- Registre del monitoratge d'agents físics, químics, biològics i factors de risc ergonòmics.
- Registre d'inspeccions internes de seguretat i salut en el treball.
- Estadístiques de seguretat i salut.
- Registre d'equipaments de seguretat o emergència.
- Registre d'inducció, capacitat, entrenament i simulacres d'emergència.

- Plans de Seguretat i Salut dels contractistes (amb les actes d'aprovació per part del Coordinador de Seguretat i Salut)
- Plans de Formació dels subcontractistes, aprovats pel Coordinador de Seguretat i Salut
- Actes de reunió de la Comissió de Seguretat i Salut
- Inspeccions de Seguretat
- Observacions de Seguretat
- Informes mensuals
- Notificacions de la Inspecció de Treball o altres organismes relacionats.
- Relació de bastides de "Autorització de Bastides".
- Relació de permisos de treball: Es registraran tots els permisos de treball autoritzats durant els treballs en obra. És obligació del sol·licitant de cada permís reflectir en aquesta llista les dates d'autorització del permís i de la finalització del treball.
- Fitxes d'incidències de seguretat (Observacions de seguretat). Es trobaran en poder del responsable de seguretat per al registre de les incidències de seguretat. Aquestes fitxes seran normalment complimentades pel Coordinador de Seguretat, però també podran ser-ho pel personal de Direcció d'Obra, que després de detectar una incidència no puguin localitzar al Coordinador de Seguretat per informar-lo.

### 28.1 DOSSIER DE PERSONAL I LA SEVA IDENTIFICACIÓ

Tot el personal, prèviament a la seva entrada a obra haurà d'estar perfectament identificat mitjançant:

- DNI i fotografia recent
- TC-1 i TC-2 en vigor
- Certificat d'aptitud mèdica
- Certificar de Formació en seguretat (20 h), i específica en cas necessari
- Lliurament de EPI's.
- Empresa a la que pertany acreditativa de la seva categoria professional

El contractista es responsabilitzarà de mantenir al dia el dossier de personal, ho ha de mantenir a disposició del Coordinador de Seguretat i Salut i de la Direcció d'Obra.

### 28.2 DOSSIER DE MAQUINARIA I EQUIPS

Tota la maquinaria i equips auxiliars, prèviament a la seva entrada a obra, han de disposar de la fitxa tècnica de l'equip i de la corresponent certificació d'Indústria d'haver realitzat la corresponent Inspecció Tècnica. També es disposarà del seu manual d'ús i manteniment, i l'assegurança corresponent.

En cas de necessitar un Projecte Tècnic Auxiliar aprovat oficialment (grues fixes, PMUD de bastides, etc,) haurà d'acompanyar-se del nomenat dossier.

El contractista es responsabilitzarà de mantenir al dia el dossier de maquinaria, ho mantindrà a disposició del Coordinador de Seguretat i Salut i del Director d'Obra.

### 28.3 DOSSIER D'EINES I MITJANS AUXILIARS

Totes les eines i mitjans auxiliars (radials, electre-neumàtics, taladres, etc) tindran un certificat de revisió de la seva aptitud per al treball, certificats i homologacions necessàries.

El contractista es responsabilitzarà de mantenir al dia el dossier de eines i mitjans auxiliars, ho mantindrà a disposició del Coordinador de Seguretat i Salut i del Director d'Obra.

## 29 INFORMES I RESULTATS DE LA GESTIÓ

### 29.1 COMUNICAT DE RISCOS

Tot el personal d'obra, degudament canalitzat per el seu responsable pot omplir per escrit, en presència d'un risc imminent, un comunicat de risc dirigit al seu responsable d'obra i prevenció i al Coordinador de Seguretat i Salut, els quals valoraran la gravetat del mateix i la possibilitat de succés, i determinaran la urgència de la seva solució.

### 29.2 INFORME D'ACCIDENT/INCIDENT

Tot accident, amb o sense baixa a part de l'incident destacable, serà analitzat per el Cap de Seguretat del Contractista i/o Subcontractista corresponent, que tenint en compte la opinió del propi accidentat, dels testimonis i dels encarregats proposarà les mesures correctores corresponents per evitar la seva repetició.

### 29.3 ÍNDEX DE SINISTRALITAT

Per a valorar el nivell de seguretat de l'obra, als informes periòdics a realitzar per la contractista es definirà el resultat dels següents índex:

$$\text{Índex de gravetat amb baixa} = \frac{\text{Nº d'accidents amb baixa} \times 10}{\text{nº d'hores treballades}}$$

$$\text{Índex de gravetat} = \frac{\text{nº de jornades perdudes} \times 10}{\text{nº d'hores treballades}}$$

## 30 TREBALLS EN ALÇADA EN PONTS I VIADUCTES

Aquest capítol es redacta amb la finalitat d'implementar les mesures preventives per als treballs en altura, en tot el referent a les activitats relacionades amb el muntatge de bigues prefabricades, col·locació de prelloses, execució de llosa de compressió en segona fase, col·locació d'aparells de suport i muntatge de juntes, impostes, defenses i baranes en el tauler.

### 30.1 FASES DE MUNTATGE

1.-Muntatge d'aparells de suport (figura 1)

El muntatge dels "neoprens" o aparells de suport de les bigues es realitza de la següent manera:

- L'accés al capitell es realitza per mitjà d'una escala manual o d'una plataforma elevadora, ancorant un dels connectors de l'element d'amarratge al mitjà d'accés, fins que l'altre connector es pugui ancorar a una de les anelles que es van deixar incorporades al capitell, moment que es pot soltar l'ancoratge al mitjà d'accés (l'element d'amarratge del arnès estarà dotat de absorbidor d'energia i de dos connectors, tal com il·lustra la Fig. 1).



Fig 1. Element d'amarratge

- Una vegada situats sobre el capitell, ancorats a l'anella, es col·loca entre les dues anelles una línia de vida temporal horitzontal (p. ex., corda de 12 mm amb dos mosquetons).
- Es treballarà sempre des del propi capitell, emprant el arnès anticaigudes ancorat a les anelles o a la línia de vida, de manera que en tot moment l'operari tingui un dels dos connectors ancorat, amb el que s'assegura la desocupada en cas de caiguda des del capitell.

## 2.- Col·locació de les bigues doble T (figura 2)

La col·locació de les bigues, incloent els treballs d'apuntament antibolcada, replanteig, etc., s'efectua treballant de la següent manera:

- Donada la naturalesa del terreny, per a muntar les bigues centrals és necessari realitzar un canvi de grua sobre el riu, pel que es disposarà una línia de vida temporal, ancorada longitudinalment en la part superior de la biga, perquè l'operari que hagi d'accedir a aquesta pugui amarrar el arnès anticaigudes mentre realitza la maniobra d'enganxar/desenganxar de la grua.
- La recepció de la biga, replanteig i col·locació d'apuntaments i tensors, es realitza des del propi capitell, amb el arnès anticaigudes ancorat permanentment, mitjançant l'element d'amarratge descrit en el punt anterior, a alguna de les anelles embotides en el capitell, a la línia de vida o a una corda de 1 m. de longitud, dotada d'un mosquetó en l'extrem lliure, que penjarà de l'extrem de la biga (s'haurà col·locat en aquesta abans de pujar la biga), com millor convingui a la posició de treball.
- L'accés a la part superior de la biga (per exemple, per a desenganxar la grua), es realitza ancorant el connector lliure de l'element d'amarratge a la corda incorporada a la biga, de manera que, solament una vegada ancorat aquest connector al mosquetó de la corda, es podrà soltar el connector que estava ancorat a l'anella del capitell o a la línia de vida; s'accedirà a la biga per mitjà d'una escala manual adequada.
- En qualsevol cas, tot treball sobre el capitell o la biga s'efectuarà amb algun dels dos connectors de l'element d'amarratge ancorat en tot moment a les anelles del capitell, a la línia de vida o a la corda incorporada a la biga; si això no fos possible per algun imprevist o situació no contemplada en aquesta instrucció, si paralitzaran els treballs immediatament, donant avís a l'encarregat per a estudiar les accions a prendre.
- L'accés al capitell es realitzarà des de l'escala o la plataforma elevadora, conforme es va indicar en el punt anterior.

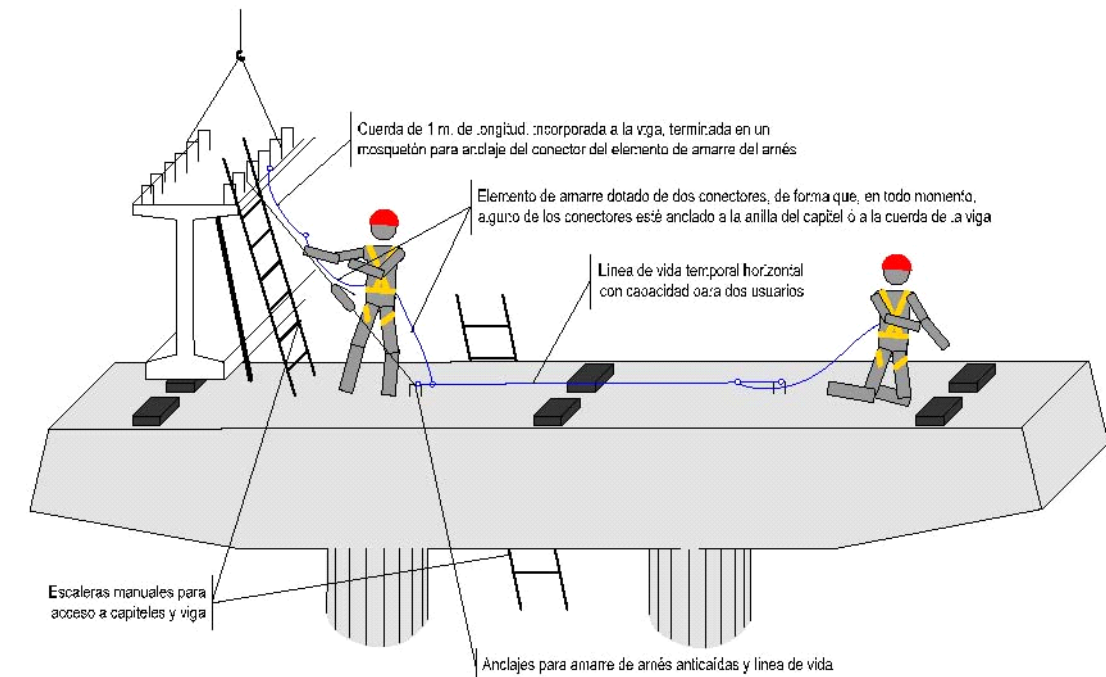


Fig. 2 Col·locació de bigues

## 3.- Col·locació de prelloses i baranes provisionals (figura 3)

El muntatge de les prelloses i de la barana provisional que servirà de protecció col·lectiva per a l'encofrat, ferrallar i formigonat de la llosa, es realitza de la següent forma:

- S'ancoren dos elements anticaigudes retràctil, de 15 m. de longitud útil, a les esperes de les bigues, de manera que, durant tota la maniobra de col·locació de les prelloses, els 2 operaris que han d'accedir al capdavant de muntatge (risc de caiguda d'altura) mantinguin la seva arnès anticaigudes connectat a aquests retràctils; el muntatge de les baranes es realitza simultàniament al de les prelloses.
- Quan s'ha d'avançar la posició d'ancoratge del retràctil, es respectarà una distància de seguretat al capdavant de la zona de col·locació de prelloses equivalent a l'ample de 2 d'aquestes i mai inferior a 3 m.
- Solament els 2 operaris que estiguin fent ús del retràctil podran accedir al capdavant de la zona de muntatge de prelloses; la resta, mantindran una separació mínima de 3 metres del front de muntatge o els laterals.

La Fig. 3 mostra un exemple de col·locació de prelloses amb aquest sistema (el treballador situat en el centre no hauria d'ocupar aquesta posició, al no estar connectat al retràctil).



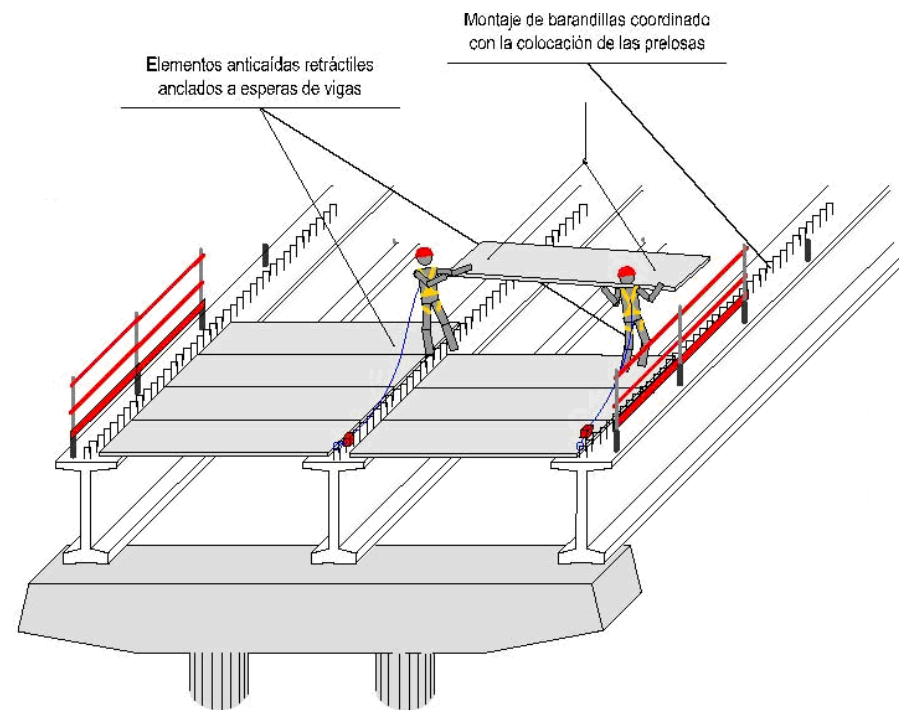


Fig.3 Col·locació prelloses i baranes



Fig. 4 Col·locació de prelloses

#### 4.- Encofrat, ferrallat i formigonat de la llosa

Aquesta fase dels treballs es realitza de la següent forma:

- La zona d'actuació està completament protegida per la barana perimetral provisional que es va col·locar durant el muntatge de les prelloses; aquesta barana queda com protecció col·lectiva després de formigonar la llosa.
- Si per algun motiu excepcional i puntual fos necessari desmuntar provisionalment la barana, s'usarà el arnès anticaídas amarrat a un punt fix de l'estructura (per exemple, pals de la barana que no es retiren, ferralla) durant tot el temps que duri aquesta circumstància, reposant la barana immediatament després d'acabar el treball que va motivar el seu desmuntatge.
- Durant el formigonat de la llosa, es deixaran unes "omeges" d'acer alineades a 100 cm. de la vora del tauler i espaiades 15 m. unes d'unes altres, sobresortint uns 5 cm. de la llosa (veure figura 3), amb la finalitat de poder ancorar en elles línies de vida per als

treballs posteriors d'encofrat de la vorada lateral i col·locació de defenses o baranes definitives.

Les fotos 5 i 6 mostren l'aspecte d'un tauler protegit per la barana provisional (l'operari pot encofrar el tap lateral sense retirar la protecció).



Fig. 5 Tauler protegit



Fig. 6 Encofrat de tap lateral

#### 5.- Execució de la vorada i muntatge de la barana definitiva (figures 7)

Per a encofrar, ferrallar i formigonar la vorada i muntar posteriorment la barana definitiva del pont, es treballarà de la següent manera:

- Es desmuntarà, només si és imprescindible, la barana provisional corresponent a la zona on s'estigui treballant (veure figura 3), reposant aquella tan aviat sigui possible; si es desmunta la barana provisional, els operaris faran ús del arnès anticaídas ancorat a una Línia de Vida Temporal Horitzontal, amb capacitat per al treball simultani de 2 persones i de 15 m. de longitud, que discorrerà paral·lela a la vora del tauler i retrancada d'aquest uns 100 cm., ancorada a les omegas que es van deixar en la llosa (veure el punt anterior).
- És fonamental mantenir en perfecte estat d'ordre i neteja la zona de treballs i mai aproximar-se a menys de 3 m. de la vora de tauler desprotegit sense fer ús del sistema anticaídas descrit, pel que la connexió o desconnexió de la línia de vida es farà en un punt protegit amb una longitud de barana no inferior a 3 m. de la zona on s'hagi retirat la barana (veure figura 4); senyalitzar permanentment la zona desprotegida amb cons o cinta d'abalisar.
- Mai es deixarà sense muntar la protecció provisional (barana) mentre durin les pauses en el treball (a l'anar a menjar, a l'acabar la jornada laboral, etc.)



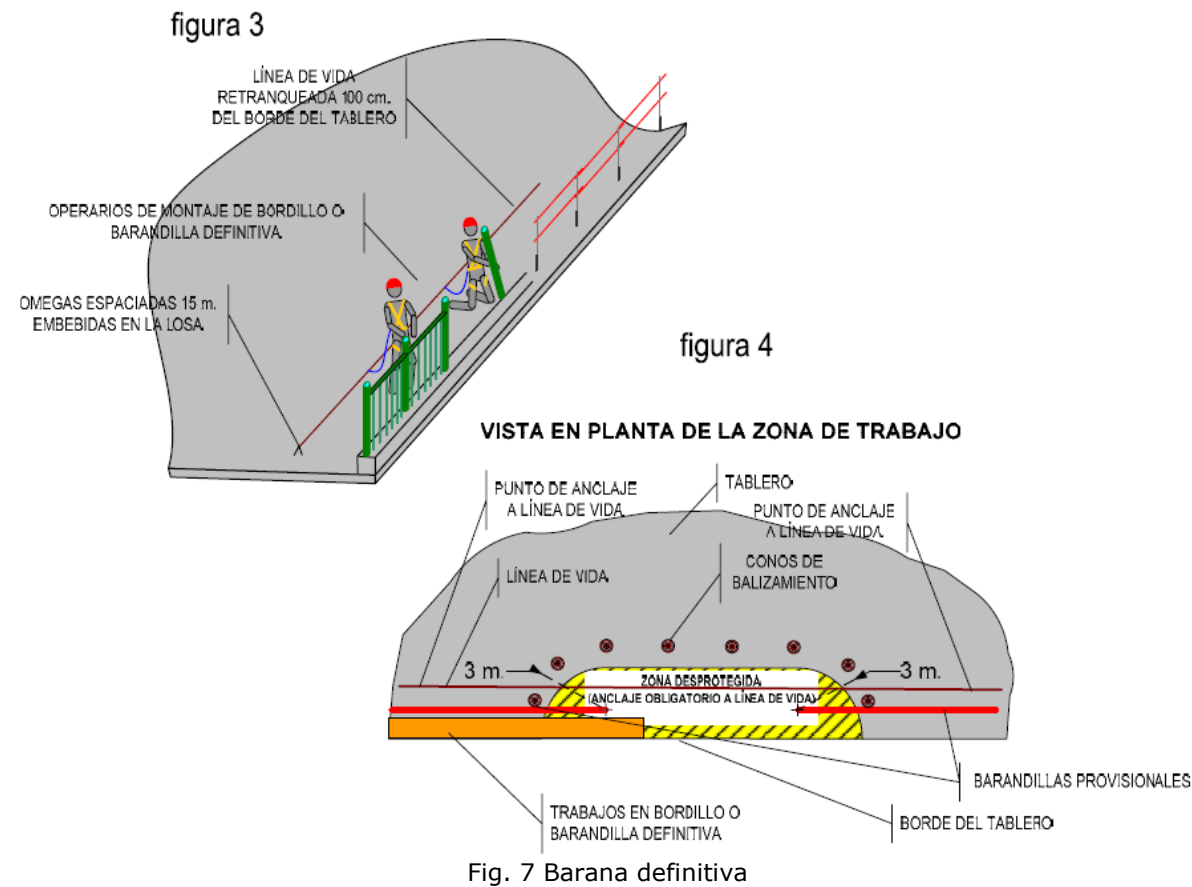


Fig. 7 Barana definitiva

6.- Altres treballs sobre el tauler

Una vegada col·locada la barana perimetral definitiva, ja es pot procedir a realitzar la resta dels treballs necessaris per a rematar el tauler, com són la col·locació de juntes de dilatació, col·locació de defenses, impermeabilització, asfaltat, tendit d'instal·lacions, etc.

**30.2 FORMACIÓ I INFORMACIÓ DELS TREBALLADORS**

Tots els operaris que intervinguin d'una o altra forma en la realització dels treballs objecte d'aquesta instrucció haurien de posseir una còpia d'aquest document, així com del pla de seguretat de l'obra i de la fitxa de seguretat; aquesta instrucció serà explicada abans de començar els treballs en ella descrits.

**30.3 RELACIÓ I QUANTITAT D'EQUIPAMENT DE SEGURETAT NECESSÀRIA**

La següent taula mostra el tipus de protecció individual i col·lectiva necessàries en cada fase dels treballs:

FASE TREBALL	DE	PROTECCIONS COL·LECTIVES	PROTECCIONS INDIVIDUALS CONTRA CAIGUDES (I.P.I.)
Muntatge aparells de suport		No es poden disposar a causa de la naturalesa del treball	Arnès anticaigudes amb element d'amarratge de dos connectors i absorbidor d'energia. Punts d'ancoratge en anelles i línia de vida en capitell.

Col·locació bigues	No es poden disposar a causa de la naturalesa del treball	Arnès anticaigudes ancorat a línia de vida sobre biga, en maniobra de canvi de grua sobre ric. Arnès anticaigudes amb element d'amarratge de dos connectors i absorbidor d'energia. Punts d'ancoratge en anelles, línia de vida en capitell i corda incorporada a biga.
Col·locació prelloses i barana provisional perimetral	No es poden disposar a causa de la naturalesa del treball	Arnès anticaigudes amb element d'amarratge retràctil de 15 m. de longitud. Punts d'ancoratge en les esperes de bigues.
Execució de llosa	Barana provisional perimetral	En casos excepcionals: arnès anticaigudes ancorat a ferralla o pals de barana.
Muntatge vorada i barana perimetral definitiva	Baranes provisionals (estalvi en zona de col·locació) perimetrals	Arnès anticaigudes amb element d'amarratge regulable (corda) de 1,80 m. y mosquetó. Punts d'encolatge en línia de vida temporal horitzontal retranquejada 1 m. de la vora del tauler. Línia de vida regulable de 15 m. de longitud ancorada a omegas perdudes en llosa de tauler per a ús simultani per dos operaris.
Treballs d'acabat del tauler	Barana definitiva perimetral	No es precisa EPI contra caigudes.

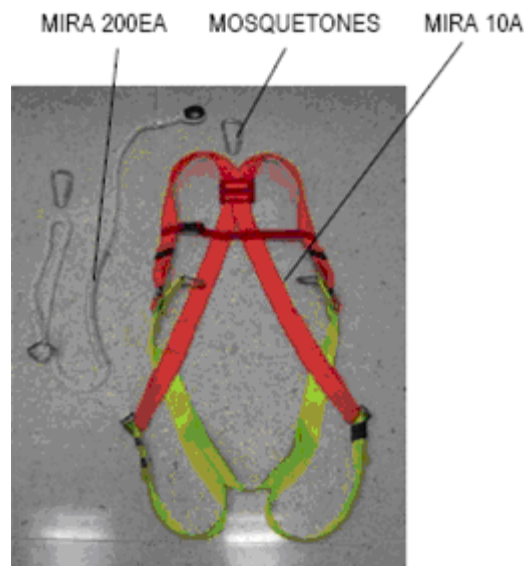
La quantitat de barana provisional (llestó superior, intermedi i rodapié) necessària és el doble de la longitud del tauler del viaducte; cada operari que treballi en les activitats descrites disposarà d'un I.P.I. contra caigudes d'altura (arnès, elements d'amarratge i connectors).

**30.4 CONSIDERACIONS SOBRE L'OCUPACIÓ D'I.P.I. CONTRA CAIGUDES**

El sistema contra caigudes en altura a emprar consisteix en:

- Arnès anticaigudes, model MIRA 10A.
- Element d'amarratge (entenimentada), regulable entre 1,1 i 1,8 m., model MIRA 200EA, dotat de dos mosquetons en els seus extrems (connectors).
- Element d'amarratge de doble connector, dotat de absorbidor d'energia, marca ALTEC.
- Element d'amarratge (entenimentada) fix, de 1 m. de longitud, model MIRA 100EA, dotat de dos mosquetons en els seus extrems (connectors), per a col·locar en les bigues.
- Opcionalment, connectors ràpids del tipus "pinça per a bastides" o ganxos.
- Opcionalment, absorbidor d'energia quan la distància de caiguda lliure en una possible caiguda superi els 0,5 m.
- Punts d'ancoratge de l'element d'amarratge que es defineixen en cada cas en aquesta instrucció, i que poden consistir en punts fixos o en una Línia de Vida Temporal Horitzontal, segons els casos, però que sempre han de garantir una resistència de, almenys, 1500 Kg en el sentit de la tracció produïda per una possible caiguda.
- Línia de vida temporal horitzontal regulable, de 20 m., marca ALTEC.

La següent figura mostra els components del sistema anticaigudes bàsic:



Aquest sistema anticaigudes admet dues formes d'utilització:

1. Com sistema de subjecció, és a dir, per a evitar que es produeixi la caiguda impedit a l'usuari acostar-se al perill.
2. Com sistema per a minimitzar els resultats nocius d'una caiguda quan aquesta es produeix; en aquest cas, cal distingir entre caigudes de més de 0,5 m. de distància de caiguda lliure i caigudes de menys d'aquesta distància.

Sempre es procurarà emprar el sistema com sistema de subjecció, regulant adequadament la longitud de l'element d'amarratge, a fi d'evitar les conseqüències d'una caiguda, per petita que aquesta sigui, i amb aquest criteri s'ha elaborat aquesta instrucció de treball. No obstant això, és possible que durant la realització dels treballs descrits, calgui emprar el sistema com sistema per a minimitzar les conseqüències d'una possible caiguda, en aquest cas, caldrà analitzar si aquesta és de més de 0,5 m. de caiguda lliure o no, ja que si és de més d'aquesta longitud, caldrà interposar entre el arnès i l'element d'amarratge un absorbidor d'energia, que garanteixi que la força de frenat es manté dintre dels límits que garanteixen la integritat de l'operari que sofreix la caiguda; en aquest últim cas, caldrà respectar les distàncies de seguretat per sota de la zona de treball que indica el absorbidor.

### 31 TREBALLS AMB INSTAL·LACIONS ELÈCTRIQUES O EN LES SEVES PROXIMITATS

Segons el RD 614/2001 sobre disposicions mínimes per a la protecció de la salut i seguretat de dels treballadors enfront del risc elèctric l'empresari ha d'adoptar les mesures necessàries perquè de la utilització o presència de l'energia elèctrica en els llocs de treball no es derivin riscos per a la salut i seguretat dels treballadors o, si això no fos possible, per a tals riscos es redueixin al mínim.

Es considera risc elèctric el risc originat per l'energia elèctrica, incloent:

- a) Xoc elèctric per contacte amb elements en tensió (contacte directe), o amb masses posades accidentalment en tensió (contacte elèctric indirecte).
- b) Cremades per xoc elèctric o arc elèctric.
- c) Caigudes o cops com a conseqüència de xoc o arc elèctric.
- d) Incendis o explosions originats per l'electricitat.

Tot treball en una instal·lació elèctrica, o en la seva proximitat, que comporti un risc elèctric s'ha de fer sense tensió, excepte en els treballs en, o en proximitat d'instal·lacions les condicions d'exploació o de continuïtat del subministrament així ho requereixin.

Els treballs que es realitzen en proximitat d'elements en tensió es duren a terme segons la ordre TIC/341/2003 i segons l'annex 5 del Reial Decret 614/2001, o bé es consideraran treballs en tensió i s'aplicaran les disposicions corresponents a aquest tipus de treballs.

D'acord amb la Llei de Prevenció de Riscos Laborals, l'empresari ha de garantir que els treballadors i els representants dels treballadors rebin una formació i informació adequades sobre el risc elèctric, així com sobre les mesures de prevenció i protecció que s'hagin d'adoptar.

#### TREBALLS SENSE TENSÍO

Les operacions i maniobres per deixar sense tensió una instal·lació, abans d'iniciar el "treball sense tensió", i la reposició de la tensió, en finalitzar, les realitzaran treballadors autoritzats que, en el cas d'instal·lacions d'alta tensió, hauran de ser treballadors qualificats.

##### 1. Preparació del treball

Abans d'iniciar el treball en proximitat d'elements en tensió, un treballador autoritzat, en el cas de treballs en baixa tensió, o un treballador qualificat, en el cas de treballs en alta tensió, determinarà la viabilitat del treball, tenint en compte el que disposa el paràgraf anterior.

Si és el treball viable, s'han d'adoptar les mesures de seguretat necessàries per reduir al mínim possible el nombre d'elements en tensió.

Les zones de perill dels elements que romanguin en tensió, mitjançant la col·locació de les pantalles, barreres, envolupants o protectors aïllants les característiques (mecàniques i elèctriques) i forma d'instal·lació garanteixen la eficàcia protectora.

Si, malgrat les mesures adoptades, segueixen existint elements en tensió les zones de perill són accessibles, s'haurà de:

- Delimitar la zona de treball respecte a les zones de perill, la delimitació serà eficaç respecte a cada zona de perill i s'efectuarà amb el material adequat.
- Informar els treballadors directament o indirectament implicats, dels riscos existents, la situació dels elements en tensió, els límits de la zona de treball i totes les precaucions i mesures de seguretat han d'adoptar per no envair la zona de perill, fent saber, a més, la necessitat que ells, a si vegada, informin sobre qualsevol circumstància que mostri la insuficiència de les mesures adoptades.

Sense perjudici del que disposen els apartats anteriors, en les empreses les activitats habituals comporten la realització de treballs en proximitat d'elements en tensió, particularment si tenen lloc fora del centre de treball, l'empresari s'ha d'assegurar que els treballadors tenen coneixements que els permeten identificar les instal·lacions elèctriques, detectar els possibles riscos i obrar en conseqüència.

##### 2. Realització del treball

Quan les mesures adoptades no siguin suficients per protegir els treballadors davant el risc elèctric, els treballs seran realitzats per treballadors autoritzats, o sota la vigilància d'un d'aquests.

En l'exercici de la seva funció de vigilància, els treballadors autoritzats han de vetllar pel compliment de les mesures de seguretat i controlar, en particular, el moviment dels treballadors i objectes a la zona de treball, tenint en compte les seves característiques, els seus possibles desplaçaments accidentals i qualsevol altra circumstància que pugui alterar les condicions en què s'ha basat la

planificació del treball. La vigilància no és exigible quan els treballs es realitzen fora de la zona de proximitat o en instal·lacions de baixa tensió.

3. Disposicions particulars per a obres i altres activitats en què es produeixin moviments o desplaçaments d'equips o materials en la proximitat de línies aèries subterrànies o altres instal·lacions elèctriques

Per a la prevenció del risc elèctric en activitats en què es produeixen o poden produir moviments o desplaçaments d'equips o materials en la proximitat de línies aèries, subterrànies o altres instal·lacions elèctriques (com passa sovint, per exemple, en la edificació, les obres públiques o determinades feines agrícoles o forestals) s'haurà d'actuar de la manera següent:

- Abans del començament de l'activitat s'identificaran les possibles línies aèries, subterrànies o altres instal·lacions elèctriques existents a la zona de treball, o en les seves rodalies.
- Si, en alguna de les fases de l'activitat, hi ha risc que una línia subterrània o algun altre element en tensió protegit pugui ser assolit, amb possible trencament del seu aïllament, s'han de prendre les mesures preventives necessàries parell evitar aquesta circumstància.

Si, en alguna de les fases de l'activitat, la presència de línies aèries o d'algun un altre element en tensió desprotegit, pot suposar un risc elèctric per als treballadors i les línies o elements no es poden desviar o deixar sense tensió, s'aplica el que es disposa anteriorment.

### 32 TREBALLS NOCTURNS

Per als possibles casos en que s'hagin de realitzar treballs nocturns s'haurà d'establir prèviament un protocol que contemplin les següents normes:

- Es definiran els treballs a realitzar, el personal que intervé, els responsables, la maquinaria a utilitzar i la zona afectada.
- Es disposaran equips mòbils de bombeig de pluvials per donar servei en qualsevol punt a les xarxes afectades per les obres.
- Es preveuran grups d'electrògens per donar servei a les instal·lacions que poguessin veure interrompuda la seva alimentació elèctrica, sempre que el Director d'Obra ho estimi oportú.
- Abans de l'inici dels treballs nocturns es tindran preparats els equips per accedir a la zona d'actuació, una vegada rebuda la comunicació d'autorització dels mateixos i sempre amb un responsable de la contractista principal present.

### 33 SIGNATURES

Barcelona, gener de 2021

Els enginyers autors de l'Estudi,



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## **2.-Plec de Condicions**

## **ÍNDEX**

<b>1</b>	<b>DEFINICIÓ I ABAST DEL PLEC .....</b>	<b>1</b>
1.1	IDENTIFICACIÓ DE LES OBRRES .....	1
1.2	OBJECTE.....	1
1.3	OBJECTE.....	1
1.4	COMPATIBILITAT I RELACIÓ ENTRE ELS ESMENTATS DOCUMENTS.....	1
<b>2</b>	<b>DEFINICIONS I COMPETÈNCIES DELS AGENTS DEL FET CONSTRUCTIU .....</b>	<b>2</b>
2.1	PROMOTOR.....	2
2.2	COORDINADOR DE SEGURETAT I SALUT .....	2
2.3	PROJECTISTA .....	3
2.4	DIRECTOR D'OBRA.....	3
2.5	CONTRACTISTA O CONSTRUCTOR (EMPRESARI PRINCIPAL) I SUBCONTRACTISTES .....	3
2.6	TREBALLADORS AUTÒNOMS .....	5
2.7	TREBALLADORS .....	5
<b>3</b>	<b>DOCUMENTACIÓ PREVENTIVA DE CARÀCTER CONTRACTUAL .....</b>	<b>5</b>
3.1	INTERPRETACIÓ DELS DOCUMENTS VINCULANTS EN MATÈRIA DE SEGURETAT I SALUT .....	5
3.2	VIGÈNCIA DE L'ESTUDI DE SEGURETAT I SALUT .....	6
3.3	PLA DE SEGURETAT I SALUT DEL CONTRACTISTA .....	6
3.4	EL "LLIBRE D'INCIDÈNCIES" .....	7
3.5	CARÀCTER VINCULANT DEL CONTRACTE O DOCUMENT DEL "CONVENI DE PREVENCIÓ I COORDINACIÓ" I DOCUMENTACIÓ CONTRACTUAL ANNEXA EN MATÈRIA DE SEGURETAT.....	8
<b>4</b>	<b>NORMATIVA LEGAL D'APLICACIÓ .....</b>	<b>8</b>
4.1	TEXTOS GENERALS .....	8
4.2	CONDICIONS AMBIENTALS .....	10
4.3	INCENDIS .....	10
4.4	INSTAL·LACIONS ELÈCTRIQUES .....	10
4.5	EQUIPS I MAQUINÀRIA.....	10
4.6	EQUIPS DE PROTECCIÓ INDIVIDUAL.....	11
4.7	SENYALITZACIÓ .....	11
4.8	DIVERSOS .....	11
<b>5</b>	<b>CONDICIONS ECONÒMIQUES.....</b>	<b>12</b>
5.1	CRITERIS D'APLICACIÓ.....	12
5.2	CERTIFICACIÓ DEL PRESSUPOST DEL PLA DE SEGURETAT I SALUT.....	12
5.3	REVISIÓ DE PREUS DEL PLA DE SEGURETAT I SALUT.....	12
5.4	PENALITZACIONS PER INCOMPLIMENT EN MATÈRIA DE SEGURETAT .....	12
<b>6</b>	<b>CONDICIONS TÈCNIQUES GENERALS DE SEGURETAT .....</b>	<b>12</b>
6.1	PREVISIONS DEL CONTRACTISTA A L'APLICACIÓ DE LES TÈCNIQUES DE SEGURETAT.....	12
6.2	CONDICIONS TÈCNIQUES DEL CONTROL DE QUALITAT DE LA PREVENCIÓ.....	13
6.3	CONDICIONS TÈCNIQUES DELS ÒRGANS DE L'EMPRESA CONTRACTISTA COMPETENTS EN MATÈRIA DE SEGURETAT I SALUT .....	13
6.4	OBLIGACIONS DE L'EMPRESA CONTRACTISTA COMPETENT EN MATÈRIA DE MEDICINA DEL TREBALL .....	13
6.5	COMPETÈNCIES DELS COL·LABORADORS PREVENCIONISTES A L'OBRA .....	14
6.6	COMPETÈNCIES DE FORMACIÓ EN SEGURETAT A L'OBRA.....	14
<b>7</b>	<b>PLEC DE CONDICIONS TÈCNIQUES ESPECÍFIQUES DE SEGURETAT DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES .....</b>	<b>14</b>
7.1	DEFINICIÓ I CARACTERÍSTIQUES DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES.....	14
7.2	CONDICIONS D'ELECCIÓ, UTILITZACIÓ, EMMAGATZEMATGE I MANTENIMENT DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES.....	14
7.3	NORMATIVA APLICABLE .....	15
<b>8</b>	<b>SIGNATURES .....</b>	<b>16</b>



## **PLEC**

### **1 DEFINICIÓ I ABAST DEL PLEC**

#### **1.1 IDENTIFICACIÓ DE LES OBRES**

Projecte Constructiu de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol.

#### **1.2 OBJECTE**

Aquest Plec de Condicions de l'Estudi de Seguretat i Salut relatiu a les obres per al "Condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol" comprèn el conjunt d'especificacions que hauran d'acomplir tant el Pla de Seguretat i Salut del Contractista com a document de Gestió Preventiva (Planificació, Organització, Execució i Control) de l'obra, les diferents proteccions a emprar per la reducció dels riscos (Mitjans Auxiliars d'Utilitat Preventiva, Sistemes de Protecció Col·lectiva, Equips de Protecció Individual), Implantacions provisionals per a la Salubritat i Confort dels treballadors, així com les tècniques de la seva implementació a l'obra i les que hauran de manar l'execució de qualsevol tipus d'instal·lacions i d'obres accessòries. Per a qualsevol tipus d'especificació no inclosa en aquest Plec, es tindran en compte les condicions tècniques que es derivin d'entendre com a normes d'aplicació:

- Tots aquells continguts al:
  - "Plec General de Condicions Tècniques de l'Edificació", confeccionat pel Centre Experimental d'Arquitectura, aprovat pel Consell Superior de Col·legis d'Arquitectes i adaptat a les seves obres per la "Direcció General d'Arquitectura". (cas d'Edificació)
  - "Plec de Clàusules Administratives Generals, per a la Contractació d'Obres de l'Estat" i adaptat a les seves obres per la "Direcció de Política Territorial i Obres Públiques". (cas d'Obra Pública)
- Les contingudes al Reglament General de Contractació de l'Estat, Normes Tecnològiques de l'Edificació publicades pel "Ministerio de la Vivienda" i posteriorment pel "Ministerio de Obras Públicas y Urbanismo".
- La normativa legislativa vigent d'obligat compliment i les condicionades per les companyies subministradores de serveis públics, totes elles al moment de l'oferta.

#### **1.3 OBJECTE**

Segons la normativa legal vigent, Art. 5, 2 del R.D. 1627/1997, de 24 d'octubre sobre "DISPOSICIONS MÍNIMES DE SEGURETAT I DE SALUT A LES OBRES DE CONSTRUCCIÓ", l'Estudi de Seguretat haurà de formar part del Projecte d'Execució d'Obra o, al seu defecte, del Projecte d'Obra, havent de ser coherent amb el contingut del mateix i recollir les mesures preventives adequades als riscos que comporta la realització de l'obra, contenint com a mínim els següents documents:

**Memòria:** Descriptiva dels procediments, equips tècnics i medis auxiliars que hagin d'utilitzar-se o que la seva utilització es pugui preveure; identificació dels riscos laborals que puguin ser evitats, indicant a l'efecte les mesures tècniques necessàries per fer-ho; relació dels riscos laborals que no es puguin eliminar conforme als assenyalats anteriorment, especificant les mesures preventives i proteccions tècniques tendents a controlar i reduir els esmentats riscos i valorant la seva eficàcia, en especial quan es proposin mesures alternatives.

**Plec:** De condicions particulars en el que es tindran en compte les normes legals i reglamentaries aplicables a les especificacions tècniques pròpies de l'obra que es tracti, així com les prescripcions

que s'hauran de complir en relació amb les característiques, l'ús i la conservació de les màquines, utensilis, eines, sistemes i equips preventius.

**Plànols:** On es desenvolupen els gràfics i esquemes necessaris per la millor definició i comprensió de les mesures preventives definides a la Memòria, amb expressió de les especificacions tècniques necessàries.

**Amidaments:** De totes les unitats o elements de seguretat i salut al treball que hagin estat definits o projectats.

**Pressupost:** Quantificació del conjunt de despeses previstes per l'aplicació i execució de l'Estudi de Seguretat i Salut.

#### **1.4 COMPATIBILITAT I RELACIÓ ENTRE ELS ESMENTATS DOCUMENTS**

L'Estudi de Seguretat i Salut forma part del Projecte d'Execució d'obra, o en el seu cas, del Projecte d'Obra, havent de ser cadascun dels documents que l'integren, coherents amb el contingut del Projecte, i recollir les mesures preventives, de caràcter pal·liatiu, adequades als riscos, no eliminats o reduïts a la fase de disseny, que comporti la realització de l'obra, en els terminis i circumstàncies socio-tècniques on la mateixa s'hagi de materialitzar.

El Plec de Condicions Particulars, els Plànols i Pressupost de l'Estudi de Seguretat i Salut són documents contractuals, que restaran incorporats al Contracte i, per tant, són d'obligat compliment, llevat modificacions degudament autoritzades.

La resta de Documents o dades de l'Estudi de Seguretat i Salut són informatius, i estan constituïts per la Memòria Descriptiva, amb tots els seus Annexos, els Detalls Gràfics d'interpretació, els Amidaments i els Pressupostos Parcials.

Els esmentats documents informatius representen només una opinió fonamentada de l'Autor de l'Estudi de Seguretat i Salut, sense que això suposi que es responsabilitzi de la certesa de les dades que se subministren. Aquestes dades han de considerar-se, tant sols, com a complement d'informació que el Contractista ha d'adquirir directament i amb els seus propis mitjans.

Només els documents contractuals constitueixen la base del Contracte; per tant, el Contractista no podrà al·legar ni introduir al seu Pla de Seguretat i Salut cap modificació de les condicions del Contracte en base a les dades contingudes als documents informatius, llevat que aquestes dades apareguin a algun document contractual.

El Contractista serà, doncs, responsable de les errades que puguin derivar-se de no obtenir la suficient informació directa, que rectifiqui o ratifiqui la continguda als documents informatius de l'Estudi de Seguretat i Salut.

Si hi hagués contradicció entre els Plànols i les Prescripcions Tècniques Particulars, en cas d'incloure's aquestes com a document que complementi el Plec de Condicions Generals del Projecte, té prevalença el que s'ha prescrit en les Prescripcions Tècniques Particulars. En qualsevol cas, ambdós documents tenen prevalença sobre les Prescripcions Tècniques Generals.

El que s'ha esmentat al Plec de condicions i només als Plànols, o viceversa, haurà de ser executat com si hagués estat exposat a ambdós documents, sempre que, a criteri de l'Autor de l'Estudi de Seguretat i Salut, quedin suficientment definides les unitats de Seguretat i Salut corresponent, i aquestes tinguin preu al Contracte.

## 2 DEFINICIONS I COMPETÈNCIES DELS AGENTS DEL FET CONSTRUCTIU

Dins l'àmbit de la respectiva capacitat de decisió cadascun dels actors del fet constructiu, estan obligats a prendre decisions ajustant-se als Principis Generals de l'Acció Preventiva (Art. 15 a la L. 31/1995):

1. Evitar els riscos.
2. Avaluat els riscos que no es poden evitar.
3. Combatre els riscos en el seu origen.
4. Adaptar la feina a la persona, en particular al que fa referència a la concepció dels llocs de treball, com també a l'elecció dels equips i els mètodes de treball i de producció, amb l'objectiu específic d'atenuar la feina monòtona i repetitiva i de reduir-ne els efectes a la salut.
5. Tenir en compte l'evolució de la tècnica.
6. Substituir el que sigui perillós pel que comporti poc perill o no en comporti cap.
7. Planificar la prevenció, amb la recerca d'un conjunt coherent que hi integri la tècnica, l'organització de la feina, les condicions de treball, les relacions socials i la influència dels factors ambientals al treball.
8. Adoptar mesures que donin prioritat a la protecció col·lectiva respecte de la individual.
9. Facilitar les corresponents instruccions als treballadors.

### 2.1 PROMOTOR

Als efectes del present Estudi de Seguretat i Salut, serà considerat Promotor qualsevol persona, física o jurídica, pública o privada, que, individual o col·lectivament, decideixi, impulsi, programi i financi, amb recursos propis o aliens, les obres de construcció per sí mateix, o per la seva posterior alienació, lliurament o cessió a tercers sota qualsevol títol.

Competències en matèria de Seguretat i Salut del Promotor:

1. Designar al tècnic competent per la Coordinació de Seguretat i Salut en fase de Projecte, quan sigui necessari o es cregui convenient.
2. Designar, en fase de Projecte, la redacció de l'Estudi de Seguretat, facilitant al Projectista i al Coordinador, respectivament, la documentació i informació prèvia necessària per l'elaboració del Projecte i redacció de l'Estudi de Seguretat i Salut, així com autoritzar als mateixos les modificacions pertinents.
3. Facilitar que el Coordinador de Seguretat i Salut en la fase de projecte intervingui en totes les fases d'elaboració del projecte i de preparació de l'obra.
4. Designar el Coordinador de Seguretat i Salut en fase d'Obra per l'aprovació del Pla de Seguretat i Salut, aportat pel contractista amb antelació a l'inici de les obres, el qual Coordinarà la Seguretat i Salut en fase d'execució material de les mateixes.
5. La designació dels Coordinadors en matèria de Seguretat i Salut no eximeix al Promotor de les seves responsabilitats.
6. Gestionar "l'Avís Previ" davant l'Administració Laboral i obtenir les preceptives llicències i autoritzacions administratives.
7. El Promotor es responsabilitza que tots els agents del fet constructiu tinguin en compte les observacions del Coordinador de Seguretat i Salut, degudament justificades, o bé proposin unes mesures d'una eficàcia, pel cap baix, equivalents.

### 2.2 COORDINADOR DE SEGURETAT I SALUT

El Coordinador de Seguretat i Salut serà als efectes del present Estudi de Seguretat i Salut, qualsevol persona física legalment habilitada pels seus coneixements específics i que compti amb titulació acadèmica en Construcció.

És designat pel Promotor en qualitat de Coordinador de Seguretat: a) En fase de concepció, estudi i elaboració del Projecte o b) Durant l'Execució de l'obra.

El Coordinador de Seguretat i Salut i Salut forma part de la Direcció d'Obra o Direcció Facultativa/Direcció d'Execució.

Competències en matèria de Seguretat i Salut del Coordinador de Seguretat del Projecte:

El Coordinador de Seguretat i Salut en fase de projecte, és designat pel Promotor quan en l'elaboració del projecte d'obra intervinguin varis projectistes.

Les funcions del Coordinador en matèria de Seguretat i Salut durant l'elaboració del projecte, segons el R.D. 1627/1997, són les següents:

1. Vetllar per a què en fase de concepció, estudi i elaboració del Projecte, el Projectista tingui en consideració els "Principis Generals de la Prevenció en matèria de Seguretat i Salut" (Art. 15 a la L.31/1995), i en particular:
  - a) Prendre les decisions constructives, tècniques i d'organització amb la finalitat de planificar les diferents feines o fases de treball que es desenvolupin simultània o successivament.
  - b) Estimar la duració requerida per l'execució de les diferents feines o fases de treball.
2. Traslladar al Projectista tota la informació preventiva necessària que li cal per integrar la Seguretat i Salut a les diferents fases de concepció, estudi i elaboració del projecte d'obra.
3. Tenir en compte, cada vegada que sigui necessari, qualsevol estudi de seguretat i salut o estudi bàsic, així com les previsions i informacions útils per efectuar al seu dia, amb les degudes condicions de seguretat i salut, els previsibles treballs posteriors (manteniment).
4. Coordinar l'aplicació del que es disposa en els punts anteriors i redactar o fer redactar l'Estudi de Seguretat i Salut.

Competències en matèria de Seguretat i Salut del Coordinador de Seguretat i Salut d'Obra:

El Coordinador de Seguretat i Salut en fase d'execució d'obra, és designat pel Promotor en tots aquells casos en què intervé més d'una empresa i treballadors autònoms o diversos treballadors autònoms.

Les funcions del Coordinador en matèria de Seguretat i Salut durant l'execució de l'obra, segons el R.D. 1627/1997, són les següents:

5. Coordinar l'aplicació dels Principis Generals de l'Acció Preventiva (Art. 15 L. 31/1995) :
  - c) En el moment de prendre les decisions tècniques i d'organització amb el fi de planificar les diferents tasques o fases de treball que s'hagin de desenvolupar simultània o successivament.
  - d) En l'estimació de la durada requerida per a l'execució d'aquests treballs o fases de treball.
6. Coordinar les activitats de l'obra per garantir que els Contractistes, i, si n'hi ha dels Subcontractistes i els treballadors autònoms, apliquin de manera coherent i responsable els Principis de l'Acció Preventiva que recull l'article 15 de la Llei de Prevenció de Riscos Laborals (L.31/1995 de 8 de novembre) durant l'execució de l'obra i, en particular, en les tasques o activitats al què es refereix l'article 10 del R.D. 1627/1997 de 24 d'octubre sobre Disposicions mínimes de Seguretat i Salut a les obres de construcció:
  - e) El manteniment de l'obra en bon estat d'ordre i neteja.



- f) L'elecció de l'emplaçament dels llocs i àrees de treball, tenint en compte les seves condicions d'accés, i la determinació de les vies o zones de desplaçament o circulació.
  - g) La manipulació dels diferents materials i la utilització dels mitjans auxiliars.
  - h) El manteniment, el control previ a la posta en servei i el control periòdic de les instal·lacions i dispositius necessaris per a l'execució de l'obra, a fi de corregir els defectes que puguin afectar a la seguretat i la salut dels treballadors.
  - i) La delimitació i el condicionament de les zones d'emmagatzematge i dipòsit dels diferents materials, en particular si es tracta de matèries o substàncies perilloses.
  - j) La recollida dels materials perillosos utilitzats.
  - k) L'emmagatzematge i l'eliminació o evacuació dels residus i deixalles.
  - l) L'adaptació, d'acord amb l'evolució de l'obra, del període de temps efectiu que haurà de dedicar-se als diferents treballs o fases de treball.
  - m) La informació i coordinació entre els contractistes, subcontractistes i treballadors autònoms.
  - n) Les interaccions i incompatibilitats amb qualsevol tipus de treball o activitat que es realitzi en l'obra o a prop del lloc de l'obra.
- 7. Aprovar el Pla de Seguretat i Salut (PSS) elaborat pel contractista i, si s'escau, les modificacions que s'hi haguessin introduït. La Direcció Facultativa prendrà aquesta funció quan no calgui la designació de Coordinador.
  - 8. Organitzar la coordinació d'activitats empresarials prevista en l'article 24 de la Llei de Prevenció de Riscos Laborals.
  - 9. Coordinar les accions i funcions de control de l'aplicació correcta dels mètodes de treball.
  - 10. Adoptar les mesures necessàries perquè només puguin accedir a l'obra les persones autoritzades.

El Coordinador de Seguretat i Salut en la fase d'execució de l'obra respondrà davant del Promotor, del compliment de la seva funció com staff assessor especialitzat en Prevenció de la Sinistralitat Laboral, en col·laboració estricta amb els diferents agents que intervinguin a l'execució material de l'obra. Qualsevol divergència serà presentada al Promotor com a màxim patró i responsable de la gestió constructiva de la promoció de l'obra, a fi que aquest prengui, en funció de la seva autoritat, la decisió executiva que calgui.

Les responsabilitats del Coordinador no eximiran de les seves responsabilitats al Promotor, Fabricants i Subministradors d'equips, eines i mitjans auxiliars, Direcció d'Obra o Direcció Facultativa, Contractistes, Subcontractistes, treballadors autònoms i treballadors.

### **2.3 PROJECTISTA**

És el tècnic habilitat professionalment que, per encàrrec del Promotor i amb subjecció a la normativa tècnica i urbanística corresponent, redacta el Projecte.

Podran redactar projectes parcials del Projecte, o parts que el complementin, altres tècnics, de forma coordinada amb l'autor d'aquest, contant en aquest cas, amb la col·laboració del Coordinador de Seguretat i Salut designat pel Promotor.

Quan el Projecte es desenvolupa o completa mitjançant projectes parcials o d'altres documents tècnics, cada projectista assumeix la titularitat del seu projecte.

Competències en matèria de Seguretat i Salut del Projectista:

- 1. Tenir en consideració els suggeriments del Coordinador de Seguretat i Salut en fase de Projecte per integrar els Principis de l'Acció Preventiva (Art. 15 L. 31/1995), prendre les decisions constructives, tècniques i d'organització que puguin afectar a la planificació dels treballs o fases de treball durant l'execució de les obres.
- 2. Acordar, en el seu cas, amb el promotor la contractació de col·laboracions parcials.

### **2.4 DIRECTOR D'OBRA**

És el tècnic habilitat professionalment que, formant part de la Direcció d'Obra o Direcció Facultativa, dirigeix el desenvolupament de l'obra en els aspectes tècnics, estètics, urbanístics i mediambientals, de conformitat amb el Projecte que el defineix, la llicència constructiva i d'altres autoritzacions preceptives i les condicions del contracte, amb l'objecte d'assegurar l'adequació al fi proposat. En el cas que el Director d'Obra dirigeixi a més a més l'execució material de la mateixa, assumirà la funció tècnica de la seva realització i del control qualitatiu i quantitatiu de l'obra executada i de la seva qualitat.

Podran dirigir les obres dels projectes parcials altres tècnics, sota la coordinació del Director d'Obra, contant amb la col·laboració del Coordinador de Seguretat i Salut en fase d'Obra, nomenat pel Promotor.

Competències en matèria de Seguretat i Salut del Director d'Obra:

- 1. Verificar el replanteig, l'adequació dels fonaments, estabilitat dels terrenys i de l'estructura projectada a les característiques geotècniques del terreny.
- 2. Si dirigeix l'execució material de l'obra, verificar la recepció d'obra dels productes de construcció, ordenant la realització dels assaigs i proves precises; comprovar els nivells, desploms, influència de les condicions ambientals en la realització dels treballs, els materials, la correcta execució i disposició dels elements constructius, de les instal·lacions i dels Medis Auxiliars d'Utilitat Preventiva i la Senyalització, d'acord amb el Projecte i l'Estudi de Seguretat i Salut.
- 3. Resoldre les contingències que es produeixin a l'obra i consignar en el Llibre d'Ordres i Assistència les instruccions necessàries per la correcta interpretació del Projecte i dels Medis Auxiliars d'Utilitat Preventiva i solucions de Seguretat i Salut Integrada previstes en el mateix.
- 4. Elaborar a requeriment del Coordinador de Seguretat i Salut o amb la seva conformitat, eventuais modificacions del projecte, que vinguin exigides per la marxa de l'obra i que puguin afectar a la Seguretat i Salut dels treballs, sempre que les mateixes s'adeqüin a les disposicions normatives contemplades a la redacció del Projecte i del seu Estudi de Seguretat i Salut.
- 5. Subscriure l'Acta de Replanteig o començament de l'obra, confrontant prèviament amb el Coordinador de Seguretat i Salut l'existència prèvia de l'Acta d'Aprovació del Pla de Seguretat i Salut del contractista.
- 6. Certificar el final d'obra, simultàniament amb el Coordinador de Seguretat, amb els visats que siguin preceptius.
- 7. Conformar les certificacions parcials i la liquidació final de les unitats d'obra i de Seguretat i Salut executades, simultàniament amb el Coordinador de Seguretat.
- 8. Les instruccions i ordres que doni la Direcció d'Obra o Direcció Facultativa, seran normalment verbals, tenint força per obligar a tots els efectes. Els desviaments respecte al compliment del Pla de Seguretat i Salut, s'anotaran pel Coordinador al Llibre d'incidències.
- 9. Elaborar i subscriure conjuntament amb el Coordinador de Seguretat, la Memòria de Seguretat i Salut de l'obra finalitzada, per lliurar-la al promotor, amb els visats que foren perceptius.

### **2.5 CONTRACTISTA O CONSTRUCTOR (EMPRESARI PRINCIPAL) I SUBCONTRACTISTES**

Definició de Contractista:

És qualsevol persona, física o jurídica, que, individual o col·lectivament, assumeix contractualment davant el Promotor el compromís d'executar, en condicions de solvència i seguretat, amb medis humans i materials, propis o aliens, les obres o part de les mateixes amb subjecció al contracte, el Projecte i el seu Estudi de Seguretat i Salut.

#### Definició de Subcontractista:

És qualsevol persona física o jurídica que assumeix contractualment davant el contractista, empresari principal, el compromís de realitzar determinades parts o instal·lacions de l'obra, amb subjecció al contracte, al Projecte i al Pla de Seguretat, del Contractista, pel que es regeix la seva execució.

#### Competències en matèria de Seguretat i Salut del Contractista i/o Subcontractista:

1. El Contractista haurà d'executar l'obra amb subjecció al Projecte, directrius de l'Estudi i compromisos del Pla de Seguretat i Salut, a la legislació aplicable i a les instruccions del Director d'Obra, i del Coordinador de Seguretat i Salut, amb la finalitat de dur a terme les condicions preventives de la sinistralitat laboral i l'assegurament de la qualitat, compromeses en el Pla de Seguretat i Salut i exigides en el Projecte.
2. Tenir acreditació empresarial i la solvència i capacitació tècnica, professional i econòmica que l'habiliti per al compliment de les condicions exigibles per actuar com constructor (i/o subcontractista, en el seu cas), en condicions de Seguretat i Salut.
3. Designar al Cap d'Obra que assumirà la representació tècnica del Constructor (i/o Subcontractista, en el seu cas), a l'obra i que per la seva titulació o experiència haurà de tenir la capacitat adequada d'acord amb les característiques i complexitat de l'obra.
4. Assignar a l'obra els medis humans i materials que la seva importància ho requereixi.
5. Formalitzar les subcontractacions de determinades parts o instal·lacions de l'obra dins dels límits establerts en el Contracte.
6. Redactar i signar el Pla de Seguretat i Salut que desenvolupi l'Estudi de Seguretat i Salut del Projecte. El Subcontractista podrà incorporar els suggeriments de millora corresponents a la seva especialització, en el Pla de Seguretat i Salut del Contractista i presentar-los a l'aprovació del Coordinador de Seguretat.
7. El representant legal del Contractista signarà l'Acta d'Aprovació del Pla de Seguretat i Salut conjuntament amb el Coordinador de Seguretat.
8. Signar l'Acta de Replanteig o començament i l'Acta de Recepció de l'obra.
9. Aplicarà els Principis de l'Acció Preventiva que recull l'article 15 de la Llei de Prevenció de Riscos Laborals, en particular, en desenvolupar les tasques o activitats indicades en l'esmentat article 10 del R.D. 1627/1997:
  - a) Complir i fer complir al seu personal allò establert en el Pla de Seguretat i Salut (PSS).
  - b) Complir la normativa en matèria de prevenció de riscos laborals, tenint en compte, si s'escau, les obligacions que fan referència a la coordinació d'activitats empresarials previstes en l'article 24 de la Llei de Prevenció de Riscos Laborals, i en conseqüència complir el R.D. 171/2004, i també complir les disposicions mínimes establertes en l'annex IV del R.D. 1627/1997, durant l'execució de l'obra.
  - c) Informar i facilitar les instruccions adequades als treballadors autònoms sobre totes les mesures que s'hagin d'adoptar pel que fa a la seguretat i salut a l'obra.
  - d) Atendre les indicacions i complir les instruccions del Coordinador en matèria de seguretat i salut durant l'execució de l'obra, i si és el cas, de la Direcció Facultativa.
10. Els Contractistes i Subcontractistes seran responsables de l'execució correcta de les mesures preventives fixades en el Pla de Seguretat i Salut (PSS) en relació amb les obligacions que corresponen directament a ells o, si escau, als treballadors autònoms que hagin contractat.
11. A més, els Contractistes i Subcontractistes respondran solidàriament de les conseqüències que es derivin de l'incompliment de les mesures previstes al Pla, als termes de l'apartat 2 de l'article 42 de la Llei de Prevenció de Riscos Laborals.
12. El Contractista principal haurà de vigilar el compliment de la normativa de prevenció de riscos laborals per part de les empreses Subcontractistes.
13. Abans de l'inici de l'activitat a l'obra, el Contractista principal exigirà als Subcontractistes que acreditin per escrit que han realitzat, per als treballs a realitzar, l'avaluació de riscos i

la planificació de la seva activitat preventiva. Així mateix, el Contractista principal exigirà als Subcontractistes que acreditin per escrit que han complert les seves obligacions en matèria d'informació i formació respecte als treballadors que hagin de prestar servei a l'obra.

14. El Contractista principal haurà de comprovar que els Subcontractistes que concorren a l'obra han establert entre ells els medis necessaris de coordinació.
15. Les responsabilitats del Coordinador, de la Direcció Facultativa i del Promotor no eximiran de les seves responsabilitats als Contractistes i al Subcontractistes.
16. El Constructor serà responsable de la correcta execució dels treballs mitjançant l'aplicació de Procediments i Mètodes de Treball intrínsecament segurs (SEGURETAT INTEGRADA), per assegurar la integritat de les persones, els materials i els mitjans auxiliars fets servir a l'obra.
17. El Contractista principal facilitarà per escrit a l'inici de l'obra, el nom del Director Tècnic, que serà creditor de la conformitat del Coordinador i de la Direcció Facultativa. El Director Tècnic podrà exercir simultàniament el càrrec de Cap d'Obra, o bé, delegarà l'esmentada funció a altre tècnic, Cap d'Obra, amb coneixements contrastats i suficients de construcció a peu d'obra. El Director Tècnic, o en absència el Cap d'Obra o l'Encarregat General, ostentaran successivament la prelatió de representació del Contractista a l'obra.
18. El representant del Contractista a l'obra, assumirà la responsabilitat de l'execució de les activitats preventives incloses al present Plec i el seu nom figurarà al Llibre d'Incidències.
19. Serà responsabilitat del Contractista i del Director Tècnic, o del Cap d'Obra i/o Encarregat en el seu cas, l'incompliment de les mesures preventives, a l'obra i entorn material, de conformitat a la normativa legal vigent.
20. El Contractista també serà responsable de la realització del Pla de Seguretat i Salut (PSS), així com de l'específica vigilància i supervisió de seguretat, tant del personal propi com subcontractat, així com de facilitar les mesures sanitàries de caràcter preventiu laboral, formació, informació i capacitació del personal, conservació i reposició dels elements de protecció personal dels treballadors, càlcul i dimensions dels Sistemes de Proteccions Col·lectives i en especial, les baranes i passarel·les, condemna de forats verticals i horitzontals susceptibles de permetre la caiguda de persones o objectes, característiques de les escales i estabilitat dels esglaons i recolzadors, ordre i neteja de les zones de treball, enllumenat i ventilació dels llocs de treball, bastides, apuntalaments, encofrats i estintolaments, aplecs i emmagatzematges de materials, ordre d'execució dels treballs constructius, seguretat de les màquines, grues, aparells d'elevació, mesures auxiliars i equips de treball en general, distància i localització d'estesa i canalitzacions de les companyies subministradores, així com qualsevol altre mesura de caràcter general i d'obligat compliment, segons la normativa legal vigent i els costums del sector i que pugui afectar a aquest centre de treball.
21. El Director Tècnic (o el Cap d'Obra), visitaran l'obra com a mínim amb una cadència diària i hauran de donar les instruccions pertinents a l'Encarregat General, que haurà de ser una persona de provada capacitat pel càrrec, haurà d'estar present a l'obra durant la realització de tot el treball que s'executi. Sempre que sigui preceptiu i no existeixi altra designada a l'efecte, s'entendrà que l'Encarregat General és al mateix temps el Supervisor General de Seguretat i Salut del Centre de Treball per part del Contractista, amb independència de qualsevol altre requisit formal.
22. L'acceptació expressa o tàcita del Contractista pressuposa que aquest ha reconegut l'emplaçament del terreny, les comunicacions, accessos, afectació de serveis, característiques del terreny, mides de seguretat necessàries, etc. i no podrà al·legar en el futur ignorància d'aquestes circumstàncies.
23. El Contractista haurà de disposar de les pòlisses d'assegurança necessària per a cobrir les responsabilitats que puguin esdevenir per motius de l'obra i el seu entorn, i serà responsable dels danys i perjudicis directes o indirectes que pugui ocasionar a tercers, tant per omissió com per negligència, imprudència o imperícia professional, del personal al seu càrrec, així com del Subcontractistes, industrials i/o treballadors autònoms que intervinguin a l'obra.

24. Les instruccions i ordres que doni la Direcció d'Obra o Direcció Facultativa, seran normalment verbals, tenint força per obligar a tots els efectes. Els desviaments respecte al compliment del Pla de Seguretat i Salut, s'anotaran pel Coordinador al Llibre d'Incidències.
25. En cas d'incompliment reiterat dels compromisos del Pla de Seguretat i Salut (PSS), el Coordinador i Tècnics de la Direcció d'Obra o Direcció Facultativa, Constructor, Director Tècnic, Cap d'Obra, Encarregat, Supervisor de Seguretat, Delegat Sindical de Prevenció o els representants del Servei de Prevenció (propri o concertat) del Contractista i/o Subcontractistes, tenen el dret a fer constar al Llibre d'Incidències, tot allò que consideri d'interès per a reconduir la situació als àmbits previstos al Pla de Seguretat i Salut de l'obra.
26. Les condicions de seguretat i salut del personal, dins de l'obra i els seus desplaçaments a/o des del seu domicili particular, seran responsabilitat dels Contractistes i/o Subcontractistes així com dels propis treballadors Autònoms.
27. També serà responsabilitat del Contractista, el tancament perimetral del recinte de l'obra i protecció de la mateixa, el control i reglament intern de policia a l'entrada, per a evitar la intromissió incontrolada de tercers aliens i curiosos, la protecció d'accessos i l'organització de zones de pas amb destinació als visitants de les oficines d'obra.
28. El Contractista haurà de disposar d'un senzill, però efectiu, Pla d'Emergència per a l'obra, en previsió d'incendis, pluges, glaçades, vent, etc. que puguin posar en situació de risc al personal d'obra, a tercers o als medis e instal·lacions de la pròpia obra o limitrofs.
29. El Contractista i/o Subcontractistes tenen absolutament prohibit l'ús d'explosius sense autorització escrita de la Direcció d'Obra o Direcció Facultativa.
30. La utilització de grues, elevadors o d'altres màquines especials, es realitzarà per operaris especialitzats i posseïdors del carnet de grua torre, del títol d'operador de grua mòbil i en altres casos l'acreditació que correspongui, sota la supervisió d'un tècnic especialitzat i competent a càrrec del Contractista. El Coordinador rebrà una còpia de cada títol d'habilitació signat per l'operador de la màquina i del responsable tècnic que autoritza l'habilitació avalant-hi la idoneïtat d'aquell per a realitzar la seva feina, en aquesta obra en concret.
31. Tot operador de grua mòbil haurà d'estar en possessió del carnet de gruista segons la Instrucció Tècnica Complementària "MIE-AEM-4" aprovada per RD 837/2003 expedit pel òrgan competent o en el seu defecte certificat de formació com a operador de grua de l'Institut Gaudí de la Construcció o entitat similar; tot ell per garantir el total coneixement dels equips de treballs de forma que es pugui garantir el màxim de seguretat a les tasques a desenvolupar.
32. El delegat del contractista haurà de certificar que tot operador de grua mòbil es troba en possessió del carnet de gruista segons especificacions del paràgraf anterior, així mateix haurà de certificar que totes les grues mòbils que s'utilitzin a l'obra compleixen totes i cadascunes de les especificacions establertes a l'ITC "MIE-AEM-4".

## 2.6 TREBALLADORS AUTÒNOMS

Persona física diferent al Contractista i/o Subcontractista que realitzarà de forma personal i directa una activitat professional, sense cap subjecció a un contracte de treball, i que assumeix contractualment davant el Promotor, el Contractista o el Subcontractista el compromís de realitzar determinades parts o instal·lacions de l'obra.

Competències en matèria de Seguretat i Salut del Treballador Autònom:

1. Aplicar els Principis de l'Acció Preventiva que es recullen en l'article 15 de la Llei de Prevenció de Riscos Laborals, en particular, en desenvolupar les tasques o activitats indicades en l'article 10 del R.D. 1627/1997.
2. Complir les disposicions mínimes de seguretat i salut, que estableix l'annex IV del R.D. 1627/1997, durant l'execució de l'obra.
3. Complir les obligacions en matèria de prevenció de riscos que estableix pels treballadors l'article 29, 1,2, de la Llei de Prevenció de Riscos Laborals.

4. Ajustar la seva actuació en l'obra conforme als deures de coordinació d'activitats empresarials establerts en l'article 24 de la Llei de Prevenció de Riscos Laborals, participant, en particular, en qualsevol mesura d'actuació coordinada que s'hagi establert.
5. Utilitzar els equips de treball d'acord amb allò disposat en el R.D. 1215/1997, de 18 de juliol, pel qual s'estableixen les disposicions mínimes de seguretat i salut per a la utilització dels equips de treball per part dels treballadors.
6. Escollir i utilitzar els equips de protecció individual, segons preveu el R.D. 773/1997, de 30 de maig, sobre disposicions mínimes de seguretat i salut relativa a la utilització dels equips de protecció individual per part dels treballadors.
7. Atendre les indicacions i complir les instruccions del Coordinador en matèria de seguretat i de salut durant l'execució de l'obra i de la Direcció d'Obra o Direcció Facultativa, si n'hi ha.
8. Els treballadors autònoms hauran de complir allò establert en el Pla de Seguretat i Salut (PSS):
  - a) La maquinària, els aparells i les eines que s'utilitzen a l'obra, han de respondre a les prescripcions de seguretat i salut, equivalents i pròpies, dels equipaments de treball que l'empresari Contractista posa a disposició dels seus treballadors.
  - b) Els autònoms i els empresaris que exerceixen personalment una activitat a l'obra, han d'utilitzar equipament de protecció individual apropiat, i respectar el manteniment en condicions d'eficàcia dels diferents sistemes de protecció col·lectiva instal·lats a l'obra, segons el risc que s'ha de prevenir i l'entorn del treball.

## 2.7 TREBALLADORS

Persona física diferent al Contractista, Subcontractista i/o Treballador Autònom que realitzarà de forma personal i directa una activitat professional remunerada per compte aliè, amb subjecció a un contracte laboral, i que assumeix contractualment davant l'empresari el compromís de desenvolupar a l'obra les activitats corresponents a la seva categoria i especialitat professional, seguint les instruccions d'aquell.

Competències en matèria de Seguretat i Salut del Treballador:

1. El deure d'obeir les instruccions del Contractista en allò relatiu a Seguretat i Salut.
2. El deure d'indicar els perills potencials.
3. Té responsabilitat dels actes personals.
4. Té el dret a rebre informació adequada i comprensible i a formular propostes, en relació a la seguretat i salut, en especial sobre el Pla de Seguretat i Salut (PSS).
5. Té el dret a la consulta i participació, d'acord amb l'article 18, 2 de la Llei de Prevenció de Riscos Laborals.
6. Té el dret a adreçar-se a l'autoritat competent.
7. Té el dret a interrompre el treball en cas de perill imminent i seriós per a la seva integritat i la dels seus companys o tercers aliens a l'obra.
8. Té el dret de fer us i el fruit d'unes instal·lacions provisionals de Salubritat i Confort, previstes especialment pel personal d'obra, suficients, adequades i dignes, durant el temps que duri la seva permanència a l'obra.

## 3 DOCUMENTACIÓ PREVENTIVA DE CARÀCTER CONTRACTUAL

### 3.1 INTERPRETACIÓ DELS DOCUMENTS VINCULANTS EN MATÈRIA DE SEGURETAT I SALUT

Excepte en el cas que l'escriptura del Contracte o Document de Conveni Contractual ho indiqui específicament d'altra manera, l'ordre de prelación dels Documents contractuals en matèria de Seguretat i Salut per aquesta obra serà el següent:



- Escriptura del Contracte o Document del Conveni Contractual.
- Bases del Concurs.
- Plec de Prescripcions per la Redacció dels Estudis de Seguretat i Salut i la Coordinació de Seguretat i salut en fases de Projecte i/o d'Obra.
- Plec de Condicions Generals del Projecte i de l'Estudi de Seguretat i Salut.
- Plec de Condicions Facultatives i Econòmiques del Projecte i de l'Estudi de Seguretat i Salut.
- Procediments Operatius de Seguretat i Salut i/o Procediments de control Administratiu de Seguretat, redactats durant la redacció del Projecte i/o durant l'Execució material de l'Obra, pel Coordinador de Seguretat.
- Plànols i Detalls Gràfics de l'Estudi de Seguretat i Salut.
- Pla d'Acció Preventiva de l'empresari-contractista.
- Pla de Seguretat i Salut de desenvolupament de l'Estudi de Seguretat i Salut del Contractista per l'obra en qüestió.
- Protocols, procediments, manuals i/o Normes de Seguretat i Salut interna del Contractista i/o Subcontractistes, d'aplicació en l'obra.

Feta aquesta excepció, els diferents documents que constitueixen el Contracte seran considerats com mútuament explicatius, però en el cas d'ambigüitats o discrepàncies interpretatives de temes relacionats amb la Seguretat, seran aclarides i corregides pel Director d'Obra qui, després de consultar amb el Coordinador de Seguretat, farà l'ús de la seva facultat d'aclarir al Contractista les interpretacions pertinents.

Si en el mateix sentit, el Contractista descobreix errades, omissions, discrepàncies o contradiccions tindrà que notificar-ho immediatament per escrit al Director d'Obra qui després de consultar amb el Coordinador de Seguretat, aclarirà ràpidament tots els assumptes, notificant la seva resolució al Contractista. Qualsevol treball relacionat amb temes de Seguretat i Salut, que hagués estat executat pel Contractista sense prèvia autorització del Director d'Obra o del Coordinador de Seguretat, serà responsabilitat del Contractista, restant el Director d'Obra i el Coordinador de Seguretat, eximits de qualsevol responsabilitat derivada de les conseqüències de les mesures preventives, tècnicament inadequades, que hagin pogut adoptar el Contractista pel seu compte.

En el cas que el contractista no notifiqui per escrit el descobriment d'errades, omissions, discrepàncies o contradiccions, això, no tan sols no l'eximeix de l'obligació d'aplicar les mesures de Seguretat i Salut raonablement exigibles per la reglamentació vigent, els usos i la praxi habitual de la Seguretat Integrada en la construcció, que siguin manifestament indispensables per dur a terme l'esperit o la intenció posada en el Projecte i l'Estudi de Seguretat i Salut, si no que hauran de ser materialitzats com si haguessin estat completes i correctament especificades en el Projecte i el corresponent Estudi de Seguretat i Salut.

Totes les parts del contracte s'entenen complementàries entre si, per la qual cosa qualsevol treball requerit en un sol document, encara que no estigui esmentat en cap altre, tindrà el mateix caràcter contractual que si s'hagués recollit en tots.

### 3.2 VIGÈNCIA DE L'ESTUDI DE SEGURETAT I SALUT

El Coordinador de Seguretat, a la vista dels continguts del Pla de Seguretat i Salut aportat pel Contractista, com document de gestió preventiva d'adaptació de la seva pròpia "cultura preventiva interna d'empresa" el desenvolupament dels continguts del Projecte i l'Estudi de Seguretat i Salut per l'execució material de l'obra, podrà indicar en l'Acta d'Aprovació del Pla de Seguretat, la declaració expressa de subsistència, d'aquells aspectes que puguin estar, a criteri del Coordinador, millor desenvolupats en l'Estudi de Seguretat, com ampliadors i complementaris dels continguts del Pla de Seguretat i Salut del Contractista.

Els Procediments Operatius i/o Administratius de Seguretat, que poguessin redactar el Coordinador de Seguretat i Salut amb posterioritat a l'Aprovació del Pla de Seguretat i Salut, tindrà la

consideració de document de desenvolupament de l'Estudi i Pla de Seguretat, essent, per tant, vinculants per les parts contractants.

### 3.3 PLA DE SEGURETAT I SALUT DEL CONTRACTISTA

D'acord al que es disposa el R.D. 1627 / 1997, cada contractista està obligat a redactar, abans de l'inici dels seus treballs a l'obra, un Pla de Seguretat i Salut adaptant aquest E.S.S. als seus medis, mètodes d'execució i al "PLA D'ACCIÓ PREVENTIVA INTERNA D'EMPRESA", realitzat de conformitat al R.D.39 / 1997 "LLEI DE PREVENCIÓ DE RISCOS LABORALS" (Arts. 1, 2 ap. 1, 8 i 9).

El Contractista en el seu Pla de Seguretat i Salut està obligat a incloure els requisits formals establerts a l'Art. 7 del R.D. 1627/ 1997, no obstant, el Contractista té plena llibertat per estructurar formalment aquest Pla de Seguretat i Salut .

El Contractista, en el seu Pla de Seguretat i Salut, adjuntarà, com a mínim, els plànols següents amb els continguts que en cada cas s'indiquen.

Plànol o Plànols de situació amb les característiques de l'entorn. Indicant:

- Ubicació dels serveis públics
  - o Electricitat
  - o Clavegueram
  - o Aigua potable
  - o Gas
  - o Oleoductes
  - o Altres
- Situació i amplada dels carrers (reals i previstos)
  - o Accessos al recinte
  - o Garites de control d'accessos
- Acotat del perímetre del solar
- Distàncies de l'edifici amb els límits del solar
- Edificacions veïnes existents
- Servituds

Plànols en planta d'ordenació general de l'obra, segons les diverses fases previstes en funció del seu pla d'execució real. Indicant:

- Tancament del solar.
- Murs de contenció, atalussats, pous, talls del terreny i desnivells.
- Nivells definitius dels diferents accessos al solar i rasants de vials colindants.
- Ubicació d'instal·lacions d'implantació provisional per al personal d'obra:
  - o Banys: Equipament (lavabos, retretes, dutxes, escalfador..).
  - o Vestuaris del personal: Equipament (taquilles, bancs correguts, estufes..).
  - o Refectori o Menjador: Equipament (taules, seients, escalfaplat, frigorífic..).
  - o Farmaciola: Equipament.
  - o Altres
- Llocs destinats a apilaments.
  - o Àrids i materials ensitjats.
  - o Armadures, barres, tubs i biguetes.
  - o Materials paletitzats.
  - o Fusta.
  - o Materials ensacats.
  - o Materials en caixes.
  - o Materials en bidons.

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

- o Materials solts.
- o Runes i residus.
- o Ferralla.
- o Aigua.
- o Combustibles.
- o Substàncies tòxiques.
- o Substàncies explosives i/o deflagrants.
- Ubicació de maquinària fixa i àmbit d'influència previst.
  - o Aparells de manutenció mecànica: grues torre, muntacàrregues, cabrestants, maquetes, baixants de runes, cintes transportadores, bomba d'extracció de fluids.
  - o Estació de formigonat.
  - o Sitja de morter.
  - o Planta de piconament i/o selecció d'àrids.
- Circuits de circulació interna de vehicles, límits de circulació i zones d'aparcament. Senyalització de circulació.
- Circuits de circulació interna del personal d'obra. Senyalització de Seguretat.
- Esquema d'instal·lació elèctrica provisional.
- Esquema d'instal·lació d'il·luminació provisional.
- Esquema d'instal·lació provisional de subministrament d'aigua.

Plànols en planta i seccions d'instal·lació de Sistemes de Protecció Col·lectiva.

(\*) Representació cronològica per fases d'execució:

- Protecció en previsió de caigudes de persones o objectes des de buits verticals de façanes:
  - o Ubicació de bastida porticada d'estructura tubular cobrint la totalitat dels fronts de façana en avançament simultani a l'execució d'estructura fins l'acabament de tancaments i coberta.(\*).
  - (\*) Sistema de Protecció Col·lectiva preferent
  - o Ubicació i replanteig del conjunt de forques metàl·liques i xarxes de seguretat.(\*).
  - (\*) En cas de no realitzar-se seguretat integrada amb bastides tubulars, prèvia justificació en l'ESS.
  - o Ubicació i replanteig de xarxes de desencofrat.
  - o Ubicació i replanteig de baranes de seguretat (\*).
  - (\*) En cas de no realitzar-se seguretat integrada amb bastides tubulars, prèvia justificació en l'ESS.
  - o Ubicació i replanteig de marquesines en voladís de seguretat (\*).
  - (\*) En cas de no realitzar-se seguretat integrada amb bastides tubulars, prèvia justificació en l'ESS.
- Protecció en previsió de caigudes de persones o objectes des de buits verticals d'escalles:
  - o Ubicació i replanteig de xarxes verticals de seguretat en perímetre i buit de travessers d'escalles (\*).
  - (\*) Sistema de Protecció Col·lectiva preferent.
  - o Ubicació i replanteig de baranes de seguretat en perímetre i buit de travessers d'escalles.
- Protecció en previsió de caigudes de persones o objectes des de buits horitzontals de patis de llums, xemeneies, buits d'instal·lacions i encofrats.
  - o Ubicació i replanteig de condemna amb malla electrosoldada enjovant en el cercol perimetral (\*).
  - (\*) Sistema de Protecció Col·lectiva preferent en forjat.
  - o Ubicació i replanteig de xarxes horitzontals de seguretat en patis interiors.
  - o Planta d'estructura amb ubicació i replanteig de xarxes horitzontals de seguretat sota taulers i sotaponts d'encofrats horitzontals recuperables.

- o Ubicació i replanteig d'entarimat horitzontal de fusta colada en passos d'instal·lacions, arquetes i registres provisionals.
- o Ubicació i replanteig de barana perimetral de seguretat.

Plànols de proteccions en plataformes i zones de pas. Contingut:

- Passarel·les (ubicació i elements constitutius).
- Escales provisionals.
- Detalls de tapes provisionals d'arquetes o de buits.
- Abalisament i senyalització de zones de pas.
- Condemna d'accessos i proteccions en contenció d'estabilitat de terrenys.
- Ubicació de bastides penjades: Projecte i replanteig dels pescants i les guindoles.
- Sàgola de cable per a ancoratge i llicament de cinturó de seguretat en perímetres exteriors amb risc de caigudes d'altura.

Plànol o plànols de distribució d'elements de seguretat per a l'ús i manteniment posterior de l'obra executada (\*).

- Bastides suspeses sobre guindoles carrileres per a neteja de façana.
- Plataformes lliscants sobre carrils per a manteniment de paraments verticals.
- Bastides especials.
- Plataformes en voladís i moll de descàrrega escamotejables per a introducció i evacuació d'equips.
- Baranes perimetrals escamotejables per a treballs de manteniment en cobertes no transitables.
- Escales de gat amb enclavament d'accessos i equipament de Sistema de Protecció Col·lectiva.
- Replanteig d'ancoratges i sàgoles per a cinturons en façanes, xemeneies, finestres i patis.
- Replanteig de pescants escamotejables o bigues retràctils.
- Escala d'incendis i/o mànega tèxtil ignífuga d'evacuació.
- Altres.
- (\*) Tant sols en cas que estiguin contemplats en el Projecte Executiu.

Plànol d'evacuació interna d'accidentats (\*).

- Plànol de carrers per a evacuació d'accidentats en obres urbanes.
- Plànol de carreteres per a evacuació d'accidentats en obres aïllades.
- (\*) Tant sols per a obres complexes o especials.
- Altres.

### 3.4 EL "LLIBRE D'INCIDÈNCIES"

A l'obra existirà, adequadament protocolitzat, el document oficial "LLIBRE D'INCIDÈNCIES", facilitat per la Direcció d'Obra o Direcció Facultativa, visat pel Col·legi Professional corresponent (O. Departament de Treball 22 Gener de 1998 D.O.G.C. 2565 -27.1.1998).

Segons l'article 13 del Real Decret 1627/97 de 24 d'Octubre, aquest llibre haurà d'estar permanentment a l'obra, en poder del Coordinador de Seguretat i Salut, i a disposició de la Direcció d'Obra o Direcció Facultativa, Contractistes, Subcontractistes i Treballadors Autònoms, Tècnics dels Centres Provincials de Seguretat i Salut i del Vigilant (Supervisor) de Seguretat, o en el seu cas, del representant dels treballadors, els quals podran realitzar-li les anotacions que considerin adient respecte a les desviacions en el compliment del Pla de Seguretat i Salut, per a que el Contractista procedeixi a la seva notificació a l'Autoritat Laboral, en un termini inferior a 24 hores.

### **3.5 CARÀCTER VINCULANT DEL CONTRACTE O DOCUMENT DEL "CONVENI DE PREVENCIÓ I COORDINACIÓ" I DOCUMENTACIÓ CONTRACTUAL ANNEXA EN MATÈRIA DE SEGURETAT**

El CONVENI DE PREVENCIÓ I COORDINACIÓ subscrit entre el Promotor (o el seu representant), Contractista, Projectista, Coordinador de Seguretat, Direcció d'Obra o Direcció Facultativa i Representant Sindical Delegat de Prevenió, podrà ésser elevat a escriptura pública a requeriment de les parts atorgants del mateix, essent de compte exclusiva del Contractista totes les despeses notarial i fiscals que es derivin.

El Promotor podrà, prèvia notificació escrita al Contractista, assignar totes o part de les seves facultats assumides contractualment, a la persona física, jurídica o corporació que tingüés a bé designar a l'efecte, segons procedeixi.

Els terminis i provisions de la documentació contractual contemplada en l'apartat 2.1. del present Plec, junt amb els terminis i provisions de tots els documents aquí incorporats per referència, constitueixen l'acord ple i total entre les parts i no durà a terme cap acord o enteniment de cap naturalesa, ni el Promotor farà cap endossament o representacions al Contractista, excepte les que s'estableixin expressament mitjançant contracte. Cap modificació verbal als mateixos tindrà validesa o força o efecte algun.

El Promotor i el Contractista s'obligaran a si mateixos i als seus successors, representants legals i/o concessionaris, amb respecte al pactat en la documentació contractual vinculant en matèria de Seguretat. El Contractista no és agent o representant legal del Promotor, per la qual cosa aquest no serà responsable de cap manera de les obligacions o responsabilitats en què incorri o assumeixi el Contractista.

No es considerarà que alguna de les parts hagi renunciat a algun dret, poder o privilegi atorgat per qualsevol dels documents contractuals vinculants en matèria de Seguretat, o provisió dels mateixos, llevat que tal renúncia hagi estat degudament expressada per escrit i reconeguda per les parts afectades.

Tots els recursos o remeis brindats per la documentació contractual vinculant en matèria de Seguretat hauran de ser presos i interpretats com acumulatius, és a dir, addicionals a qualsevol altre recurs prescrit per la llei.

Les controvèrsies que puguin sorgir entre les parts, respecte a la interpretació de la documentació contractual vinculant en matèria de Seguretat, serà competència de la jurisdicció civil. No obstant, es consideraran actes jurídics separables els que es dicten en relació amb la preparació i adjudicació del Contracte i, en conseqüència, podran ser impugnats davant l'ordre jurisdiccional contenciós-administratiu d'acord amb la normativa reguladora de l'esmentada jurisdicció.

## **4 NORMATIVA LEGAL D'APLICACIÓ**

Per a la realització del Pla de Seguretat i Salut, el Contractista tindrà en compte la normativa existent i vigent en el decurs de la redacció de l'ESS (o EBSS), obligatòria o no, que pugui ésser d'aplicació.

A títol orientatiu, i sense caràcter limitatiu, s'adjunta una relació de normativa aplicable. El Contractista, no obstant, afegirà al llistat general de la normativa aplicable a la seva obra les esmenes de caràcter tècnic particular que no siguin a la relació i correspongui aplicar al seu Pla.

### **4.1 TEXTOS GENERALS**

- Convenis col·lectius.
- "Reglamento de seguridad e higiene en el trabajo en la industria de la construcción. OM 20 de mayo de 1952 (BOE 15 de junio de 1958)". Modificada per "Orden 10 de diciembre de 1953 (BOE 2 de febrero de 1956)" i "Orden 23 de de septiembre 1966 (BOE 1 de octubre de 1966)". Derogada parcialment per "Orden 20 de enero de 1956 (BOE 2 de febrero de 1956)" i "R.D. 2177/2004 (BOE 13 de noviembre de 2004)".
- "Ordenanza general de seguridad e higiene en el trabajo. OM 9 de marzo de 1971 (BOE 16 de marzo de 1971)", en vigor parts del títol II. Derogada parcialment per "R.D. 1316/1989 (BOE 2 de noviembre de 1989)", "Ley 31/1995 (BOE 10 de noviembre de 1995)", R.D. 486/1997 (BOE 23 de abril de 1997)", "R.D. 664/1997 (BOE 24 de mayo de 1997)", "R.D. 665/1997 (BOE 24 de mayo de 1997)", "R.D. 773/1997 (BOE 12 de junio de 1997)", "R.D. 1215/1997 (BOE 7 de agosto de 1997)", "R.D. 614/2001 (BOE 21 de junio de 2001)" i "R.D. 349/2003 (BOE 5 de abril de 2003)".
- "Regulación de la jornada de trabajo, jornadas especiales y descanso. R.D. 2001/1983 de 28 de julio (BOE 29 de julio de 1983)". Modificada per "R.D. 2403/1985 (BOE 30 de diciembre de 1985)", "R.D. 1346/1989 (BOE 7 de noviembre 1989)" i anul·lada parcialment per "R.D. 1561/1995 de 21 de septiembre (BOE 26 de septiembre de 1995)".
- "Orden de 20 de septiembre de 1986, por la que se establece el modelo de libro de incidencias correspondiente a las obras en las que sea obligatorio un estudio de Seguridad e Higiene en el trabajo (BOE de 13 de octubre de 1986)".
- "Establecimiento de modelos de notificación de accidentes de trabajo. OM 16 de diciembre de 1987 (BOE 29 de diciembre de 1987)".
- "Instrumento de ratificación de 17 de julio de 1990 del Convenio de 24 de junio de 1986 sobre Utilización del asbesto en condiciones de seguridad (número 162 de la OIT), adoptado en Ginebra (BOE de 23 de noviembre de 1990)".
- "Ley de prevención de riesgos laborales. Ley 31/1995 de noviembre (BOE 10 de noviembre de 1995)". Complementada per "R.D. 614/2001 de 8 de junio (BOE 21 de junio de 2001)".
- "Real Decreto 363/1995, de 10 de marzo, por la que se aprueba el reglamento sobre notificación de sustancias nuevas y clasificación, envasado y etiquetado de sustancias peligrosas (BOE de 5 de junio de 1995)".
- "Real Decreto 1561/1995, de 21 de septiembre, sobre jornadas especiales de trabajo (BOE de 26 de septiembre de 1995)".
- "Reglamento de los servicios de prevención. R.D. 39/1997 de 17 de enero (BOE 31 de enero de 1997)". Complementat per "Orden de 22 de abril de 1997 (BOE 24 de abril de 1997)" i "R.D. 688/2005 (BOE 11 de junio de 2006)". Modificado por "R.D. 780/1998 de 30 de abril (BOE 1 de mayo de 1998)", "R.D. 604/2006 (BOE 29 de mayo de 2006)", "R.D. 298/2009 (BOE 57 de marzo de 2009)", "R.D. 337/2010 (BOE 71 de marzo de 2010)", "R.D. 598/2015 (BOE 159 de junio de 2015)" y "R.D. 899/2015 (BOE 243 de octubre de 2015)".
- "Disposiciones mínimas de seguridad y salud en los lugares de trabajo. R.D. 486/1997 de 14 de abril de 1997 (BOE 23 de abril de 1997)". Complementat per "Orden TAS/2947/2007 (BOE 11 de octubre de 2007)" i modificat per "R.D. 2177/2004 (BOE 13 de noviembre de 2004)".
- "Disposiciones mínimas de seguridad y salud relativas a la manipulación manual de cargas que comporten riesgos, en particular dorsolumbares, para los trabajadores. R.D. 487/1997 de 14 de abril de 1997 (BOE 23 de abril de 1997)".
- "Disposiciones mínimas de seguridad y salud para la utilización por los trabajadores de los equipos de trabajo. R.D. 1215/1997 de 18 de julio (BOE 7 de agosto de 1997)".
- "Disposiciones mínimas destinadas a proteger la seguridad y la salud de los trabajadores en las actividades mineras. R.D. 1389/1997 de 5 de septiembre (BOE 7 de octubre de 1997)".
- "Disposiciones mínimas de seguridad y salud en las obras de construcción. R.D. 1627/1997 de 24 de octubre (BOE 25 de octubre de 1997)". Modificat per "R.D. 2177/2004 (BOE 13 de noviembre 2004)" i "R.D. 604/2006 (BOE 29 de mayo de 2006)". Complementat per "R.D. 1109/2007 (BOE 25 de agosto de 2007)".



Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

- Ordre de 12 de gener de 1998, per la qual s'aprova el model de Llibre d'Incidències en les obres de construcció (DOGC Diari Oficial de la Generalitat de Catalunya de 27 de gener de 1998).
- "Disposiciones mínimas de seguridad y salud en el trabajo en el ámbito de las empresas de trabajo temporal. R.D. 216/1999 de 5 de febrero (BOE 24 de febrero de 1999)".
- "Ley 38/1999, de 5 de noviembre, de Ordenación de la Edificación (BOE de 6 de noviembre de 1999)".
- "Protección de la seguridad y la salud de los trabajadores contra los riesgos relacionados con los agentes químicos durante el trabajo. R.D. 374/2001 de 6 de abril (BOE 1 de mayo de 2001)".
- "Real Decreto 379/2001, de 6 de abril, por el que se aprueba el Reglamento de almacenamiento de productos químicos y sus instrucciones técnicas complementarias MIE APQ-1, MIE APQ-2, MIE APQ-3, MIE APQ-4, MIE APQ-5, MIE APQ-6 y MIE APQ-7 (BOE 112 de 10 de mayo de 2001)". Complementat per "R.D. 2016/2004 (BOE 23 de octubre de 2004)".
- "Real Decreto 783/2001, de 6 de julio, por el que se aprueba el Reglamento sobre protección sanitaria contra radiaciones ionizantes (BOE de 26 de julio de 2001)".
- "Ley 54/2003, de 12 de diciembre, de reforma del marco normativo de la prevención de riesgos laborales (BOE de 13 de diciembre de 2003)".
- "Real Decreto 1801/2003, de 26 de diciembre, sobre seguridad general de los productos (BOE 10 de enero de 2004)".
- Real Decreto 171/2004, por el que se desarrolla el artículo 24 de la Ley 31/1995 de prevención de laborales, en materia de coordinación de actividades empresariales (BOE 31 de enero de 2004).
- Decret 399/2004, de 5 d'octubre de 2004, pel qual es crea el registre de delegats i delegades de prevenció i el registre de comitès de seguretat i salut, i es regula el dipòsit de les comunicacions de designació de delegats i delegades de prevenció i de constitució dels comitès de seguretat i salut (DOGC Diari Oficial de la Generalitat de Catalunya de 7 d'octubre de 2004).
- "Real Decreto 2177/2004, de 12 de noviembre, por el que se modifica el R.D. 1215/1997, de 18 de julio, en el que se establecen las disposiciones mínimas de seguridad y salud para la utilización por parte de los trabajadores de los equipos de trabajo, en materia de trabajos temporales en altura (BOE de 13 de noviembre de 2004)".
- "Real Decreto 1311/2005, de 4 de noviembre, sobre la protección de la salud y seguridad de los trabajadores frente a los riesgos derivados o que puedan derivarse de la exposición a vibraciones mecánicas".
- "Real Decreto 604/2006, de 19 de mayo, por el que se modifican el R.D. 39/1997, de 17 de enero, por el que se aprueba el Reglamento de los Servicios de Prevención, y el R.D. 1627/1997, de 24 de octubre, por el que se establecen las disposiciones mínimas de seguridad y salud en las obras de construcción (BOE 127 de 29 de mayo)".
- "Real Decreto 635/2006, de 26 de mayo, sobre requisitos mínimos de seguridad en los túneles de carreteras del Estado".
- "Ley ordinaria 32/2006 reguladora de la subcontratación en el Sector de la Construcción (BOE 250 de 19 de octubre)".
- "Real Decreto 1299/2006, de 10 de noviembre, por el que se aprueba el cuadro de enfermedades profesionales en el sistema de la Seguridad Social y se establecen criterios para su notificación y registro (BOE 302 de diciembre de 2006).
- "Ley orgánica 3/2007, de 22 de marzo, para la igualdad efectiva de mujeres y hombres (BOE 23 de marzo de 2007)".
- "RESOLUCIÓN, de 4 de octubre de 2007, de la Dirección General de Trabajo, por la que se registra y publica el IV Convenio colectivo general del sector de derivados del cemento (BOE 250 de octubre de 2007)".
- "Real Decreto 1109/2007, de 24 de agosto, por el que se desarrolla la Ley 32/2006, de 18 de octubre, reguladora de la subcontratación en el Sector de la Construcción (BOE 204 de 25 de agosto)".
- Decret 102/2008, de 6 de maig, de creació del Registre d'Empreses Acreditades de Catalunya per intervenir en el procés de contractació en el sector de la construcció (DOGC Diari Oficial de la Generalitat de Catalunya de 08 de maig de 2008).
- "Real Decreto 1802/2008, de 3 de noviembre, por el que se modifica el Reglamento sobre notificación de sustancias nuevas y clasificación, envasado y etiquetado de sustancias peligrosas, aprobado por R.D. 363/1995, de 10 de marzo, con la finalidad de adaptar sus disposiciones al Reglamento (CE) n.º 1907/2006 del Parlamento Europeo y del Consejo (Reglamento REACH)".
- Decret 10/2009, de 27 de gener. Decret de creació del Registre d'empreses sancionades per infraccions molt greus en matèria de prevenció de riscos laborals i del procediment per a la seva publicació (DOGC Diari Oficial de la Generalitat de Catalunya de 03 de febrer de 2009).
- "Real Decreto 298/2009, de 6 de marzo, por el que se modifica el Real Decreto 39/1997, de 17 de enero, por el que se aprueba el Reglamento de los Servicios de Prevención, en relación con la aplicación de medidas para promover la mejora de la seguridad y de la salud en el trabajo de la trabajadora embarazada, que haya dado a luz o en período de lactancia".
- "Real Decreto 330/2009, de 13 de marzo, por el que se modifica el Real Decreto 1311/2005, de 4 de noviembre, sobre la protección de la salud y la seguridad de los trabajadores frente a los riesgos derivados o que puedan derivarse de la exposición a vibraciones mecánicas".
- "Real Decreto 327/2009 de 13 de marzo, por el que se modifica el Real Decreto 1109/2007, de 24 de agosto, por el que se desarrolla la Ley 32/2006, de 18 de octubre, reguladora de la subcontratación en el sector de la construcción (BOE 63 de 14 de marzo de 2009)".
- "Instrumento de Ratificación del Convenio número 187 de la OIT, sobre el marco promocional para la seguridad y salud en el trabajo, hecho en Ginebra el 31 de mayo de 2006 (BOE 187 de 4 de agosto de 2009)".
- "Real Decreto 337/2010, de 19 de marzo, por el que se modifican el Real Decreto 39/1997, de 17 de enero, por el que se aprueba el Reglamento de los Servicios de Prevención; el Real Decreto 1109/2007, de 24 de agosto, por el que se desarrolla la Ley 32/2006, de 18 de octubre, reguladora de la subcontratación en el sector de la construcción y el Real Decreto 1627/1997, de 24 de octubre, por el que se establecen disposiciones mínimas de seguridad y salud en obras de construcción (BOE 71 de 23 de marzo de 2010)."
- "Reglamento (UE) nº 276/2010 de la Comisión, de 31 de marzo de 2010, por el que se modifica el Reglamento (CE) nº 1907/2006 del Parlamento Europeo y del Consejo, relativo al registro, la evaluación, la autorización y la restricción de las sustancias y preparados químicos (REACH), en lo que respecta a su anexo XVII (diclorometano, aceites para lámparas y líquidos encendedores de barbacoa y compuestos organoestánicos)."
- "Real Decreto 486/2010, de 23 de abril, sobre la protección de la salud y la seguridad de los trabajadores contra los riesgos relacionados con la exposición a radiaciones ópticas artificiales (BOE 99 de 24 de abril de 2010)."
- "Real Decreto 717/2010, de 28 de mayo, por el que se modifican el Real Decreto 363/1995, de 10 de marzo, por el que se aprueba el Reglamento sobre clasificación, envasado y etiquetado de sustancias peligrosas y el Real Decreto 255/2003, de 28 de febrero, por el que se aprueba el Reglamento sobre clasificación, envasado y etiquetado de preparados peligrosos (BOE 139 de 8 de junio de 2010)."
- "Real Decreto 795/2010, de 16 de junio, por el que se regula la comercialización y manipulación de gases fluorados y equipos basados en los mismos, así como la certificación de los profesionales que los utilizan (BOE 154 de 25 de junio de 2010)."
- "Real Decreto 1439/2010, de 5 de noviembre, por el que se modifica el Reglamento sobre protección sanitaria contra radiaciones ionizantes, aprobado por Real Decreto 783/2001, de 6 de julio (BOE 279 de 18 de noviembre de 2010)."
- "Real Decreto 843/2011, de 17 de junio, por el que se establecen los criterios básicos sobre la organización de recursos para desarrollar la actividad sanitaria de los servicios de prevención."



- "Ley 22/2011, de 28 de julio, de residuos y suelos contaminados."
- "Ley 33/2011, de 4 de octubre, General de Salud Pública."
- "Real Decreto Legislativo 3/2011, de 14 de noviembre, por el que se aprueba el texto refundido de la Ley de Contratos del Sector Público."
- "Real Decreto 842/2013, de 31 de octubre, por el que se aprueba la clasificación de los productos de construcción y de los elementos constructivos en función de sus propiedades de reacción y de resistencia frente al fuego".
- Real Decreto 97/2014, de 14 de febrero, por el que se regulan las operaciones de transporte de mercancías peligrosas por carretera en territorio español (BOE 50 de 27 de febrero)".

#### 4.2 CONDICIONS AMBIENTALS

- Ordre de 27 de juny de 1985, sobre inscripció d'empreses amb risc per amiant (DOGC Diari Oficial de la Generalitat de Catalunya de 05 d'agost de 1985).
- Ordre de 30 de juny de 1987, sobre registre de dades de control de l'ambient laboral i vigilància mèdica en empreses amb risc d'amiant (DOGC Diari Oficial de la Generalitat de Catalunya de 10 de juliol de 1987).
- "Real Decreto 108/1991, de 1 de febrero, sobre la prevención y reducción de la contaminación del medio ambiente producida por el amianto (BOE de 6 de febrero de 1991)".
- "Real Decreto 664/1997, de 12 de mayo, sobre la protección de los trabajadores contra los riesgos relacionados con la exposición a agentes biológicos durante el trabajo (BOE de 24 de mayo de 1997)". Modificat per "Orden de 25 de marzo de 1998".
- "Real Decreto 665/1997, de 12 de mayo, sobre la protección de los trabajadores contra los riesgos relacionados con la exposición a agentes cancerígenos durante el trabajo (BOE de 24 de mayo de 1997)". Modificat per "Real Decreto 1124/2000 (BOE de 17 de junio de 2000)" i "Real Decreto 349/2003 (BOE de 5 de abril de 2003)".
- "Real decreto 212/2002, de 22 de febrero de 2002, por el que se regulan las emisiones sonoras en el entorno debidas a determinadas máquinas de uso al aire libre (BOE de 1 de marzo de 2002)". Modificat per "Real Decreto 524/2006 (BOE de 4 de mayo de 2006)".
- "Real Decreto 681/2003, de 12 de junio, sobre la protección de la salud y la seguridad de los trabajadores expuestos a los riesgos derivados de atmósferas explosivas en el lugar de trabajo (BOE de 18 de junio de 2003).
- "Ley ordinaria 37/2003 del Ruido de 17 de noviembre (BOE de 18 noviembre de 2003)". Desenvolupada per "Real Decreto 1513/2005 (BOE de 17 de diciembre de 2005)" i "Real Decreto 1367/2007 (BOE de 23 de octubre 2007)".
- "Protección de los trabajadores ante los riesgos derivados de la exposición al ruido durante el trabajo. Real Decreto 286/2006, de 10 de marzo, sobre la protección de la salud y seguridad de los trabajadores contra los riesgos relacionados con la exposición al ruido. (BOE 11 de marzo de 2006)".
- "Real decreto 1367/2007, de 19 de octubre, por el que se desarrolla la Ley 37/2003, de 17 de noviembre, del Ruido, en lo referente a zonificación acústica, objetivos de calidad y emisiones acústicas (BOE de 23 de octubre de 2007)".
- "Ley 34/2007, de 15 de noviembre, de calidad del aire y protección de la atmósfera (BOE de 16 de noviembre de 2007)".

#### 4.3 INCENDIS

- Ordenances municipals.
- "Real Decreto 1942/1993, de 5 de noviembre, por el que se aprueba el Reglamento de Instalaciones de Protección Contra Incendios (RIPCI) (BOE de 14 de diciembre de 1993)". Complementat per "Orden de 16 de abril de 1998 (BOE de 28 de abril de 1998)" i "Orden de 27 de julio de 1999 (BOE de 5 de agosto de 1999)".
- Decret 64/1995, de 7 de març, pel qual s'estableixen mesures de prevenció d'incendis forestals (DOGC Diari Oficial de la Generalitat de Catalunya de 10 de març de 1995) i

desenvolupada per Ordre MAB/62/2003 (DOGC Diari Oficial de la Generalitat de Catalunya de 24 de Febrer de 2003).

- "Real decreto 110/2008, de 1 de febrero, por el que se modifica el Real Decreto 312/2005 de 18 de marzo, por el que se aprueba la clasificación de los productos de construcción y de los elementos constructivos en función de sus propiedades de reacción y de resistencia frente al fuego. BOE núm. 37 de 12 de febrero".

#### 4.4 INSTAL·LACIONS ELÈCTRIQUES

- "Reglamento de líneas aéreas de alta tensión. R.D. 3151/1968 de 28 de noviembre (BOE 27 de diciembre de 1968)". Rectificat: "BOE 8 de marzo de 1969". Es deroga amb efectes de 19 de setembre de 2010, per "R.D. 223/2008 (BOE 19 de marzo de 2008)".
- "Orden de 18 de julio de 1978, por la que se aprueba la Norma Tecnológica NTE-IEE/1978, "Instalaciones de electricidad: alumbrado exterior" (BOE de 12 de agosto de 1978)".
- Resolució de 4 de novembre de 1988, per la qual s'estableix un certificat sobre compliment de les distàncies reglamentàries d'obres i construccions a línies elèctriques (DOGC Diari Oficial de la Generalitat de Catalunya de 30 de novembre de 1988).
- "Ley 54/1997, de 27 de noviembre de 1997, del Sector Eléctrico (BOE de 28 de noviembre de 1997)". Complementada per "Real Decreto 1955/2000 (BOE de 27 de diciembre de 2000)".
- Llei 6/2001, de 31 de maig, d'ordenació ambiental de l'enllumenament per a la protecció del medi nocturn (DOGC Diari Oficial de la Generalitat de Catalunya de 12 de juny de 2001).
- "Real Decreto 614/2001, de 8 de junio, sobre disposiciones mínimas para la protección de la salud y seguridad de los trabajadores frente al riesgo eléctrico (BOE de 21 de junio de 2001)".
- Decret 329/2001, de 4 de desembre, pel qual s'aprova el Reglament del subministrament elèctric (DOGC Diari Oficial de la Generalitat de Catalunya de 18 de desembre de 2001).
- "Reglamento electrotécnico de baja tensión. R.D. 842/2002 de 2 de agosto (BOE de 18 de septiembre de 2002)".
- "Sentencia de 17 de febrero de 2004, de la Sala Tercera del Tribunal Supremo, por la que se anula el inciso 4.2.c.2 de la ITC-BT-03 anexa al Reglamento Electrónico para baja tensión, aprobado por Real Decreto 842/2002, de 2 de agosto".
- "Real decreto 223/2008, de 15 de febrero, del Ministerio de Industria, Turismo y Comercio por el que se aprueban el Reglamento sobre condiciones técnicas y garantías de seguridad en líneas eléctricas de alta tensión y sus instrucciones técnicas complementarias ITC-LAT 01 a 09 (BOE de 19 de marzo de 2008)".
- "Instrucciones Técnicas Complementarias del Reglamento electrotécnico de baja tensión: ITC-BT-09 Instalaciones de alumbrado exterior e ITC-BT-33 Instalaciones provisionales y temporales de obras".

#### 4.5 EQUIPS I MAQUINÀRIA

- "Orden de 30 de julio de 1974, por la que se determinan las condiciones que deben reunir los aparatos elevadores de propulsión hidráulica y las normas para la aprobación de sus equipos impulsores (BOE de 9 de agosto de 1974)".
- "Orden de 23 de mayo de 1977, por la que se aprueba el Reglamento de Aparatos Elevadores para obras (BOE de 14 de junio de 1977". Modificada per "Orden de 7 de marzo de 1981 (BOE de 14 de marzo de 1981)". Es deroga amb efectes de 29 de desembre de 2009, per "Real Decreto 1644/2008 (BOE de 11 de octubre de 2008)".
- "Reglamento de recipientes a presión. R.D. 1244/1979 de 4 de abril (BOE de 29 de mayo de 1979)". Modificat per "R.D. 507/1982 (BOE de 12 de marzo de 1982)" i "R.D. 1504/1990 (BOE de 28 de noviembre de 1990)".
- "Reglamento de aparatos de elevación y su mantenimiento. R.D. 2291/1985 de 8 de noviembre (BOE de 11 de diciembre de 1985)". Derogat parcialment per "R.D. 1314/1997 (BOE de 30 de septiembre de 1997)".



- "Real Decreto 474/1988, de 30 de marzo, por el que se dictan las disposiciones de aplicación de la Directiva del Consejo de las Comunidades Europeas 84/528/CEE sobre aparatos elevadores y de manejo mecánico (BOE de 20 de mayo de 1988)".
- "Real Decreto 1435/1992, de 27 de noviembre, por el que se dictan las disposiciones de aplicación de la Directiva del Consejo 89/392/CEE, relativa a la aproximación de las legislaciones de los estados miembros sobre maquinas (BOE de 11 de diciembre de 1992)". Modificat per "Real Decreto 56/1995 (BOE de 8 de febrero de 1995)". Es deroga amb efecte de 29 de desembre de 2009, per "Real Decreto 1644/2008 (BOE de 11 de octubre de 2008)".
- "Resolución de 3 abril de 1997, de la Dirección General de Tecnología y Seguridad Industrial por la que se autoriza la instalación de ascensores sin cuarto de máquinas (BOE de 23 de abril de 1997)".
- "Real Decreto 488/1997, de 14 de abril, sobre disposiciones mínimas de seguridad y salud relativas al trabajo con equipos que incluyen pantallas de visualización (BOE de 23 de abril de 1997)".
- "Disposiciones mínimas de seguridad y salud relativas a la utilización por los trabajadores de equipos de protección Individual. RD 773/1997 de 30 de mayo (BOE 12 de junio de 1997)".
- "Real Decreto 1215/1997, de 18 de julio por el que se establecen las disposiciones mínimas de seguridad y salud para la utilización por los trabajadores de los equipos de trabajo (BOE de 7 de agosto de 1997)". Modificat per "Real Decreto 2177/2004 (BOE de 13 de noviembre de 2004)".
- "Real Decreto 1314/1997, de 1 de agosto, por el que se dictan las disposiciones de aplicación de la Directiva del Parlamento Europeo y del Consejo 95/16/CE, sobre ascensores (BOE de 30 de septiembre de 1997)". Complementat per "Real Decreto 1644/2008 (BOE de 11 de octubre de 2008)".
- "Resolución de 10 de septiembre de 1998, de la Dirección General de Tecnología y Seguridad Industrial, por la que se autoriza la Instalación de ascensores con máquinas en foso (BOE de 25 septiembre de 1998)".
- "Real decreto 769/1999, de 7 de mayo, por el cual se dictan las disposiciones de aplicación de la Directiva del Parlamento Europeo y del Consejo, 97/23/CE, relativa a los equipos de presión, y se modifica el Real decreto 1244/1979, de 4 de abril, que aprobó el Reglamento de aparatos de presión (BOE de 31 de mayo de 1999)".
- "Real Decreto 1849/2000, de 10 de noviembre, del Reglamento de seguridad en las máquinas, por el que se derogan diferentes disposiciones en materia de normalización y homologación de productos industriales (BOE de 2 de diciembre de 2000)".
- "Real Decreto 2177/2004, de 12 de noviembre, por el que se modifica el Real Decreto 1215/1997, de 18 de julio, por el que se establecen las disposiciones mínimas de seguridad y salud para la utilización por los trabajadores de los equipos de trabajo, en materia de trabajos temporales en altura (BOE de 13 de noviembre de 2004)".
- "Real Decreto 1311/2005, de 4 de noviembre de 2005, sobre la protección de la salud y la seguridad de los trabajadores frente a los riesgos derivados o que puedan derivarse de la exposición a vibraciones mecánicas (BOE de 5 de noviembre de 2005)".
- "Real Decreto 1388/2011, de 14 de octubre, por el que se dictan las disposiciones de aplicación de la Directiva 2010/35/UE del Parlamento Europeo y del Consejo de 16 de junio de 2010 sobre equipos a presión transportables y por la que se derogan las Directivas 76/767/CEE, 84/525/CEE, 84/526/CEE, 84/527/CEE y 1999/36/CE."
- Instruccions Tècniques Complementaries:
  - "ITC – MIE - AP5 del Reglamento de Aparatos a Presión "Extintores de incendio" Orden de 31 de mayo de 1982 (BOE de 23 de junio de 1982)". Modificació: "Orden de 26 de octubre de 1983 (BOE de 7 de noviembre de 1983)", "Orden de 31 de mayo de 1985 (BOE de 20 de junio de 1985)", "Orden de 15 de noviembre de 1989 (BOE de 28 de noviembre de 1989)" i "Orden de 10 de marzo de 1998 (BOE de 28 de abril de 1998)".
  - "ITC – MIE – AEM1: Ascensores electromecánicos. OM 23 de septiembre de 1987 (BOE 6 de octubre de 1987)". Modificació: "Orden de 11 de octubre de 1988 (BOE 21 de octubre de 1988)". "Autorización de instalación de ascensores con máquina en foso. Resolución de 10 de septiembre de 1998 (BOE 25 de septiembre de 1998)".
  - "Autorización de la instalación de ascensores sin cuarto de máquinas. Resolución de 3 de abril de 1997 (BOE de 23 de abril de 1997)".
  - "ITC – MIE – AEM2: Grúas torre desmontables para obras. RD 836/2003 de 27 de mayo de 2003 (BOE 17 de julio de 2003)".
  - "ITC – MIE – AEM3: Carretas automotrices de manutención. OM. 26 de mayo de 1989 (BOE 9 de junio de 1989)".
  - "ITC – MIE – AEM4: Reglamento de aparatos de elevación y manutención, referentes a grúas móviles autopropulsadas. RD 837/2003 de 27 de mayo de 2003 (BOE 17 de julio de 2003)".
  - "ITC - MIE - MSG1: Máquinas, elementos de máquinas o sistemas de protección utilizados. OM. 8 de abril de 1991 (BOE 11 de abril de 1991)".
  - "Norma UNE-58921-IN Instrucciones para la instalación, manejo, mantenimiento, revisiones e inspecciones de las plataformas elevadoras móviles de personal (PEMP)".

#### 4.6 EQUIPS DE PROTECCIÓ INDIVIDUAL

- "Comercialización y libre circulación intracomunitaria de los equipos de protección individual. R.D. 1407/1992 de 20 de noviembre (BOE 28 de diciembre de 1992)". Modificat per "OM de 16 de mayo de 1994", per "R.D. 159/1995 de 3 de febrero (BOE 8 de marzo de 1995)" i per la "Resolución de 27 de mayo de 2002 (BOE 4 de julio de 2002)". Complementat per la "Resolución de 25 de abril de 1996 (BOE de 28 de mayo de 1996)", "Resolución de 18 de marzo de 1998 (BOE de 22 de abril de 1998)", "Resolución de 29 de abril de 1999 (BOE de 29 de junio de 1999)", "Resolución de 28 de julio de 2000 (BOE de 8 de septiembre de 2000)" i "Resolución de 7 de septiembre de 2001 (BOE de 27 de septiembre de 2001)".
- "Real Decreto 159/1995, de 3 de febrero , por el que se modifica el Real Decreto 1407/1992, de 20 de noviembre, por el que se regula las condiciones para la comercialización y libre circulación intracomunitaria de los equipos de protección individual (BOE de 8 de marzo de 1995) modificado por Orden de 20 de febrero de 1997 (BOE de 6 de marzo de 1997)".
- "R.D. 773/1997 de 30 de mayo, sobre disposiciones mínimas de seguridad y salud relativas a la utilización por los trabajadores de equipos de protección individual".
- "Decisión de la Comisión, de 16 de marzo de 2006, relativa a la publicación de las referencias de la norma EN 143:2000, Equipos de protección respiratoria. Filtros contra partículas. Requisitos, ensayos, marcado, de conformidad con la Directiva 89/686/CEE del Consejo (equipos de protección individual) [notificada con el número C(2006) 777]".
- Normes Tècniques Reglamentàries.

#### 4.7 SENYALITZACIÓ

- "Disposiciones mínimas en materia de señalización de seguridad y salud en el trabajo. R.D. 485/1997 (BOE 23 de abril de 1997)".
- "Orden de 31 de agosto de 1987 sobre Señalización, balizamiento, defensa, limpieza y terminación de obras fijas en vías fuera de poblado (BOE de 18 de septiembre de 1987)".
- Normes sobre senyalització d'obres en carreteres. "Instrucción 8.3. IC" del Ministeri de Foment.

#### 4.8 DIVERSOS

- "Orden de 20 de marzo de 1986 por la que se aprueban determinadas Instrucciones técnicas complementarias, relativas a los capítulos IV, V, IX y X del Reglamento General de Normas Básicas de Seguridad Minera (BOE de 11 de abril de 1986)". Modificada per "Orden de 29 de abril de 1987 (BOE de 13 de mayo de 1987)" i "Orden de 29 de julio de 1994 (BOE de 16 de agosto de 1994)".

- "Orden de 20 de junio de 1986 sobre Catalogación y Homologación de los explosivos, productos explosivos y sus accesorios (BOE de 1 de julio de 1986)".
- "Real Decreto 230/1998, de 16 de febrero, por el que se aprueba el Reglamento de explosivos (BOE de 12 de marzo de 1998)". Modificat per "Real Decreto 277/2005 (BOE de 12 de marzo de 2005)" i "Orden INT/3543/2007 (BOE núm. 292 de 6 de diciembre de 2007)". Complementada per la "Resolución de 24 de agosto de 2005 (BOE de 13 de septiembre de 2005)", "Orden PRE/252/2006 (BOE de 9 de febrero de 2006)", "Orden PRE/672/2006 (BOE de 11 de marzo de 2006)" i "Orden PRE/174/2007 (BOE de 3 de febrero de 2007)".
- "Orden de 16 de diciembre de 1987 por la que se establecen nuevos modelos para la notificación de accidentes de trabajo y se dan instrucciones para su cumplimentación y tramitación (BOE de 29 de diciembre de 1987)". Modificada per "Orden TAS/2926/2002 (BOE de 21 de noviembre de 2002)".
- "Real Decreto 1299/2006, de 10 de noviembre por el que se aprueba el cuadro de enfermedades profesionales en el sistema de la Seguridad Social y se establecen criterios para su notificación y registro (BOE de 19 de diciembre de 2006)". Complementat per "Orden TAS/1/2007 (BOE de 4 de enero de 2007)".
- "Resolución de 1 de agosto de 2007, de la Dirección General de Trabajo, por la que se inscribe en el registro y publica el IV Convenio Colectivo General del Sector de la Construcción (BOE de 17 de agosto de 2007)".
- Convenis col·lectius.
- "Real Decreto 1591/2009, de 16 de octubre, por el que se regulan los productos sanitarios (BOE 268 de 6 de noviembre de 2009)."
- "Real Decreto 248/2010, de 5 de marzo, por el que se modifica el Reglamento de explosivos, aprobados por Real Decreto 230/1998, de 16 de febrero, para adaptarlo a lo dispuesto en la Ley 17/2009, de 23 de noviembre, sobre el libre acceso a las actividades de servicios y su ejercicio (BOE 67 de 18 de marzo de 2010)."
- Orden TIN/1071/2010, de 27 de abril, sobre los requisitos y datos que deben reunir las comunicaciones de apertura o de reanudación de actividades en los centros de trabajo (BOE 106 de 1 de mayo de 2010).

## 5 CONDICIONES ECONÓMICAS

### 5.1 CRITERIS D'APLICACIÓ

L' Art. 5, 4 del R.D. 1627 / 1997, de 24 d'octubre manté, per al sector de la construcció, la necessitat d'estimar l'aplicació de la Seguretat i Salut com un cost "afegit" a l'Estudi de Seguretat i Salut, i per conseqüent, incorporat al Projecte.

El pressupost per a l'aplicació i execució de l'estudi de Seguretat i Salut haurà de quantificar el conjunt de "despeses" previstes, tant pel que es refereix a la suma total com a la valoració unitària d'elements, amb referència al quadre de preus sobre el que es calcula. Només podran figurar partides alçades en els casos d'elements o operacions de difícil previsió.

Els amidaments, qualitats i valoració recollides en el pressupost de l'Estudi de Seguretat i Salut podran ser modificades o substituïdes per alternatives proposades pel Contractista en el seu Pla de Seguretat i Salut, prèvia justificació tècnica degudament motivada, sempre que això no suposi una disminució de l'import total ni dels nivells de protecció continguts en l'Estudi de Seguretat i Salut. A aquests efectes, el pressupost del E.S.S. haurà d'anar incorporant al pressupost general de l'obra com un capítol més del mateix.

La tendència a integrar la Seguretat i Salut (pressupost de Seguretat i Salut = 0), es contempla en el mateix cos legal quan el legislador indica que no s'inclouran en el pressupost de l'Estudi de Seguretat i Salut els costos exigits per la correcta execució professional dels treballs, conforme a

les normes reglamentàries en vigor i els criteris tècnics generalment admesos, emanats dels organismes especialitzats. Aquest criteri és l'aplicat en el present E.S.S. en l'apartat relatiu a Medis Auxiliars d'Utilitat Preventiva (MAUP).

### 5.2 CERTIFICACIÓ DEL PRESSUPOST DEL PLA DE SEGURETAT I SALUT

Si bé el Pressupost de Seguretat, amb criteris de "Seguretat Integrada" hauria d'estar inclòs en les partides del Projecte, de forma no segregable, per les obres de Construcció, es precisa l'establiment d'un criteri respecte a la certificació de les partides contemplades en el pressupost del Pla de Seguretat i Salut del Contractista per cada obra.

El pressupost de seguretat i salut s'abonarà d'acord amb el que indiqui el corresponent contracte d'obra.

### 5.3 REVISIÓ DE PREUS DEL PLA DE SEGURETAT I SALUT

Els preus aprovats pel Coordinador de Seguretat i Salut continguts en el Pla de Seguretat i Salut del Contractista, es mantindrà durant la totalitat de l'execució material de les obres.

Excepcionalment, quan el contracte s'hagi executat en un 20% i transcorregut com a mínim un any des de la seva adjudicació, podrà contemplar-se la possibilitat de revisió de preus del pressupost de Seguretat, mitjançant els índexs o fórmules de caràcter oficial que determini l'òrgan de contractació, en els terminis contemplats en el Títol IV del R.D. Legislatiu 2 / 2002, de 16 de juny, pel que s'aprova el text refós de la Llei de Contractes de les Administracions Públiques.

### 5.4 PENALITZACIONS PER INCOMPLIMENT EN MATÈRIA DE SEGURETAT

La reiteració d'incompliments en l'aplicació dels compromisos adquirits en el Pla de Seguretat i Salut, a criteri per unanimitat del Coordinador de Seguretat i Salut i dels restants components de la Direcció d'Obra o Direcció Facultativa, per acció u omissió del personal propi i/o Subcontractistes i Treballadors Autònoms contractats per ell, duran aparellats conseqüentment per el Contractista, les següents Penalitzacions:

1.-	MOLT LLEU	:	3% del Benefici Industrial de l'obra contractada
2.-	LLEU	:	20% del Benefici Industrial de l'obra contractada
3.-	GREU	:	75% del Benefici Industrial de l'obra contractada
4.-	MOLT GREU	:	75% del Benefici Industrial de l'obra contractada
5.-	GRAVÍSSIM	:	Paralització dels treballadors +100% del Benefici Industrial de l'obra contractada + Pèrdua d'homologació com Contractista, per la mateixa Propietat, durant 2 anys.

## 6 CONDICIONS TÈCNIQUES GENERALS DE SEGURETAT

### 6.1 PREVISIONS DEL CONTRACTISTA A L'APLICACIÓ DE LES TÈCNIQUES DE SEGURETAT

La Prevenció de la Sinistralitat Laboral pretén aconseguir uns objectius concrets, en el nostre cas, detectar i corregir els riscos d'accidents laborals.

El Contractista Principal haurà de reflectir al seu Pla de Seguretat i Salut la manera concreta de desenvolupar les Tècniques de Seguretat i Salut i com les aplicarà en aquesta obra. Tot seguit s'anomenen a títol orientatiu una sèrie de descripcions de les diferents Tècniques Analítiques i Operatives de Seguretat:



#### • Tècniques analítiques de seguretat

Les Tècniques Analítiques de Seguretat i Salut tenen com a objectiu exclusiu la detecció de riscos i la recerca de les causes.

##### Prèvies als accidents:

- Inspeccions de seguretat.
- Anàlisi de treball.
- Anàlisi Estadística de la sinistralitat.
- Anàlisi del entorn de treball.

##### Posteriors als accidents:

- Notificació d'accidents.
- Registre d'accidents
- Investigació Tècnica d'Accidents.

#### • Tècniques operatives de seguretat.

Les Tècniques Operatives de Seguretat i Salut pretenen eliminar les Causes i a través d'aquestes corregir el Risc.

Segons que l'objectiu de l'acció correctora hagi d'operar sobre la conducta humana o sobre els factors perillosos mesurats, el Contractista haurà de demostrar al seu Pla de Seguretat i Salut i Higiene que té desenvolupat un sistema d'aplicació de Tècniques Operatives sobre

##### El Factor Tècnic:

- Sistemes de Seguretat
- Proteccions col·lectives i Resguards
- Manteniment Preventiu
- Proteccions Personals
- Normes
- Senyalització

##### El Factor Humà:

- Test de Selecció prelaboral del personal.
- Reconeixements Mèdics prelaborals.
- Formació
- Aprenentatge
- Propaganda
- Acció de grup
- Disciplina
- Incentius

### **6.2 CONDICIONS TÈCNIQUES DEL CONTROL DE QUALITAT DE LA PREVENCIÓ**

El Contractista inclourà a les Empreses Subcontractades i treballadors Autònoms, lligats amb ell contractualment, en el desenvolupament del seu Pla de Seguretat i Salut; haurà d'incloure els documents tipus en el seu format real, així com els procediments de complimentació fets servir a la seva estructura empresarial, per a controlar la qualitat de la Prevenció de la Sinistralitat Laboral. Aportem al present Estudi de Seguretat, a títol de guia, l'enunciat dels més importants:

- Programa implantat a l'empresa, de Qualitat Total o el reglamentari Pla d'Acció Preventiva.
- Programa Bàsic de Formació Preventiva estandarditzat pel Contractista Principal.
- Formats documentals i procediments de complimentació, integrats a l'estructura de gestió empresarial, relatius al Control Administratiu de la Prevenció.

- Comitè i/o Comissions vinculats a la Prevenció.
- Documents vinculants, actes i/o memoràndums.
- Manuals i/o Procediments Segurs de Treball, d'ordre intern d'empresa.
- Control de Qualitat de Seguretat del Producte.

### **6.3 CONDICIONS TÈCNIQUES DELS ÒRGANS DE L'EMPRESA CONTRACTISTA COMPETENTS EN MATÈRIA DE SEGURETAT I SALUT**

El comitè o les persones encarregades de la promoció, coordinació i vigilància de la Seguretat i Salut de l'obra seran, com a mínim, els establerts per la normativa vigent per al cas concret de l'obra de referència, assenyalant-se específicament al Pla de Seguretat, la seva relació amb l'organigrama general de Seguretat i Salut de l'empresa adjudicatària de les obres.

El Contractista acreditarà l'existència d'un Servei Tècnic de Seguretat i Salut (propi o concertat) com a departament staff depenent de l'Alta Direcció de l'Empresa Contractista, dotat dels recursos, medis i qualificació necessària conforme al R.D. 39 /1997 "Reglamento de los Servicios de Prevención". En tot cas el constructor comptarà amb l'ajut del Departament Tècnic de Seguretat i Salut de la Mútua d'Accidents de Treball amb la que tingui establerta pòlissa.

El Coordinador de Seguretat i Salut podrà vedar la participació en aquesta obra del Delegat Sindical de Prevenció que no reuneixi, al seu criteri, la capacitació tècnica preventiva pel correcte compliment de la seva important missió.

L'empresari Contractista, com a màxim responsable de la Seguretat i Salut de la seva empresa, haurà de fixar els àmbits de competència funcional dels Delegats Sindicals de Prevenció en aquesta obra.

L'obra disposarà de Tècnic de Seguretat i Salut (propi o concertat) a temps parcial, que assessorarà als responsables tècnics (i consegüentment de seguretat) de l'empresa constructora en matèria preventiva, així com una Brigada de reposició i manteniment de les proteccions de seguretat, amb indicació de la seva composició i temps de dedicació a aquestes funcions.

### **6.4 OBLIGACIONS DE L'EMPRESA CONTRACTISTA COMPETENT EN MATÈRIA DE MEDICINA DEL TREBALL**

El Servei de Medicina del Treball integrat en el Servei de Prevenció, o en el seu cas, el Quadre Facultatiu competent, d'acord amb la reglamentació oficial, serà l'encarregat de vetllar per les condicions higièniques que haurà de reunir el centre de treball.

Respecte a les instal·lacions mèdiques a l'obra existirà com a mínim una farmaciola d'urgència, que estarà degudament assenyalada i contindrà allò disposat a la normativa vigent i es revisarà periòdicament el control d'existències.

Al Pla de Seguretat i Salut i Higiene el contractista principal desenvoluparà l'organigrama, així com les funcions i competències de la seva estructura en Medicina Preventiva.

Tot el personal de l'obra (Propi, Subcontractat o Autònom), amb independència del termini de durada de les condicions particulars de la seva contractació, haurà d'haver passat un reconeixement mèdic d'ingrés i estar classificat d'acord amb les seves condicions psicofísiques.

Independentment del reconeixement d'ingrés, s'haurà de fer a tots els treballadors del Centre de Treball (propis i Subcontractats), segons ve assenyalat a la vigent reglamentació al respecte, com a mínim un reconeixement periòdic anual.

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Paral·lelament l'equip mèdic del Servei de Prevenció de l'empresa (Propi, Mancomunat, o assistit per Mútua d'Accidents) haurà d'establir al Pla de Seguretat i Salut un programa d'actuació cronològica a les matèries de la seva competència:

- Higiene i Prevenció al treball.
- Medicina preventiva dels treballadors.
- Assistència Mèdica.
- Educació sanitària i preventiva dels treballadors.
- Participació en comitè de Seguretat i Salut.
- Organització i posta al dia del fitxer i arxiu de medicina d'Empresa.

### 6.5 COMPETÈNCIES DELS COL·LABORADORS PREVENCIONISTES A L'OBRA

D'acord amb les necessitats de disposar d'un interlocutor alternatiu en absència del Cap d'Obra es nomenarà un Supervisor de Seguretat i Salut (equivalent a l'antic Vigilant de Seguretat), considerant-se en principi l'Encarregat General de l'obra, com a persona més adient per a complir-ho, en absència d'un altre treballador més qualificat en aquests treballs a criteri del Contractista. El seu nomenament es formalitzarà per escrit i es notificarà al Coordinador de Seguretat.

S'anomenarà un Socorrista, preferiblement amb coneixements en Primers Auxilis, amb la missió de realitzar petites cures i organitzar l'evacuació dels accidentats als centres assistencials que correspongui que a més a més serà l'encarregat del control de la dotació de la farmaciola.

A efectes pràctics, i amb independència del Comitè de Seguretat i Salut, si la importància de l'obra ho aconsella, es constituirà a peu d'obra una "Comissió Tècnica Interempresarial de Responsables de Seguretat", integrat pels màxims Responsables Tècnics de les Empreses participants a cada fase d'obra, aquesta "comissió" es reunirà com a mínim mensualment, i serà presidida pel Cap d'Obra del Contractista, amb l'assessorament del seu Servei de Prevenció (propri o concertat).

### 6.6 COMPETÈNCIES DE FORMACIÓ EN SEGURETAT A L'OBRA

El Contractista haurà d'establir al Pla de Seguretat i Salut un programa d'actuació que reflecteixi un sistema d'entrenament inicial bàsic de tots els treballadors nous. El mateix criteri es seguirà si són traslladats a un nou lloc de treball, o ingressin com a operadors de màquines, vehicles o aparells d'elevació.

S'efectuarà entre el personal la formació adequada per assegurar el correcte ús dels medis posats al seu abast per millorar el seu rendiment, qualitat i seguretat del seu treball.

## 7 PLEC DE CONDICIONS TÈCNIQUES ESPECÍFIQUES DE SEGURETAT DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES

### 7.1 DEFINICIÓ I CARACTERÍSTIQUES DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES

#### • Definició

És un conjunt de peces o òrgans units entre si, dels quals un al menys és mòbil i, en el seu cas, d'òrgans d'accionament, circuits de comandament i de potència, etc., associats de forma solidària per a una aplicació determinada, en particular destinada a la transformació, tractament, desplaçament i accionament d'un material.

El terme equip i/o màquina també cobreix:

- Un conjunt de màquines que estiguin disposades i siguin accionades per a funcionar solidàriament.
- Un mateix equip intercanviable, que modifiqui la funció d'una màquina, que es comercialitza en condicions que permetin al propi operador, acoblar a una màquina, a una sèrie d'elles o a un tractor, sempre que aquest equip no sigui una peça de recanvi o una ferramenta.

Quan l'equip, màquina i/o màquina ferramenta disposi de components de seguretat que es comercialitzin per separat per a garantir una funció de seguretat en el seu ús normal, aquests adquireixen als efectes del present Estudi de Seguretat i Salut la consideració de Mitjà Auxiliar d'Utilitat Preventiva (MAUP).

#### • Característiques

Els equips de treball i màquines aniran acompanyats d'unes instruccions d'utilització, esteses pel fabricant o importador, en les quals figuraran les especificacions de manutenció, instal·lació i utilització, així com les normes de seguretat i qualsevol altra instrucció que de forma específica siguin exigides en les corresponents Instruccions Tècniques Complementàries (ITC), les quals inclouran els plànols i esquemes necessaris per al manteniment i verificació tècnica, estant ajustats a les normes UNE que li siguin d'aplicació. Portaran a més a més, una placa de material durador i fixada amb solidesa en lloc ben visible, en la qual figuraran, com a mínim, les següents dades:

- Nom del fabricant.
- Any de fabricació, importació i/o subministrament.
- Tipus i número de fabricació.
- Potència en Kw.
- Contrasenya d'homologació CE i certificat de seguretat d'ús d'entitat acreditada, si procedeix.

### 7.2 CONDICIONS D'ELECCIÓ, UTILITZACIÓ, EMMAGATZEMATGE I MANTENIMENT DELS EQUIPS, MÀQUINES I/O MÀQUINES-FERRAMENTES

#### • Elecció d'un Equip

Els Equips, Màquines i/o Màquines Ferramentes hauran de seleccionar-se en base a uns criteris de garanties de Seguretat per als seus operadors i respecte al seu Medi Ambient de Treball.

#### • Condicions d'utilització dels Equips, Màquines i/o Màquines ferramentes

Són les contemplades en l'Annex II del R.D. 1215/97, de 18 de juliol sobre "Disposicions mínimes de Seguretat i Salut per a la utilització pels treballadors dels Equips de treball":

#### • Emmagatzematge i manteniment

- Se seguiran escrupolosament les recomanacions d'emmagatzematge i esment, fixats pel fabricant i contingudes en la seva "Guia de manteniment preventiu".
- Es reemplaçaran els elements, es netejaran, engreixaran, pintaran, ajustaran i es col·locaran en el lloc assignat, seguint les instruccions del fabricant.
- S'emmagatzemaran en compartiments amplis i secs, amb temperatures compreses entre 15 i 25°C.
- L'emmagatzematge, control d'estat d'utilització i els lliuraments d'Equips estaran documentades i custodiades, amb justificació de recepció de conformitat, lliurament i rebut, per un responsable tècnic, delegat per l'usuari.

### 7.3 **NORMATIVA APLICABLE**

- **Directives comunitàries relatives a la seguretat de les màquines, transposicions i dates d'entrada en vigor**

Sobre comercialització i/o posada en servei en la Unió Europea

#### Directiva fonamental

- Directiva del Consell 89/392/CEE, de 14/06/89, relativa a l'aproximació de les legislacions dels Estats membres sobre màquines (D.O.C.E. Núm. L 183, de 29/6/89), modificada per les Directives del Consell 91/368/CEE, de 20/6/91 (D.O.C.E. Núm. L 198, de 22/7/91), 93/44/CEE, de 14/6/93 (D.O.C.E. Núm. L 175, de 19/7/93) i 93/68/CEE, de 22/7/93 (D.O.C.E. Núm. L 220, de 30/8/93). Aquestes 4 directives s'han codificat en un sol text mitjançant la Directiva 98/37/CE (D.O.C.E. Núm. L 207, de 23/7/98).  
Transposada pel Reial Decret 1435/1992, de 27 de novembre (B.O.E. d'11/12/92), modificat pel Reial Decret 56/1995, de 20 de gener (B.O.E. de 8/2/95).  
Entrada en vigor del R.D. 1435/1992: l'1/1/93, amb període transitori fins l'1/1/95.  
Entrada en vigor del R.D. 56/1995: el 9/2/95.

#### Excepcions:

- Carretons automotors de manutenció: l'1/7/95, amb període transitori fins l'1/1/96.
- Màquines per a elevació o desplaçament de persones: el 9/2/95, amb període transitori fins l'1/1/97.
- Components de seguretat (inclou ROPS i FOPS, vegeu la Comunicació de la Comissió 94/C253/03 -D.O.C.E. ISP C253, de 10/9/94): el 9/2/95, amb període transitori fins l'1/1/97.
- Marcat: el 9/2/95, amb període transitori fins l'1/1/97.

#### Altres Directives

- Directiva del Consell 73/23/CEE, de 19/2/73, relativa a l'aproximació de les legislacions dels Estats membres sobre el material elèctric destinat a utilitzar-se amb determinats límits de tensió (D.O.C.E. Núm. L 77, de 26/3/73), modificada per la Directiva del Consell 93/68/CEE.  
Transposada pel Reial Decret 7/1988, de 8 de gener (B.O.E. de 14/1/88), modificat pel Reial Decret 154/1995 de 3 de febrer (B.O.E. de 3/3/95).  
Entrada en vigor del R.D. 7/1988: l'1/12/88.  
Entrada en vigor del R.D. 154/1995: el 4/3/95, amb període transitori fins l'1/1/97.  
A aquest respecte veure també la Resolució d'11/6/98 de la Direcció General de Tecnologia i Seguretat Industrial (B.O.E. de 13/7/98).
- Directiva del Consell 87/404/CEE, de 25/6/87, relativa a l'aproximació de les legislacions dels Estats membres sobre recipients a pressió simple (D.O.C.E. Núm. L 270 de 8/8/87), modificada per les Directives del Consell 90/488/CEE, de 17/9/90 (D.O.C.E. Núm. L 270 de 2/10/90) i 93/68/CEE.  
Transposades pel Reial Decret 1495/1991, d'11 d'octubre (B.O.E. de 15/10/91), modificat pel Reial Decret 2486/1994, de 23 de desembre (B.O.E. de 24/1/95).  
Entrada en vigor del R.D. 1495/1991: el 16/10/91.  
Entrada en vigor del R.D. 2486/1994: l'1/1/95 amb període transitori fins l'1/1/97.
- Directiva del Consell 89/336/CEE, de 3/5/89, relativa a l'aproximació de les legislacions dels Estats membres sobre comptabilitat electromagnètica (D.O.C.E. Núm. L 139, de 23/5/89), modificada per les Directives del Consell 93/68/CEE i 93/97/CEE, de 29/10/93 (D.O.C.E. Núm. L 290, de 24/11/93); 92/31/CEE, de 28/4/92 (D.O.C.E. Núm. L 126, de 12/5/92); 99/5/CE, de 9/3/99 (D.O.C.E. Núm. L 091, de 7/4/1999).

Transposades pel Reial Decret 444/1994, d'11 de març (B.O.E. d'1/4/94), modificat pel Reial Decret 1950/1995, d'1 de desembre (B.O.E. de 28/12/95) i Ordre Ministerial de 26/3/96 (B.O.E. de 3/4/96).

Entrada en vigor del R.D. 444/1994: el 2/4/94 amb període transitori fins l'1/1/96.  
Entrada en vigor del R.D. 1950/1995: el 29/12/95. Entrada en vigor de l'Ordre de 26/03/1996: el 4/4/96.

- Directiva del Consell 90/396/CEE, de 29/6/90, relativa a l'aproximació de les legislacions dels Estats membres sobre aparells de gas (D.O.C.E. Núm. L 196, de 26/7/90), modificada per la Directiva del Consell 93/68/CEE.  
Transposada pel Reial Decret 1428/1992, de 27 de novembre (B.O.E. de 5/12/92), modificat pel Reial Decret 276/1995, de 24 de febrer (B.O.E. de 27/3/95).  
Entrada en vigor del R.D. 1428/1992: el 25/12/92 amb període transitori fins l'1/1/96.  
Entrada en vigor del R.D. 276/1995: el 28/3/95.
- Directiva del Parlament Europeu i del Consell 94/9/CE, de 23/3/94, relativa a l'aproximació de legislacions dels Estats membres sobre els aparells i sistemes de protecció per a ús en atmosferes potencialment explosives (D.O.C.E. Núm. L 100, de 19/4/94).  
Transposada pel Reial Decret 400/1996, d'1 de març (B.O.E. de 8/4/96).  
Entrada en vigor: l'1/3/96 amb període transitori fins l'1/7/03.
- Directiva del Parlament Europeu i del Consell 97/23/CE, de 29/5/97, relativa a l'aproximació de les legislacions dels Estats membres sobre equips a pressió (D.O.C.E. Núm. L 181, de 9/7/97).  
Entrada en vigor: 29/11/99 amb període transitori fins el 30/5/02.
- Onze Directives, amb les seves corresponents modificacions i adaptacions al progrés tècnic, relatives a l'aproximació de les legislacions dels Estats membres sobre determinació de l'emissió sonora de màquines i materials utilitzats en les obres de construcció.  
Transposades pel Reial Decret 212/2002, de 22 de febrer (B.O.E. d'1/3/02); Ordre Ministerial de 18/7/1991 (B.O.E. de 26/7/91), Reial Decret 71/1992, de 31 de gener (B.O.E. de 6/2/92) i Ordre Ministerial de 29/3/1996 (B.O.E. de 12/4/96).  
Entrada en vigor: En funció de cada directiva.

Sobre utilització de màquines i equips per al treball:

- Directiva del Consell 89/655/CEE, de 30/11/89, relativa a les disposicions mínimes de seguretat i de salut per a la utilització dels treballadors en el treball dels equips de treball (D.O.C.E. Núm. L 393, de 30/12/89), modificada per la Directiva del Consell 95/63/CE, de 5/12/95 (D.O.C.E. Núm. L 335/28, de 30/12/95).  
Transposades pel Reial Decret 1215/1997, de 18 de juliol (B.O.E. de 7/8/97).  
Entrada en vigor: el 27/8/97 excepte per l'apartat 2 de l'Annex I i els apartats 2 i 3 de l'Annex II, que entren en vigor el 5/12/98.

- **Normativa d'aplicació restringida**

- Reial Decret 1849/2000, de 10 de Novembre, pel qual es deroguen diferents disposicions en matèria de normalització i homologació de productes industrials (B.O.E. de 2/12/2000), i Ordre Ministerial de 8/4/1991, per la qual s'aprova la Instrucció Tècnica Complementària MSG-SM-1 del Reglament de Seguretat de les Màquines, referent a màquines, elements de màquines o sistemes de protecció, usats (B.O.E. d'11/5/91).
- Ordre Ministerial, de 26/5/1989, per la qual s'aprova la Instrucció Tècnica Complementària MIE-AEM-3 del Reglament d'Aparells d'Elevació i Manutenció referent a Carretons automotors de manutenció (B.O.E. de 9/6/89).
- Reial Decret 836/2003, de 27 de juny, per la qual s'aprova la nova Instrucció Tècnica Complementària MIE-AEM-2 del Reglament d'Aparells d'elevació i Manutenció, referent a Grues Torre desmuntables per a obres (B.O.E. de 17/7/03).
- Reial Decret 837/2003, de 27 de juny, pel qual s'aprova el nou text modificat i refós de la Instrucció Tècnica Complementària MIE-AEM-4 del Reglament d'Aparells d'elevació i Manutenció, referent a Grues mòbils autopropulsades usades (B.O.E. de 17/7/03).

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

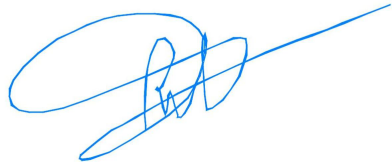
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- Reial Decret 1849/2000, de 10 de novembre, pel qual es deroguen diferents disposicions en matèria de normalització i homologació de productes industrials (B.O.E. de 2/12/00).
- Ordre Ministerial, de 9/3/1971, per la qual s'aprova l'Ordenança General de Seguretat i Higiene en el Treball (B.O.E. de 16/3/71; B.O.E. de 17/3/71 i B.O.E. de 6/4/71). Anul·lada parcialment per R.D 614/2001 de 8 de juny. BOE de 21 de juny de 2001.
- Real Decreto 1644/2008, de 10 de octubre, por el que se establecen las normas para la comercialización y puesta en servicio de las máquinas (B.O.E. 246 de octubre de 2008).

## 8 SIGNATURES

Barcelona, gener de 2021

Els enginyers autors de l'Estudi,



Sebastià Ribot Florit  
AYESA



Julio Alcobendas García  
AYESA





### **3.-Pressupost**



## Amidaments

**AMIDAMENTS**

Pàg.: 1

Obra 01 PRESSUPOST ESS\_GIP-5129  
 Capítol 01 EQUIPS DE PROTECCIÓ INDIVIDUAL

NUM.	CODI	UA	DESCRIPCIÓ
1	H1411111	u	Casc de seguretat per a ús normal, contra cops, de polietilè amb un pes màxim de 400 g, homologat segons UNE-EN 812
			<b>AMIDAMENT DIRECTE</b> 17.000
2	H141300F	u	Casc de seguretat de protecció per a la indústria, tipus escalador sense visera, homologat segons UNE-EN 397
			<b>AMIDAMENT DIRECTE</b> 5.000
3	H141511E	u	Casc de seguretat dielèctric per a baixa tensió polietilè, homologat segons UNE-EN 50365
			<b>AMIDAMENT DIRECTE</b> 4.000
4	H1421110	u	Ulleres de seguretat antiimpactes estàndard, amb muntura universal, amb visor transparent i tractament contra l'entelament, homologades segons UNE-EN 167 i UNE-EN 168
			<b>AMIDAMENT DIRECTE</b> 17.000
5	H1423230	u	Ulleres de seguretat per a tall oxiacetilènic, amb muntura universal de barnilla d'acer recoberta de PVC, amb visors circulars de 50 mm de D foscos de color DIN 5, homologades segons UNE-EN 175 i UNE-EN 169
			<b>AMIDAMENT DIRECTE</b> 6.000
6	H142AC60	u	Pantalla facial per a soldadura elèctrica, amb marc abatible de mà i suport de polièster reforçat amb fibra de vidre vulcanitzada d'1,35 mm de gruix, amb visor inactínic semifosc amb protecció DIN 12, homologada segons UNE-EN 175
			<b>AMIDAMENT DIRECTE</b> 5.000
7	H1431101	u	Protector auditiu de tap d'escuma, homologat segons UNE-EN 352-2 i UNE-EN 458
			<b>AMIDAMENT DIRECTE</b> 320.000
8	H1432012	u	Protector auditiu d'auricular, acoblat al cap amb arnès i orelleres antisoroll, homologat segons UNE-EN 352-1 i UNE-EN 458
			<b>AMIDAMENT DIRECTE</b> 8.000
9	H1445003	u	Mascareta de protecció respiratòria, homologada segons UNE-EN 140
			<b>AMIDAMENT DIRECTE</b> 17.000
10	H1446004	u	Semimàscara de protecció filtrant contra partícules, homologada segons UNE-EN 149
			<b>AMIDAMENT DIRECTE</b> 17.000
11	H1447005	u	Màscara de protecció respiratòria, homologada segons UNE-EN 136
			<b>AMIDAMENT DIRECTE</b> 17.000
12	H144D205	u	Filtre contra partícules, identificat amb banda de color blanc, homologat segons UNE-EN 143 i UNE-EN 12083

EUR

**AMIDAMENTS**

Pàg.: 2

			<b>AMIDAMENT DIRECTE</b> 17.000
13	H144E406	u	Filtre mixte contra gasos i partícules, homologat segons UNE-EN 14387 i UNE-EN 12083
			<b>AMIDAMENT DIRECTE</b> 17.000
14	H1455710	u	Parella de guants d'alta resistència al tall i a l'abracció per a ferrallista, amb dits i palmell de cautxú rugós sobre suport de cotó, i subjecció elàstica al canell, homologats segons UNE-EN 388 i UNE-EN 420
			<b>AMIDAMENT DIRECTE</b> 4.000
15	H1459630	u	Parella de guants per a soldador, amb palmell de pell, folre interior de cotó, i màniga llarga de serratge folrada de dril fort, homologats segons UNE-EN 407 i UNE-EN 420
			<b>AMIDAMENT DIRECTE</b> 5.000
16	H145C002	u	Parella de guants de protecció contra riscos mecànics comuns de construcció nivell 3, homologats segons UNE-EN 388 i UNE-EN 420
			<b>AMIDAMENT DIRECTE</b> 17.000
17	H145K4B9	u	Parella de guants de material aïllant per a treballs elèctrics, classe 2, logotip color groc, tensió màxima 17000 V, homologats segons UNE-EN 420
			<b>AMIDAMENT DIRECTE</b> 4.000
18	H1461164	u	Parella de botes d'aigua de PVC de canya alta, per posada en obra del formigó, amb plantilla metàl·lica, amb sola antilliscant i folrades de niló rentable, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347
			<b>AMIDAMENT DIRECTE</b> 17.000
19	H1463253	u	Parella de botes dielèctriques resistents a la humitat, de pell rectificada, amb turmellera encoixinada sola antilliscant i antiestàtica, falca amortidora per al taló, llengüeta de manxa, de despreniment ràpid, sense ferramenta metàl·lica, amb puntera reforçada, homologades segons DIN 4843
			<b>AMIDAMENT DIRECTE</b> 4.000
20	H1465275	u	Parella de botes baixes de seguretat industrial per a treballs de construcció en general, resistents a la humitat, de pell rectificada, amb turmellera encoixinada, amb puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347
			<b>AMIDAMENT DIRECTE</b> 17.000
21	H1465376	u	Parella de botes baixes de seguretat industrial per a soldador, resistents a la humitat, de pell rectificada adobada al crom, amb turmellera encoixinada, amb llengüeta de manxa de despreniment ràpid, puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347
			<b>AMIDAMENT DIRECTE</b> 5.000
22	H146J364	u	Parella de plantilles anticlaus de fleix d'acer de 0,4 mm de gruix, de 120 kg de resistència a la perforació, pintades amb pintures epoxi i folrades, homologades segons UNE-EN ISO 20344 i UNE-EN 12568
			<b>AMIDAMENT DIRECTE</b> 17.000
23	H147D405	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus lliscant sobre línia d'ancoratge flexible de llargaria 10 m, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 353-2

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## AMIDAMENTS

			<b>AMIDAMENT DIRECTE</b>	<b>2.000</b>
24	H147D501	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus absorbent d'energia, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 355	
			<b>AMIDAMENT DIRECTE</b>	<b>2.000</b>
25	H147L015	u	Aparell d'ancoratge per a equip de protecció individual contra caiguda d'alçada, homologat segons UNE-EN 795, amb fixació amb tac mecànic	
			<b>AMIDAMENT DIRECTE</b>	<b>5.000</b>
26	H147N000	u	Faixa de protecció dorslubar	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
27	H1481343	u	Granota de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
28	H1481654	u	Granota de treball per a soldadors i/o treballadors de tubs, de cotó sanforitzat (100%), color blau vergara, trama 320, amb butxaques interiors dotades de cremalleres metàl·liques, homologada segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	
			<b>AMIDAMENT DIRECTE</b>	<b>5.000</b>
29	H1482320	u	Camisa de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, homologada segons UNE-EN 340	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
30	H1483344	u	Pantalons de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologats segons UNE-EN 340	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
31	H1484110	u	Samarreta de treball, de cotó	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
32	H1485800	u	Armillia reflectant amb tires reflectants a la cintura, al pit i a l'esquena, homologada segons UNE-EN 471	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
33	H1486241	u	Casaca tipus enginyer, de polièster embuatada amb material aïllant, butxaques exteriors	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
34	H1487460	u	Impermeable amb jaqueta, caputxa i pantalons, per a obres públiques, de PVC soldat de 0,4 mm de gruix, de color viu, homologat segons UNE-EN 340	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
35	H1488580	u	Davantal per a soldador, de serratge, homologat segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	

## AMIDAMENTS

			<b>AMIDAMENT DIRECTE</b>	<b>5.000</b>
36	H1489790	u	Jaqueta de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340	
			<b>AMIDAMENT DIRECTE</b>	<b>17.000</b>
37	H148B580	u	Parell de maniguets amb protecció per a espallla, per a soldador, elaborat amb serratge, homologats segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	
			<b>AMIDAMENT DIRECTE</b>	<b>3.000</b>

Obra	01	PRESSUPOST ESS_GIP-5129
Capítol	02	SISTEMES DE PROTECCIÓ COL·LECTIVA

NUM.	CODI	UA	DESCRIPCIÓ																																				
1	H1511017	m2	Protecció amb xarxa de seguretat horitzontal en trams laterals en viaductes o ponts, ancorada a suports metàl·lics, en voladiu, i amb el desmuntatge inclòs																																				
			<table border="1"> <thead> <tr> <th>Num.</th> <th>Text</th> <th>Tipus</th> <th>[C]</th> <th>[D]</th> <th>[E]</th> <th>[F]</th> <th>TOTAL</th> <th>Fórmula</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>T</td> <td>Longitud (m)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>120.000</td> <td>2.000</td> <td>2.000</td> <td></td> <td>480.000</td> <td>C#*D#*E#*F#</td> </tr> <tr> <td colspan="7" style="text-align: right;"><b>TOTAL AMIDAMENT</b></td> <td style="border: 1px solid black; text-align: center;"><b>480.000</b></td> <td></td> </tr> </tbody> </table>	Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula	1		T	Longitud (m)						2			120.000	2.000	2.000		480.000	C#*D#*E#*F#	<b>TOTAL AMIDAMENT</b>							<b>480.000</b>	
Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula																															
1		T	Longitud (m)																																				
2			120.000	2.000	2.000		480.000	C#*D#*E#*F#																															
<b>TOTAL AMIDAMENT</b>							<b>480.000</b>																																
2	H1512010	m2	Protecció de projecció de partícules incandescentes amb manta ignífuga, xarxa de seguretat normalitzada (UNE-EN 1263-1) poliàmida no regenerada, de tenacitat alta, nuada amb corda perimetral de poliàmida i corda de cosit de 12 mm de diàmetre i amb el desmuntatge inclòs																																				
			<b>AMIDAMENT DIRECTE</b>	<b>20.000</b>																																			
3	H1522111	m	Barana de protecció en el perímetre de la coronació d'excavacions, d'alçària 1 m, amb travesser superior, travesser intermedi i muntants de tub metàl·lic de 2,3", sòcol de post de fusta, ancorada al terreny amb daus de formigó i amb el desmuntatge inclòs																																				
			<b>AMIDAMENT DIRECTE</b>	<b>80.000</b>																																			
4	H152D801	m	Línia horitzontal per a l'ancoratge i desplaçament de cinturons de seguretat, amb corda de poliàmida de 16 mm de D i dispositiu anticaiguda autoblocador per a subjectar cinturó de seguretat i amb el desmuntatge inclòs																																				
			<table border="1"> <thead> <tr> <th>Num.</th> <th>Text</th> <th>Tipus</th> <th>[C]</th> <th>[D]</th> <th>[E]</th> <th>[F]</th> <th>TOTAL</th> <th>Fórmula</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>T</td> <td>Longitud (m)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>120.000</td> <td>2.000</td> <td></td> <td></td> <td>240.000</td> <td>C#*D#*E#*F#</td> </tr> <tr> <td colspan="7" style="text-align: right;"><b>TOTAL AMIDAMENT</b></td> <td style="border: 1px solid black; text-align: center;"><b>240.000</b></td> <td></td> </tr> </tbody> </table>	Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula	1		T	Longitud (m)						2			120.000	2.000			240.000	C#*D#*E#*F#	<b>TOTAL AMIDAMENT</b>							<b>240.000</b>	
Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula																															
1		T	Longitud (m)																																				
2			120.000	2.000			240.000	C#*D#*E#*F#																															
<b>TOTAL AMIDAMENT</b>							<b>240.000</b>																																
5	H152J105	m	Cable fiador per al cinturó de seguretat, fixat en ancoratges de servei i amb el desmuntatge inclòs																																				
			<b>AMIDAMENT DIRECTE</b>	<b>80.000</b>																																			
6	H152N681	m	Barana de protecció sobre sostre o llosa, d'alçària 1 m, enjovada en cercol perimetral de formigó cada 2,5 m i amb el desmuntatge inclòs																																				
			<table border="1"> <thead> <tr> <th>Num.</th> <th>Text</th> <th>Tipus</th> <th>[C]</th> <th>[D]</th> <th>[E]</th> <th>[F]</th> <th>TOTAL</th> <th>Fórmula</th> </tr> </thead> </table>	Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula																											
Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula																															

## AMIDAMENTS

Pàg.: 5

1		T	Longitud (m)						
2			120.000	2.000				240.000	C#*D#*E#*F#
<b>TOTAL AMIDAMENT</b>								<b>240.000</b>	
7	H152U000	m	Tanca d'advertència o abalisament d'1 m d'alçada amb malla de polietilè taronja, fixada a 1 m del perímetre del sostre amb suports d'acer allotjats amb forats al sostre						
1		T	Longitud (m)						
2			120.000	2.000				240.000	C#*D#*E#*F#
<b>TOTAL AMIDAMENT</b>								<b>240.000</b>	
8	H152V017	m3	Barrera de seguretat contra esllavissades en coronacions de rases i excavacions amb les terres deixades a la vora i amb el desmuntatge inclòs						
<b>AMIDAMENT DIRECTE</b>								<b>40.000</b>	
9	H1534001	u	Peça de plàstic en forma de bolet, de color vermell, per a protecció dels extrems de les armadures per a qualsevol diàmetre, amb desmuntatge inclòs						
<b>AMIDAMENT DIRECTE</b>								<b>500.000</b>	
10	H153A9F1	u	Topall per a descàrrega de camions en excavacions, de 4 m d'amplada amb tauló de fusta i perfils IPN 100 clavats al terreny i amb el desmuntatge inclòs						
<b>AMIDAMENT DIRECTE</b>								<b>8.000</b>	
11	H15B0007	u	Pantalla aïllant per a treballs en zones d'influència de línies elèctriques en tensió						
<b>AMIDAMENT DIRECTE</b>								<b>5.000</b>	
12	HM31161J	u	Extintor de pols seca, de 6 kg de càrrega, amb pressió incorporada, pintat, amb suport a la paret i amb el desmuntatge inclòs						
<b>AMIDAMENT DIRECTE</b>								<b>6.000</b>	

Obra 01 PRESSUPOST ESS\_GIP-5129  
 Capítol 03 SENYALITZACIÓ I ABALISAMENT

NUM.	CODI	UA	DESCRIPCIÓ
1	HBAA005	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs
<b>AMIDAMENT DIRECTE</b>			<b>8.000</b>
2	HBAA007	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 10 cm, amb cartell explicatiu rectangular, per ser vista fins 3 m, fixada i amb el desmuntatge inclòs
<b>AMIDAMENT DIRECTE</b>			<b>8.000</b>
3	HBAB115	u	Senyal de obligació, normalitzada amb pictograma blanc sobre fons blau, de forma circular amb cantells en color blanc, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs

EUR

## AMIDAMENTS

Pàg.: 6

			<b>AMIDAMENT DIRECTE</b>	<b>8.000</b>
4	HBAC005	u	Senyal indicativa de la ubicació d'equips d'extinció d'incendis, normalitzada amb pictograma blanc sobre fons vermell, de forma rectangular o quadrada, costat major 29 cm, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>5.000</b>
5	HBAC013	u	Senyal indicativa d'informació de salvament o socors, normalitzada amb pictograma blanc sobre fons verd, de forma rectangular o quadrada, costat major 60 cm, per ser vista fins 25 m de distància, fixada i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>6.000</b>
6	HBBAE001	u	Rètol adhesiu ( MIE-RAT.10 ) de maniobra per a quadre o pupitre de control elèctric, adherit	
			<b>AMIDAMENT DIRECTE</b>	<b>8.000</b>
7	HBBAF004	u	Senyal d'advertència, normalitzada amb pictograma negre sobre fons groc, de forma triangular amb el cantell negre, costat major 41 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>8.000</b>
8	HBB20005	u	Senyal manual per a senyalista	
			<b>AMIDAMENT DIRECTE</b>	<b>4.000</b>
9	HBC1D081	m	Garlanda reflectora, amb un suport cada 5 m i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>100.000</b>
10	HBC1KJ00	m	Tanca mòbil metàl·lica de 2,5 m de llargària i 1 m d'alçada i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>50.000</b>
11	HBC12500	u	Con de plàstic reflector de 75 cm d'alçada	
			<b>AMIDAMENT DIRECTE</b>	<b>50.000</b>
12	HBC1H0K1	u	Llumenera amb làmpada llampegant amb energia de bateria recarregable i amb el desmuntatge inclòs	
			<b>AMIDAMENT DIRECTE</b>	<b>15.000</b>

Obra 01 PRESSUPOST ESS\_GIP-5129  
 Capítol 04 IMPLANTACIÓ PROVISIONAL DE PERSONAL D'OBRA

NUM.	CODI	UA	DESCRIPCIÓ
1	HQU1B130	mes	Lloguer de mòdul prefabricat per a equipament sanitari a obra de 2,4x2,6 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb 1 inodor, 2 dutxes, lavabo col·lectiu amb 1 aixeta i termos elèctric 50 litres

Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula
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EUR

**AMIDAMENTS**

Pàg.: 7

Num.	Text	Tipus	[C]	[D]	[E]	[F]	TOTAL	Fórmula
1		T	Unitats (u)	Durada (meso)				
2			2.000	12.000			24.000	C#*D#*E#*F#
<b>TOTAL AMIDAMENT</b>							<b>24.000</b>	
2	HQU1D190	mes	Lloguer de mòdul prefabricat per equipament de vestidors a obra de 8x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 2 punts de llum, interruptor, endolls i protecció diferencial					
<b>TOTAL AMIDAMENT</b>							<b>24.000</b>	
3	HQU1E170	mes	Lloguer de mòdul prefabricat per a equipament de menjador a obra de 6x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb aigüera de 1 pica amb aixeta i taulell					
<b>TOTAL AMIDAMENT</b>							<b>24.000</b>	
4	HQU25701	u	Banc de fusta, de 3,5 m de llargària i 0,4 m d'amplària, amb capacitat per a 5 persones, col·locat i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>4.000</b>	
5	HQU27902	u	Taula de fusta amb tauler de melamina, de 3,5 m de llargària i 0,8 m d'amplària, amb capacitat per a 10 persones, col·locada i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>2.000</b>	
6	HQU2AF02	u	Nevera elèctrica, de 100 l de capacitat, col·locada i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>2.000</b>	
7	HQU2E001	u	Forn microones per a escalfar menjars, col·locat i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>4.000</b>	
8	HQU2P001	u	Penja-robes per a dutxa, col·locat i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>15.000</b>	
9	HQU2GF01	u	Recipient per a recollida d'escombraries, de 100 l de capacitat, col·locat i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>4.000</b>	
10	HQU22301	u	Armari metàl·lic individual de doble compartiment interior, de 0,4x0,5x1,8 m, col·locat i amb el desmuntatge inclòs					
<b>AMIDAMENT DIRECTE</b>							<b>15.000</b>	



**Quadre de Preus núm. 1**



**QUADRE DE PREUS NÚMERO 1**

Pàg.: 1

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-1	H1411111	u	Casc de seguretat per a ús normal, contra cops, de polietilè amb un pes màxim de 400 g, homologat segons UNE-EN 812 (CINC EUROS AMB VUITANTA-SIS CÈNTIMS)	5.86 €
P-2	H141300F	u	Casc de seguretat de protecció per a la indústria, tipus escalador sense visera, homologat segons UNE-EN 397 (VINT-I-DOS EUROS AMB SEIXANTA-SIS CÈNTIMS)	22.66 €
P-3	H141511E	u	Casc de seguretat dielèctric per a baixa tensió polietilè, homologat segons UNE-EN 50365 (CATORZE EUROS AMB ONZE CÈNTIMS)	14.11 €
P-4	H1421110	u	Ulleres de seguretat antiimpactes estàndard, amb muntura universal, amb visor transparent i tractament contra l'entelament, homologades segons UNE-EN 167 i UNE-EN 168 (SIS EUROS AMB DOTZE CÈNTIMS)	6.12 €
P-5	H1423230	u	Ulleres de seguretat per a tall oxiacetilènic, amb muntura universal de barnilla d'acer recoberta de PVC, amb visors circulars de 50 mm de D foscos de color DIN 5, homologades segons UNE-EN 175 i UNE-EN 169 (CINC EUROS AMB CINC CÈNTIMS)	5.05 €
P-6	H142AC60	u	Pantalla facial per a soldadura elèctrica, amb marc abatible de mà i suport de polièster reforçat amb fibra de vidre vulcanitzada d'1,35 mm de gruix, amb visor inactínic semifosc amb protecció DIN 12, homologada segons UNE-EN 175 (VUIT EUROS AMB SETANTA-SET CÈNTIMS)	8.77 €
P-7	H1431101	u	Protector auditiu de tap d'escuma, homologat segons UNE-EN 352-2 i UNE-EN 458 (ZERO EUROS AMB VINT-I-QUATRE CÈNTIMS)	0.24 €
P-8	H1432012	u	Protector auditiu d'auricular, acoblat al cap amb arnès i orelles antisoroll, homologat segons UNE-EN 352-1 i UNE-EN 458 (DIVUIT EUROS AMB NORANTA-SIS CÈNTIMS)	18.96 €
P-9	H1445003	u	Mascareta de protecció respiratòria, homologada segons UNE-EN 140 (UN EUROS AMB QUARANTA-CINC CÈNTIMS)	1.45 €
P-10	H1446004	u	Semimàscara de protecció filtrant contra partícules, homologada segons UNE-EN 149 (DOTZE EUROS AMB NORANTA CÈNTIMS)	12.90 €
P-11	H1447005	u	Màscara de protecció respiratòria, homologada segons UNE-EN 136 (DEU EUROS AMB VUITANTA-QUATRE CÈNTIMS)	10.84 €
P-12	H144D205	u	Filtre contra partícules, identificat amb banda de color blanc, homologat segons UNE-EN 143 i UNE-EN 12083 (UN EUROS)	1.00 €
P-13	H144E406	u	Filtre mixte contra gasos i partícules, homologat segons UNE-EN 14387 i UNE-EN 12083 (DOS EUROS AMB SETANTA-SET CÈNTIMS)	2.77 €
P-14	H1455710	u	Parella de guants d'alta resistència al tall i a l'abracció per a ferrallista, amb dits i palmell de cautxú rugós sobre suport de cotó, i subjecció elàstica al canell, homologats segons UNE-EN 388 i UNE-EN 420 (DOS EUROS AMB SETANTA-SET CÈNTIMS)	2.77 €
P-15	H1459630	u	Parella de guants per a soldador, amb palmell de pell, folre interior de cotó, i màniga llarga de serratge folrada de dril fort, homologats segons UNE-EN 407 i UNE-EN 420 (NOU EUROS AMB VUITANTA-NOU CÈNTIMS)	9.89 €

**QUADRE DE PREUS NÚMERO 1**

Pàg.: 2

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-16	H145C002	u	Parella de guants de protecció contra riscos mecànics comuns de construcció nivell 3, homologats segons UNE-EN 388 i UNE-EN 420 (VUIT EUROS AMB VINT-I-TRES CÈNTIMS)	8.23 €
P-17	H145K4B9	u	Parella de guants de material aïllant per a treballs elèctrics, classe 2, logotip color groc, tensió màxima 17000 V, homologats segons UNE-EN 420 (CINQUANTA-SIS EUROS AMB VINT-I-UN CÈNTIMS)	56.21 €
P-18	H1461164	u	Parella de botes d'aigua de PVC de canya alta, per posada en obra del formigó, amb plantilla metàl·lica, amb sola antilliscant i folrades de niló rentable, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (DINOU EUROS AMB CINQUANTA-SIS CÈNTIMS)	19.56 €
P-19	H1463253	u	Parella de botes dielèctriques resistents a la humitat, de pell rectificada, amb turmellera encoixinada sola antilliscant i antiestàtica, falca amortidora per al taló, llengüeta de manxa, de despreniment ràpid, sense ferramenta metàl·lica, amb puntera reforçada, homologades segons DIN 4843 (SEIXANTA-CINC EUROS AMB TRES CÈNTIMS)	65.03 €
P-20	H1465275	u	Parella de botes baixes de seguretat industrial per a treballs de construcció en general, resistents a la humitat, de pell rectificada, amb turmellera encoixinada, amb puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (DISSET EUROS AMB TRENTA-QUATRE CÈNTIMS)	17.34 €
P-21	H1465376	u	Parella de botes baixes de seguretat industrial per a soldador, resistents a la humitat, de pell rectificada adobada al crom, amb turmellera encoixinada, amb llengüeta de manxa de despreniment ràpid, puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (VINT EUROS)	20.00 €
P-22	H146J364	u	Parella de plantilles anticlaus de fleix d'acer de 0,4 mm de gruix, de 120 kg de resistència a la perforació, pintades amb pintures epoxi i folrades, homologades segons UNE-EN ISO 20344 i UNE-EN 12568 (DOS EUROS AMB SETANTA-TRES CÈNTIMS)	2.73 €
P-23	H147D405	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus lliscant sobre línia d'ancoratge flexible de llargària 10 m, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 353-2 (CINC-CENTS DISSET EUROS AMB SET CÈNTIMS)	517.07 €
P-24	H147D501	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus absorbent d'energia, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 355 (DOS-CENTS QUARANTA EUROS AMB NORANTA-TRES CÈNTIMS)	240.93 €
P-25	H147L015	u	Aparell d'ancoratge per a equip de protecció individual contra caiguda d'alçada, homologat segons UNE-EN 795, amb fixació amb tac mecànic (VINT-I-TRES EUROS AMB VUITANTA-SIS CÈNTIMS)	23.86 €
P-26	H147N000	u	Faixa de protecció dorslubar (VINT-I-TRES EUROS AMB VINT-I-QUATRE CÈNTIMS)	23.24 €

**QUADRE DE PREUS NÚMERO 1**

Pàg.: 3

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-27	H1481343	u	Granota de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340 (VUITANTA-SIS EUROS AMB SEIXANTA-TRES CÈNTIMS)	86.63 €
P-28	H1481654	u	Granota de treball per a soldadors i/o treballadors de tubs, de cotó sanforitzat (100%), color blau vergara, trama 320, amb butxaques interiors dotades de cremalleres metàl·liques, homologada segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (VINT-I-DOS EUROS AMB VUITANTA-UN CÈNTIMS)	22.81 €
P-29	H1482320	u	Camisa de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, homologada segons UNE-EN 340 (SIS EUROS AMB QUARANTA-SET CÈNTIMS)	6.47 €
P-30	H1483344	u	Pantalons de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologats segons UNE-EN 340 (DEU EUROS AMB SETANTA-SIS CÈNTIMS)	10.76 €
P-31	H1484110	u	Samarreta de treball, de cotó (DOS EUROS AMB VUITANTA-CINC CÈNTIMS)	2.85 €
P-32	H1485800	u	Armilla reflectant amb tires reflectants a la cintura, al pit i a l'esquena, homologada segons UNE-EN 471 (QUINZE EUROS AMB QUARANTA-VUIT CÈNTIMS)	15.48 €
P-33	H1486241	u	Casaca tipus enginyer, de polièster embuatada amb material aïllant, butxaques exteriors (TRENTA EUROS AMB CINQUANTA-QUATRE CÈNTIMS)	30.54 €
P-34	H1487460	u	Impermeable amb jaqueta, caputxa i pantalons, per a obres públiques, de PVC soldat de 0,4 mm de gruix, de color viu, homologat segons UNE-EN 340 (SIS EUROS AMB VINT-I-VUIT CÈNTIMS)	6.28 €
P-35	H1488580	u	Davantall per a soldador, de serratge, homologat segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (DINOU EUROS AMB CINQUANTA-DOS CÈNTIMS)	19.52 €
P-36	H1489790	u	Jaqueta de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340 (TRETZE EUROS AMB CATORZE CÈNTIMS)	13.14 €
P-37	H148B580	u	Parell de maniguets amb protecció per a espallta, per a soldador, elaborat amb serratge, homologats segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (VINT-I-UN EUROS AMB DOS CÈNTIMS)	21.02 €
P-38	H1511017	m2	Protecció amb xarxa de seguretat horitzontal en trams laterals en viaductes o ponts, ancorada a suports metàl·lics, en voladriu, i amb el desmuntatge inclòs (QUINZE EUROS AMB CINQUANTA-CINC CÈNTIMS)	15.55 €
P-39	H1512010	m2	Protecció de projecció de partícules incandescentes amb manta ignífuga, xarxa de seguretat normalitzada (UNE-EN 1263-1) poliamida no regenerada, de tenacitat alta, nuada amb corda perimetral de poliamida i corda de cosit de 12 mm de diàmetre i amb el desmuntatge inclòs (NOU EUROS AMB TRENTA-DOS CÈNTIMS)	9.32 €

**QUADRE DE PREUS NÚMERO 1**

Pàg.: 4

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-40	H1522111	m	Barana de protecció en el perímetre de la coronació d'excavacions, d'alçària 1 m, amb travesser superior, travesser intermedi i muntants de tub metàl·lic de 2,3'', sòcol de post de fusta, ancorada al terreny amb daus de formigó i amb el desmuntatge inclòs (TRETZE EUROS AMB QUARANTA-CINC CÈNTIMS)	13.45 €
P-41	H152D801	m	Línia horitzontal per a l'ancoratge i desplaçament de cinturons de seguretat, amb corda de poliamida de 16 mm de D i dispositiu anticaiguda autoblocador per a subjectar cinturó de seguretat i amb el desmuntatge inclòs (ONZE EUROS AMB QUARANTA-UN CÈNTIMS)	11.41 €
P-42	H152J105	m	Cable fiador per al cinturó de seguretat, fixat en ancoratges de servei i amb el desmuntatge inclòs (CINC EUROS AMB CINQUANTA-VUIT CÈNTIMS)	5.58 €
P-43	H152N681	m	Barana de protecció sobre sostre o llosa, d'alçària 1 m, enjovada en cercol perimetral de formigó cada 2,5 m i amb el desmuntatge inclòs (SET EUROS AMB TRETZE CÈNTIMS)	7.13 €
P-44	H152U000	m	Tanca d'advertència o abalisament d'1 m d'alçada amb malla de polietilè taronja, fixada a 1 m del perímetre del sostre amb suports d'acer allotjats amb forats al sostre (DOS EUROS AMB TRENTA-TRES CÈNTIMS)	2.33 €
P-45	H152V017	m3	Barrera de seguretat contra esllavissades en coronacions de rases i excavacions amb les terres deixades a la vora i amb el desmuntatge inclòs (VINT-I-NOU EUROS AMB VUITANTA-TRES CÈNTIMS)	29.83 €
P-46	H1534001	u	Peça de plàstic en forma de bolet, de color vermell, per a protecció dels extrems de les armadures per a qualsevol diàmetre, amb desmuntatge inclòs (ZERO EUROS AMB VINT-I-DOS CÈNTIMS)	0.22 €
P-47	H153A9F1	u	Topall per a descàrrega de camions en excavacions, de 4 m d'amplada amb tauló de fusta i perfils IPN 100 clavats al terreny i amb el desmuntatge inclòs (VINT-I-TRES EUROS AMB TRETZE CÈNTIMS)	23.13 €
P-48	H15B0007	u	Pantalla aïllant per a treballs en zones d'influència de línies elèctriques en tensió (CENT DOS EUROS AMB VINT-I-TRES CÈNTIMS)	102.23 €
P-49	HBB20005	u	Senyal manual per a senyalista (DOTZE EUROS AMB CINQUANTA-QUATRE CÈNTIMS)	12.54 €
P-50	HBBAA005	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs (TRENTA-QUATRE EUROS AMB SETANTA-NOU CÈNTIMS)	34.79 €
P-51	HBBAA007	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 10 cm, amb cartell explicatiu rectangular, per ser vista fins 3 m, fixada i amb el desmuntatge inclòs (VINT-I-VUIT EUROS AMB SETANTA-CINC CÈNTIMS)	28.75 €
P-52	HBBAB115	u	Senyal de obligació, normalitzada amb pictograma blanc sobre fons blau, de forma circular amb cantells en color blanc, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs (TRENTA-TRES EUROS AMB SETANTA-TRES CÈNTIMS)	33.73 €

**QUADRE DE PREUS NÚMERO 1**

Pàg.: 5

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-53	HBBAC005	u	Senyal indicativa de la ubicació d'equips d'extinció d'incendis, normalitzada amb pictograma blanc sobre fons vermell, de forma rectangular o quadrada, costat major 29 cm, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs (VINT-I-SET EUROS AMB SEIXANTA CÈNTIMS)	27.60 €
P-54	HBBAC013	u	Senyal indicativa d'informació de salvament o socors, normalitzada amb pictograma blanc sobre fons verd, de forma rectangular o quadrada, costat major 60 cm, per ser vista fins 25 m de distància, fixada i amb el desmuntatge inclòs (TRENTA EUROS AMB VUITANTA-TRES CÈNTIMS)	30.83 €
P-55	HBBAE001	u	Rètol adhesiu ( MIE-RAT.10 ) de maniobra per a quadre o pupitre de control elèctric, adherit (CINC EUROS AMB SEIXANTA-VUIT CÈNTIMS)	5.68 €
P-56	HBBAF004	u	Senyal d'avertència, normalitzada amb pictograma negre sobre fons groc, de forma triangular amb el cantell negre, costat major 41 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs (QUARANTA-TRES EUROS AMB DEU CÈNTIMS)	43.10 €
P-57	HBC12500	u	Con de plàstic reflector de 75 cm d'alçària (VINT-I-DOS EUROS AMB SETANTA-NOU CÈNTIMS)	22.79 €
P-58	HBC1D081	m	Garlanda reflectora, amb un suport cada 5 m i amb el desmuntatge inclòs (DOS EUROS AMB QUARANTA-NOU CÈNTIMS)	2.49 €
P-59	HBC1H0K1	u	Llumenera amb làmpada llamegant amb energia de bateria recarregable i amb el desmuntatge inclòs (CENT CINC EUROS AMB TRENTA-CINC CÈNTIMS)	105.35 €
P-60	HBC1KJ00	m	Tanca mòbil metàl·lica de 2,5 m de llargària i 1 m d'alçària i amb el desmuntatge inclòs (CINC EUROS AMB SEIXANTA-CINC CÈNTIMS)	5.65 €
P-61	HM31161J	u	Extintor de pols seca, de 6 kg de càrrega, amb pressió incorporada, pintat, amb suport a la paret i amb el desmuntatge inclòs (QUARANTA-SIS EUROS)	46.00 €
P-62	HQU1B130	mes	Lloguer de mòdul prefabricat per a equipament sanitaris a obra de 2,4x2,6 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb 1 inodor, 2 dutxes, lavabo col·lectiu amb 1 aixeta i termos elèctric 50 litres (CINQUANTA-SIS EUROS AMB DIVUIT CÈNTIMS)	56.18 €
P-63	HQU1D190	mes	Lloguer de mòdul prefabricat per equipament de vestidors a obra de 8x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 2 punts de llum, interruptor, endolls i protecció diferencial (SETANTA-TRES EUROS AMB TRENTA-SIS CÈNTIMS)	73.36 €
P-64	HQU1E170	mes	Lloguer de mòdul prefabricat per a equipament de menjador a obra de 6x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb aigüera de 1 pica amb aixeta i taulell (SEIXANTA-CINC EUROS AMB SEIXANTA-QUATRE CÈNTIMS)	65.64 €

**QUADRE DE PREUS NÚMERO 1**

Pàg.: 6

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU
P-65	HQU22301	u	Armari metàl·lic individual de doble compartiment interior, de 0,4x0,5x1,8 m, col·locat i amb el desmuntatge inclòs (SEIXANTA EUROS AMB TRENTA-SET CÈNTIMS)	60.37 €
P-66	HQU25701	u	Banc de fusta, de 3,5 m de llargària i 0,4 m d'amplària, amb capacitat per a 5 persones, col·locat i amb el desmuntatge inclòs (VINT-I-QUATRE EUROS AMB VUITANTA-UN CÈNTIMS)	24.81 €
P-67	HQU27902	u	Taula de fusta amb tauler de melamina, de 3,5 m de llargària i 0,8 m d'amplària, amb capacitat per a 10 persones, col·locada i amb el desmuntatge inclòs (TRENTA EUROS AMB TRENTA-CINC CÈNTIMS)	30.35 €
P-68	HQU2AF02	u	Nevera elèctrica, de 100 l de capacitat, col·locada i amb el desmuntatge inclòs (CENT VUIT EUROS AMB CINQUANTA-QUATRE CÈNTIMS)	108.54 €
P-69	HQU2E001	u	Forn microones per a escalfar menjars, col·locat i amb el desmuntatge inclòs (SETANTA-UN EUROS AMB SETANTA-TRES CÈNTIMS)	71.73 €
P-70	HQU2GF01	u	Recipient per a recollida d'escombraries, de 100 l de capacitat, col·locat i amb el desmuntatge inclòs (QUARANTA-SIS EUROS AMB QUARANTA CÈNTIMS)	46.40 €
P-71	HQU2P001	u	Penja-robes per a dutxa, col·locat i amb el desmuntatge inclòs (UN EUROS AMB NORANTA CÈNTIMS)	1.90 €

Barcelona, gener de 2021  
Els enginyers autors del projecte,



Sebastià Ribot Florit  
AYESA



Julio Alcobendas Garcia  
AYESA



**Quadre de Preus núm. 2**

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 1

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
P-1	H1411111	u	Casc de seguretat per a ús normal, contra cops, de polietilè amb un pes màxim de 400 g, homologat segons UNE-EN 812	<b>5.86</b>	€
	B1411111	u	Casc de seguretat per a ús normal, contra cops, de polietilè amb un pes màxim de 400 Altres conceptes	5.58000 0.28000	€ €
P-2	H141300F	u	Casc de seguretat de protecció per a la indústria, tipus escalador sense visera, homologat segons UNE-EN 397	<b>22.66</b>	€
	B141300F	u	Casc de seguretat de protecció per a la indústria, tipus escalador sense visera, homolo Altres conceptes	21.58000 1.08000	€ €
P-3	H141511E	u	Casc de seguretat dielèctric per a baixa tensió polietilè, homologat segons UNE-EN 50365	<b>14.11</b>	€
	B141511E	u	Casc de seguretat dielèctric per a baixa tensió de polietilè, homologat segons UNE-EN Altres conceptes	13.44000 0.67000	€ €
P-4	H1421110	u	Ulleres de seguretat antiimpactes estàndard, amb muntura universal, amb visor transparent i tractament contra l'entelament, homologades segons UNE-EN 167 i UNE-EN 168	<b>6.12</b>	€
	B1421110	u	Ulleres de seguretat antiimpactes estàndard, amb muntura universal, amb visor transp Altres conceptes	5.83000 0.29000	€ €
P-5	H1423230	u	Ulleres de seguretat per a tall oxiacetilènic, amb muntura universal de barnilla d'acer recoberta de PVC, amb visors circulars de 50 mm de D foscos de color DIN 5, homologades segons UNE-EN 175 i UNE-EN 169	<b>5.05</b>	€
	B1423230	u	Ulleres de seguretat per a tall oxiacetilènic, amb muntura universal de barnilla d'acer re Altres conceptes	4.81000 0.24000	€ €
P-6	H142AC60	u	Pantalla facial per a soldadura elèctrica, amb marc abatible de mà i suport de polièster reforçat amb fibra de vidre vulcanitzada d'1,35 mm de gruix, amb visor inactínic semifosc amb protecció DIN 12, homologada segons UNE-EN 175	<b>8.77</b>	€
	B142AC60	u	Pantalla facial per a soldadura elèctrica, amb marc abatible de mà i suport de polièster Altres conceptes	8.35000 0.42000	€ €
P-7	H1431101	u	Protector auditiu de tap d'escuma, homologat segons UNE-EN 352-2 i UNE-EN 458	<b>0.24</b>	€
	B1431101	u	Protector auditiu de tap d'escuma, homologat segons UNE-EN 352-2 i UNE-EN 458 Altres conceptes	0.23000 0.01000	€ €
P-8	H1432012	u	Protector auditiu d'auricular, acoblat al cap amb arnès i orelleres antisoroll, homologat segons UNE-EN 352-1 i UNE-EN 458	<b>18.96</b>	€
	B1432012	u	Protector auditiu d'auricular, acoblat al cap amb arnès i orelleres antisoroll, homologat Altres conceptes	18.06000 0.90000	€ €
P-9	H1445003	u	Mascareta de protecció respiratòria, homologada segons UNE-EN 140	<b>1.45</b>	€
	B1445003	u	Mascareta de protecció respiratòria, homologada segons UNE-EN 140 Altres conceptes	1.38000 0.07000	€ €
P-10	H1446004	u	Semimàscara de protecció filtrant contra partícules, homologada segons UNE-EN 149	<b>12.90</b>	€
	B1446004	u	Semimàscara de protecció filtrant contra partícules, homologada segons UNE-EN 149 Altres conceptes	12.29000 0.61000	€ €
P-11	H1447005	u	Màscara de protecció respiratòria, homologada segons UNE-EN 136	<b>10.84</b>	€
	B1447005	u	Màscara de protecció respiratòria, homologada segons UNE-EN 136 Altres conceptes	10.32000 0.52000	€ €
P-12	H144D205	u	Filtre contra partícules, identificat amb banda de color blanc, homologat segons UNE-EN 143 i UNE-EN 12083	<b>1.00</b>	€

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 2

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
	B144D205	u	Filtre contra partícules, identificat amb banda de color blanc, homologat segons UNE- Altres conceptes	0.95000 0.05000	€ €
P-13	H144E406	u	Filtre mixte contra gasos i partícules, homologat segons UNE-EN 14387 i UNE-EN 12083	<b>2.77</b>	€
	B144E406	u	Filtre mixte contra gasos i partícules, homologat segons UNE-EN 14387 i UNE-EN 120 Altres conceptes	2.64000 0.13000	€ €
P-14	H1455710	u	Parella de guants d'alta resistència al tall i a l'abracció per a ferrallista, amb dits i palmell de cautxú rugós sobre suport de cotó, i subjecció elàstica al canell, homologats segons UNE-EN 388 i UNE-EN 420	<b>2.77</b>	€
	B1455710	u	Parella de guants d'alta resistència al tall i a l'abracció per a ferrallista, amb dits i palm Altres conceptes	2.64000 0.13000	€ €
P-15	H1459630	u	Parella de guants per a soldador, amb palmell de pell, folre interior de cotó, i màniga llarga de serratge folrada de dril fort, homologats segons UNE-EN 407 i UNE-EN 420	<b>9.89</b>	€
	B1459630	u	Parella de guants per a soldador, amb palmell de pell, folre interior de cotó i màniga lla Altres conceptes	9.42000 0.47000	€ €
P-16	H145C002	u	Parella de guants de protecció contra riscos mecànics comuns de construcció nivell 3, homologats segons UNE-EN 388 i UNE-EN 420	<b>8.23</b>	€
	B145C002	u	Parella de guants de protecció contra riscos mecànics comuns de construcció nivell 3, h Altres conceptes	7.84000 0.39000	€ €
P-17	H145K4B9	u	Parella de guants de material aïllant per a treballs elèctrics, classe 2, logotip color groc, tensió màxima 17000 V, homologats segons UNE-EN 420	<b>56.21</b>	€
	B145K4B9	u	Parella de guants de material aïllant per a treballs elèctrics, classe 2, logotip color groc Altres conceptes	53.53000 2.68000	€ €
P-18	H1461164	u	Parella de botes d'aigua de PVC de canya alta, per posada en obra del formigó, amb plantilla metàl·lica, amb sola antilliscant i folrades de niló rentable, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347	<b>19.56</b>	€
	B1461164	u	Parella de botes d'aigua de PVC de canya alta, per posada en obra del formigó, amb p Altres conceptes	18.63000 0.93000	€ €
P-19	H1463253	u	Parella de botes dielèctriques resistents a la humitat, de pell rectificada, amb turmellera encoixinada sola antilliscant i antiestàtica, falca amortidora per al taló, llengüeta de manxa, de despreniment ràpid, sense ferramenta metàl·lica, amb puntera reforçada, homologades segons DIN 4843	<b>65.03</b>	€
	B1463253	u	Parella de botes dielèctriques resistents a la humitat, de pell rectificada, amb turmeller Altres conceptes	61.93000 3.10000	€ €
P-20	H1465275	u	Parella de botes baixes de seguretat industrial per a treballs de construcció en general, resistents a la humitat, de pell rectificada, amb turmellera encoixinada, amb puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347	<b>17.34</b>	€
	B1465275	u	Parella de botes baixes de seguretat industrial per a treballs de construcció en general, Altres conceptes	16.51000 0.83000	€ €
P-21	H1465376	u	Parella de botes baixes de seguretat industrial per a soldador, resistents a la humitat, de pell rectificada adobada al crom, amb turmellera encoixinada, amb llengüeta de manxa de despreniment ràpid, puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347	<b>20.00</b>	€
	B1465376	u	Parella de botes baixes de seguretat industrial per a soldador, resistents a la humitat,	19.05000	€



**QUADRE DE PREUS NÚMERO 2**

Pàg.: 3

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
			Altres conceptes	0.95000	€
P-22	H146J364	u	Parella de plantilles anticlaus de fleix d'acer de 0,4 mm de gruix, de 120 kg de resistència a la perforació, pintades amb pintures epoxi i folrades, homologades segons UNE-EN ISO 20344 i UNE-EN 12568	<b>2.73</b>	€
	B146J364	u	Parella de plantilles anticlaus de fleix d'acer de 0,4 mm de gruix, de 120 kg de resistència	2.60000	€
			Altres conceptes	0.13000	€
P-23	H147D405	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus lliscant sobre línia d'ancoratge flexible de llargaria 10 m, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 353-2	<b>517.07</b>	€
	B147D405	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàrie	492.45000	€
			Altres conceptes	24.62000	€
P-24	H147D501	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus absorbent d'energia, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 355	<b>240.93</b>	€
	B147D501	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàrie	229.46000	€
			Altres conceptes	11.47000	€
P-25	H147L015	u	Aparell d'ancoratge per a equip de protecció individual contra caiguda d'alçada, homologat segons UNE-EN 795, amb fixació amb tac mecànic	<b>23.86</b>	€
	B1Z09F90	u	Tac d'acer de d 10 mm, amb cargol, volandera i femella, per a seguretat i salut	0.97000	€
	B147L005	u	Aparell d'ancoratge per a equip de protecció individual contra caiguda d'alçada, homol	19.55000	€
			Altres conceptes	3.34000	€
P-26	H147N000	u	Faixa de protecció dorslumar	<b>23.24</b>	€
	B147N000	u	Faixa de protecció dorslumar	22.13000	€
			Altres conceptes	1.11000	€
P-27	H1481343	u	Granota de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340	<b>86.63</b>	€
	B1481343	u	Granota de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-	82.50000	€
			Altres conceptes	4.13000	€
P-28	H1481654	u	Granota de treball per a soldadors i/o treballadors de tubs, de cotó sanforitzat (100%), color blau vergara, trama 320, amb butxaques interiors dotades de cremalleres metàl·liques, homologada segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	<b>22.81</b>	€
	B1481654	u	Granota de treball per a soldadors i/o treballadors de tubs, de cotó sanforitzat (100%),	21.72000	€
			Altres conceptes	1.09000	€
P-29	H1482320	u	Camisa de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, homologada segons UNE-EN 340	<b>6.47</b>	€
	B1482320	u	Camisa de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-	6.16000	€
			Altres conceptes	0.31000	€
P-30	H1483344	u	Pantalons de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologats segons UNE-EN 340	<b>10.76</b>	€
	B1483344	u	Pantalons de treball per a construcció d'obres lineals en servei, de polièster i cotó (65	10.25000	€

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 4

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
			Altres conceptes	0.51000	€
P-31	H1484110	u	Samarreta de treball, de cotó	<b>2.85</b>	€
	B1484110	u	Samarreta de treball, de cotó	2.71000	€
			Altres conceptes	0.14000	€
P-32	H1485800	u	Armilla reflectant amb tires reflectants a la cintura, al pit i a l'esquena, homologada segons UNE-EN 471	<b>15.48</b>	€
	B1485800	u	Armilla reflectant amb tires reflectants a la cintura, al pit i a l'esquena, homologada seg	14.74000	€
			Altres conceptes	0.74000	€
P-33	H1486241	u	Casaca tipus enginyer, de polièster embuatada amb material aïllant, butxaques exteriors	<b>30.54</b>	€
	B1486241	u	Casaca tipus enginyer, de polièster embuatada amb material aïllant, butxaques exterio	29.09000	€
			Altres conceptes	1.45000	€
P-34	H1487460	u	Impermeable amb jaqueta, caputxa i pantalons, per a obres públiques, de PVC soldat de 0,4 mm de gruix, de color viu, homologat segons UNE-EN 340	<b>6.28</b>	€
	B1487460	u	Impermeable amb jaqueta, caputxa i pantalons, per a obres públiques, de PVC soldat	5.98000	€
			Altres conceptes	0.30000	€
P-35	H1488580	u	Davantall per a soldador, de serratge, homologat segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	<b>19.52</b>	€
	B1488580	u	Davantall per a soldador, de serratge, homologat segons UNE-EN 340, UNE-EN 470-1	18.59000	€
			Altres conceptes	0.93000	€
P-36	H1489790	u	Jaqueta de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340	<b>13.14</b>	€
	B1489790	u	Jaqueta de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-	12.51000	€
			Altres conceptes	0.63000	€
P-37	H148B580	u	Parell de maniguets amb protecció per a espatlla, per a soldador, elaborat amb serratge, homologats segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348	<b>21.02</b>	€
	B148B580	u	Parell de maniguets amb protecció per a espatlla per a soldador elaborat amb serratge	20.02000	€
			Altres conceptes	1.00000	€
P-38	H1511017	m2	Protecció amb xarxa de seguretat horitzontal en trams laterals en viaductes o ponts, ancorada a suports metàl·lics, en voladiu, i amb el desmuntatge inclòs	<b>15.55</b>	€
	B1Z11215	m2	Xarxa de fil trenat de poliamida no regenerada, de tenacitat alta, de 4 mm de D i 80x80	0.28800	€
	B1520007	u	Conjunt de suport amb barra, porta, xarxa i mordassa per a mòdul de 4x3 m, per a 8 u	1.86240	€
	B0AC112D	m	Cable d'acer galvanitzat rígid de composició 1x7+0 i diàmetre 9 mm, per a seguretat i	2.54400	€
			Altres conceptes	10.85560	€
P-39	H1512010	m2	Protecció de projecció de partícules incandescents amb manta ignífuga, xarxa de seguretat normalitzada (UNE-EN 1263-1) poliamida no regenerada, de tenacitat alta, nuada amb corda perimetral de poliamida i corda de cosit de 12 mm de diàmetre i amb el desmuntatge inclòs	<b>9.32</b>	€
	B1510005	m2	Manta ignífuga per a 5 usos, per a seguretat i salut	4.48800	€
	B1Z11215	m2	Xarxa de fil trenat de poliamida no regenerada, de tenacitat alta, de 4 mm de D i 80x80	0.21600	€
	B15Z1500	m	Corda de poliamida de 12 mm de diàmetre, per a seguretat i salut	0.12750	€
			Altres conceptes	4.48850	€
P-40	H1522111	m	Barana de protecció en el perímetre de la coronació d'excavacions, d'alçària 1 m, amb travesser superior, travesser intermedi i muntants de tub metàl·lic de 2,3", sòcol de post de fusta, ancorada al terreny amb daus de formigó i amb el desmuntatge inclòs	<b>13.45</b>	€

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 5

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
	B1Z0D400	m2	Post de fusta de pi per a 3 usos, per a seguretat i salut	1.07580	€
	B0DZSM0K	u	Tub metàl·lic de 2,3'' de diàmetre, per a 150 usos, per a seguretat i salut	0.42000	€
	B1Z0300C	m3	Formigó HM-20/P/20/I de consistència plàstica, grandària màxima del granulat 20 mm,	1.19720	€
			Altres conceptes	10.75700	€
P-41	H152D801	m	Línia horitzontal per a l'ancoratge i desplaçament de cinturons de seguretat, amb corda de poliamida de 16 mm de D i dispositiu anticaiguda autoblocador per a subjectar cinturó de seguretat i amb el desmuntatge inclòs	<b>11.41</b>	€
	B15Z1700	m	Corda de poliamida de 16 mm de diàmetre, per a seguretat i salut	0.94500	€
	B152KK00	u	Dispositiu anticaiguda autoblocador per a subjectar cinturó de seguretat a una corda d	5.87370	€
			Altres conceptes	4.59130	€
P-42	H152J105	m	Cable fiador per al cinturó de seguretat, fixat en ancoratges de servei i amb el desmuntatge inclòs	<b>5.58</b>	€
	B0AC112D	m	Cable d'acer galvanitzat rígid de composició 1x7+0 i diàmetre 9 mm, per a seguretat i	1.27200	€
			Altres conceptes	4.30800	€
P-43	H152N681	m	Barana de protecció sobre sostre o llosa, d'alçària 1 m, enjovada en cercol perimetral de formigó cada 2,5 m i amb el desmuntatge inclòs	<b>7.13</b>	€
	B1Z0D400	m2	Post de fusta de pi per a 3 usos, per a seguretat i salut	1.07580	€
	B1526EK6	u	Muntant metàl·lic per a barana de seguretat, d'1 m d'alçària, amb mordassa per al sost	0.57600	€
	B0DZSM0K	u	Tub metàl·lic de 2,3'' de diàmetre, per a 150 usos, per a seguretat i salut	0.28800	€
			Altres conceptes	5.19020	€
P-44	H152U000	m	Tanca d'avertència o abalisament d'1 m d'alçada amb malla de polietilè taronja, fixada a 1 m del perímetre del sostre amb suports d'acer allotjats amb forats al sostre	<b>2.33</b>	€
	B1526EL6	u	Muntant metàl·lic per a barana de seguretat, d'1 m d'alçària, per a allotjar en perforació	0.59500	€
	B152U000	m	Malla de polietilè d'alta densitat color taronja per a tanques d'avertència o abalisamen	0.52500	€
			Altres conceptes	1.21000	€
P-45	H152V017	m3	Barrera de seguretat contra esllavissades en coronacions de rases i excavacions amb les terres deixades a la vora i amb el desmuntatge inclòs	<b>29.83</b>	€
			Altres conceptes	29.83000	€
P-46	H1534001	u	Peça de plàstic en forma de bolet, de color vermell, per a protecció dels extrems de les armadures per a qualsevol diàmetre, amb desmuntatge inclòs	<b>0.22</b>	€
	B1534001	u	Peça de plàstic en forma de bolet, de color vermell, per a protecció dels extrems de les	0.03000	€
			Altres conceptes	0.19000	€
P-47	H153A9F1	u	Topall per a descàrrega de camions en excavacions, de 4 m d'amplada amb tauló de fusta i perfils IPN 100 clavats al terreny i amb el desmuntatge inclòs	<b>23.13</b>	€
	B1Z4501A	kg	Acer S275JR segons UNE-EN 10025-2, format per peça simple, en perfils laminats en	12.00000	€
	B1Z0D230	m	Tauló de fusta de pi per a 10 usos, per a seguretat i salut	3.96000	€
			Altres conceptes	7.17000	€
P-48	H15B0007	u	Pantalla aïllant per a treballs en zones d'influència de línies elèctriques en tensió	<b>102.23</b>	€
	B15B0007	u	Pantalla aïllant per a treballs en zones d'influència de línies elèctriques en tensió	97.36000	€
			Altres conceptes	4.87000	€
P-49	HBB20005	u	Senyal manual per a senyalista	<b>12.54</b>	€
	BBB2A001	u	Senyal manual per a senyalista	11.94000	€

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 6

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
			Altres conceptes	0.60000	€
P-50	HBBA005	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs	<b>34.79</b>	€
	BBBAD015	u	Cartell explicatiu del contingut de la senyal, amb llegenda indicativa de prohibició, amb	8.89000	€
	BBBAA005	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma c	5.83000	€
			Altres conceptes	20.07000	€
P-51	HBBA007	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 10 cm, amb cartell explicatiu rectangular, per ser vista fins 3 m, fixada i amb el desmuntatge inclòs	<b>28.75</b>	€
	BBBAD017	u	Cartell explicatiu del contingut de la senyal, amb llegenda indicativa de prohibició, amb	6.12000	€
	BBBAA007	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma c	2.85000	€
			Altres conceptes	19.78000	€
P-52	HBBAB115	u	Senyal de obligació, normalitzada amb pictograma blanc sobre fons blau, de forma circular amb cantells en color blanc, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs	<b>33.73</b>	€
	BBBAD025	u	Cartell explicatiu del contingut de la senyal, amb llegenda indicativa d'obligació, amb el	7.88000	€
	HBBAB115	u	Senyal de obligació, normalitzada amb pictograma blanc sobre fons blau, de forma circ	5.83000	€
			Altres conceptes	20.02000	€
P-53	HBBAC005	u	Senyal indicativa de la ubicació d'equips d'extinció d'incendis, normalitzada amb pictograma blanc sobre fons vermell, de forma rectangular o quadrada, costat major 29 cm, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs	<b>27.60</b>	€
	BBBAC005	u	Senyal indicativa de la ubicació d'equips d'extinció d'incendis, normalitzada amb pictog	7.88000	€
			Altres conceptes	19.72000	€
P-54	HBBAC013	u	Senyal indicativa d'informació de salvament o socors, normalitzada amb pictograma blanc sobre fons verd, de forma rectangular o quadrada, costat major 60 cm, per ser vista fins 25 m de distància, fixada i amb el desmuntatge inclòs	<b>30.83</b>	€
	BBBAC013	u	Senyal indicativa d'informació de salvament o socors, normalitzada amb pictograma bl	10.95000	€
			Altres conceptes	19.88000	€
P-55	HBBAE001	u	Rètol adhesiu ( MIE-RAT.10 ) de maniobra per a quadre o pupitre de control elèctric, adherit	<b>5.68</b>	€
	BBBAE001	u	Rètol adhesiu ( MIE-RAT.10 ) de maniobra per a quadre o pupitre de control elèctric, p	5.41000	€
			Altres conceptes	0.27000	€
P-56	HBBAF004	u	Senyal d'avertència, normalitzada amb pictograma negre sobre fons groc, de forma triangular amb el cantell negre, costat major 41 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs	<b>43.10</b>	€
	BBBAF004	u	Senyal d'avertència, normalitzada amb pictograma negre sobre fons groc, de forma tri	9.59000	€
	BBBAD004	u	Cartell explicatiu del contingut de la senyal, amb llegenda indicativa d'avertència, am	13.05000	€
			Altres conceptes	20.46000	€
P-57	HBC12500	u	Con de plàstic reflector de 75 cm d'alçària	<b>22.79</b>	€
	BBC12502	u	Con d'abalisament de plàstic reflector de 75 cm d'alçària, per a 2 usos, per a seguretat	21.24000	€
			Altres conceptes	1.55000	€
P-58	HBC1D081	m	Garlanda reflectora, amb un suport cada 5 m i amb el desmuntatge inclòs	<b>2.49</b>	€



**QUADRE DE PREUS NÚMERO 2**

Pàg.: 7

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
	BBC1D000	m	Garlanda d'abaliment reflectora, per a seguretat i salut	0.09000	€
	B1Z0B700	kg	Acer en barres corrugades B400S de límit elàstic >= 400 N/mm2, per a seguretat i salut	0.07440	€
			Altres conceptes	2.32560	€
P-59	HBC1H0K1	u	Llumenera amb làmpada llampegant amb energia de bateria recarregable i amb el desmuntatge inclòs	<b>105.35</b>	€
	BBC1H0K2	u	Llumenera amb làmpada llampegant , amb energia de bateria recarregable, per a 2 us	97.57000	€
			Altres conceptes	7.78000	€
P-60	HBC1KJ00	m	Tanca mòbil metàl·lica de 2,5 m de llargària i 1 m d'alçària i amb el desmuntatge inclòs	<b>5.65</b>	€
	BBC1KJ04	m	Tanca mòbil metàl·lica de 2,5 m de llargària i 1 m d'alçària, per a 4 usos, per a seguretat	4.27200	€
			Altres conceptes	1.37800	€
P-61	HM31161J	u	Extintor de pols seca, de 6 kg de càrrega, amb pressió incorporada, pintat, amb suport a la paret i amb el desmuntatge inclòs	<b>46.00</b>	€
	BM311611	u	Extintor de pols seca, de càrrega 6 kg, amb pressió incorporada, pintat, per a seguretat	35.17000	€
	B1ZM1000	u	Part proporcional d'elements especials per a extintors, per a seguretat i salut	0.31000	€
			Altres conceptes	10.52000	€
P-62	HQU1B130	mes	Lloguer de mòdul prefabricat per a equipament sanitari a obra de 2,4x2,6 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb 1 inodor, 2 dutxes, lavabo col·lectiu amb 1 aixeta i termos elèctric 50 litres	<b>56.18</b>	€
	BQU1B130	mes	Lloguer de mòdul prefabricat per a equipament sanitari a obra de 2,4x2,6 m amb tanc	53.50000	€
			Altres conceptes	2.68000	€
P-63	HQU1D190	mes	Lloguer de mòdul prefabricat per equipament de vestidors a obra de 8x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 2 punts de llum, interruptor, endolls i protecció diferencial	<b>73.36</b>	€
	BQU1D190	mes	Lloguer de mòdul prefabricat per equipament de vestidors a obra de 8x2,4 m amb tanc	69.87000	€
			Altres conceptes	3.49000	€
P-64	HQU1E170	mes	Lloguer de mòdul prefabricat per a equipament de menjador a obra de 6x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb aigüera de 1 pica amb aixeta i taulell	<b>65.64</b>	€
	BQU1E170	mes	Lloguer de mòdul prefabricat per a equipament de menjador a obra de 6x2,4 m amb ta	62.51000	€
			Altres conceptes	3.13000	€
P-65	HQU22301	u	Armari metàl·lic individual de doble compartiment interior, de 0,4x0,5x1,8 m, col·locat i amb el desmuntatge inclòs	<b>60.37</b>	€
	BQU22303	u	Armari metàl·lic individual amb doble compartiment interior, de 0,4x0,5x1,8 m, per a 3	52.89000	€
			Altres conceptes	7.48000	€
P-66	HQU25701	u	Banc de fusta, de 3,5 m de llargària i 0,4 m d'amplària, amb capacitat per a 5 persones, col·locat i amb el desmuntatge inclòs	<b>24.81</b>	€
	BQU25700	u	Banc de fusta de 3,5 m de llargària i 0,4 m d'amplària, amb capacitat per a 5 persones	20.87000	€
			Altres conceptes	3.94000	€
P-67	HQU27902	u	Taula de fusta amb tauler de melamina, de 3,5 m de llargària i 0,8 m d'amplària, amb capacitat per a 10 persones, col·locada i amb el desmuntatge inclòs	<b>30.35</b>	€

**QUADRE DE PREUS NÚMERO 2**

Pàg.: 8

NÚMERO	CODI	UA	DESCRIPCIÓ	PREU	
	BQU27900	u	Taula de fusta amb tauler de melamina, de 3,5 m de llargària i 0,8 m d'amplària, amb c	22.46000	€
			Altres conceptes	7.89000	€
P-68	HQU2AF02	u	Nevera elèctrica, de 100 l de capacitat, col·locada i amb el desmuntatge inclòs	<b>108.54</b>	€
	BQU2AF02	u	Nevera elèctrica, de 100 l de capacitat, per a 2 usos, per a seguretat i salut	96.93000	€
			Altres conceptes	11.61000	€
P-69	HQU2E001	u	Forn microones per a escalfar menjars, col·locat i amb el desmuntatge inclòs	<b>71.73</b>	€
	BQU2E002	u	Forn microones, per a 2 usos, per a seguretat i salut	67.39000	€
			Altres conceptes	4.34000	€
P-70	HQU2GF01	u	Recipient per a recollida d'escombraries, de 100 l de capacitat, col·locat i amb el desmuntatge inclòs	<b>46.40</b>	€
	BQU2GF00	u	Recipient per a recollida d'escombraries de 100 l de capacitat, per a seguretat i salut	42.35000	€
			Altres conceptes	4.05000	€
P-71	HQU2P001	u	Penja-robes per a dutxa, col·locat i amb el desmuntatge inclòs	<b>1.90</b>	€
	BQZ1P000	u	Penja-robes per a dutxa, per a seguretat i salut	0.89000	€
			Altres conceptes	1.01000	€

Barcelona, gener de 2021  
Els enginyers autors del projecte,



Sebastià Ribot Florit  
AYESA



Julio Alcobendas Garcia  
AYESA



## Pressupost

**PRESSUPOST**

Pàg.: 1

Obra	01	Pressupost ESS_GIP-5129
Capítol	01	EQUIPS DE PROTECCIÓ INDIVIDUAL

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	H1411111	u	Casc de seguretat per a ús normal, contra cops, de polietilè amb un pes màxim de 400 g, homologat segons UNE-EN 812 (P - 1)	5.86	17.000	99.62
2	H141300F	u	Casc de seguretat de protecció per a la indústria, tipus escalador sense visera, homologat segons UNE-EN 397 (P - 2)	22.66	5.000	113.30
3	H141511E	u	Casc de seguretat dielèctric per a baixa tensió polietilè, homologat segons UNE-EN 50365 (P - 3)	14.11	4.000	56.44
4	H1421110	u	Ulleres de seguretat antiimpactes estàndard, amb muntura universal, amb visor transparent i tractament contra l'entelament, homologades segons UNE-EN 167 i UNE-EN 168 (P - 4)	6.12	17.000	104.04
5	H1423230	u	Ulleres de seguretat per a tall oxiacetilènic, amb muntura universal de barnilla d'acer recoberta de PVC, amb visors circulars de 50 mm de D foscos de color DIN 5, homologades segons UNE-EN 175 i UNE-EN 169 (P - 5)	5.05	6.000	30.30
6	H142AC60	u	Pantalla facial per a soldadura elèctrica, amb marc abatible de mà i suport de polièster reforçat amb fibra de vidre vulcanitzada d'1,35 mm de gruix, amb visor inactínic semifosc amb protecció DIN 12, homologada segons UNE-EN 175 (P - 6)	8.77	5.000	43.85
7	H1431101	u	Protector auditiu de tap d'escuma, homologat segons UNE-EN 352-2 i UNE-EN 458 (P - 7)	0.24	320.000	76.80
8	H1432012	u	Protector auditiu d'auricular, acoblat al cap amb arnès i orelles antisoroll, homologat segons UNE-EN 352-1 i UNE-EN 458 (P - 8)	18.96	8.000	151.68
9	H1445003	u	Mascareta de protecció respiratòria, homologada segons UNE-EN 140 (P - 9)	1.45	17.000	24.65
10	H1446004	u	Semimàscara de protecció filtrant contra partícules, homologada segons UNE-EN 149 (P - 10)	12.90	17.000	219.30
11	H1447005	u	Màscara de protecció respiratòria, homologada segons UNE-EN 136 (P - 11)	10.84	17.000	184.28
12	H144D205	u	Filtre contra partícules, identificat amb banda de color blanc, homologat segons UNE-EN 143 i UNE-EN 12083 (P - 12)	1.00	17.000	17.00
13	H144E406	u	Filtre mixte contra gasos i partícules, homologat segons UNE-EN 14387 i UNE-EN 12083 (P - 13)	2.77	17.000	47.09
14	H1455710	u	Parella de guants d'alta resistència al tall i a l'abracció per a ferrallista, amb dits i palmell de cautxú rugós sobre suport de cotó, i subjecció elàstica al canell, homologats segons UNE-EN 388 i UNE-EN 420 (P - 14)	2.77	4.000	11.08
15	H1459630	u	Parella de guants per a soldador, amb palmell de pell, folre interior de cotó, i màniga llarga de serratge folrada de dril fort, homologats segons UNE-EN 407 i UNE-EN 420 (P - 15)	9.89	5.000	49.45
16	H145C002	u	Parella de guants de protecció contra riscos mecànics comuns de construcció nivell 3, homologats segons UNE-EN 388 i UNE-EN 420 (P - 16)	8.23	17.000	139.91
17	H145K4B9	u	Parella de guants de material aïllant per a treballs elèctrics, classe 2, logotip color groc, tensió màxima 17000 V, homologats segons UNE-EN 420 (P - 17)	56.21	4.000	224.84
18	H1461164	u	Parella de botes d'aigua de PVC de canya alta, per posada en obra del formigó, amb plantilla metàl·lica, amb sola antilliscant i folrades de niló rentable, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (P - 18)	19.56	17.000	332.52
19	H1463253	u	Parella de botes dielèctriques resistents a la humitat, de pell rectificada, amb turmellera encoixinada sola antilliscant i antiestàtica, falca amortidora per al taló, llengüeta de manxa, de despreniment ràpid, sense ferramenta metàl·lica, amb puntera reforçada, homologades segons DIN 4843 (P - 19)	65.03	4.000	260.12

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**PRESSUPOST**

Pàg.: 2

20	H1465275	u	Parella de botes baixes de seguretat industrial per a treballs de construcció en general, resistents a la humitat, de pell rectificada, amb turmellera encoixinada, amb puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (P - 20)	17.34	17.000	294.78
21	H1465376	u	Parella de botes baixes de seguretat industrial per a soldador, resistents a la humitat, de pell rectificada adobada al crom, amb turmellera encoixinada, amb llengüeta de manxa de despreniment ràpid, puntera metàl·lica, sola antilliscant, falca amortidora d'impactes al taló i sense plantilla metàl·lica, homologades segons UNE-EN ISO 20344, UNE-EN ISO 20345, UNE-EN ISO 20346 i UNE-EN ISO 20347 (P - 21)	20.00	5.000	100.00
22	H146J364	u	Parella de plantilles anticlausa de fleix d'acer de 0,4 mm de gruix, de 120 kg de resistència a la perforació, pintades amb pintures epoxi i folrades, homologades segons UNE-EN ISO 20344 i UNE-EN 12568 (P - 22)	2.73	17.000	46.41
23	H147D405	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus lliscant sobre línia d'ancoratge flexible de llargaria 10 m, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 353-2 (P - 23)	517.07	2.000	1,034.14
24	H147D501	u	Sistema anticaiguda compost per un arnès anticaiguda amb tirants, bandes secundàries, bandes subglúties, bandes de cuixa, recolzament dorsal per a subjecció, elements d'ajust, element dorsal d'enganxament d'arnès anticaiguda i sivella, incorporat a un subsistema anticaiguda de tipus absorbent d'energia, homologat segons UNE-EN 361, UNE-EN 362, UNE-EN 364, UNE-EN 365 i UNE-EN 355 (P - 24)	240.93	2.000	481.86
25	H147L015	u	Aparell d'ancoratge per a equip de protecció individual contra caiguda d'alçada, homologat segons UNE-EN 795, amb fixació amb tac mecànic (P - 25)	23.86	5.000	119.30
26	H147N000	u	Faixa de protecció dorslumber (P - 26)	23.24	17.000	395.08
27	H1481343	u	Granota de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340 (P - 27)	86.63	17.000	1,472.71
28	H1481654	u	Granota de treball per a soldadors i/o treballadors de tubs, de cotó sanforitzat (100%), color blau vergara, trama 320, amb butxaques interiors dotades de cremalleres metàl·liques, homologada segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (P - 28)	22.81	5.000	114.05
29	H1482320	u	Camisa de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, homologada segons UNE-EN 340 (P - 29)	6.47	17.000	109.99
30	H1483344	u	Pantalons de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologats segons UNE-EN 340 (P - 30)	10.76	17.000	182.92
31	H1484110	u	Samarreta de treball, de cotó (P - 31)	2.85	17.000	48.45
32	H1485800	u	Armill reflectant amb tires reflectants a la cintura, al pit i a l'esquena, homologada segons UNE-EN 471 (P - 32)	15.48	17.000	263.16
33	H1486241	u	Casaca tipus enginyer, de polièster embuatada amb material aïllant, butxaques exteriors (P - 33)	30.54	17.000	519.18
34	H1487460	u	Impermeable amb jaqueta, caputxa i pantalons, per a obres públiques, de PVC soldat de 0,4 mm de gruix, de color viu, homologat segons UNE-EN 340 (P - 34)	6.28	17.000	106.76
35	H1488580	u	Davantall per a soldador, de serratge, homologat segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (P - 35)	19.52	5.000	97.60
36	H1489790	u	Jaqueta de treball per a construcció d'obres lineals en servei, de polièster i cotó (65%-35%), color groc, trama 240, amb butxaques interiors i tires reflectants, homologada segons UNE-EN 340 (P - 36)	13.14	17.000	223.38

EUR

**PRESSUPOST**

Pàg.: 3

37	H148B580	u	Parell de maniguets amb protecció per a espatlla, per a soldador, elaborat amb serratge, homologats segons UNE-EN 340, UNE-EN 470-1 i UNE-EN 348 (P - 37)	21.02	3.000	63.06
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**TOTAL Capítol 01.01 7,859.10**

Obra	01	Pressupost ESS_GIP-5129
Capítol	02	SISTEMES DE PROTECCIÓ COL·LECTIVA

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	H1511017	m2	Protecció amb xarxa de seguretat horitzontal en trams laterals en viaductes o ponts, ancorada a suports metàl·lics, en voladiu, i amb el desmuntatge inclòs (P - 38)	15.55	480.000	7,464.00
2	H1512010	m2	Protecció de projecció de partícules incandescentes amb manta ignífuga, xarxa de seguretat normalitzada (UNE-EN 1263-1) poliamida no regenerada, de tenacitat alta, nuada amb corda perimetral de poliamida i corda de cosit de 12 mm de diàmetre i amb el desmuntatge inclòs (P - 39)	9.32	20.000	186.40
3	H1522111	m	Barana de protecció en el perímetre de la coronació d'excavacions, d'alçària 1 m, amb travesser superior, travesser intermedi i muntants de tub metàl·lic de 2,3", sòcol de post de fusta, ancorada al terreny amb daus de formigó i amb el desmuntatge inclòs (P - 40)	13.45	80.000	1,076.00
4	H152D801	m	Línia horitzontal per a l'ancoratge i desplaçament de cinturons de seguretat, amb corda de poliamida de 16 mm de D i dispositiu anticaiguda autoblocador per a subjectar cinturó de seguretat i amb el desmuntatge inclòs (P - 41)	11.41	240.000	2,738.40
5	H152J105	m	Cable fiador per al cinturó de seguretat, fixat en ancoratges de servei i amb el desmuntatge inclòs (P - 42)	5.58	80.000	446.40
6	H152N681	m	Barana de protecció sobre sostre o llosa, d'alçària 1 m, enjovada en cercle perimetral de formigó cada 2,5 m i amb el desmuntatge inclòs (P - 43)	7.13	240.000	1,711.20
7	H152U000	m	Tanca d'advertència o abalisament d'1 m d'alçada amb malla de polietilè taronja, fixada a 1 m del perímetre del sostre amb suports d'acer allotjats amb forats al sostre (P - 44)	2.33	240.000	559.20
8	H152V017	m3	Barrera de seguretat contra esllavissades en coronacions de rases i excavacions amb les terres deixades a la vora i amb el desmuntatge inclòs (P - 45)	29.83	40.000	1,193.20
9	H1534001	u	Peça de plàstic en forma de bolet, de color vermell, per a protecció dels extrems de les armadures per a qualsevol diàmetre, amb desmuntatge inclòs (P - 46)	0.22	500.000	110.00
10	H153A9F1	u	Topall per a descàrrega de camions en excavacions, de 4 m d'amplada amb tauló de fusta i perfils IPN 100 clavats al terreny i amb el desmuntatge inclòs (P - 47)	23.13	8.000	185.04
11	H15B0007	u	Pantalla aïllant per a treballs en zones d'influència de línies elèctriques en tensió (P - 48)	102.23	5.000	511.15
12	HM31161J	u	Extintor de pols seca, de 6 kg de càrrega, amb pressió incorporada, pintat, amb suport a la paret i amb el desmuntatge inclòs (P - 61)	46.00	6.000	276.00

**TOTAL Capítol 01.02 16,456.99**

Obra	01	Pressupost ESS_GIP-5129
Capítol	03	SENYALITZACIÓ I ABALISAMENT

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	HBAA005	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs (P - 50)	34.79	8.000	278.32

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**PRESSUPOST**

Pàg.: 4

2	HBAA007	u	Senyal de prohibició, normalitzada amb pictograma negre sobre fons blanc, de forma circular amb cantells i banda transversal descendent d'esquerra a dreta a 45°, en color vermell, diàmetre 10 cm, amb cartell explicatiu rectangular, per ser vista fins 3 m, fixada i amb el desmuntatge inclòs (P - 51)	28.75	8.000	230.00
3	HBAB115	u	Senyal de obligació, normalitzada amb pictograma blanc sobre fons blau, de forma circular amb cantells en color blanc, diàmetre 29 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m, fixada i amb el desmuntatge inclòs (P - 52)	33.73	8.000	269.84
4	HBBAC005	u	Senyal indicativa de la ubicació d'equips d'extinció d'incendis, normalitzada amb pictograma blanc sobre fons vermell, de forma rectangular o quadrada, costat major 29 cm, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs (P - 53)	27.60	5.000	138.00
5	HBBAC013	u	Senyal indicativa d'informació de salvament o socors, normalitzada amb pictograma blanc sobre fons verd, de forma rectangular o quadrada, costat major 60 cm, per ser vista fins 25 m de distància, fixada i amb el desmuntatge inclòs (P - 54)	30.83	6.000	184.98
6	HBBAE001	u	Rètol adhesiu ( MIE-RAT.10 ) de maniobra per a quadre o pupitre de control elèctric, adherit (P - 55)	5.68	8.000	45.44
7	HBBAF004	u	Senyal d'advertència, normalitzada amb pictograma negre sobre fons groc, de forma triangular amb el cantell negre, costat major 41 cm, amb cartell explicatiu rectangular, per ser vista fins 12 m de distància, fixada i amb el desmuntatge inclòs (P - 56)	43.10	8.000	344.80
8	HBB20005	u	Senyal manual per a senyalista (P - 49)	12.54	4.000	50.16
9	HBC1D081	m	Garlanda reflectora, amb un suport cada 5 m i amb el desmuntatge inclòs (P - 58)	2.49	100.000	249.00
10	HBC1KJ00	m	Tanca mòbil metàl·lica de 2,5 m de llargària i 1 m d'alçària i amb el desmuntatge inclòs (P - 60)	5.65	50.000	282.50
11	HBC12500	u	Con de plàstic reflector de 75 cm d'alçària (P - 57)	22.79	50.000	1,139.50
12	HBC1H0K1	u	Llumenera amb làmpada llampegant amb energia de bateria recarregable i amb el desmuntatge inclòs (P - 59)	105.35	15.000	1,580.25

**TOTAL Capítol 01.03 4,792.79**

Obra	01	Pressupost ESS_GIP-5129
Capítol	04	IMPLANTACIÓ PROVISIONAL DE PERSONAL D'OBRA

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	HQU1B130	mes	Lloguer de mòdul prefabricat per a equipament sanitaris a obra de 2,4x2,6 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb 1 inodor, 2 dutxes, lavabo col·lectiu amb 1 aixeta i termos elèctric 50 litres (P - 62)	56.18	24.000	1,348.32
2	HQU1D190	mes	Lloguer de mòdul prefabricat per equipament de vestidors a obra de 8x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 2 punts de llum, interruptor, endolls i protecció diferencial (P - 63)	73.36	24.000	1,760.64
3	HQU1E170	mes	Lloguer de mòdul prefabricat per a equipament de menjador a obra de 6x2,4 m amb tancaments formats per placa de dues planxes d'acer prelacat i aïllament interior de 40mm de gruix i paviment format per tauler aglomerat hidròfug amb acabat de PVC sobre xapa galvanitzada i llana mineral de vidre, instal·lació elèctrica 1 punt de llum, interruptor, endolls i protecció diferencial, i equipat amb aigüera de 1 pica amb aixeta i taulell (P - 64)	65.64	24.000	1,575.36
4	HQU25701	u	Banc de fusta, de 3,5 m de llargària i 0,4 m d'amplària, amb capacitat per a 5 persones, col·locat i amb el desmuntatge inclòs (P - 66)	24.81	4.000	99.24

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**PRESSUPOST**

Pàg.: 5

5	HQU27902	u	Taula de fusta amb tauler de melamina, de 3,5 m de llargària i 0,8 m d'amplària, amb capacitat per a 10 persones, col·locada i amb el desmuntatge inclòs (P - 67)	30.35	2.000	60.70
6	HQU2AF02	u	Nevera elèctrica, de 100 l de capacitat, col·locada i amb el desmuntatge inclòs (P - 68)	108.54	2.000	217.08
7	HQU2E001	u	Forn microones per a escalfar menjars, col·locat i amb el desmuntatge inclòs (P - 69)	71.73	4.000	286.92
8	HQU2P001	u	Penja-robes per a dutxa, col·locat i amb el desmuntatge inclòs (P - 71)	1.90	15.000	28.50
9	HQU2GF01	u	Recipient per a recollida d'escombraries, de 100 l de capacitat, col·locat i amb el desmuntatge inclòs (P - 70)	46.40	4.000	185.60
10	HQU22301	u	Armari metàl·lic individual de doble compartiment interior, de 0,4x0,5x1,8 m, col·locat i amb el desmuntatge inclòs (P - 65)	60.37	15.000	905.55
<b>TOTAL</b>	<b>Capítol</b>		<b>01.04</b>			<b>6,467.91</b>



## **Resum de pressupost**

**RESUM DE PRESSUPOST**

Pàg.: 1

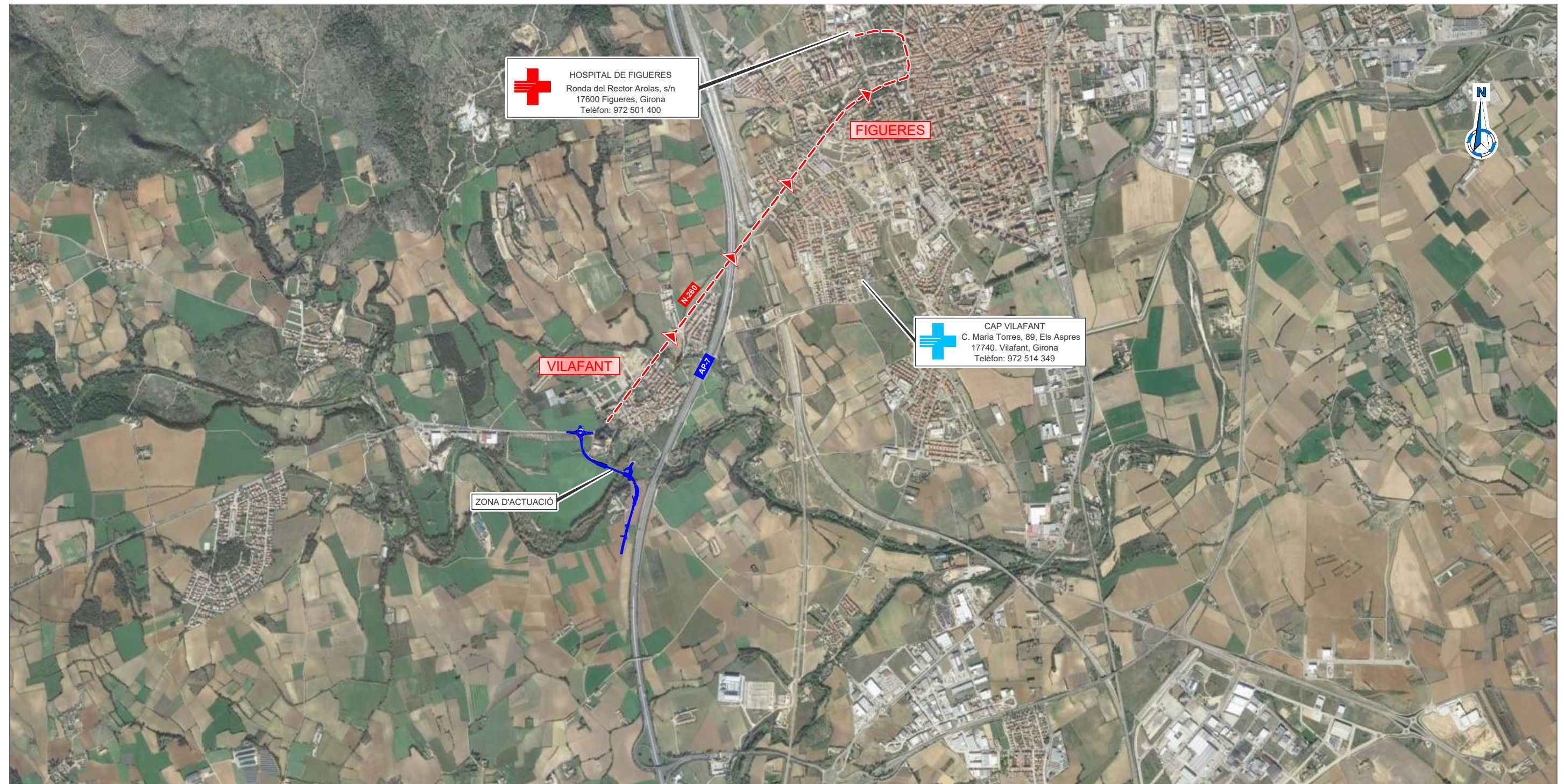
<b>NIVELL 2: Capítol</b>			<b>Import</b>
Capítol	01.01	EQUIPS DE PROTECCIÓ INDIVIDUAL	7,859.10
Capítol	01.02	SISTEMES DE PROTECCIÓ COL·LECTIVA	16,456.99
Capítol	01.03	SENYALITZACIÓ I ABALISAMENT	4,792.79
Capítol	01.04	IMPLANTACIÓ PROVISIONAL DE PERSONAL D'OBRA	6,467.91
<b>Obra</b>	<b>01</b>	<b>Pressupost ESS_GIP-5129</b>	<b>35,576.79</b>
			<b>35,576.79</b>
<b>NIVELL 1: Obra</b>			<b>Import</b>
Obra	01	Pressupost ESS_GIP-5129	35,576.79
			<b>35,576.79</b>





## 4.-Documentació gràfica





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 C. Maria Torres, 89, Els Aspres  
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 Telèfon: 972 514 349

ZONA D'ACTUACIÓ

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- AJUNTAMENT DE VILAFANT  
TEL. 972 546 020

ADMINISTRACIÓ COMARCAL

- CONSELL COMARCAL L'ALT EMPORDÀ  
TEL. 972 503 088

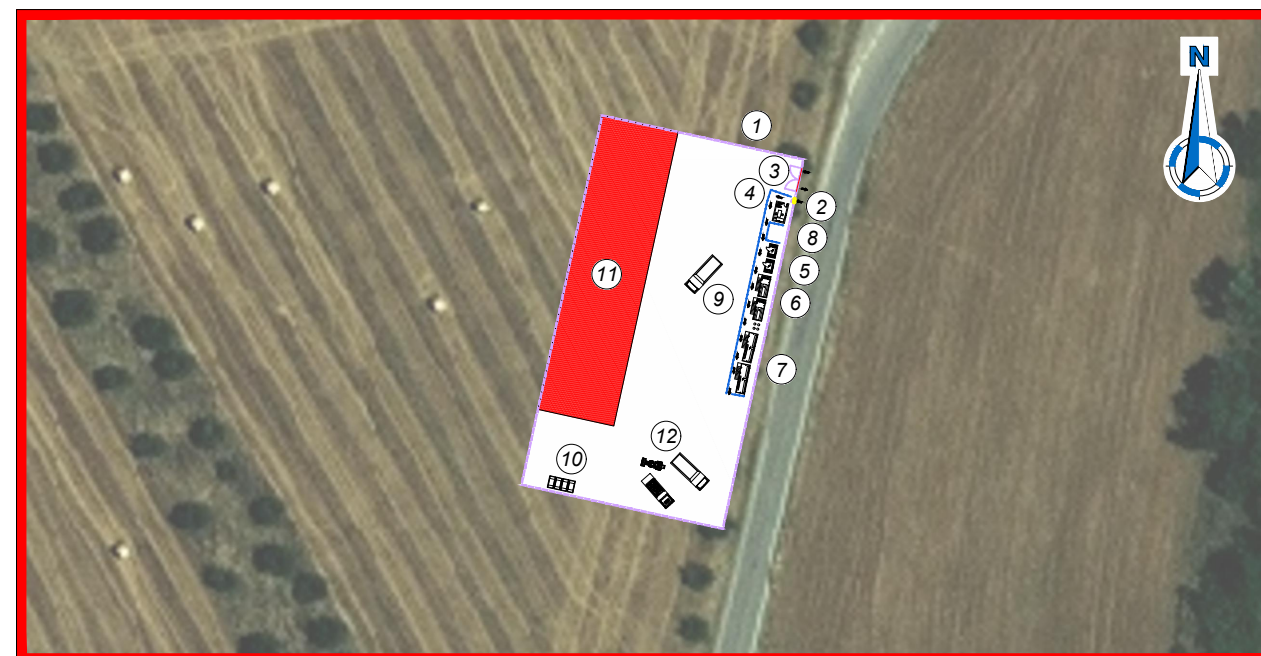
SANITAT

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- CREU ROJA  
TEL. 972 672 939

EMERGÈNCIES

- MOSSOS D'ESCUADRA  
TEL. 972 541 800 / 112
- CENTRAL D'EMERGÈNCIES  
TEL. 112
- BOMBERS  
TEL. 112
- GUARDIA MUNICIPAL DE VILAFANT  
TEL. 972 909 090
- ENDESA  
TEL. 800 760 909

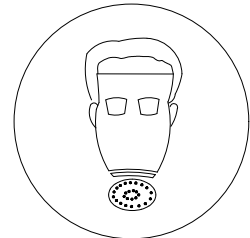




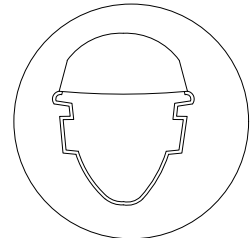
LLEENDA:	
1 Tancament perimetral del solar	7 Vestidors
2 Accés de personal	8 Grup electrògen
3 Accés de vehicles	9 Tanca de delimitació de zones
4 Control d'accés	10 Zona de gestió de residus
5 Sanitaris	11 Zona d'aplec
6 Menjador	12 Zona aparcament maquinària



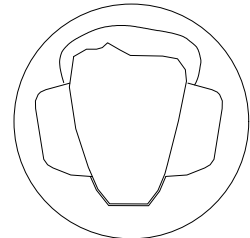
# SENYALS D'OBLIGACIÓ



US MASCARETA



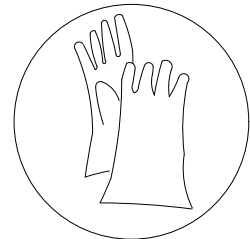
US CASC



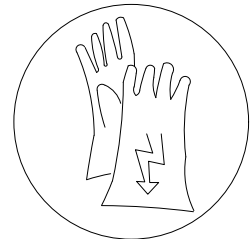
US PROTECTORS  
AUDITIUS



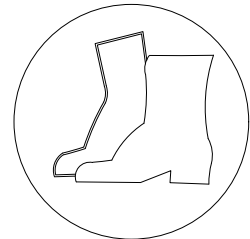
USO ULLERES



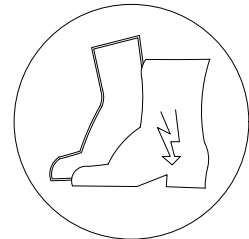
US GUANTS



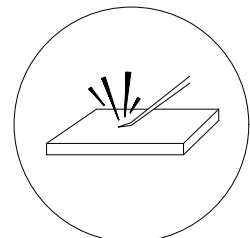
US GUANTS  
ELECTROSTÀTICS



US BOTES



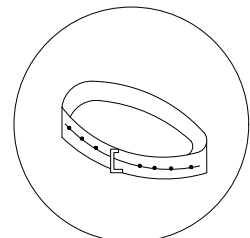
US BOTES  
ELECTROSTÀTIQUES



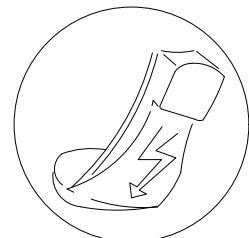
ELIMINAR PUNTES



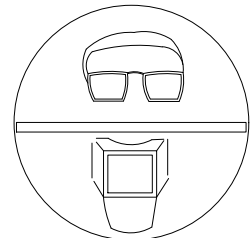
US CINTURÓ  
DE SEGURETAT



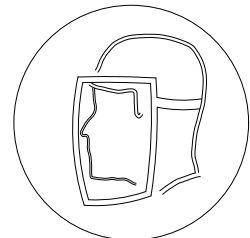
US CINTURÓ  
DE SEGURETAT



US CALÇAT  
ANTIESTÀTIC



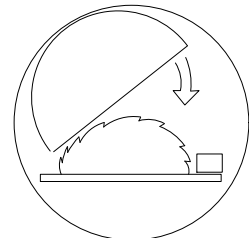
US D'ULLERES  
O PANTALLES



US DE PANTALLA



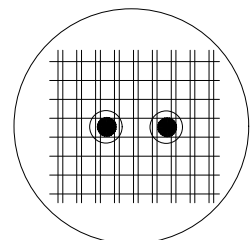
OBLIGACIÓ DE RENTAR-SE  
LES MANS



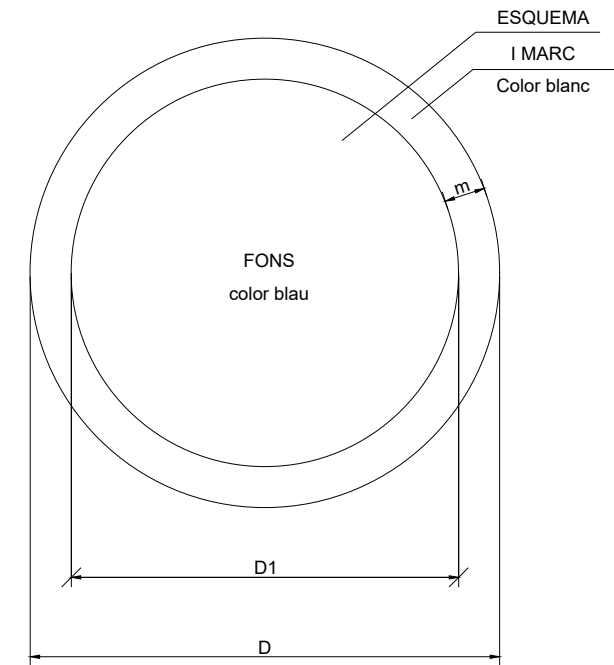
US DE PROTECTOR  
AJUSTABLE



EMPÈNYER  
NO ARROSSEGAR

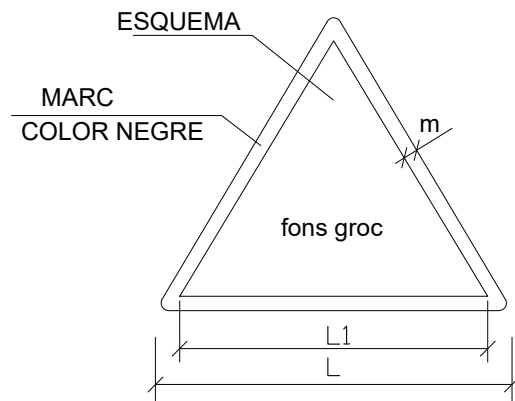


US DE PROTECTOR  
FIX

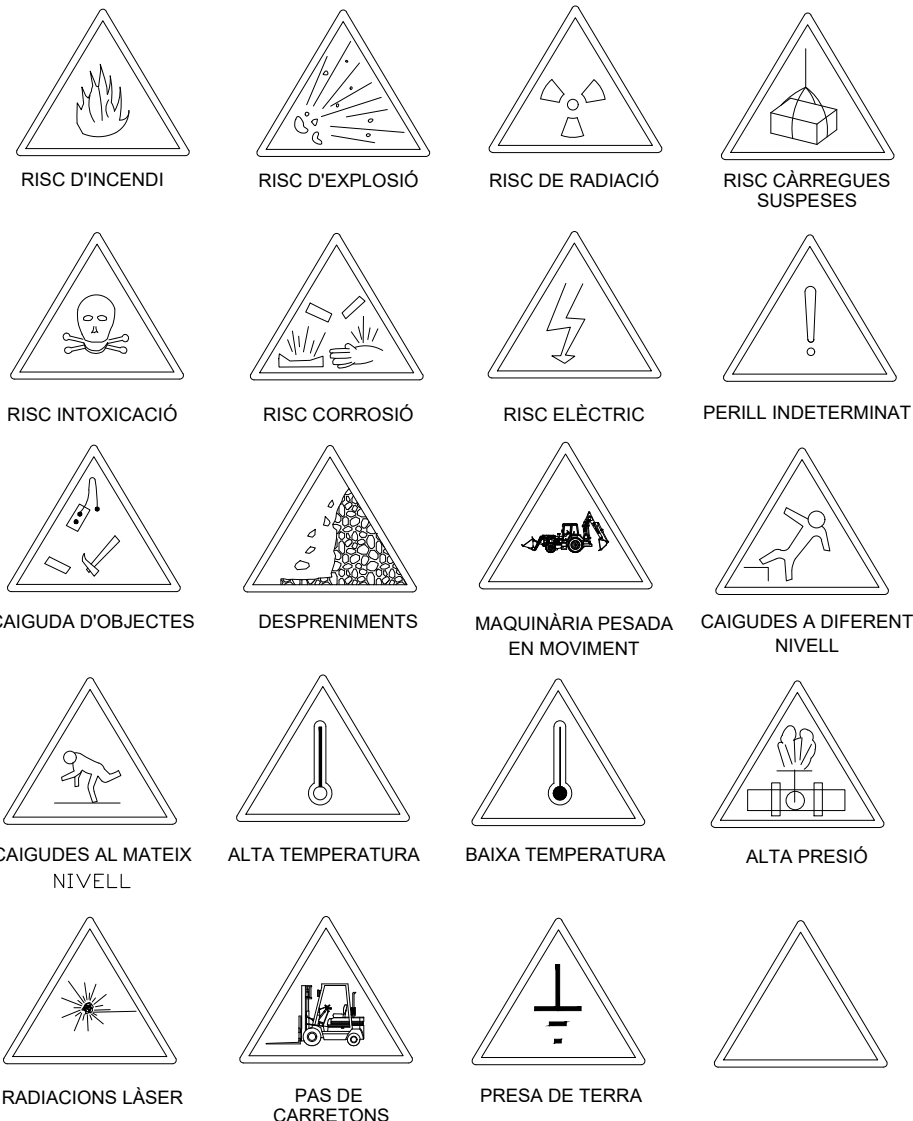


DIMENSIONS EN mm		
D	D1	m
594	534	30
420	378	21
297	267	15
210	188	11
148	132	8
105	87	5

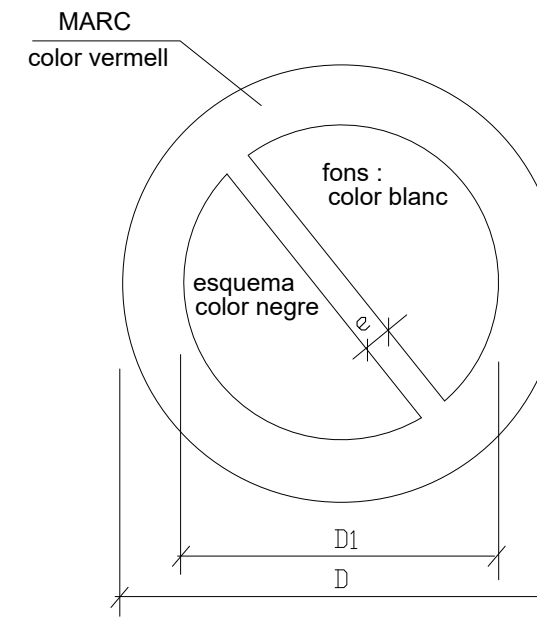
## SENYALS D'ADVERTÈNCIA DE PERILL



DIMENSIONS EN mm		
L	L1	m
594	492	30
420	348	21
297	248	15
210	174	11
148	121	8
105	87	5



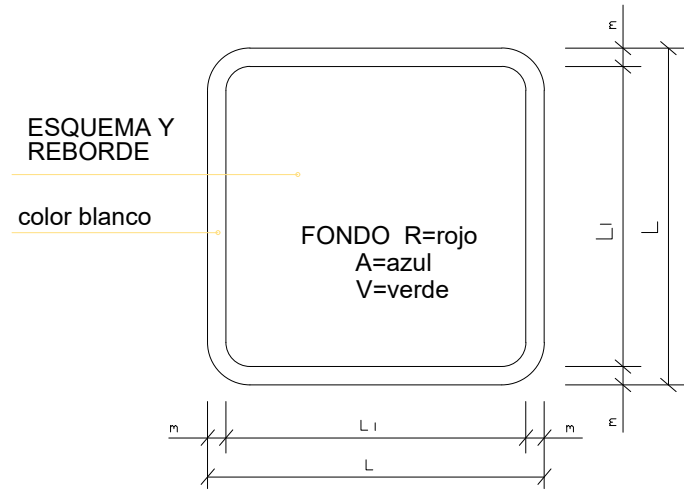
## SENYALS DE PROHIBICIÓ



DIMENSIONS EN mm		
D	D1	e
594	420	44
420	297	31
297	210	17
210	148	16
148	105	11
105	74	8



# SEÑALES SALVAMENTO VIAS DE EVACUACION EQUIPOS DE EXTINCION



DIMENSIONES EN mm.		
L	L <sub>1</sub>	m
594	534	30
420	378	21
297	267	15
210	188	11
148	132	8
105	95	5

 V. EQUIPOS PRIMEROS AUXILIOS	 V. CAMILLA DE SOCORRO	 R. EXTINTOR	 R. TELEFONO A UTILIZAR EN CASO DE EMERGENCIA	
 R. AVISADOR SONORO	 R. BOCA DE INCENDIO	 R. MATERIAL CONTRA INCENDIO	 R. PULSADOR DE ALARMA	
 R. CUBO PARA USO EN CASO DE INCENDIO	 R. ESCALERA DE INCENDIO	 A. INDICADOR DE PUERTA DE SALIDA NORMAL	 V. SALIDA DE SOCORRO EMPUJAR PARA ABRIR	
 V. SALIDA DE SOCORRO DESLIZAR PARA ABRIR	 V. SALIDA DE SOCORRO PRESIONAR LA BARRA PARA ABRIR	 V. SALIDA A UTILIZAR EN CASO DE URGENCIA	 V. ROMPER PARA PASAR	
 V. VIAS DE EVACUACION	 R. LOCALIZACION EQUIPOS CONTRA INCENDIO	 V. VIAS DE EVACUACION	 R. LOCALIZACION EQUIPOS CONTRA INCENDIO	 V. LAVA OJOS

## PRIMEROS AUXILIOS

 BOMBEROS TLFNO. <input type="text"/>	 AMBULANCIAS TLFNO. <input type="text"/>	 HOSPITAL TLFNO. <input type="text"/>
 SM SERVICIO MEDICO TLFNO. <input type="text"/>	 POLICIA TLFNO. <input type="text"/>	 OFICINAS PERSONAL TLFNO. <input type="text"/>
		 SERVICIO SEGURIDAD TLFNO. <input type="text"/>

ELEMENTOS LUMINOSOS

CLAVE	SEÑAL	DENOMINACION
TL-1		SEMAFORO (TRICOLOR)
TL-2		LUZ AMBAR INTERMITENTE
TL-3		LUZ AMBAR ALTERNATIVAMENTE INTERMITENTE
TL-4		TRIPLE LUZ AMBAR INTERMITENTE
TL-5		DISCO LUMINOSO MANUAL DE PASO PERMITIDO
TL-6		DISCO LUMINOSO MANUAL DE STOP O PASO PROHIBIDO
TL-7		LINEA DE LUCES AMARILLAS FIJAS

ELEMENTOS LUMINOSOS

CLAVE	SEÑAL	DENOMINACION
TL-8		CASCADA LUMINOSA (LUZ APARENTEMENTE MOVIL)
TL-9		TUBO LUMINOSO (LUZ APARENTEMENTE MOVIL)
TL-10		LUZ AMARILLA FIJA
TL-11		LUZ ROJA FIJA

ELEMENTOS DE DEFENSA

CLAVE	SEÑAL	DENOMINACION
TD-1		BARRERA DE SEGURIDAD RIGIDA PORTATIL
TD-2		BARRERA DE SEGURIDAD METALICA

ELEMENTOS DE BALIZAMIENTO REFLECTANTES

CLAVE	SEÑAL	DENOMINACION
TB-1		PANEL DIRECCIONAL ALTO
TB-2		PANEL DIRECCIONAL ESTRECHO
TB-3		PANEL DOBLE DIRECCIONAL ALTO
TB-4		PANEL DOBLE DIRECCIONAL ESTRECHO
TB-5		PANEL DE ZONA EXCLUIDA AL TRAFICO
TB-6		CONO
TB-7		PIQUETE

ELEMENTOS DE BALIZAMIENTO REFLECTANTES

CLAVE	SEÑAL	DENOMINACION
TB-8		BALIZA DE BORDE DERECHO
TB-9		BALIZA DE BORDE IZQUIERDO
TB-10		CAPTAFARO LADO DERECHO E IZQUIERDO
TB-11		HITO DE BORDE REFLEXIVO Y LUMINISCENTE
TB-12		MARCA VIAL NARANJA
TB-13		GUARNALDA
TB-14		BASTIDOR MOVIL

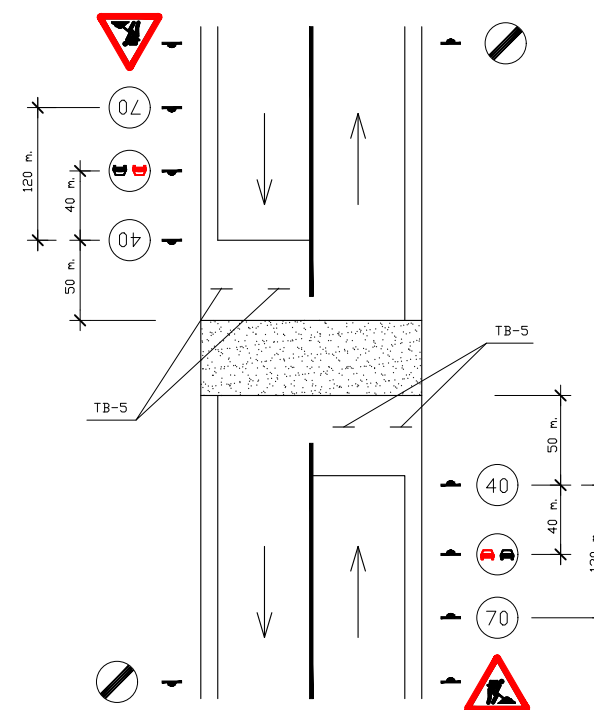
SEÑALES DE INDICACION

CLAVE	SEÑAL	DENOMINACION
TL-1		REDUCCION DE UN CARRIL POR LA DERECHA (3 a 2)
TL-1		REDUCCION DE UN CARRIL POR LA IZQUIERDA (3 a 2)
TL-1		REDUCCION DE UN CARRIL POR LA DERECHA (2 a 1)
TL-1		REDUCCION DE UN CARRIL POR LA IZQUIERDA (2 a 1)

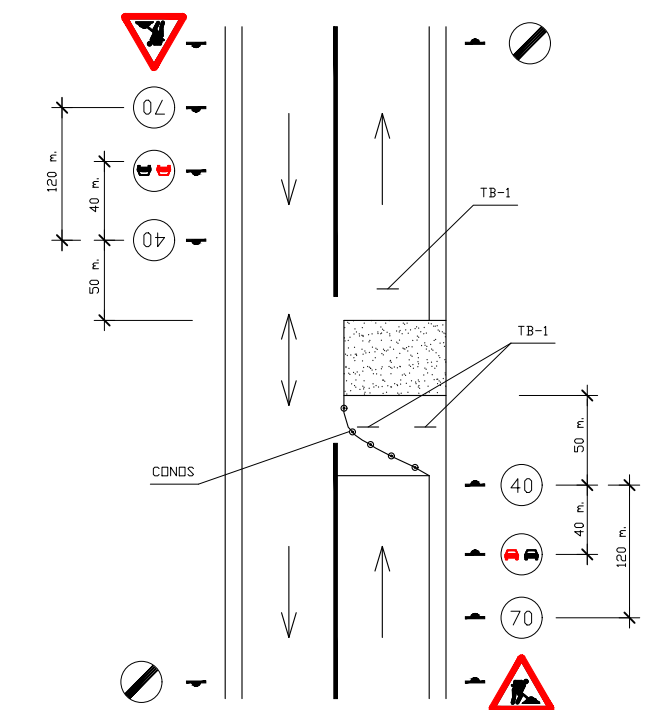
SEÑALES DE INDICACION

CLAVE	SEÑAL	DENOMINACION
TS-60		DESVIDO DE UN CARRIL POR CALZADA OPUESTA
TS-61		DESVIDO DE UN CARRIL POR CALZADA OPUESTA MANTENIENDO DTRD POR LA DE OBRAS
TS-62		DESVIDO DE DOS CARRILES POR CALZADA OPUESTA
TS-210		CARTEL CROQUIS

OBRAS QUE OCUPAN DOS VIAS COMPLETAS

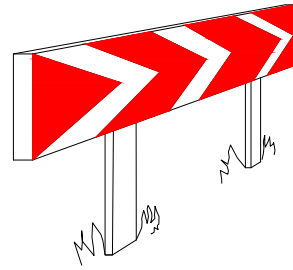


OBRAS QUE OCUPAN UNA VIA COMPLETA

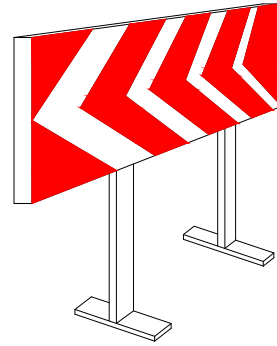




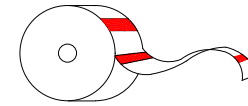
# ELEMENTS AUXILIARS DE SENYALITZACIÓ



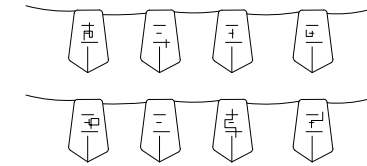
PANELS DIRECCIONALS PER A CORBES



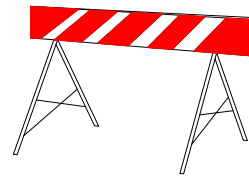
PANELS DIRECCIONALS PER A OBRES



CINTA BALISAMENT REFLECTANT



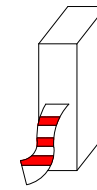
CORDÓ BALISAMENT



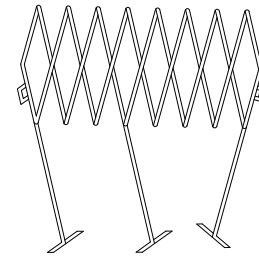
TANCA D'OBRA MODEL 2



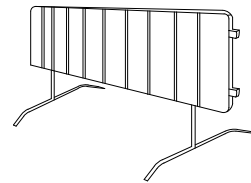
TANCA D'OBRA MODEL 1



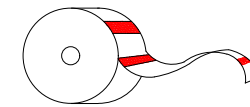
CINTA BALISAMENT PLÀSTIC



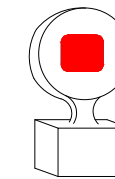
TANCA EXTENSIBLE



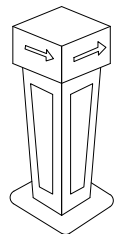
TANCA DE CONTENCIÓ DE PEATONS



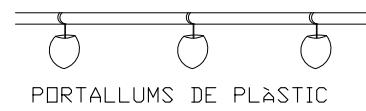
CINTA BALISAMENT PLÀSTIC



LLUM AUTÒNOMA FIXA INTERMITENT



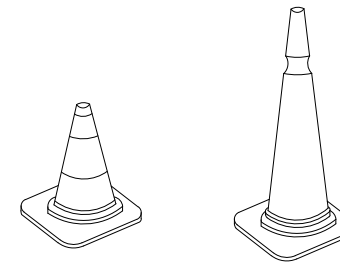
FITA LLUMINOSA



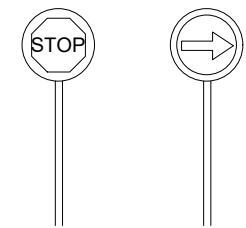
PORTALLUMS DE PLÀSTIC



CORDÓ BALISAMENT NORMAL I REFLEXIU



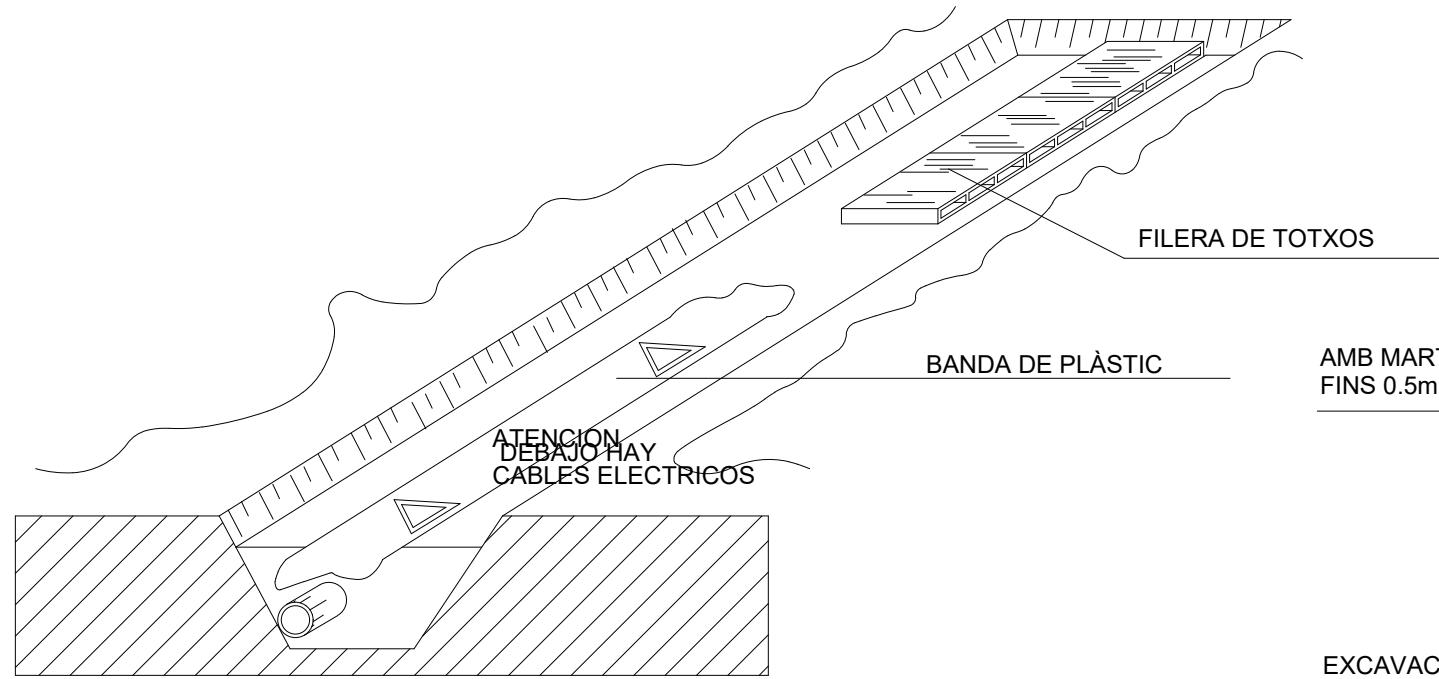
CONS



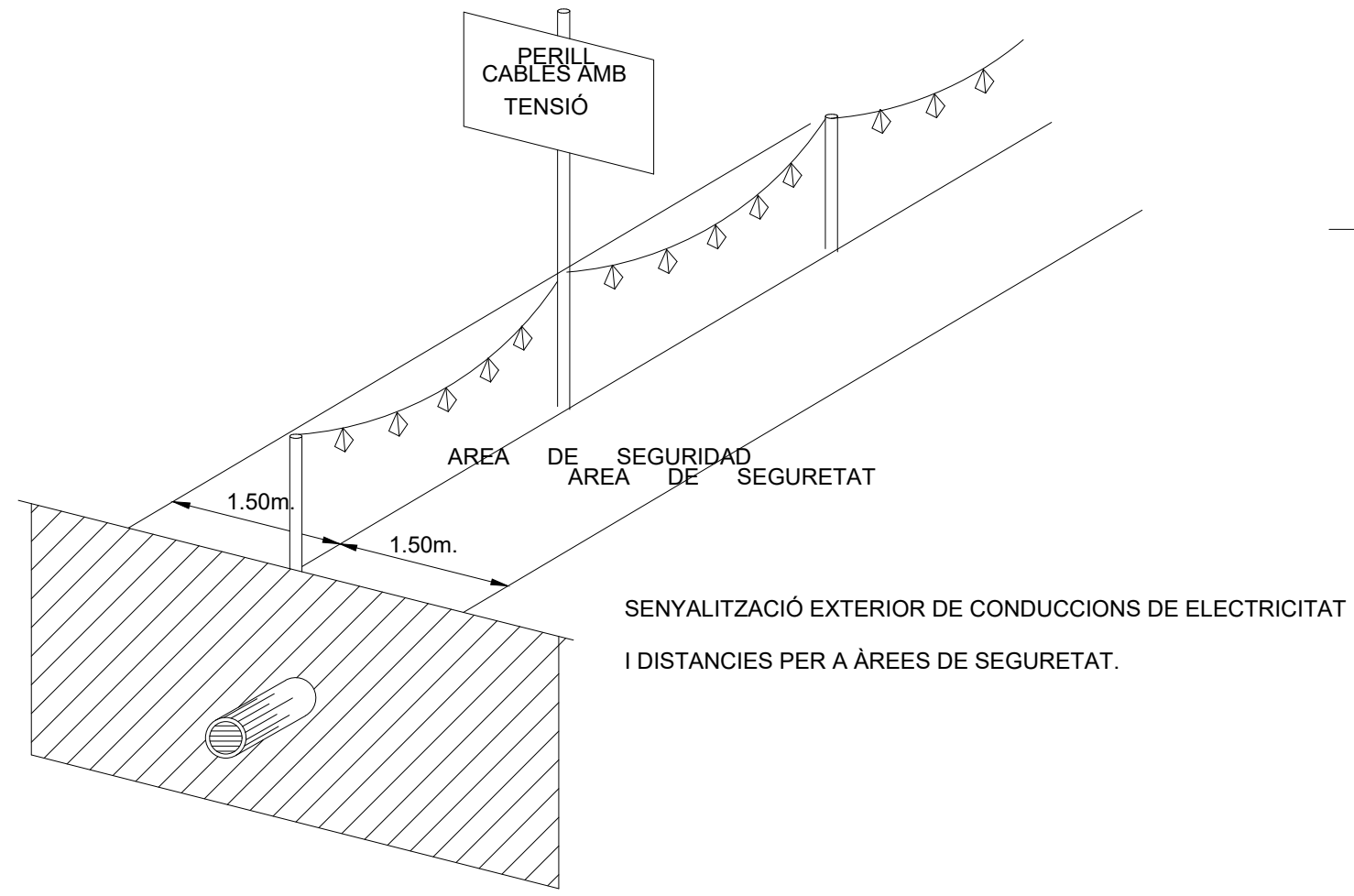
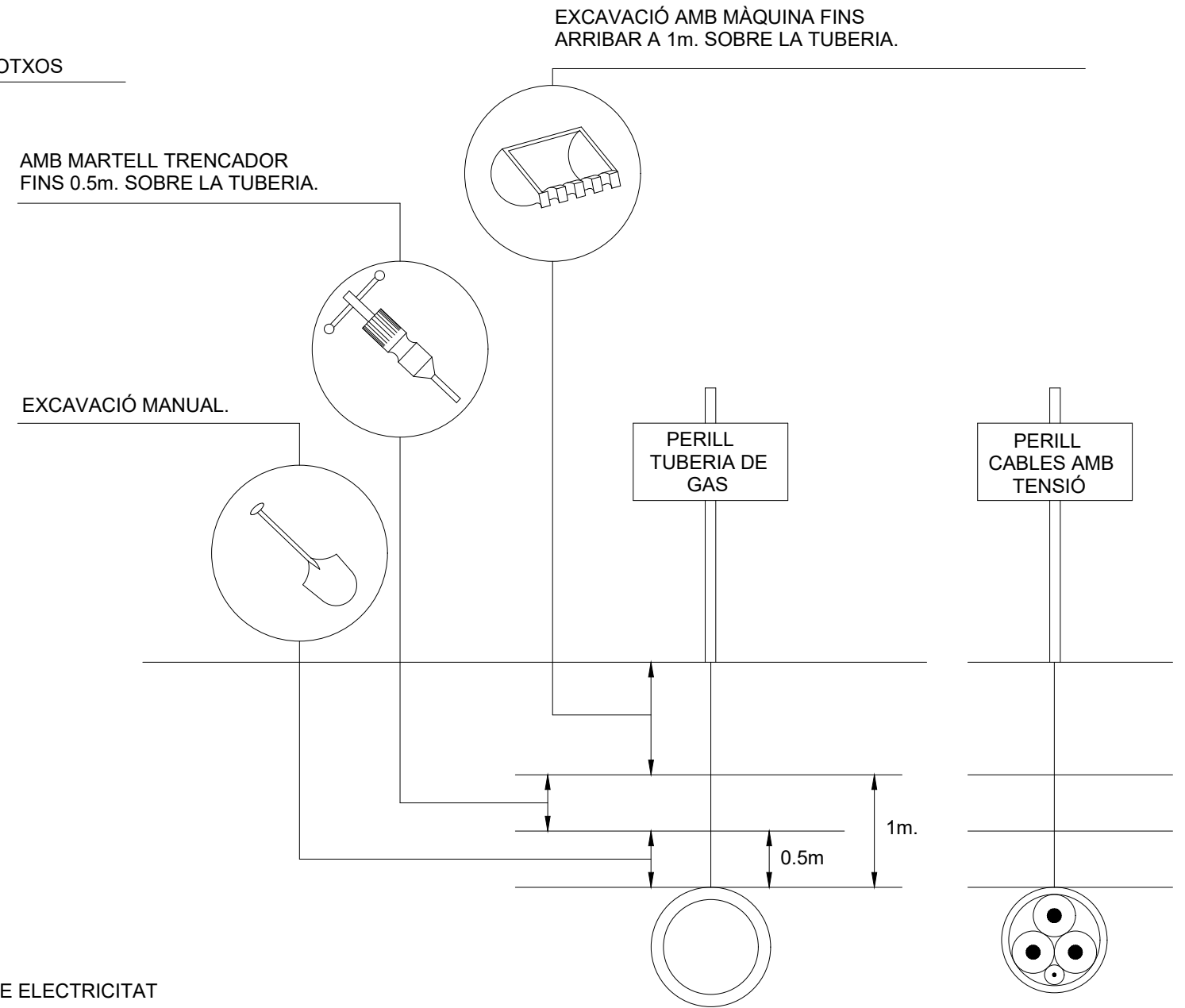
PALETES MANUALS DE SENYALITZACIÓ

# SENYALITZACIÓ INSTAL·LACIONS SERVEI

FORMES MES USUALS DE SENYALITZACIÓ INTERIOR I PROTECCIÓ  
UTILITZADES EN CONSTRUCCIONS ELÈCTRIQUES



DISTANCIAS MÀXIMES DE SEGURETAT RECOMANABLES EN TREBALLS  
D'EXCAVACIÓ SOBRE CONDUCCIONS DE GAS I ELECTRICITAT.



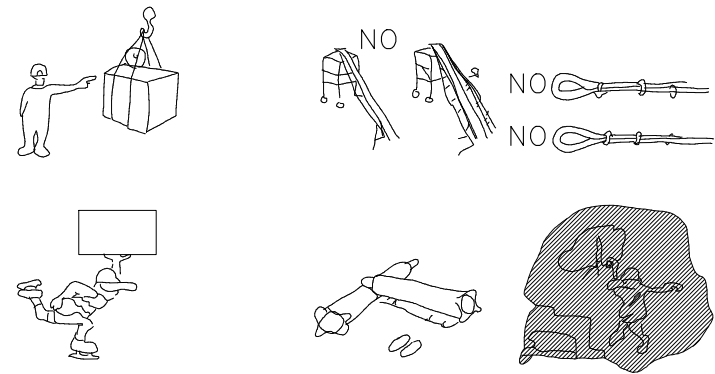
SENYALITZACIÓ EXTERIOR DE CONDUCCIONS DE ELECTRICITAT  
I DISTANCIAS PER A ÀREES DE SEGURETAT.

# MANIPULACIÓ DE MATERIALS

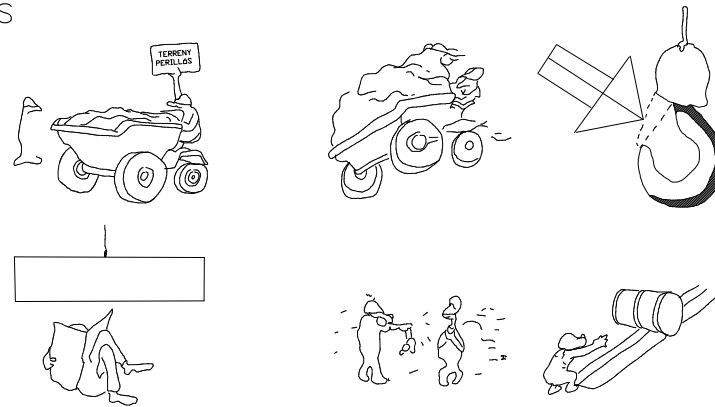
## ACCIONS PERILLOSES



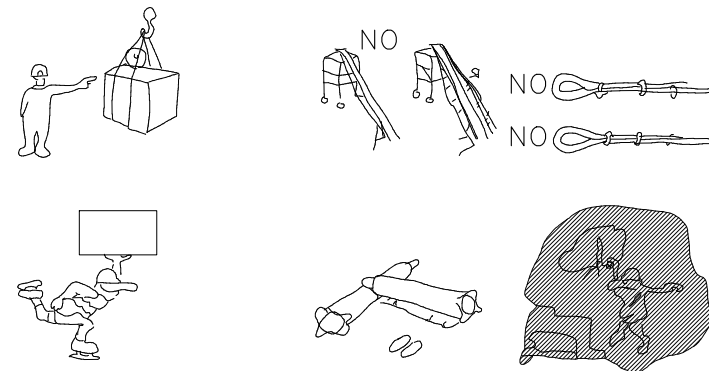
## CONDICIONS PERILLOSES



## ACCIONS PERILLOSES

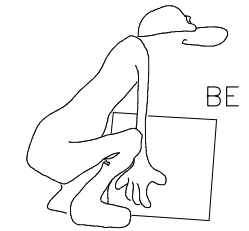
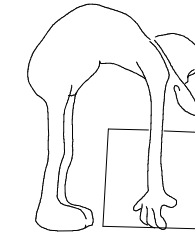


## CONDICIONS PERILLOSES

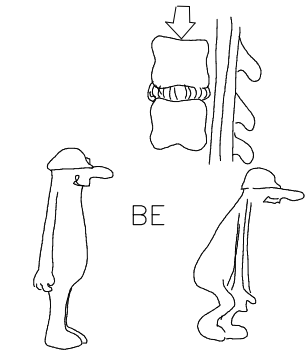
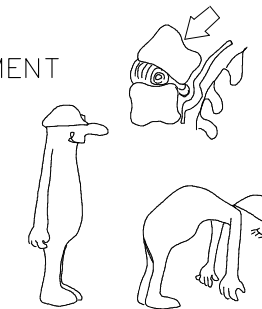


# MANIPULACIÓ DE CÀRREGUES

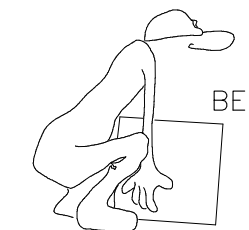
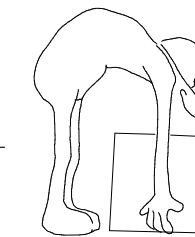
## MALAMENT



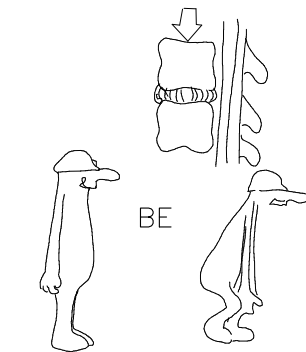
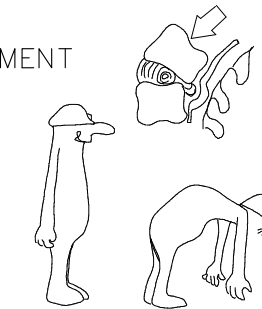
## MALAMENT

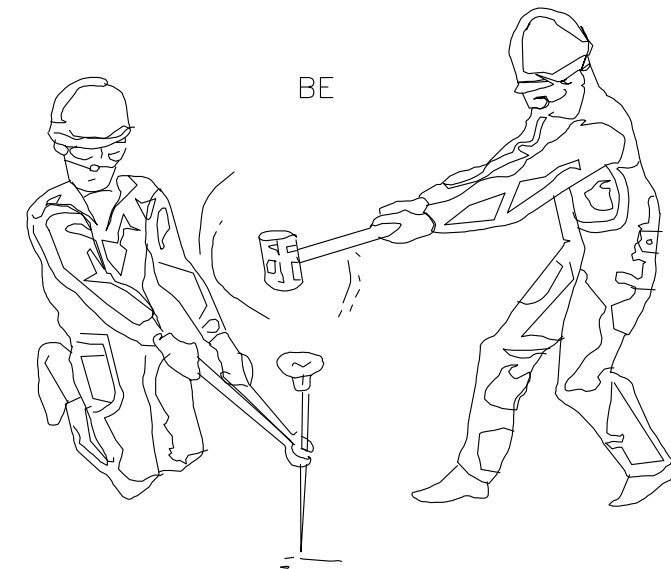
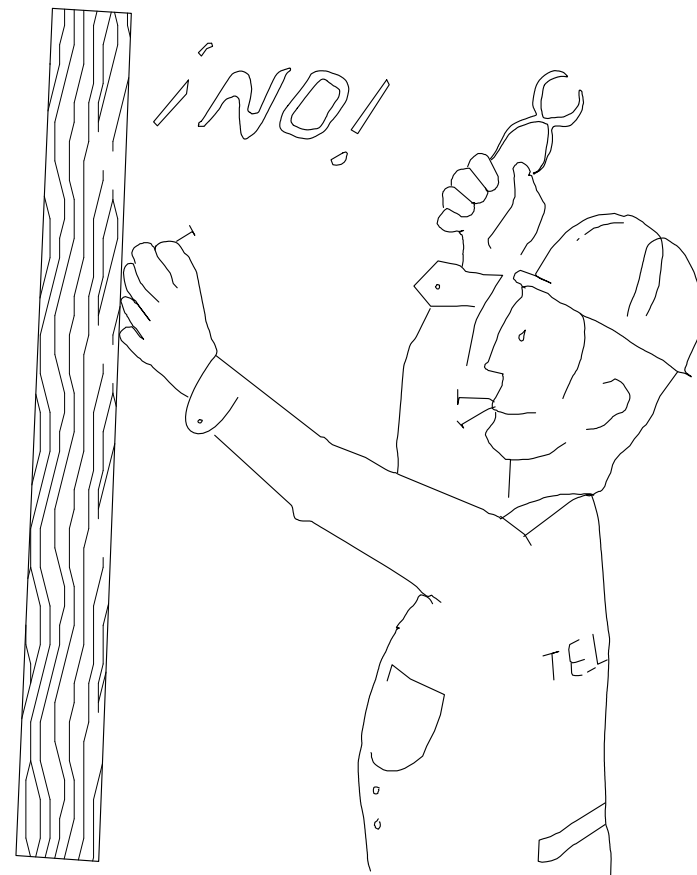
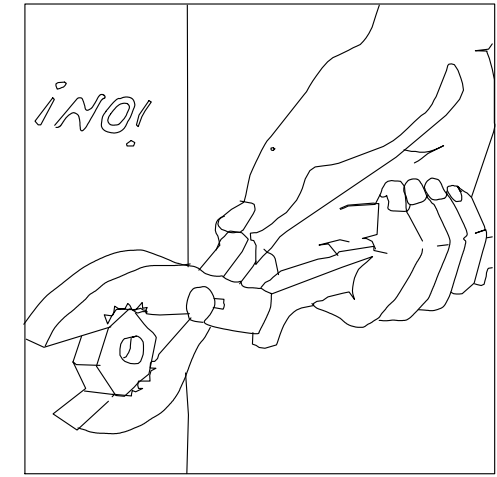
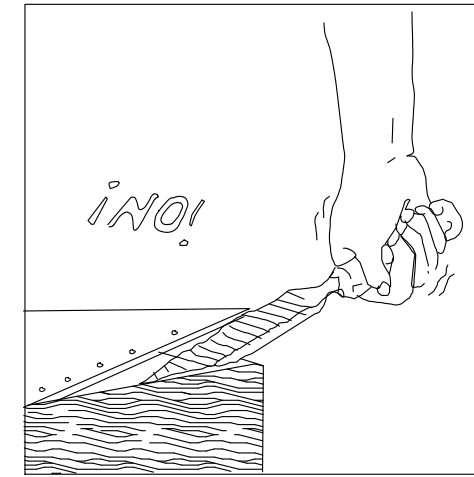
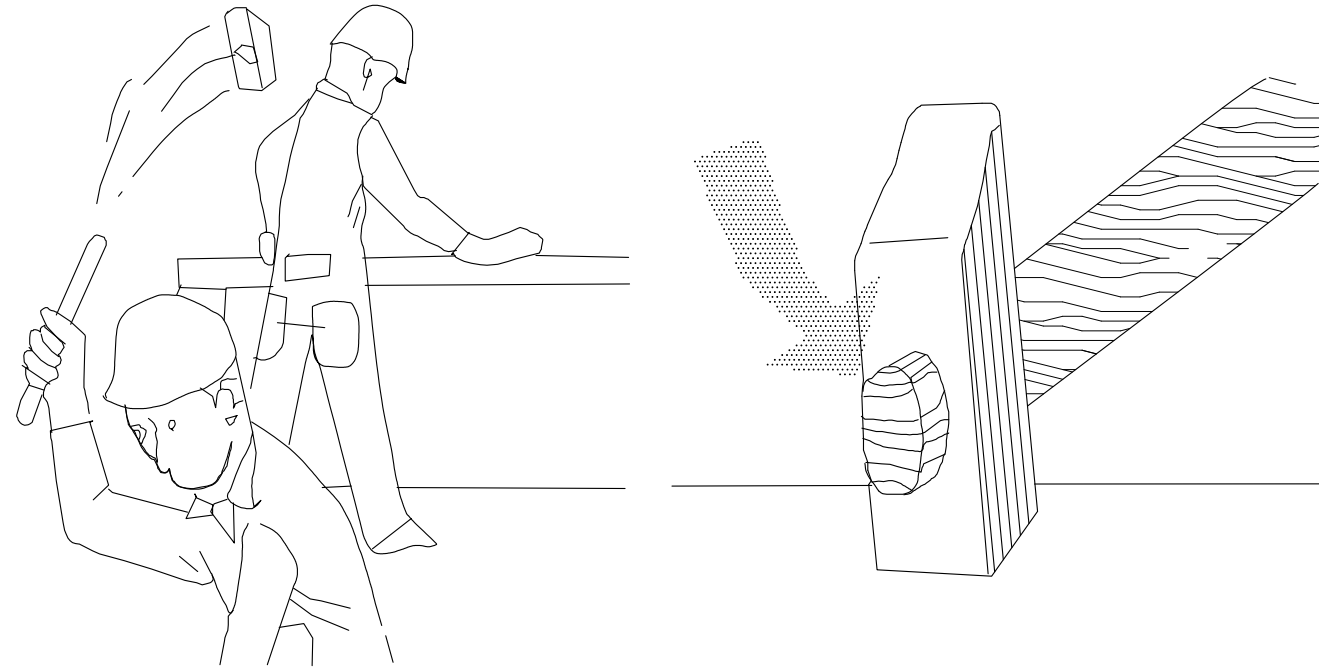


## MALAMENT



## MALAMENT





REVISAR I UTILITZAR CORRECTAMENT LES EINES

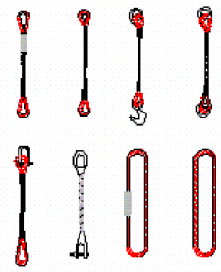
! ATENCIÓ !

REVISAR I UTILITZAR CORRECTAMENT LES EINES

# ESLLINGAT DE CÀRREGUES

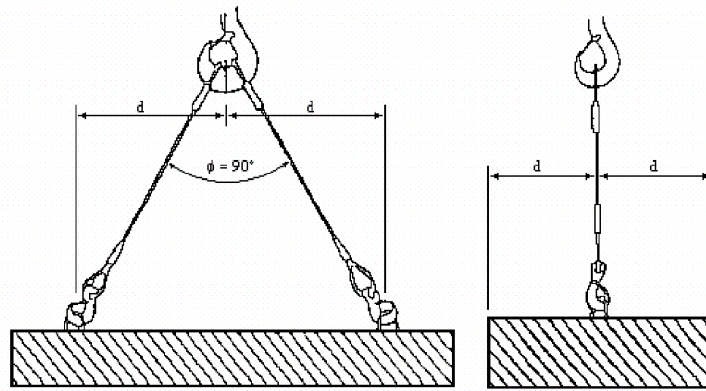
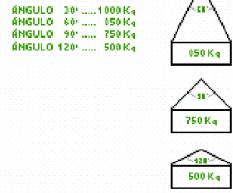
# SENYALS PER MANEIG DE GRUES

### TIPOS DE ESLLINGAS

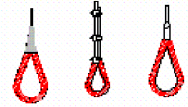


### MANEJO DE MATERIALES

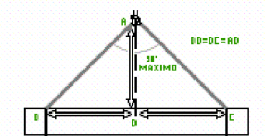
#### LA MISMA ESLLINGA



### GAZAS



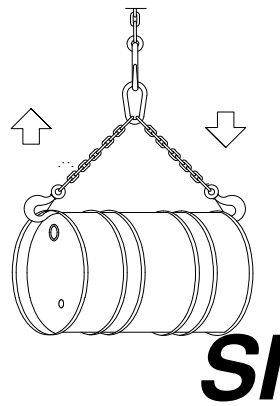
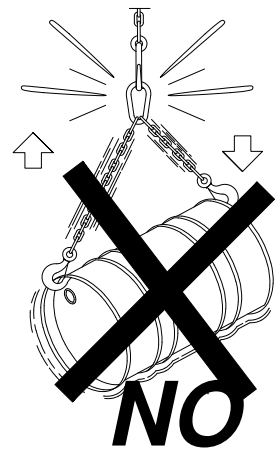
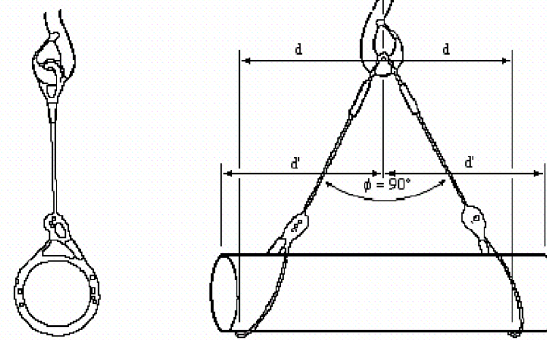
### RELACIÓ ENTRE EL ÀNGULO DE LA ESLLINGA I SU CAPACIDAD DE CÀRREGA



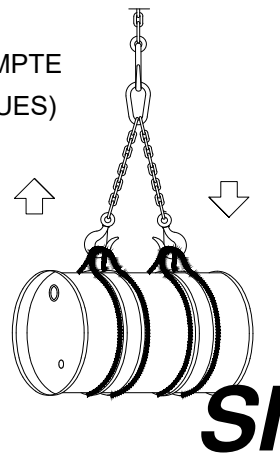
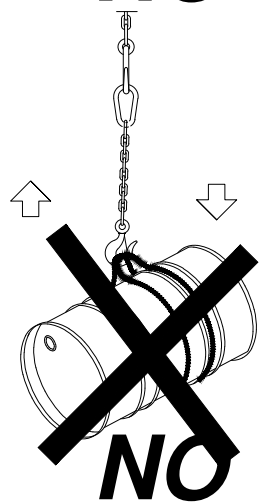
### MÉTODO CORRECTO

### MÉTODOS INCORRECTOS

DIÀMETRE DEL CABLE	NÚMERO DE PERRILLOS	DISTANCIA ENTRE PERRILLOS
Hasta 12 mm	3	6 diàmetros
12 mm a 20 mm	4	6 diàmetros
20 mm a 25 mm	5	6 diàmetros
25 mm a 35 mm	6	6 diàmetros



(PRECAUCIONS A TENIR EN COMPTE EN L'AIXECAMENT DE CÀRREGUES)



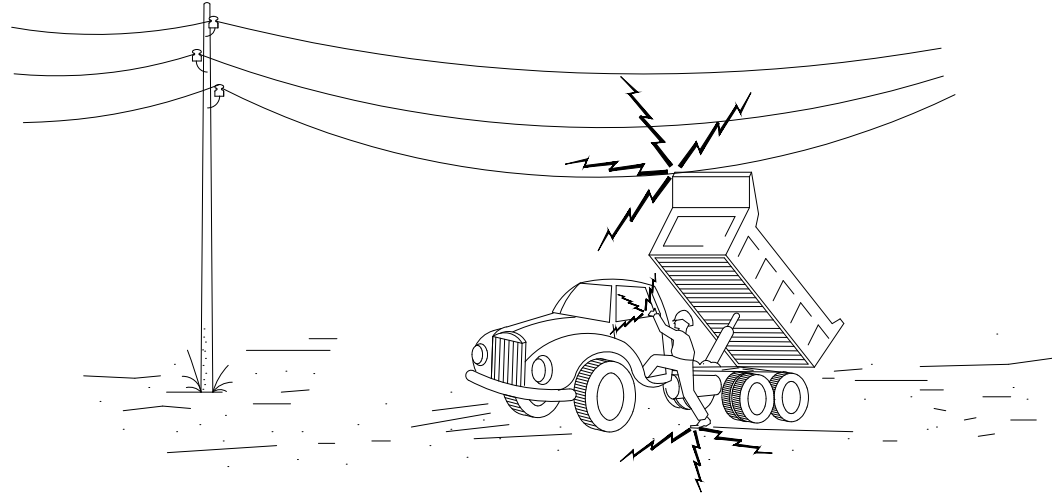
<b>ATENCIÓ</b> 	<b>PUJADA</b> 	<b>PUJADA LENTA</b> 
<b>DETENCIÓ</b> 	<b>DESCENS</b> 	<b>DESCENS LENT</b> 
<b>DETENCIÓ URGENT</b> 	<b>ACOMPANYAMENT</b> 	<b>FI DE COMANDAMENT</b> 
<b>DESPLAÇAMENT HORIZONTAL LENT</b> 		
<b>DESPLAÇAMENT HORIZONTAL</b> 		

### SENYALS ACÚSTIQUES O LLUMINOSOS DE RESPOSTA

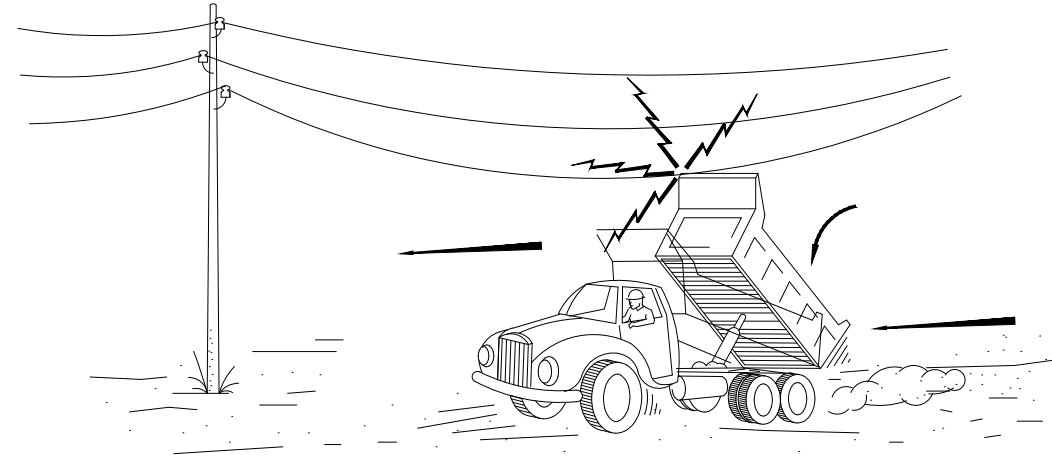
ENTÉS	
Obeeixo	senyal breu
REPETEIX	
Sol·licito ordres	Dues senyals breus
CURA	
Perill imminent	senyals llargues o una continua
en marxa lliure	
Aparell	
en desplaçament	senyals curtes



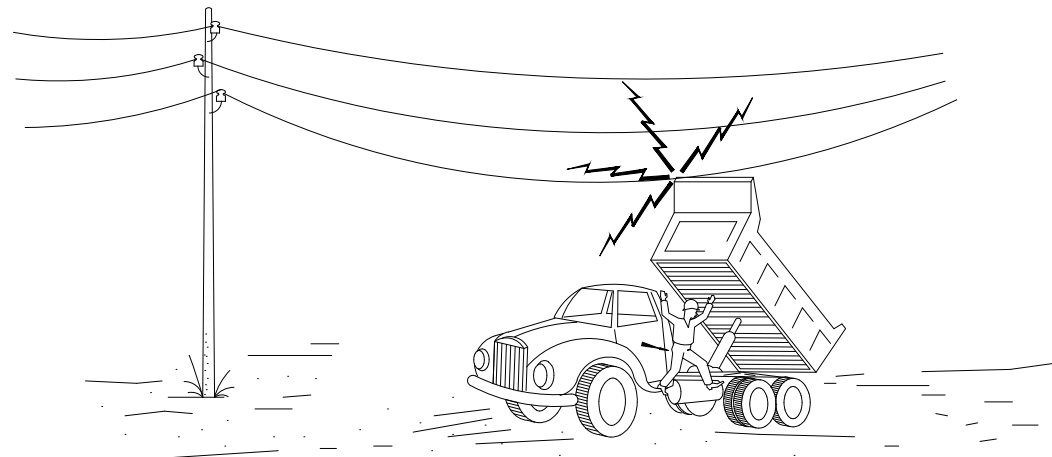
## ACTUACIÓ EN CAS DE CONTACTE



1- EN CAP CAS DESCENDEIXI LENTAMENT.

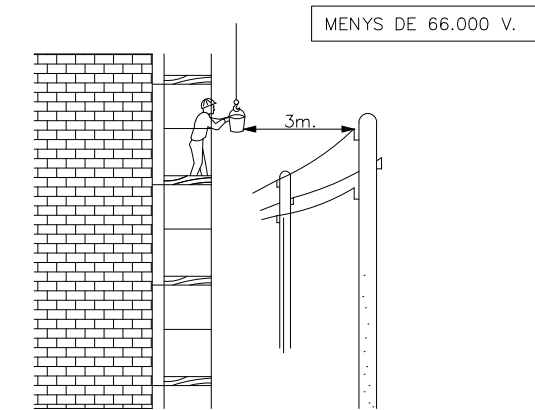


2- SI CONTACTO, NO ABANDONI LA CABINA, INTENTI EN PRIMER LLOC BAIXAR-HO I ALLUNAR-SE.

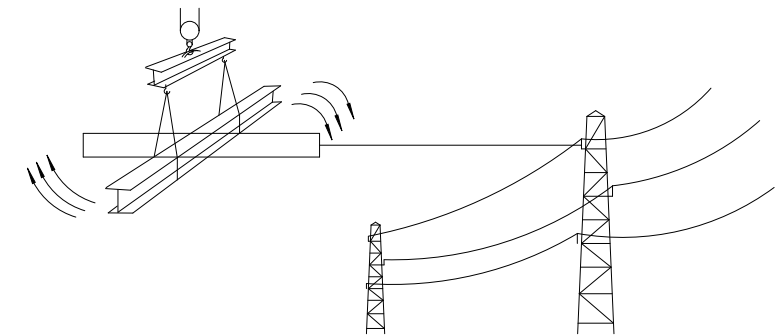


3- SI NO CONSEGUIEX QUE BAIXI, SALTI DEL CAMIÓ EL MÉS LLUNYÀ POSSIBLE

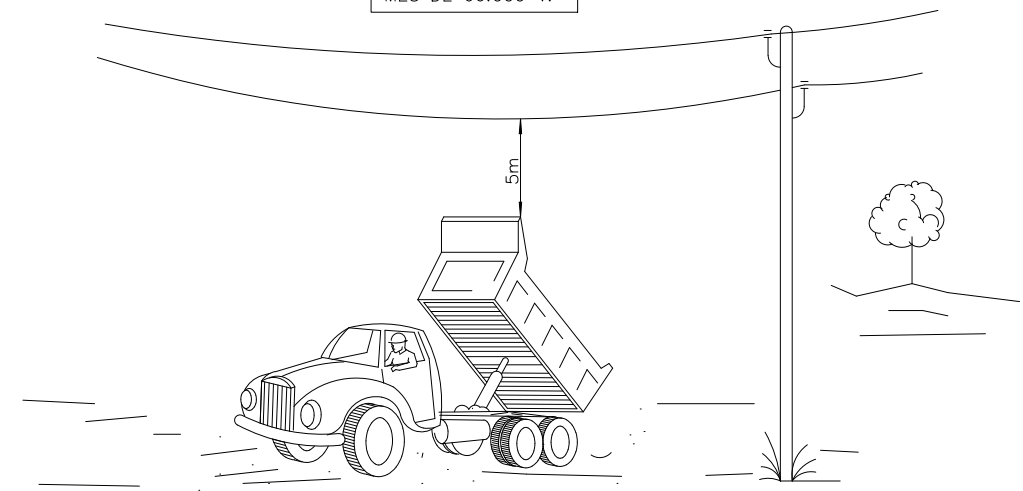
## DISTANCIES MÍNIMES DE SEGURETAT AMB RESPECTE A LÍNIES AÈRIES ELÈCTRIQUES D'ALTA TENSIÓ.



SEMPRE TENIR EN COMPTE LA SITUACIÓ MÉS DESFAVORABLE.

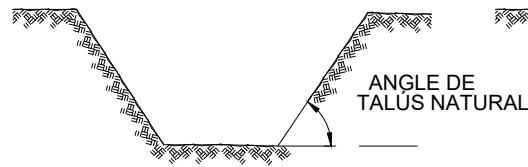


MÉS DE 66.000 V.

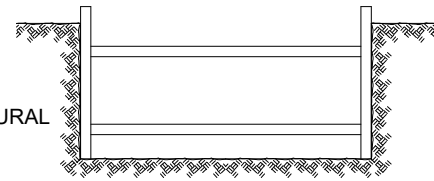


# EXCAVACIONS

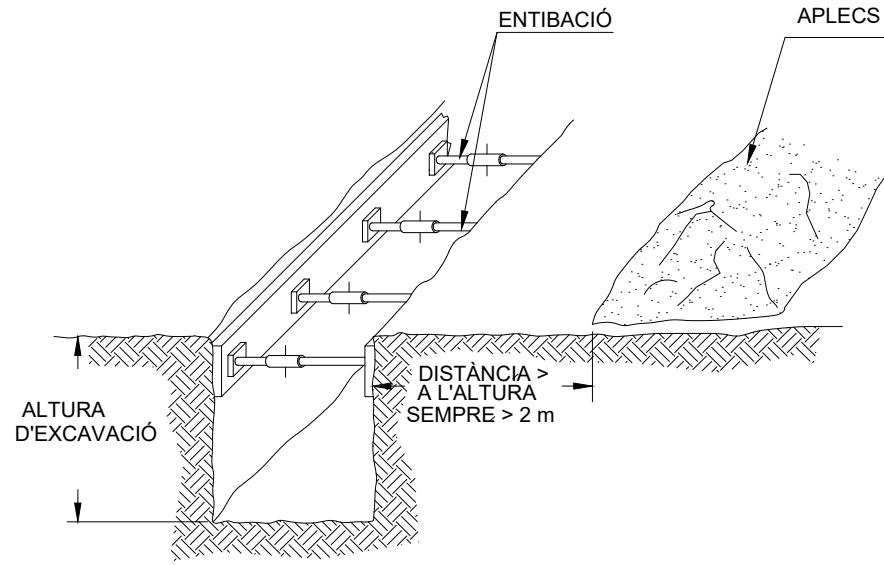
## TALÚS NATURAL



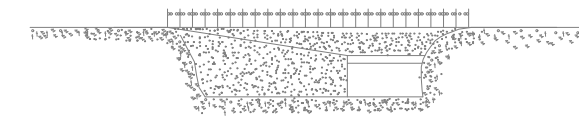
## ENTIBACIÓ



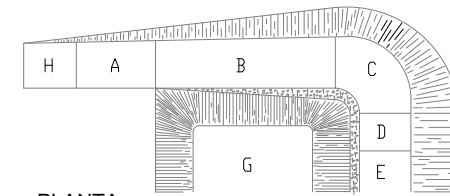
## PRECAUCIONS EN LES EXCAVACIONS



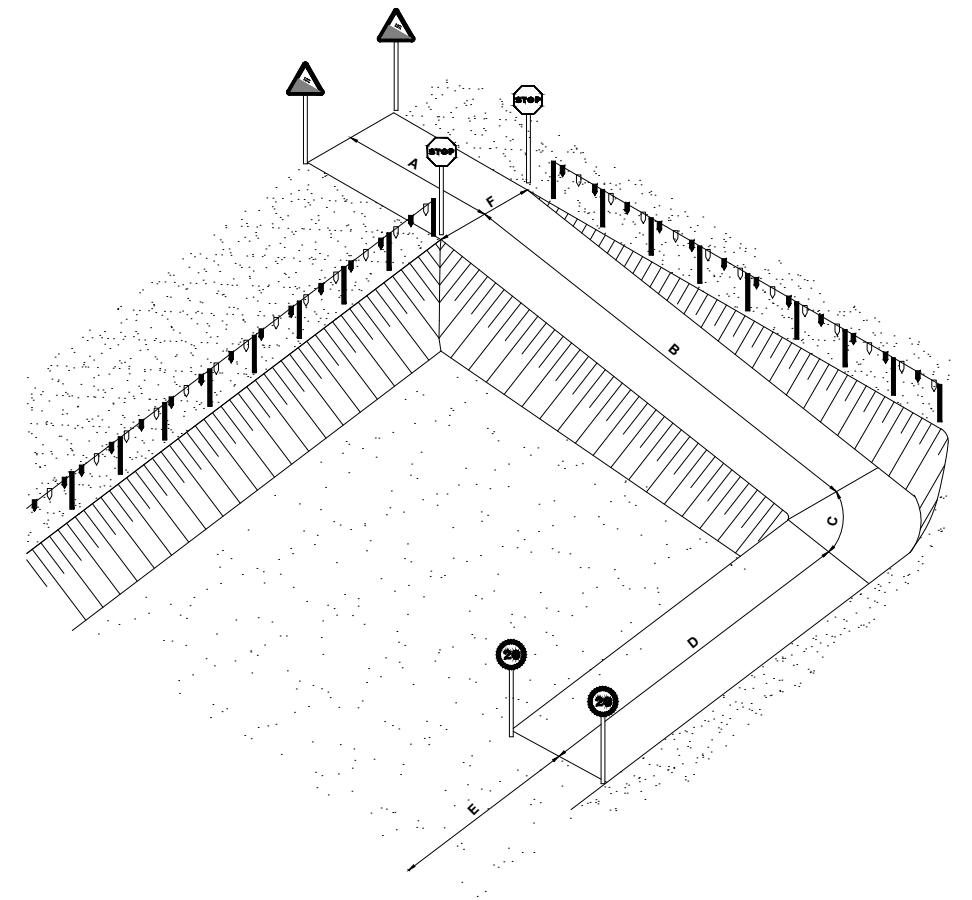
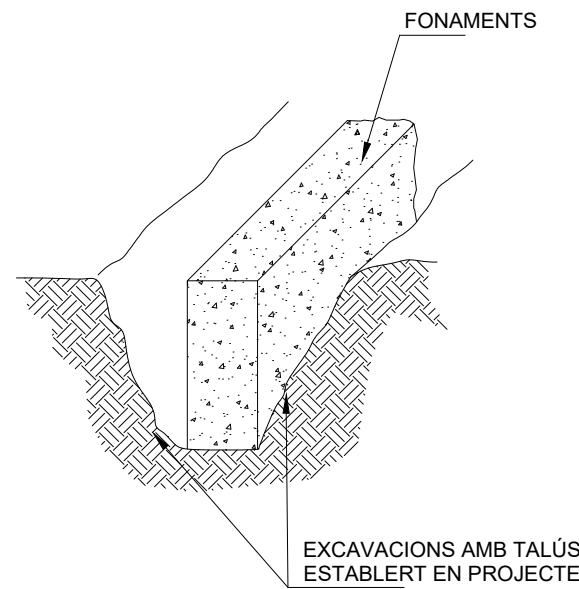
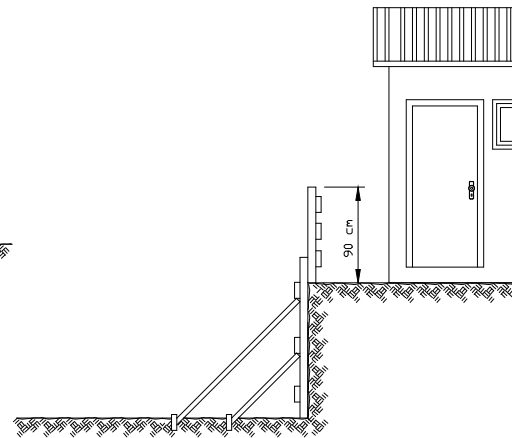
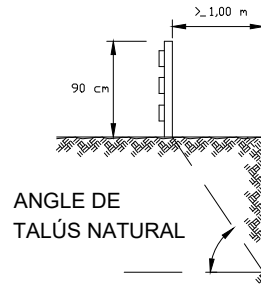
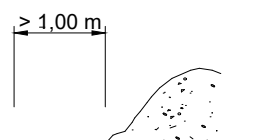
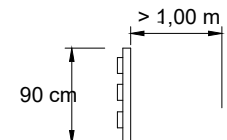
## RAMPES D'ACCÉS A ZONES EXCAVADES



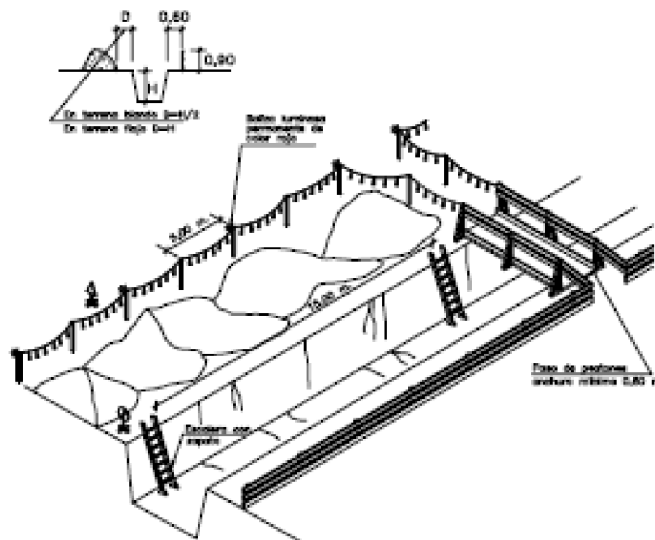
### ALÇAT SECCIÓ



- A.- ZONA HORIZONTAL
- B.- < 12% PENDENT EN TRAMS RECTES
- C.- < 8% PENDENT EN TRAMS EN CORBA
- D.- < 12% PENDENT EN TRAMS RECTES
- E.- > 6,00 m. INICI DE PUJADA
- F.- AMPLE MÍNIM 4,50 m.

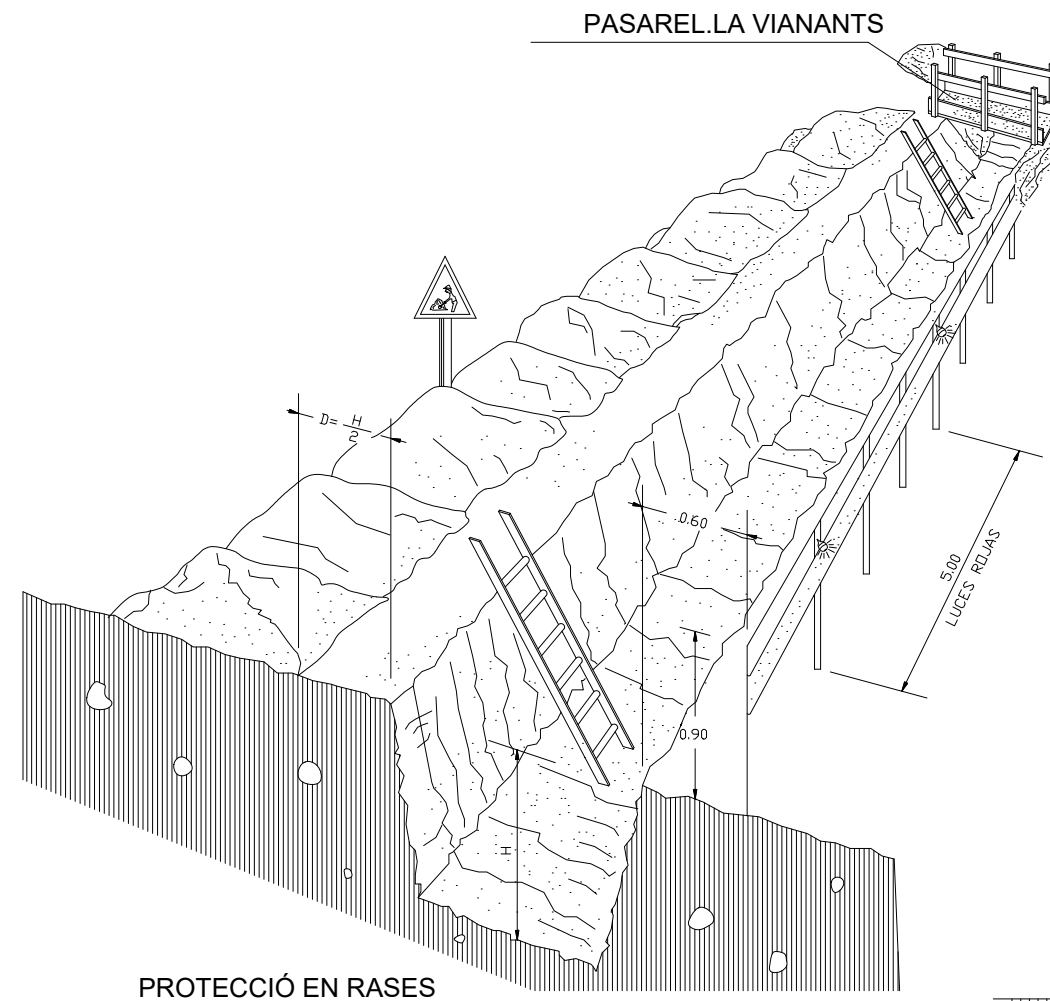


NINXOL PER A PROTECCIÓ DE SOLDADOR



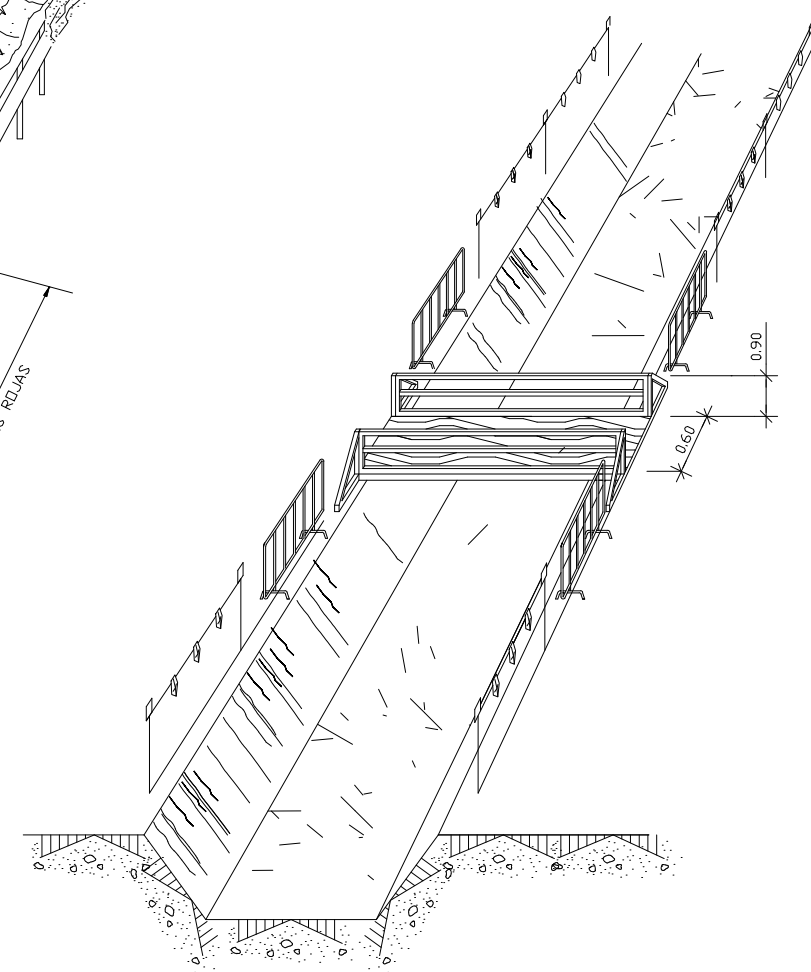


# RASES



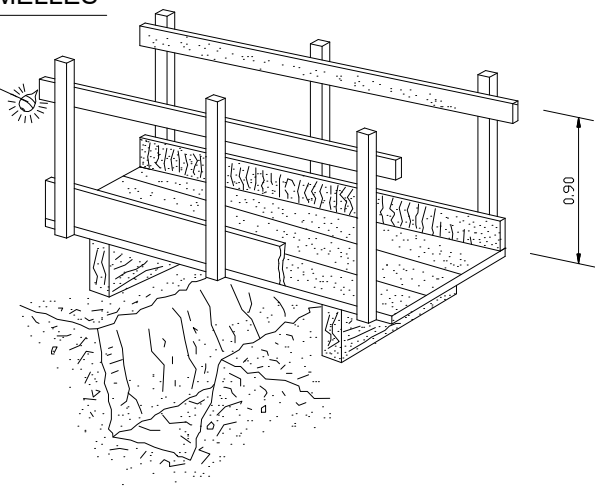
PROTECCIÓ EN RASES

## PROTECCIONS A RASES, FORATS I OBERTURES



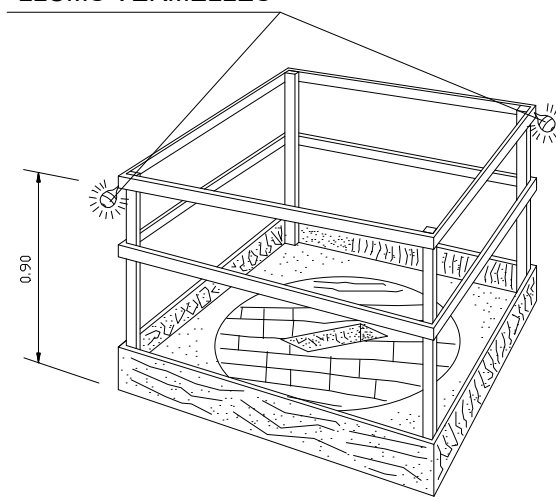
PAS EN RASES

### LLUMS VERMELLES

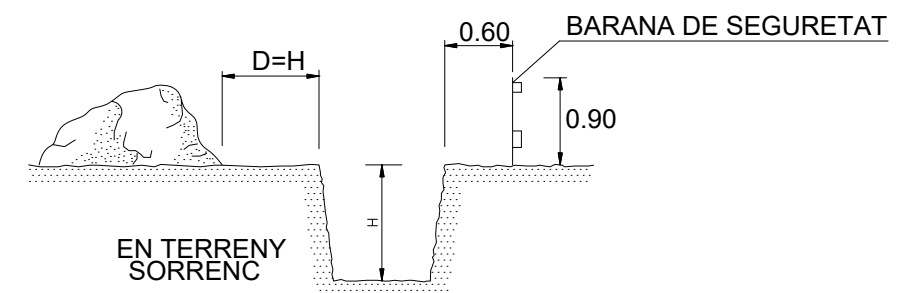


DETALL DE PASARELLA VIANANTS

### LLUMS VERMELLES

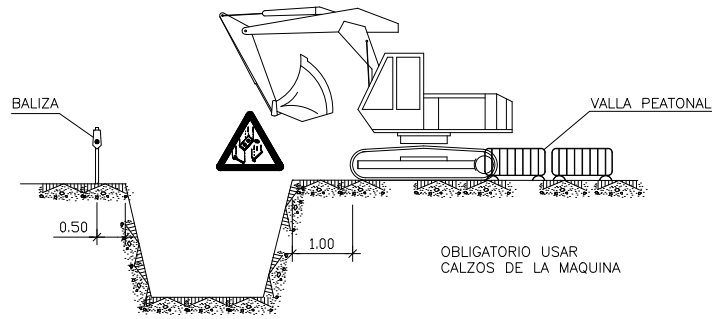


EN FORATS I OBERTURES

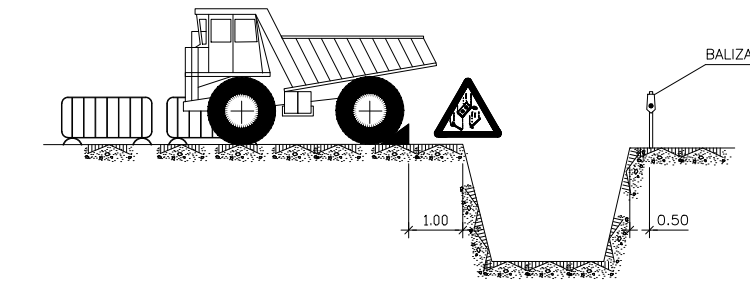


EN TERRENY SORRENC

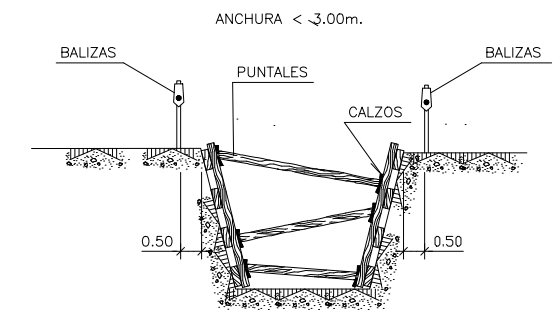
### EXCAVACION



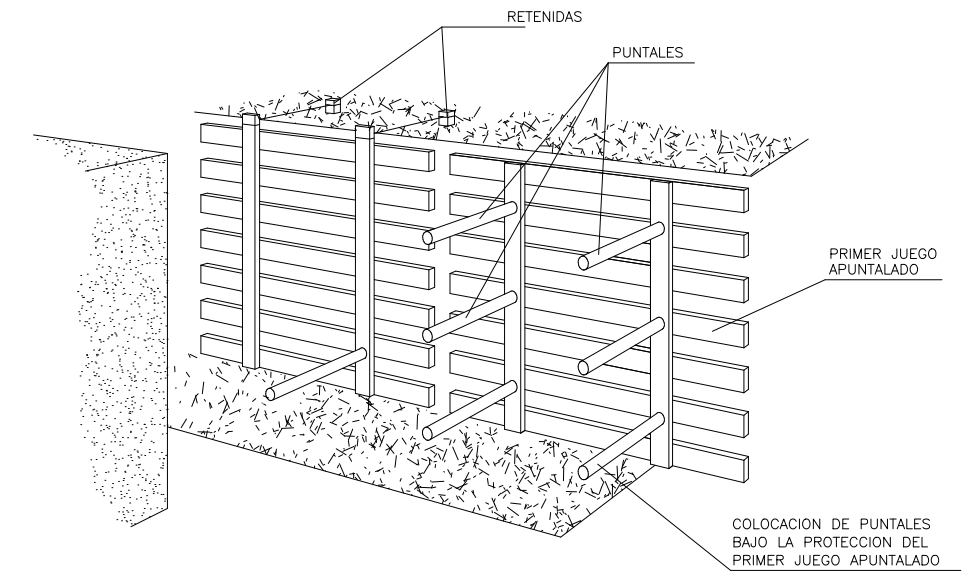
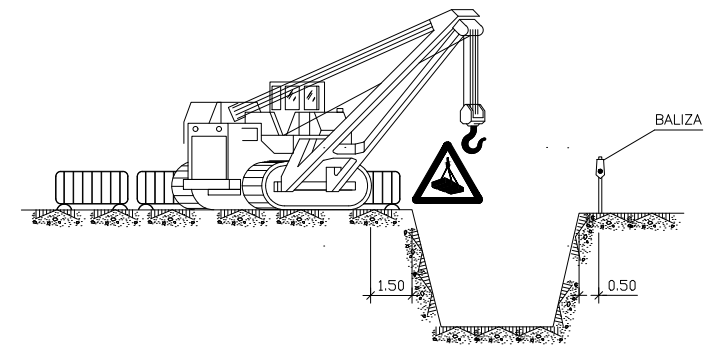
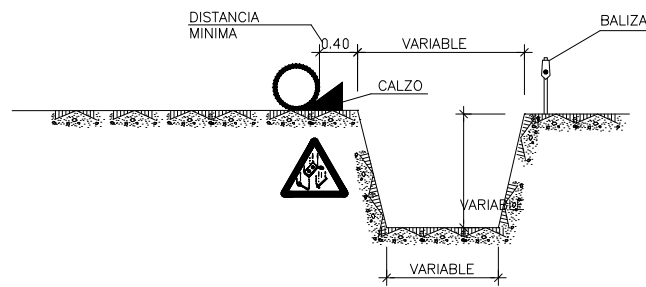
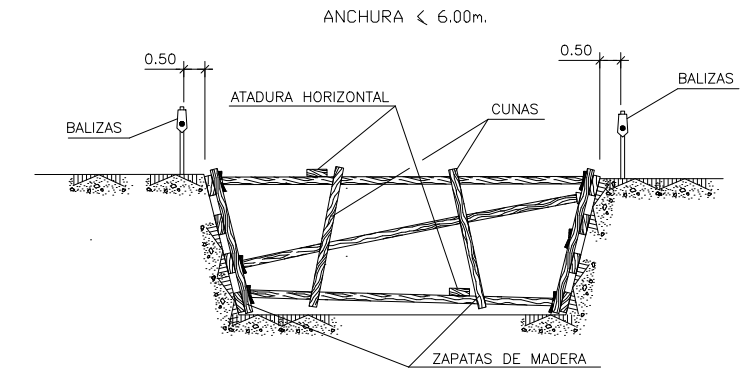
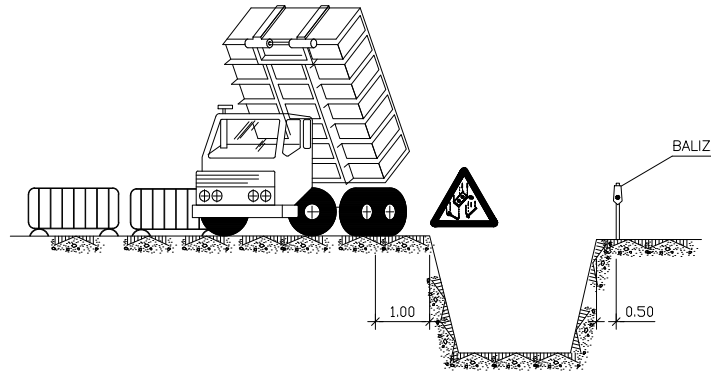
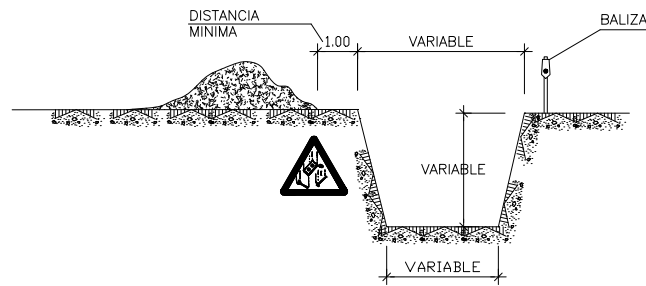
### CARGA Y DESCARGA



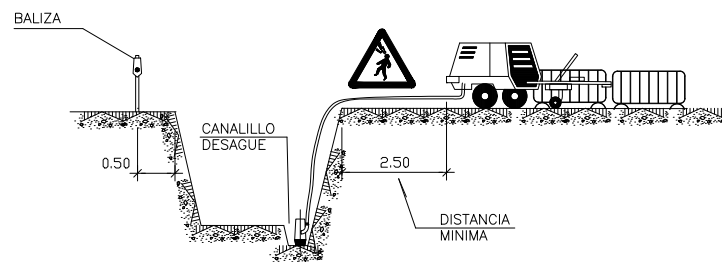
### POSIBLES TIPOS DE ENTIBACION



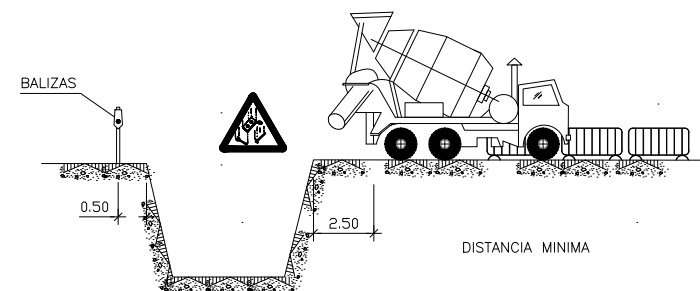
### ACOPIOS



### AGOTAMIENTOS

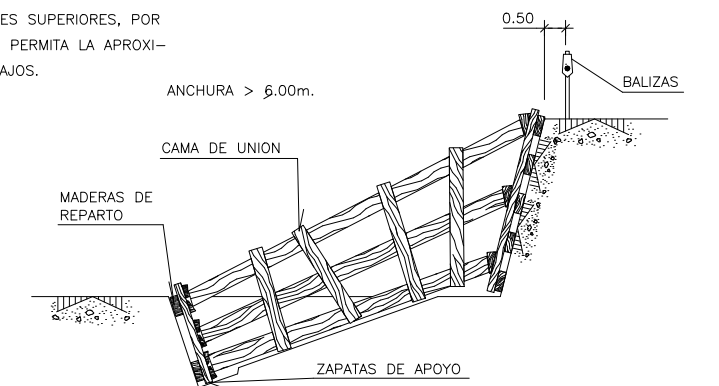


### ELEMENTOS VIBRATORIOS



LOS PANELES SE PREFABRICAN Y SE DESCENDEN AL FONDO COMO SE INDICA. SE COLOCARAN PRIMERO

LOS PUNTALES DE LOS PANELES SUPERIORES, POR MEDIO DE UNA PASARELA QUE PERMITA LA APROXIMACION: DESPUES LOS MAS BAJOS.



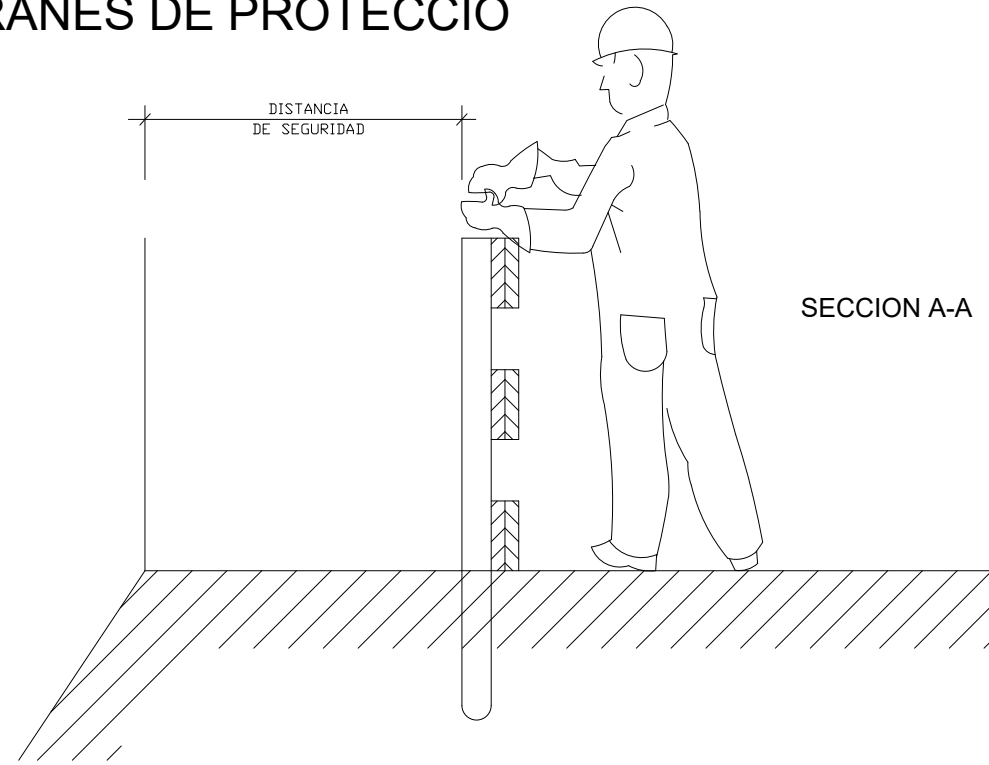
NOTA:

SE ENTIBARAN LOS TALUDES QUE SEAN NECESARIOS, CONSIDERANDO LA EXISTENCIA DE AGUA.

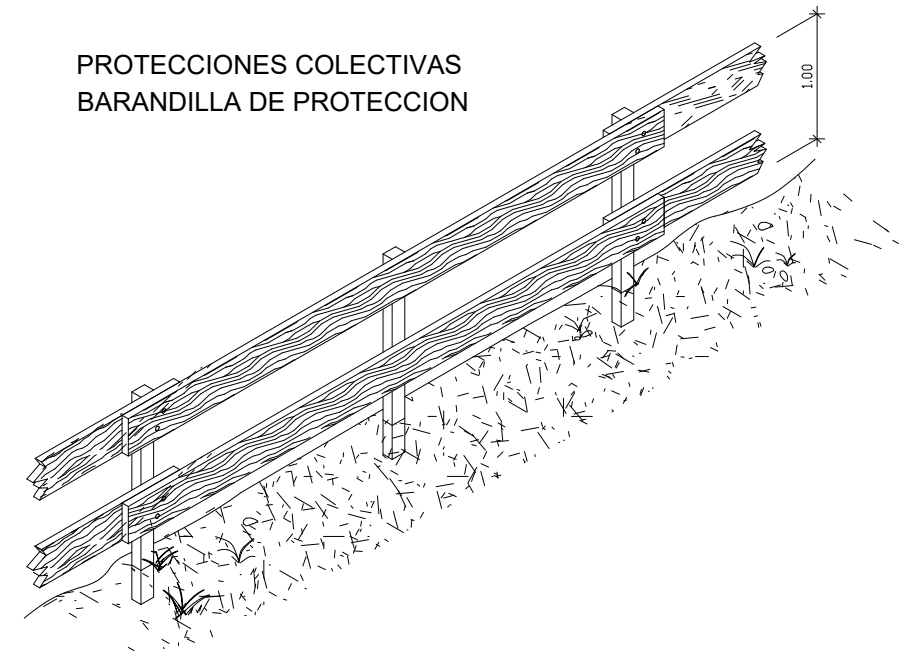
LOS PRECIOS DE ENTIBACION Y AGOTAMIENTO, ESTAN INCLUIDOS EN LAS UNIDADES DE OBRA CORRESPONDIENTES.

POR LOS POSIBLES DESPRENDIMIENTOS DE TIERRAS, SE EXTREMARAN LAS PRECAUCIONES A LA RETIRADA DE LAS ENTIBACIONES.

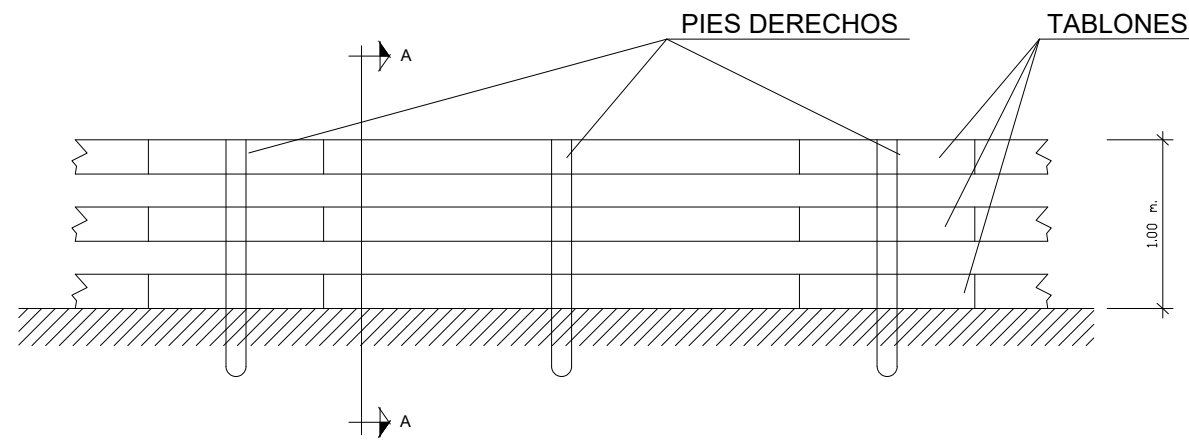
# BARANES DE PROTECCIÓ



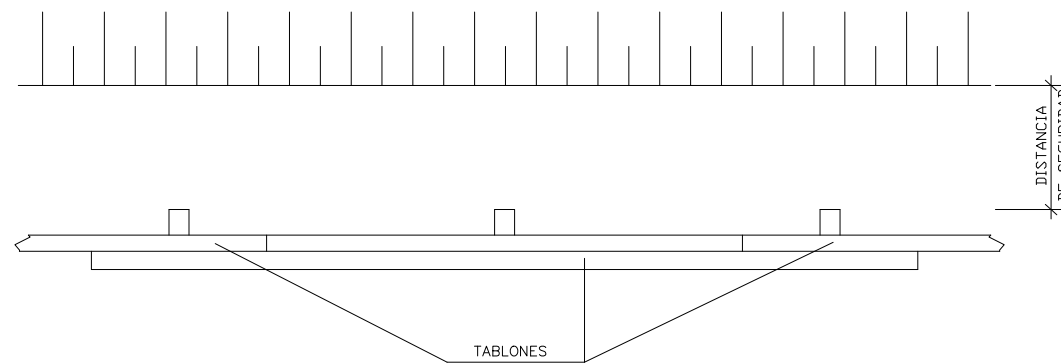
## PROTECCIONES COLECTIVAS BARANDILLA DE PROTECCION



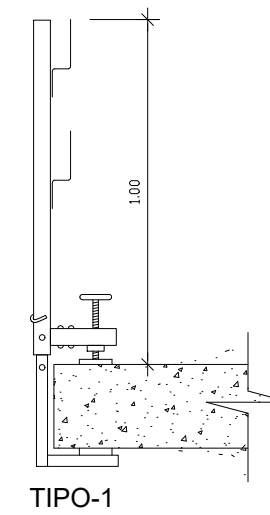
## BARANDILLA CON SOPORTE TIPO "SARGENTO"



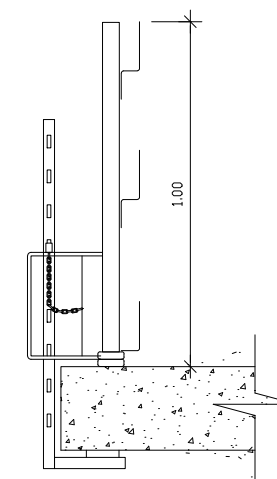
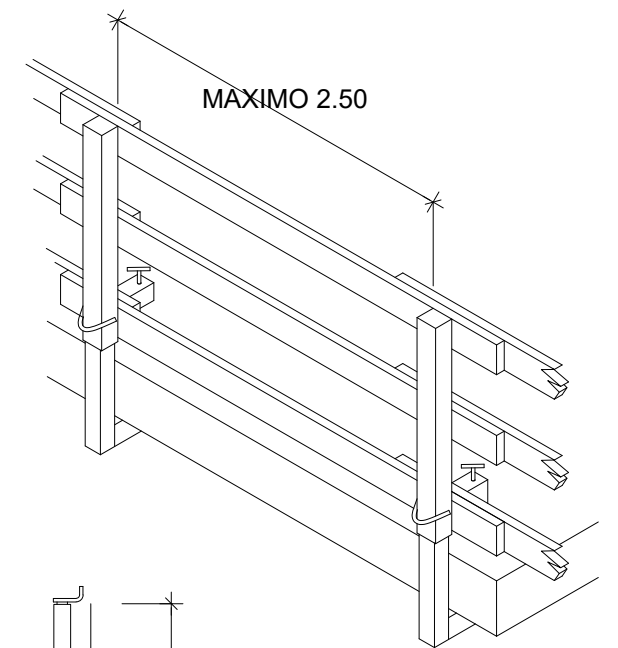
## PLANTA



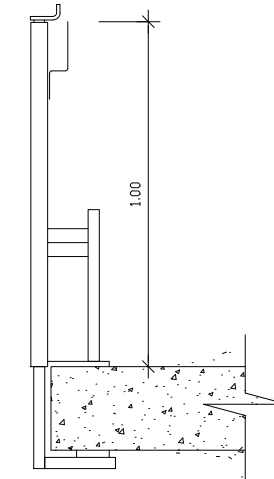
## BARANDILLA DE PROTECCION TIPO



TIPO-1

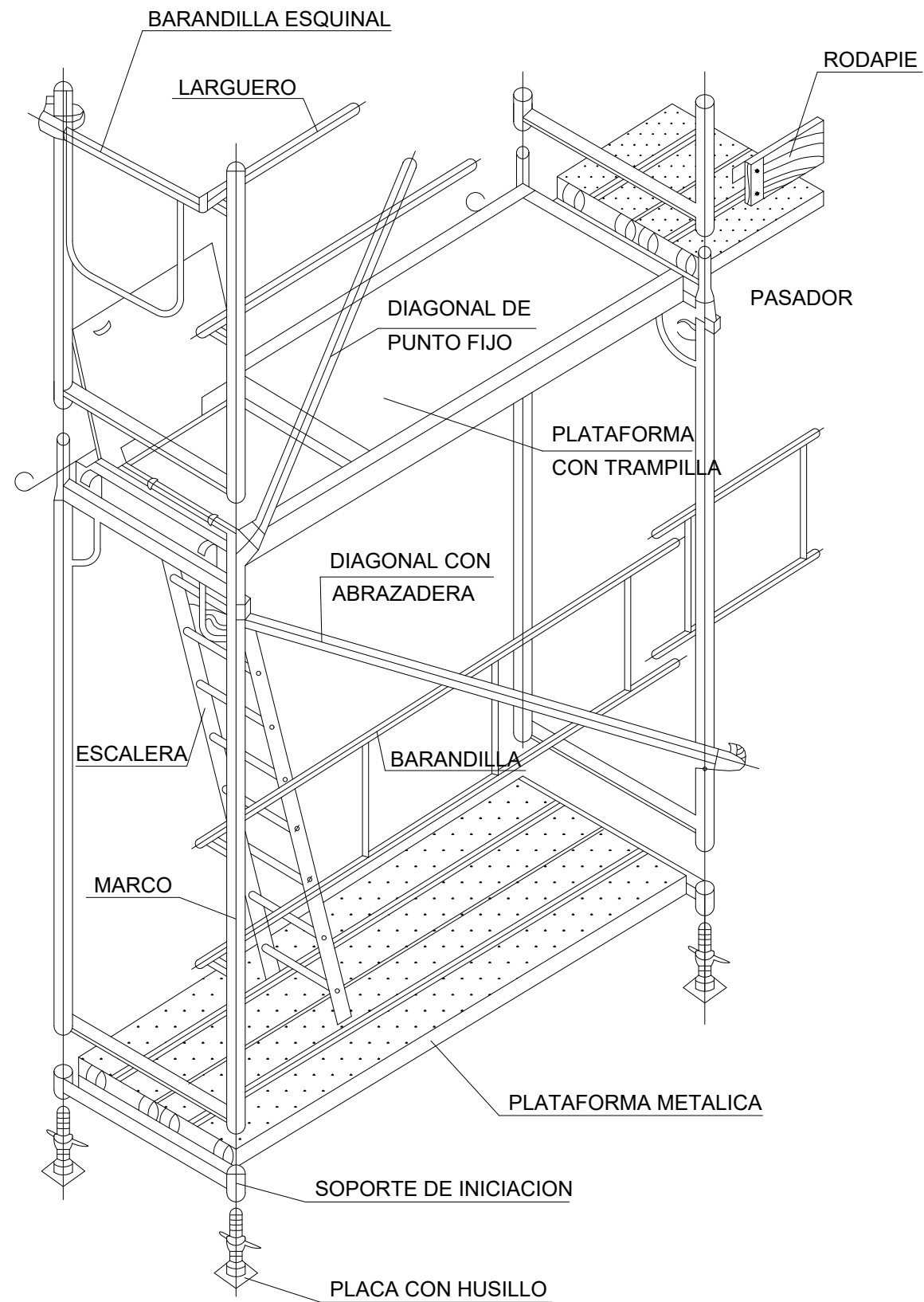


TIPO-2

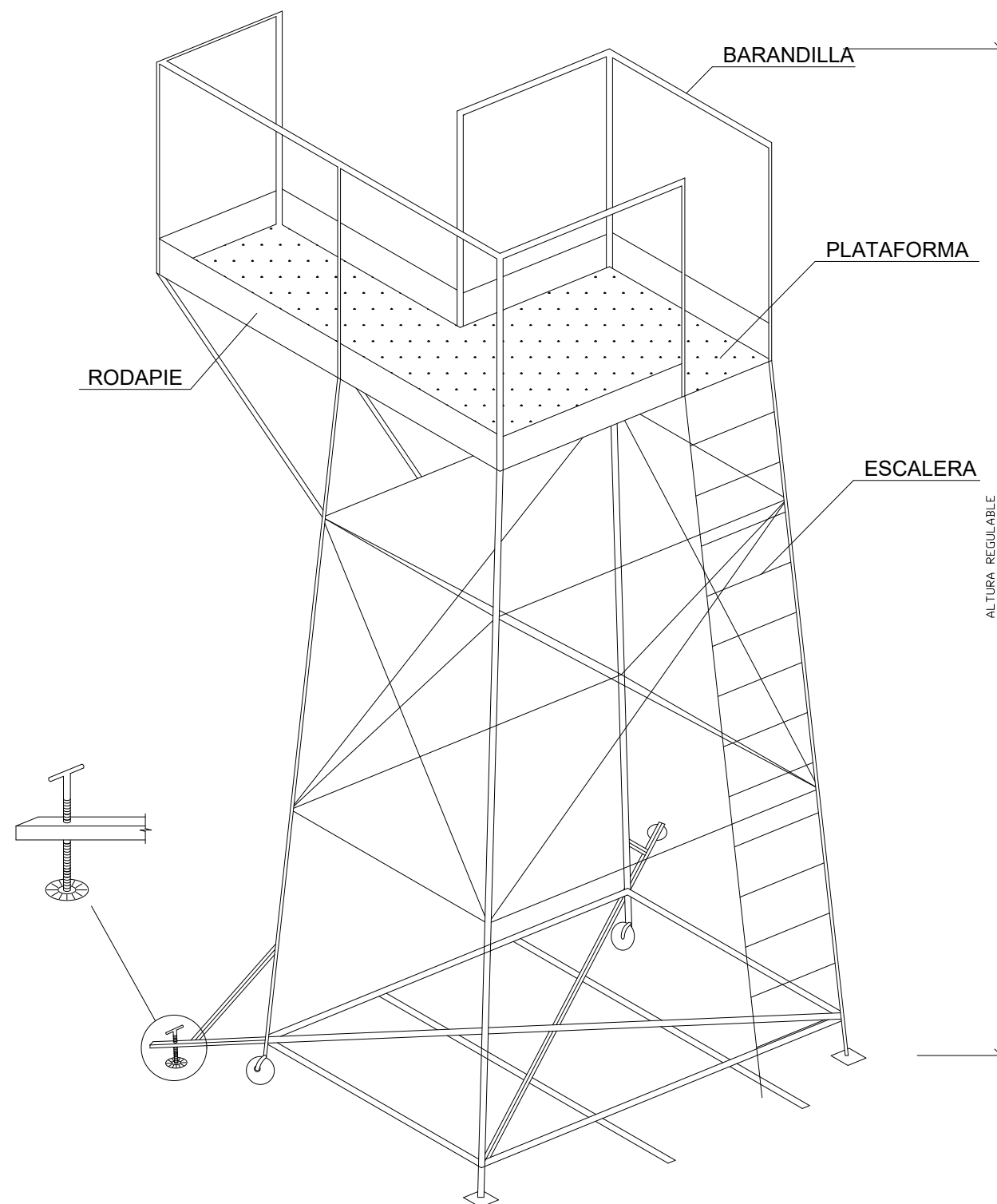


TIPO-3

### ANDAMIO TUBULAR. COMPONENTES

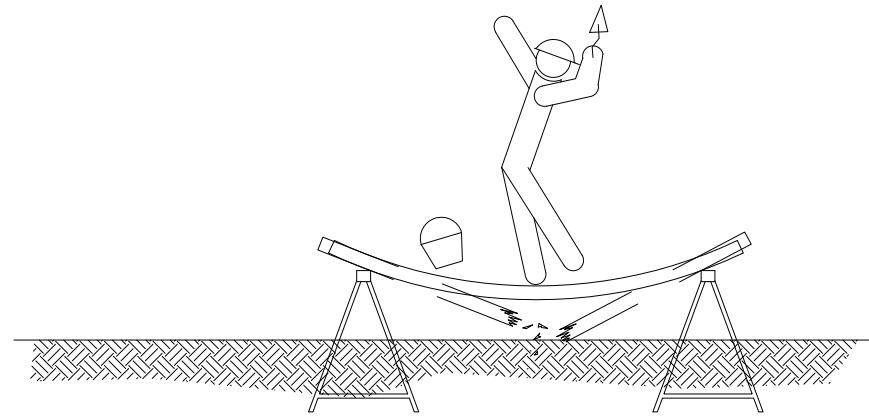


### TORRETA PARA HORMIGONADO DE PILARES

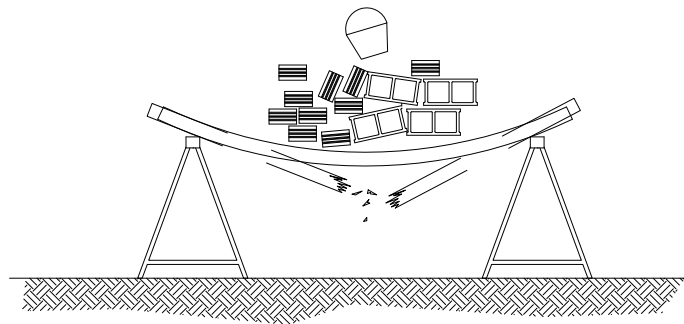




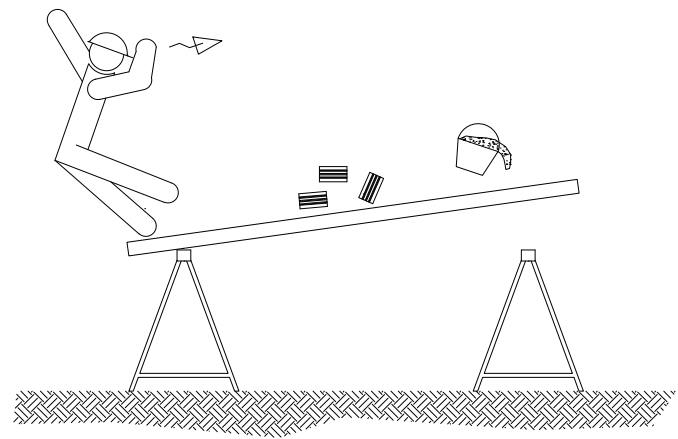
# BASTIDES DE BORRIQUETA



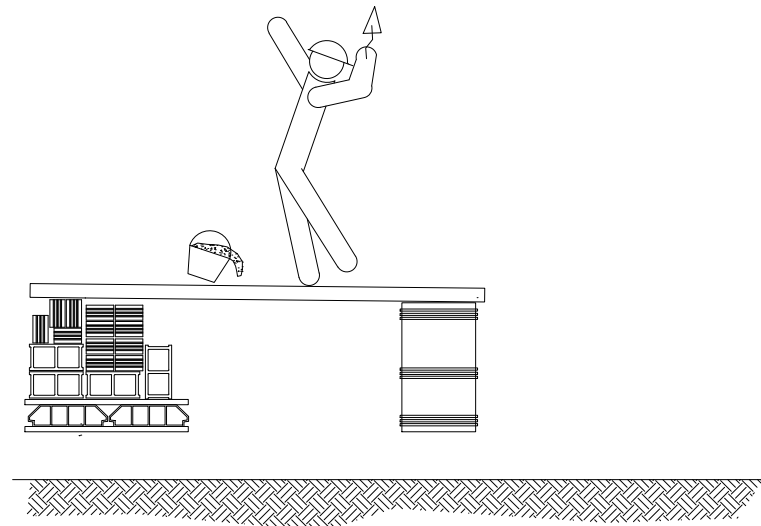
SI LA DISTÀNCIA ENTRE BORRIQUETES ÉS MAJOR DE 3 METRES, EXISTEIX EL PERILL QUE ELS Taulons DE LA PLATAFORMA PUGUIN FLETJAR O FINS I TOT ARRIBAR A TRENCAR-SE



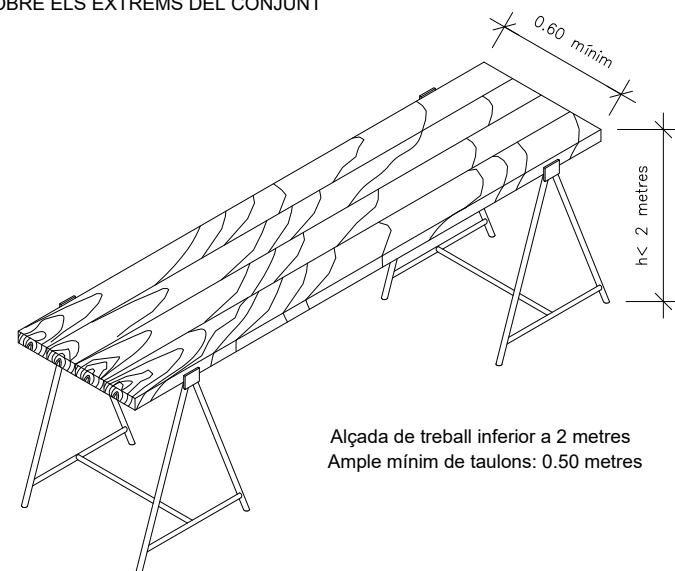
NO SOBRECARREGAR ELS Taulons AMB MATERIALS CONCENTRATS EN UN MATEIX PUNT QUE PODRIA DESEQUILIBRAR O FINS I TOT ARRIBAR A TRENCAR ELS Taulons. REPARTIR EL PES DE FORMA UNIFORME I SENSE CÀRREGUES EXCESSIVES



NO RECOLZAR-SE SOBRE ELS EXTREMS DEL CONJUNT



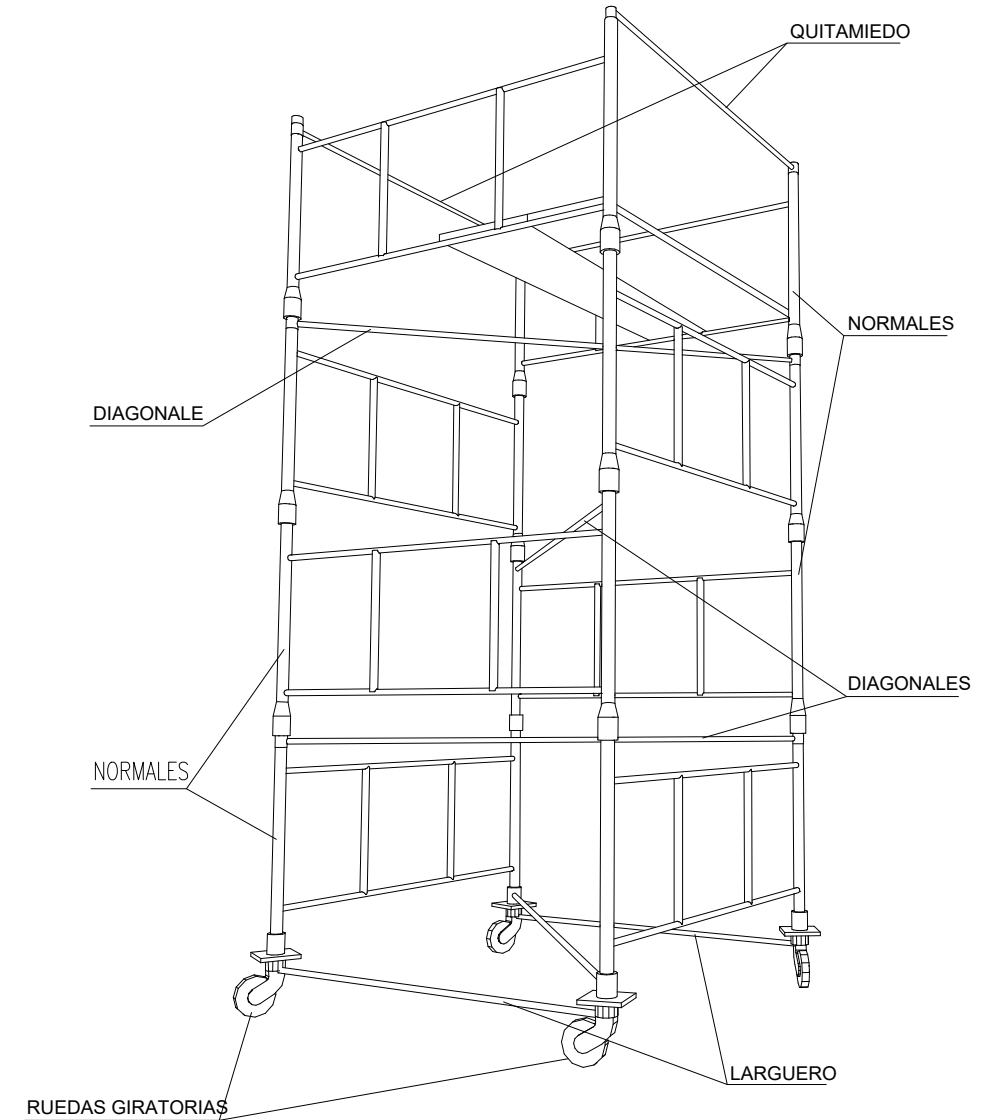
NO UTILITZAR PER AL RECOLZAMENT DELS Taulons CAP ALTRE ELEMENT QUE NO SIGUIN LES BORRIQUETES



Alçada de treball inferior a 2 metres  
Ample mínim de taulons: 0.50 metres

# BASTIDES TUBULARS

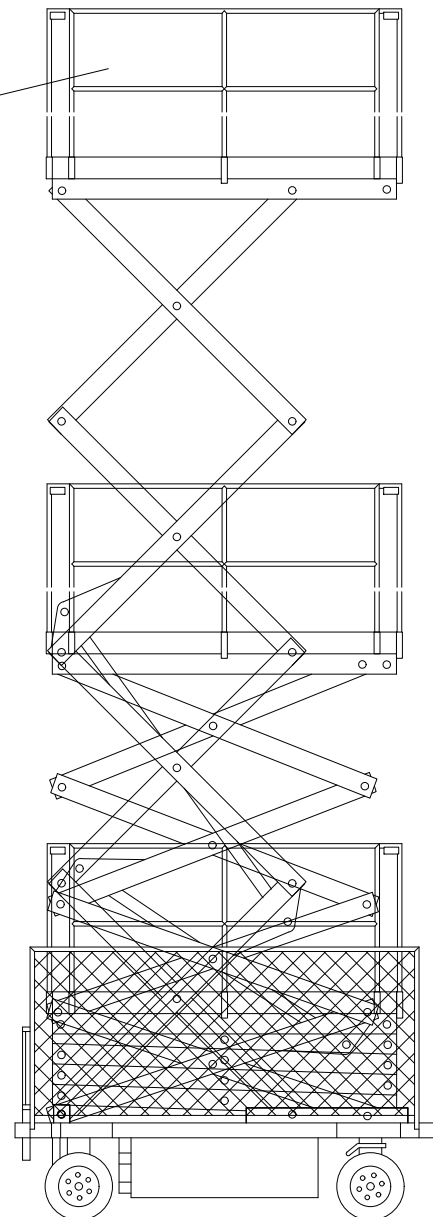
ALÇADES MAXIMES I CARREGUES ADMISSIBLES



CARGAS ADMISIBLES	
2400 Kg.	Para castilletes o torres fijas (incluido su peso propio).
2000 Kg.	Para castilletes o torres móviles sobre ruedas de hierro (incluido su peso propio).
1000 Kg.	Para castilletes o torres móviles sobre ruedas de goma (incluido su peso propio).
ALTURAS MAXIMAS DE TRABAJO	
4 Veces	Para castilletes o torres fijas (incluido su peso propio).
3 Veces	Para castilletes o torres móviles sobre ruedas de hierro (incluido su peso propio).

## ELEMENTOS AUXILIARES Y MAQUINARIA (Plataforma elevadora móvil de tijera)

Plataforma de trabajo



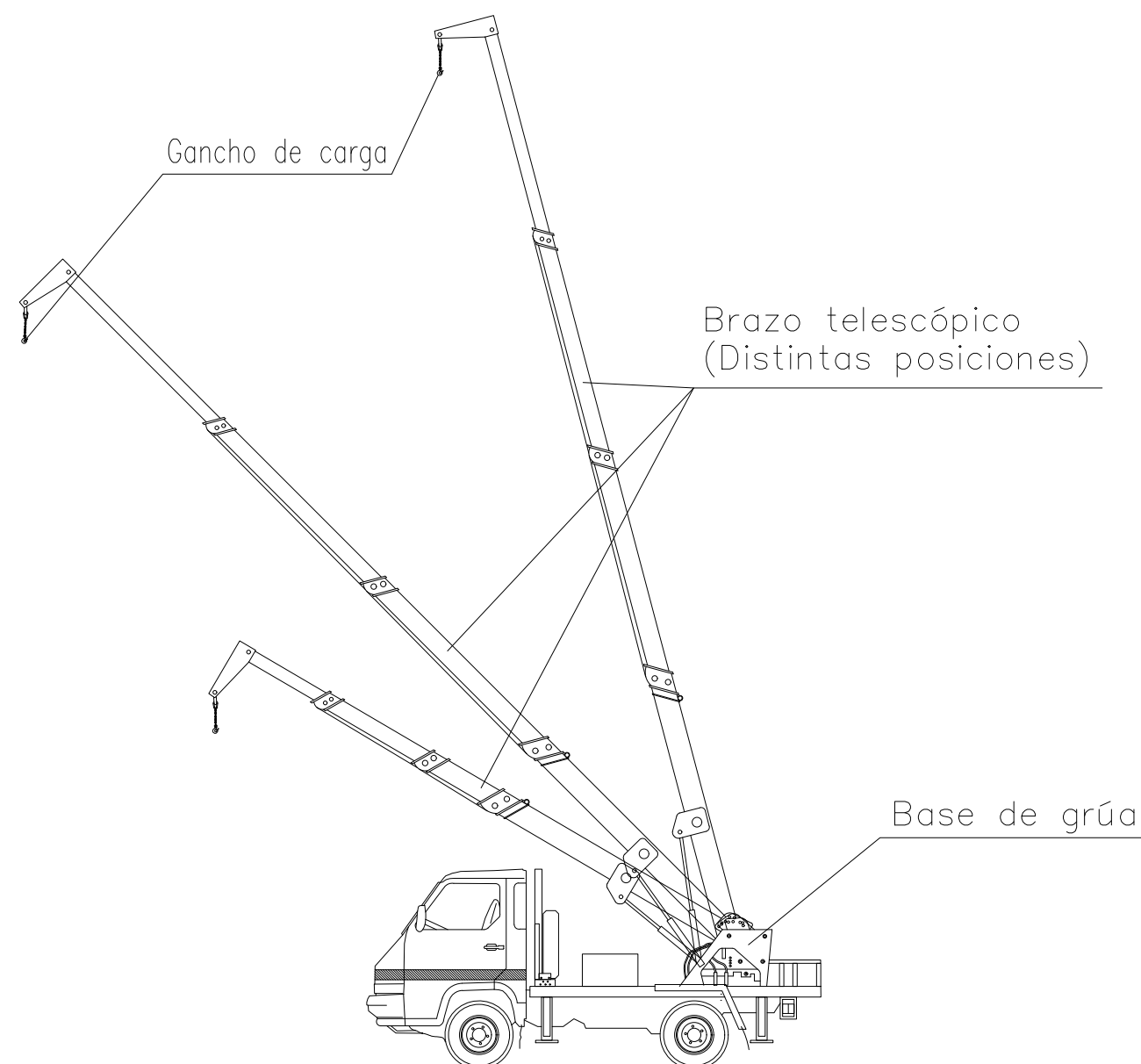
### NORMAS BÁSICAS DE SEGURIDAD Y PROTECCIONES COLECTIVAS :

- Se prohibirá sobrepasar la carga máxima admisible.
- El conductor tendrá el certificado de capacitación correspondiente.
- La manipuladora telescópica tendrá al día el libro de mantenimiento.
- No se trabajará en ningún caso con vientos superiores a los 50 Km./h.

Medidas preventivas a seguir por el conductor.

- El encargado de seguridad o el encargado de obra, entregará por escrito el siguiente listado de medidas preventivas al conductor del camión grúa. De esta entrega quedará constancia con la firma del conductor al pie de este escrito.
- Se mantendrá el vehículo alejado de terrenos inseguros.
- No se tirará marcha atrás sin la ayuda de un señalizador, detrás pueden haber operarios.
- Si se entra en contacto con una línea eléctrica, pedir auxilio con la bocina y esperar a recibir instrucciones, no tocar ninguna parte metálica del camión.
- Antes de desplazarse asegurarse de la inmovilización del brazo de la plataforma.
- No se intentará sobrepasar la carga máxima de la plataforma.
- Se respetará en todo momento las indicaciones adheridas a la máquina, y hacer que las respeten el resto de personal.
- Se evitará el contacto con el brazo telescópico en servicio, se pueden sufrir atrapamientos.
- No se permitirá que el resto de personal manipule los mandos, ya que pueden provocar accidentes.
- No se permitirá que se utilicen cables o soportes en mal estado, es muy peligroso.
- Se asegurará que todos los ganchos tengan pestillo de seguridad.
- Se utilizará siempre los elementos de seguridad indicados.

## ELEMENTOS AUXILIARES Y MAQUINARIA (Camión pequeño con grúa hidráulica)

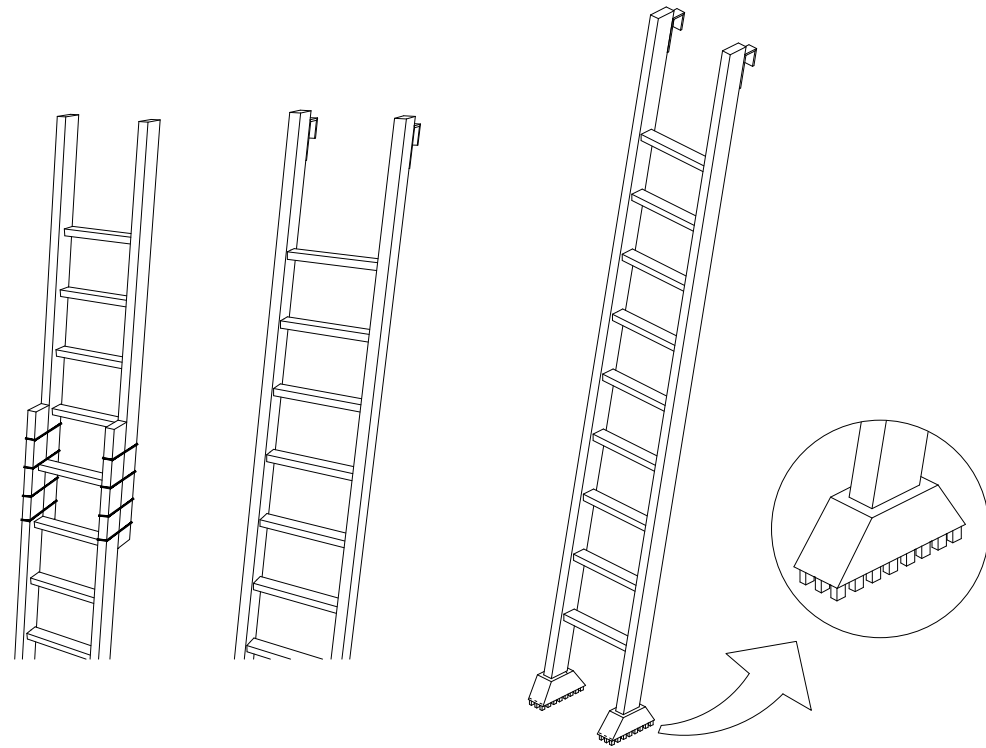


### NORMAS BÁSICAS DE SEGURIDAD Y PROTECCIONES COLECTIVAS :

- Las maniobras en la grúa serán dirigidas por un especialista.
- Los ganchos de la grúa tendrán cerradura de seguridad.
- Se prohibirá sobrepasar la carga máxima admisible.
- El gruista tendrá en todo momento la carga suspendida a la vista. Si eso no es posible las maniobras serán dirigidas por un especialista.
- Las rampas de circulación no superarán en ningún caso una inclinación superior al 20%.
- Se prohibirá estacionar el camión a menos de 2 metros del borde superior de los taludes.
- Se prohibirá arrastrar cargas con el camión.
- Se prohibirá la permanencia de personas a distancias inferiores a los 5 metros del camión.
- Se prohibirá la permanencia de operarios bajo las cargas en suspensión.
- El conductor tendrá el certificado de capacitación correspondiente.
- Se extremarán las precauciones durante las maniobras de suspensión de objetos estructurales para su colocación en obra, ya que habrán operarios trabajando en el lugar, y un pequeño movimiento inesperado puede provocar graves accidentes.
- No se trabajará en ningún caso con vientos superiores a los 50 Km./h.

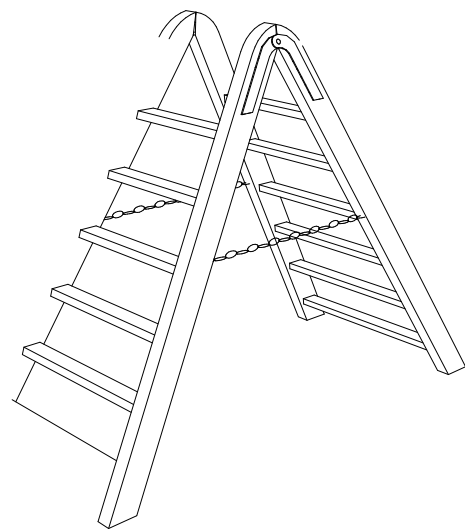


# PRECAUCIONS PER A L'ÚS D'ESCALES PORTÀTILS

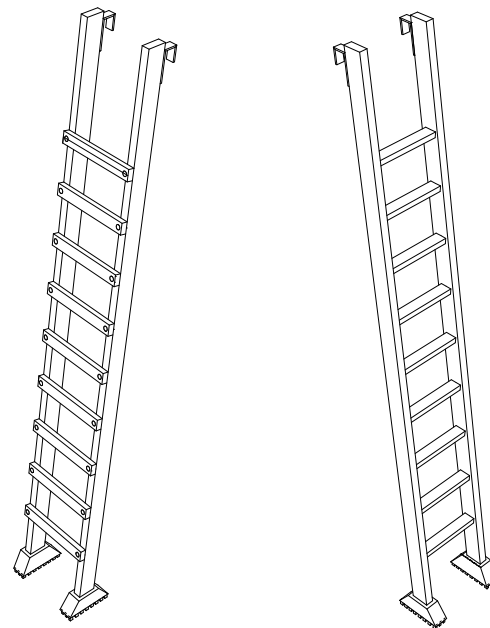


NO S'HAN D'EMPALMAR MAI DUES ESCALES

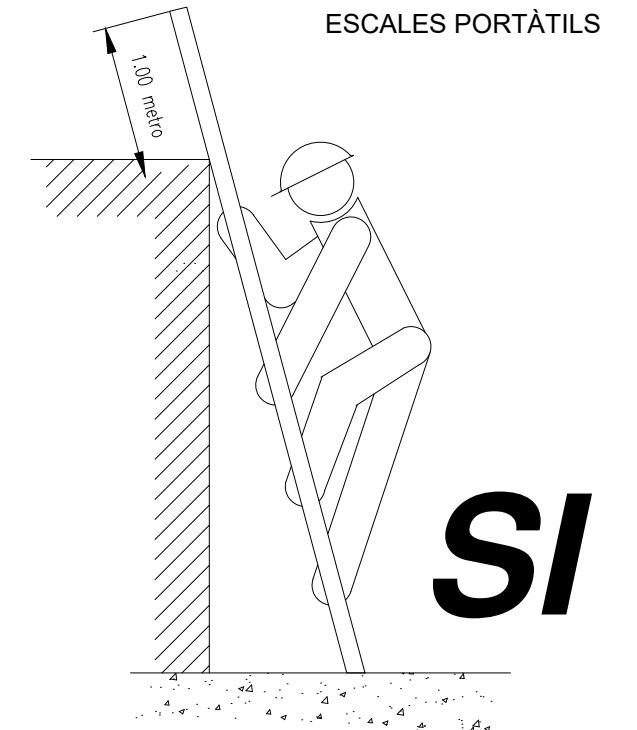
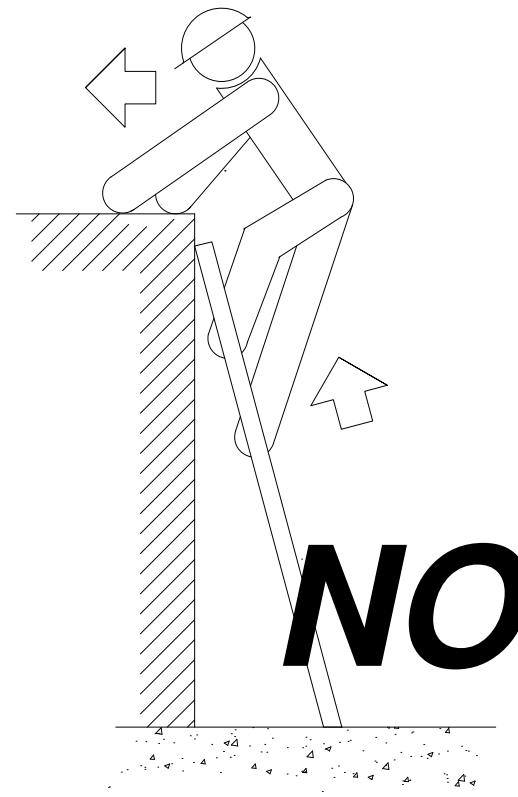
EQUIPAR LES ESCALES PORTÀTILS AMB BASES ANTILLISCANTS PER A UNA MILLOR ESTABILITAT



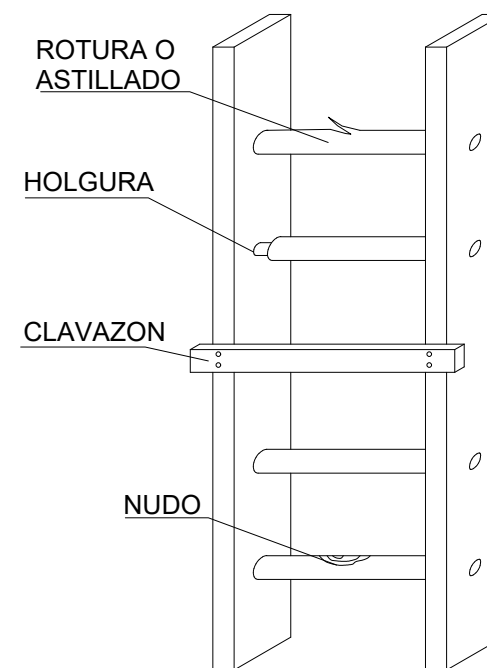
TOPALL I CADENA PER A IMPEDIR L'OBERTURA



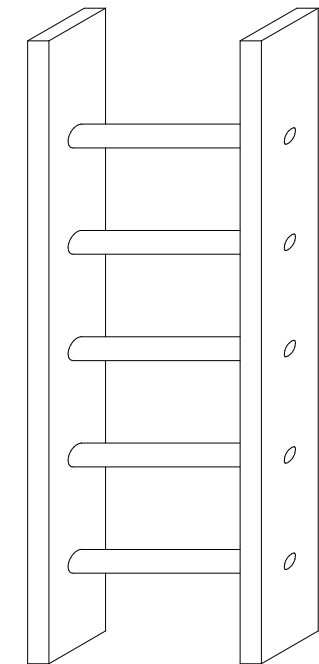
ELS TRAVESSERS SERAN D'UNA SOLA PEÇA I ELS GRAONS ESTARAN BEN ENCAIXATS I NO CLABATS



ESCALES PORTÀTILS



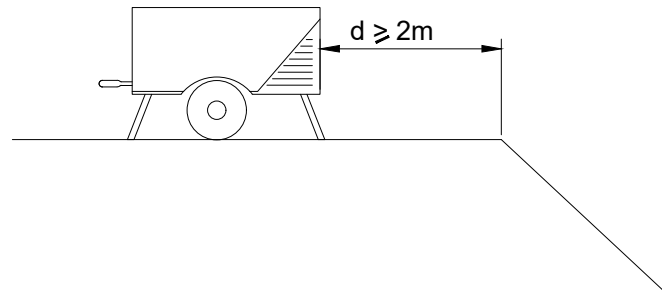
**NO**



**SI**

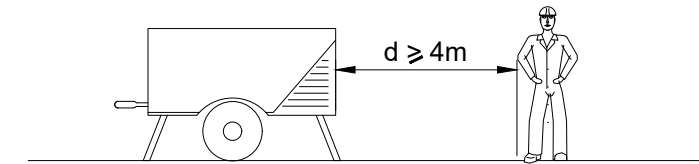
## COMPRESSORS I GRUPS ELECTROGENS

COPRESSOR/  
GRUP ELECTROGEN

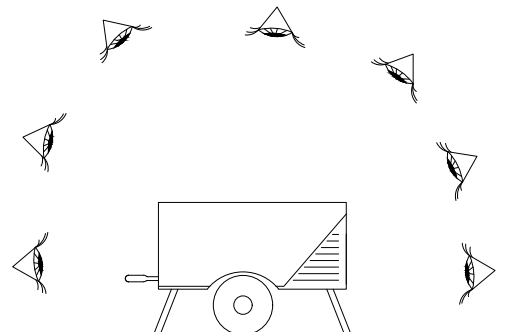


NO S'ESTACIONARÀ EL COMPRESSOR /GRUP ELECTROGEN  
A UNA DISTÀNCIA INFERIOR A 2m DE LA VORA DE  
DESMUNTS O BUIDATS

COPRESSOR/  
GRUP ELECTROGEN



NO ES TRABALLARÀ A MENYS DE 4m DE  
LA MAQUINA. SI EL COMPRESSOR NO ES  
SILENCIÓS, LA  $d \geq 15m$



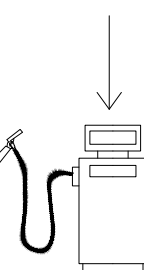
COPRESSOR/  
GRUP ELECTROGEN

LA MÀQUINA, ES REVISARÀ DIARIAMENT  
I ES REALITZARAN PARTS DIARIS  
DE MANTENIMENT

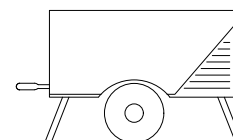
TABAC



COMBUSTIBLE

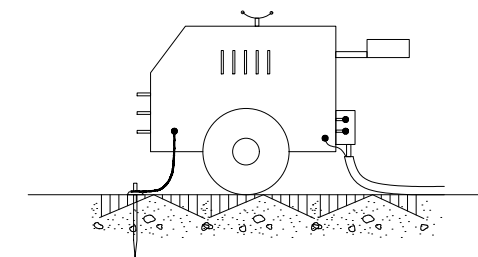


COPRESSOR/  
GRUP ELECTROGEN



NO*ii*

ES PROHIBEIX FUMAR EN LES OPERACIONS DE  
CARGA DE COMBUSTIBLE DE LES MÀQUINES

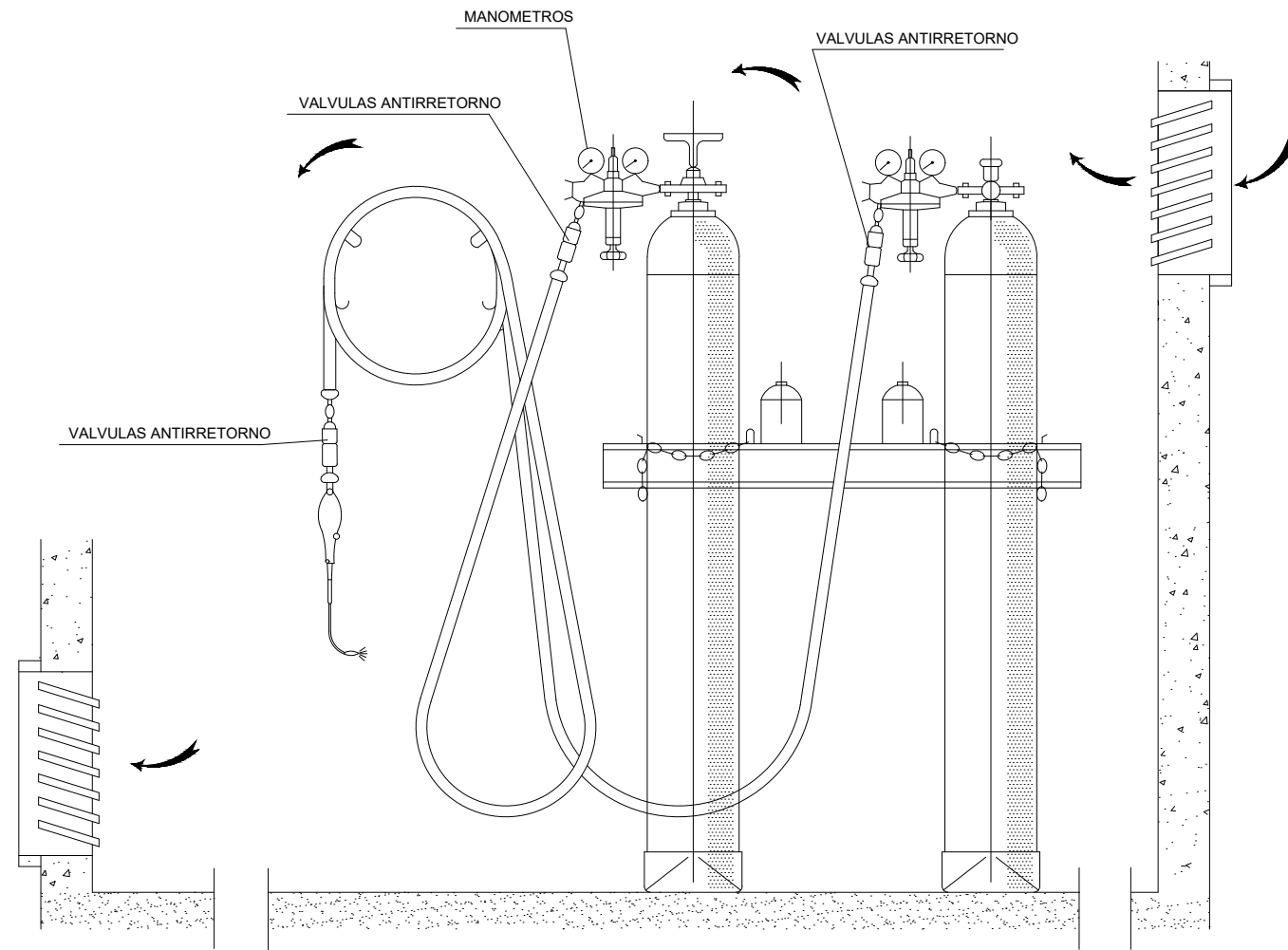


EN GRUP ELECTROGEN

NOTA:

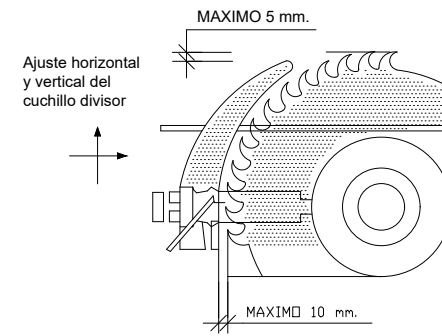
- IMPRESCINDIBLE INSTAL·LAR PRESA DE TERRA I CABLE DE MASSA.
- EVITAR ZONES HUMIDES

# PROTECCION MAQUINARIA

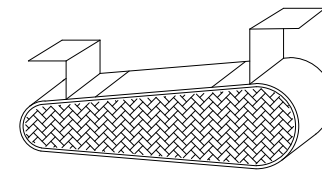


INSTALACION DE BOMBONAS DE OXIGENO Y ACETILENO

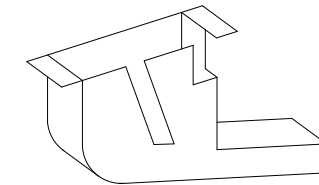
## CUCHILLO DIVISOR



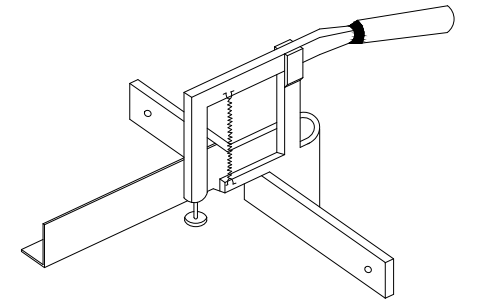
## CARENADO INFERIOR



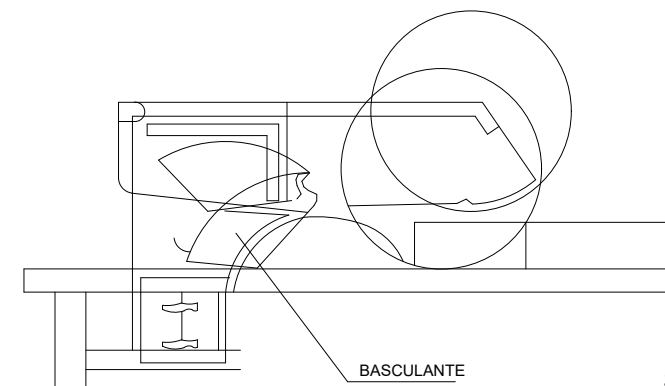
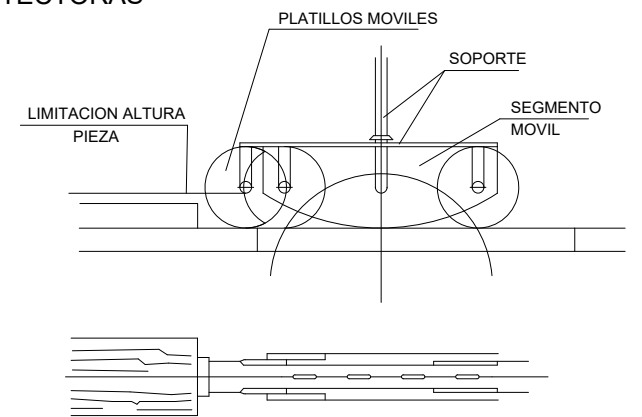
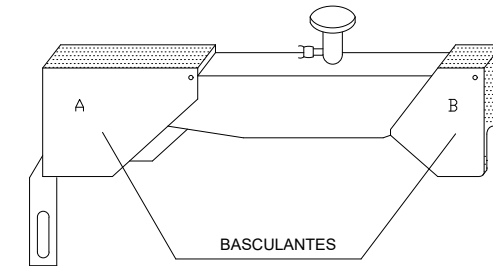
## RESGUARDO INFERIOR



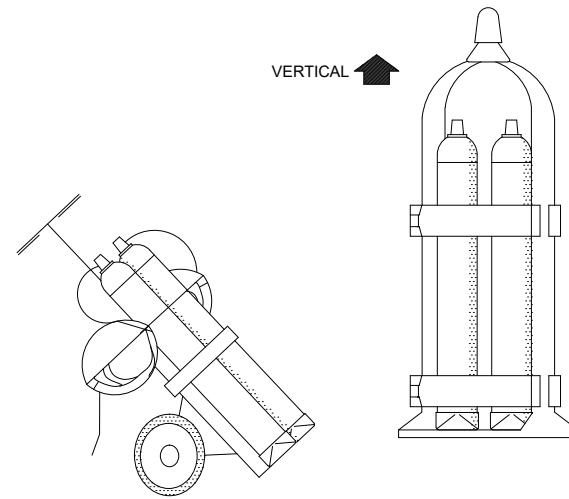
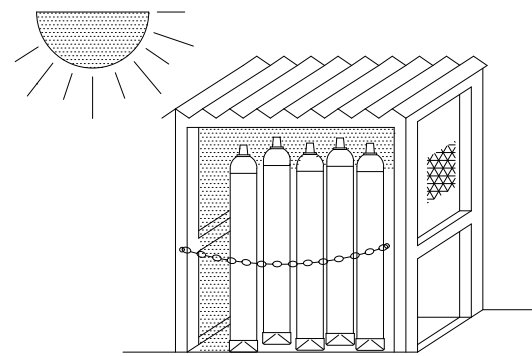
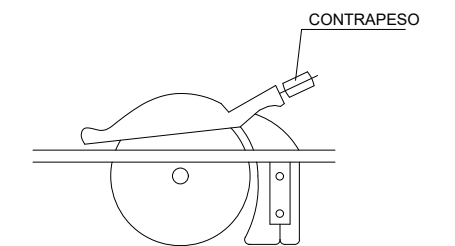
## DISPOSITIVO FABRICACION DE CUÑAS



## CARCASAS PROTECTORAS



## SIERRA CIRCULAR



GRUPO OXICORTE CON DOBLE VALVULA ANTIRRETORNO

TRANSPORTE

## INSTAL·LACIÓ:

- S'INSTAL·LARÀ PROPERA ALS LLOCS A PROTEGIR.
- SERAN FÀCILS D'ASSOLIR I LOCALITZAR, SENSE OBSTRUCCIONS QUE IMPEDEIXIN ASSOLIR-LOS I A UNA ALÇADA ASEQUIBLE.
- LA SEVA POSICIÓ ESTARÀ CONVENIENTMENT SENYALITZADA MITJANÇANT CARTELLS DE PVC FLUORESCENTS.

## DESVIAMENTS I MANTENIMENT:

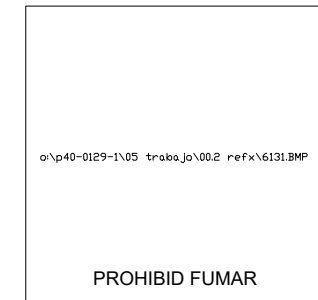
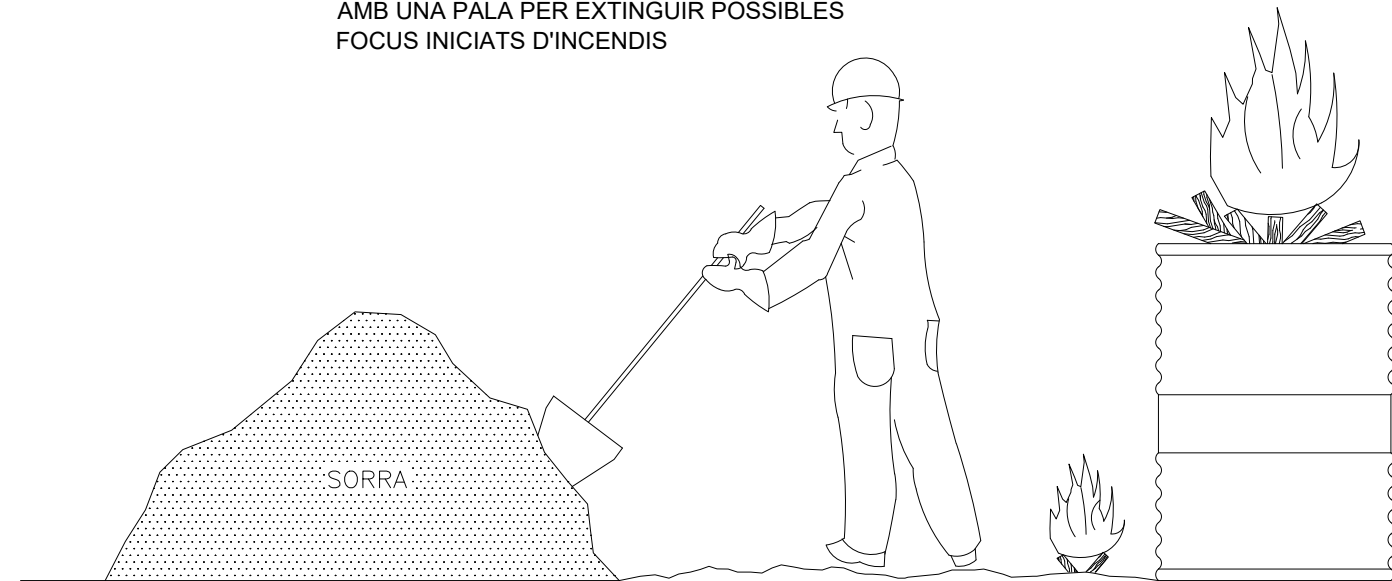
- ES REALITZARÀ UNA COMPROBACIÓ PERIÒDICA DE L'STAT DELS EXTINTORS, INCIDINT ESPECIALMENT EN:
  - a) L'ESTAT EXTERN DE L'EXTINTOR I LA SEVA ETIQUETA
  - b) L'ESTAT DE LA MÀNIGA I LA SEVA BOQUILLA
  - c) LA NO MANIPULACIÓ DELS PRECINTES
  - d) LA PRESSIÓ DEL MANÒMETRE O EL PES DEL BOTELLI DE GAS
  - e) L'ESTAT DE LA CÀRREGA.
- LA VIDA MÀXIMA D'UN EXTINTOR ES DE 20 ANYS A PARTIR DE LA PRIMERA DATA DE PROBAR PER INDUSTRIA. CADA 5 ANYS HA DE SER PROBADA LA PRESSIÓ PER AQUEST ORGANISME EN CAS CONTRARI L'EXTINTOR NO CUMPLEIX LA NORMATIVA VIGENT

## UTILITZACIÓ:

- RETIRAR EL SEGURO, TIRANT D'UNA ANILLA O SOLAPA.
- ACCIONAR LA VÀLVULA.
- DIRIGIR EL LÍQUID EXTINTOR CA A LA BASE DE LES FLAMES MES PROPERES.
- MOURE EL RAIG EN ZIG-ZAG.
- AVANÇAR SEGONS ES VAN APAGANT LES FLAMES.
- ACTUAR, SI ES POSSIBLE, AMB EL VENT A FAVOR.
- UNA COP APAGADES LES FLAMES, TRENAR I ESCAMPAR LES BRASES, TORNAN A RUIXAR AMB L'AGENT EXTINTOR.
- SI EL FOC ES DE LÍQUIDS, NO RUIXAR EL CHORRO DIRECTAMENT SOBRE EL LÍQUID ENCÉS, SINO DE MANERA SUPERFICIAL, PER EVITAR QUE ES PRODUEXI UN COP QUE VESSI EL LÍQUID CREMANT I ESCAMPI EL FOC.
- DESPRES D'UN US, RECARREGAR L'EXTINTOR.

## NOTA:

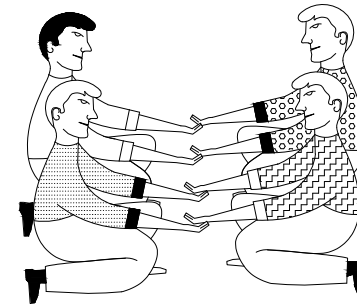
AMB CADA FOGATA ES DISPOSARÀ D'UN MONTICLE DE SORRA JUNTAMENT AMB UNA PALA PER EXTINGUIR POSSIBLES FOCUS INICIATS D'INCENDIS



PRIMEROS AUXILIOS (No traumáticos)

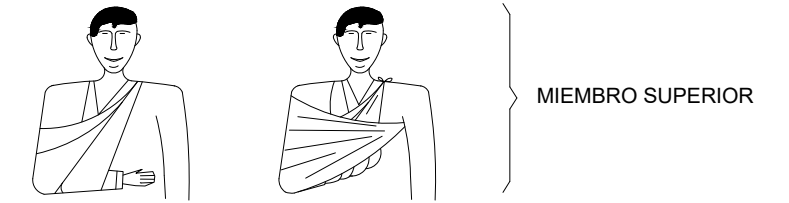
PROCESO	SINTOMAS	GRAVEDAD	NO HACER	SE PUEDE HACER	EN TODOS LOS CASOS REMITIR A S.S.
INDIGESTIONES	NAUSEAS-VOMITOS COLICOS-DIARREAS	POCA	NO DAR NADA	NO HACER NADA (Hacer vomitar)	
MAREOS	ANGUSTIA PERDIDA CONOCIMIENTO VERTIGO	POCA O PUEDE SER GRAVE	NO DAR NADA	ACOSTAR CABEZA ABAJO AIRE FRESCO DESABROCHAR	
INTOXICACIONES	VERTIGOS-ABATIMIENTO NAUSEAS-VOMITOS ESCALOFRIOS-DELIRIO	PUEDE SER GRAVE	NO ALCOHOL NO DAR NADA	HACER VOMITAR TAPAR AL LESIONADO	
INSOLACION	JAQUECAS VERTIGOS NAUSEAS	PUEDE SER GRAVE	NO TAPAR DAR SOLO AGUA	PONER A LA SOMBRA AIREAR-DESABROCHAR	
CRISIS NERVIOSA	GESTICULA-GRITA LLORA-PATALEA SE TIRA AL SUELO	NO GRAVE	NO ALCOHOL NO DAR NADA NO TRATAR EN GRUPO	AISLAR AL LESIONADO NO DEJARSE IMPRESIONAR	
EPILEPSIA	CAE SIN CONOCIMIENTO SE MUERDE LA LENGUA ORINA	APARATOSO NO SUELE SER GRAVE	NO DAR NADA	APARTAR OBJETOS PROTEGER LA CABEZA CUIDAR NO SE MUERDA	
EMBRIAGUEZ	EXCITACION ACTUACION ALOCADA OLOR A VINO	NO GRAVE	NO DAR NADA	ACOMPAÑAR A SERVICIO MEDICO	

ANTES DEL TRASLADO



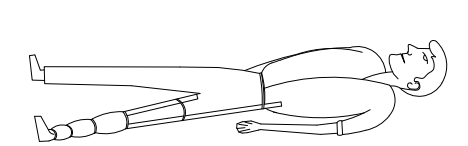
POSICION CORRECTA PARA "RECOGER" UN LESIONADO GRAVE

TRASLADOS  
INMOVILIZACION DE MIEMBROS ANTES DEL TRASLADO

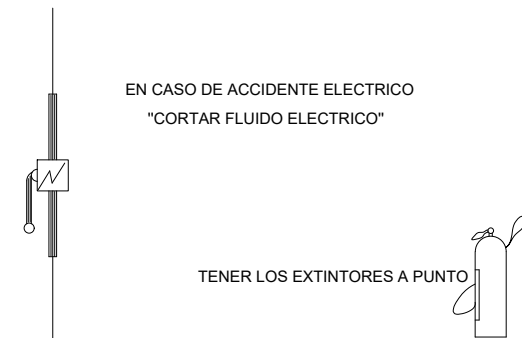
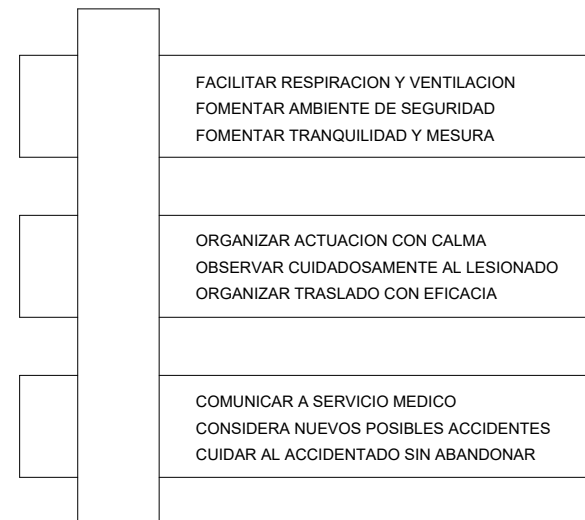


MIEMBRO SUPERIOR

MIEMBRO INFERIOR



RECOMENDACIONES BASICAS A TODA ACCION SOCORREDORA



RESUMEN

TIPOS DE ACCIDENTE

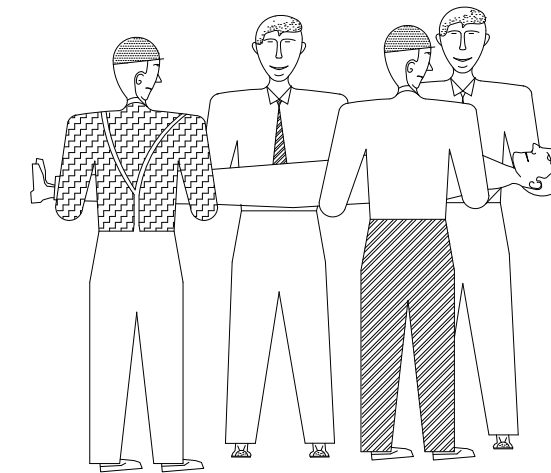
- LEVES (Muy frecuentes)
  - GRAVES
  - MORTALES
  - CATASTROFES
- (Poco frecuentes)

ACCION PREVISORA  
MEDIDAS PREVENTIVAS DE SEGURIDAD  
BOTIQUIN-CAMILLAS-MANTAS ETC.  
A.T.S. SOCORRISTAS-PERSONAL RESPONSABLE  
CONOCER CENTROS ASISTENCIALES-TELEFONOS

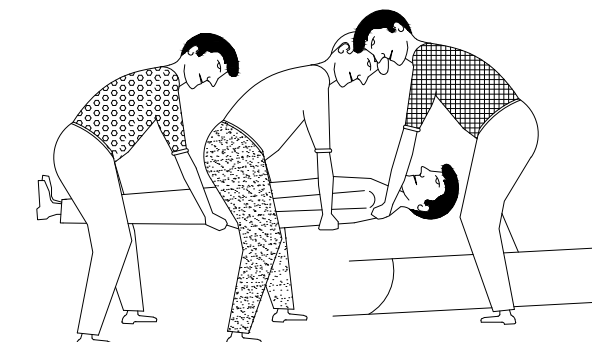
ACTUACION LESIONES GRAVES  
NO DAR NADA  
AFLOJAR ROPAS  
NO MOVILIZAR  
ABRIGAR  
TRASLADO RAPIDO A HOSPITAL

ACCIDENTES ELECTRICOS  
ANTES QUE NADA  
CERRAR PASO DE CORRIENTE  
SI HAY CABLES ROTOS O SUELTOS  
APARTARLOS DEL LESIONADO  
CON UN OBJETO DE MADERA  
SI SOLO SE PRODUCE LESION LOCAL  
TRATAR COMO QUEMADURA

TRASLADOS (Continuacion)



FORMA CORRECTA DE COGER UN LESIONADO GRAVE



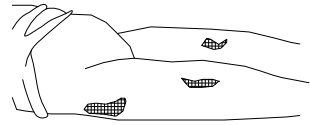
POSICION CORRECTA DE COLOCAR UN LESIONADO GRAVE EN UNA CAMILLA



**QUEMADURAS**  
PEQUEÑA QUEMADURA

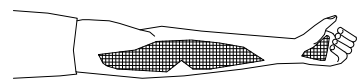


NO ABRIR AMPOLLAS  
TAPAR CON GASA  
NO TOCAR  
NO PONER NADA



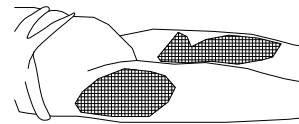
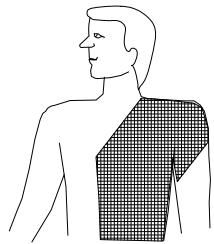
TRASLADO SIN PRISA

**GRAN QUEMADO**  
(EXTENSO)



NO TOCAR  
NO PUEDE BEBER  
NO PONER NADA

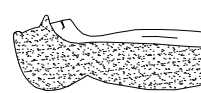
DE PONER-GASA ESTERIL  
TRASLADO URGENTE !!



**RESPIRACION DIRIGIDA - BOCA A BOCA**



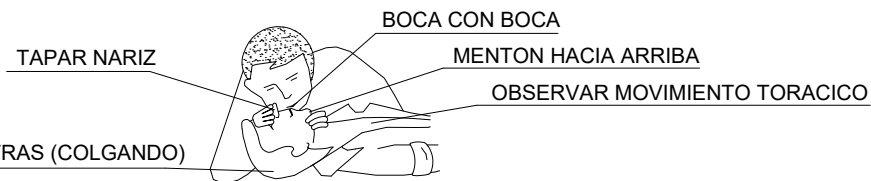
LIMPIAR CUIDADOSAMENTE  
EL INTERIOR DE LA BOCA  
SACAR PROTESIS DENTAL  
AFLOJAR ROPAS



FORZAR LA HIPER EXTENSION  
(BARBILLA HACIA ARRIBA) PARA  
LOGRAR CONDUCTOS ABIERTOS  
TAPAR NARIZ



ADAPTAR RITMO RESPIRATORIO AL PROPIO DEL QUE LO EJECUTA



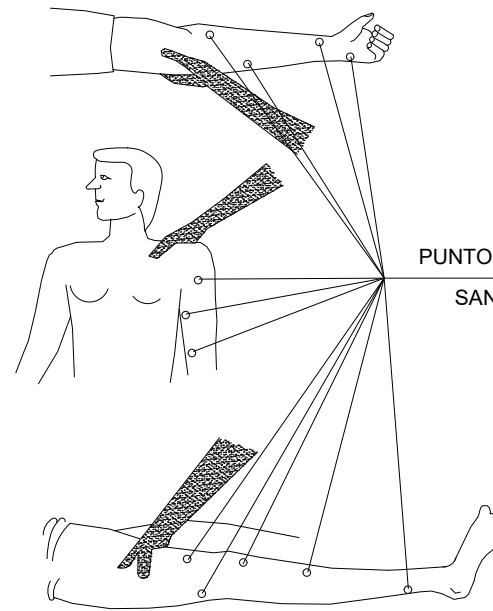
CABEZA MUY ATRAS (COLGANDO)

NO ABANDONAR LA TECNICA HASTA LLEGAR AL HOSPITAL

**HERIDAS SANGRANTES**

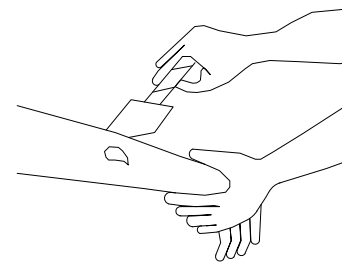
HEMORRAGIAS  
COMPRESION ARTERIAL

LAS MANOS SOMBRADAS EN OSCURO  
SON LAS QUE PRESIONAN Y CORTAN LA HEMORRAGIA  
EN LOS PUNTOS Y ZONAS INDICADAS



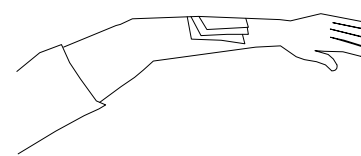
PUNTOS O ZONAS  
SANGRANTES

**HERIDAS**



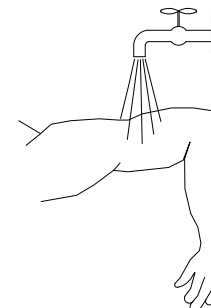
LAVAR CON AGUA  
TAPAR CON GASA

NO POMADAS  
NO LIQUIDOS  
NO MANIPULAR



TRASLADO SIN PRISA

**LESIONES POR ACIDOS O CAUSTICOS**



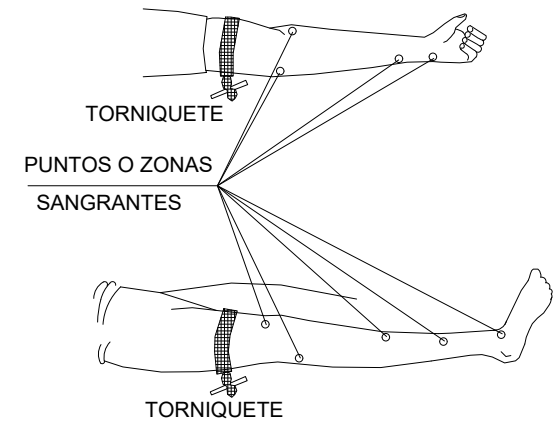
AGUA ABUNDANTE  
(A CHORRO)

TAPAR SIN COMPRIMIR  
TRASLADO SIN PRISA

**HEMORRAGIAS (continuacion)**

Metodo compresivo TORNIQUETE

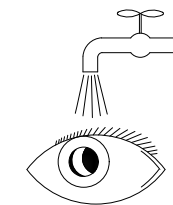
NO PUEDE LLEVARSE MAS DE  
UNA HORA SIN AFLOJARLO



ES URGENTE

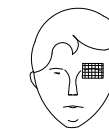
LA HEMORRAGIA

**LESIONES OCULARES**



LAVAR CON AGUA ABUNDANTE

NO TOCAR  
NO INTENTAR SACAR NADA  
NO POMADAS  
!! NO MANIPULAR !!



TAPAR SUAVEMENTE

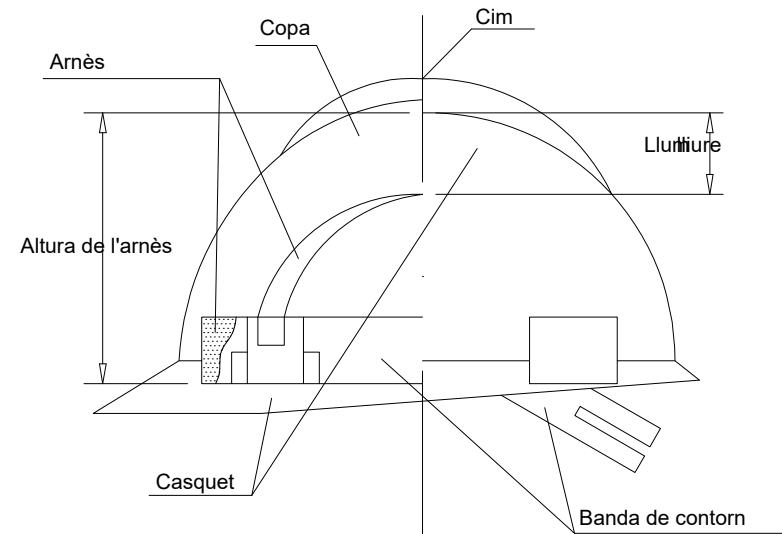
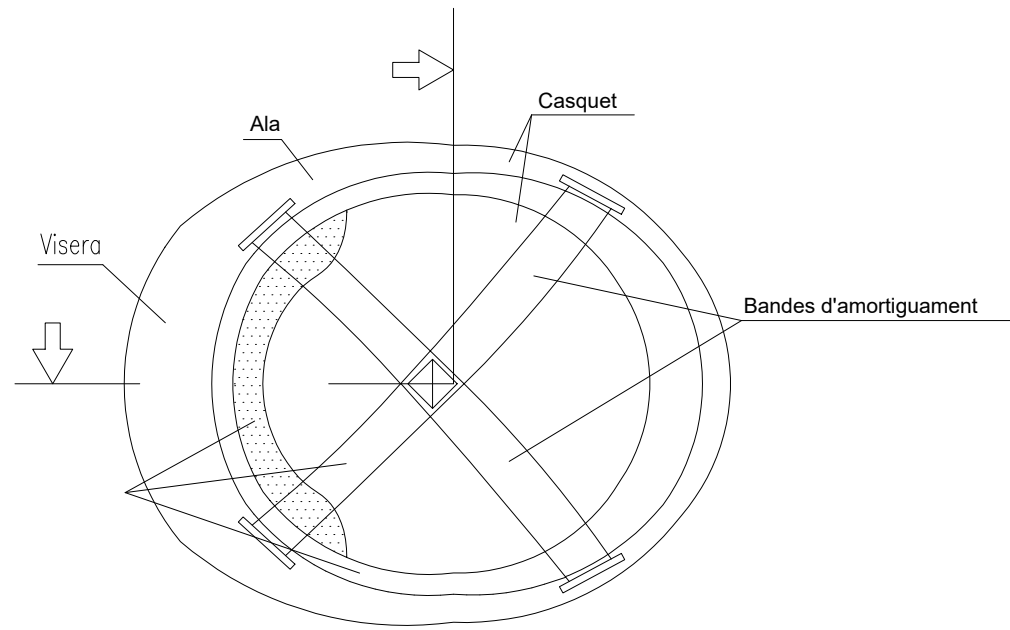


TRASLADO (A ser posible  
a centro especializado)

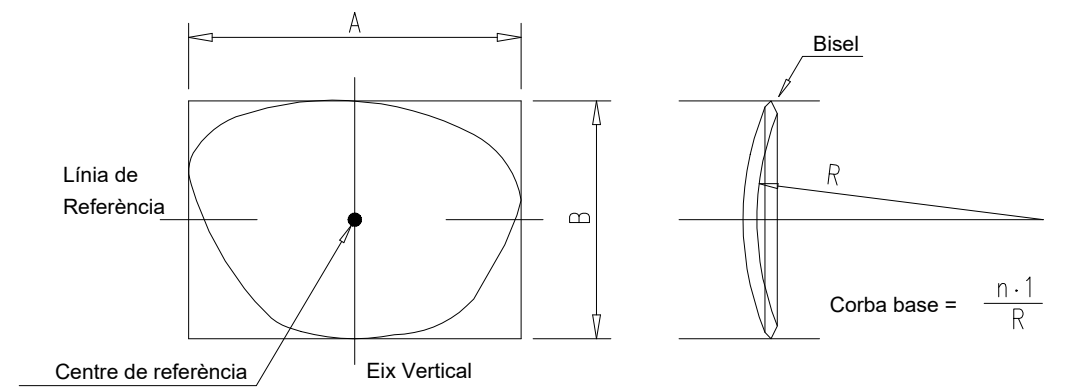
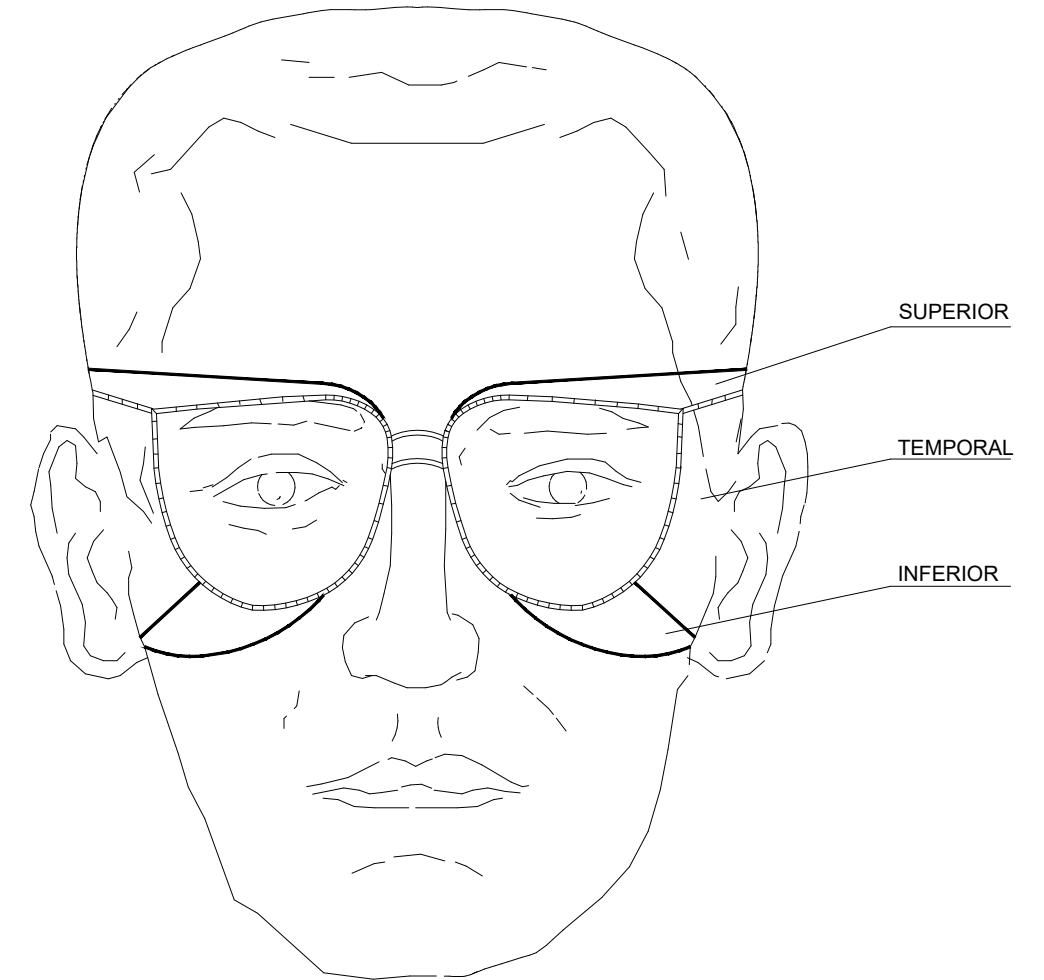
LESIONES NARIZ OIDO  
TAPONAR SUAVEMENTE - TRASLADO  
EPISTAXIS (Nariz sangrante) TAPONAR

# PROTECCIONS INDIVIDUALS

## CASC DE SEGURETAT



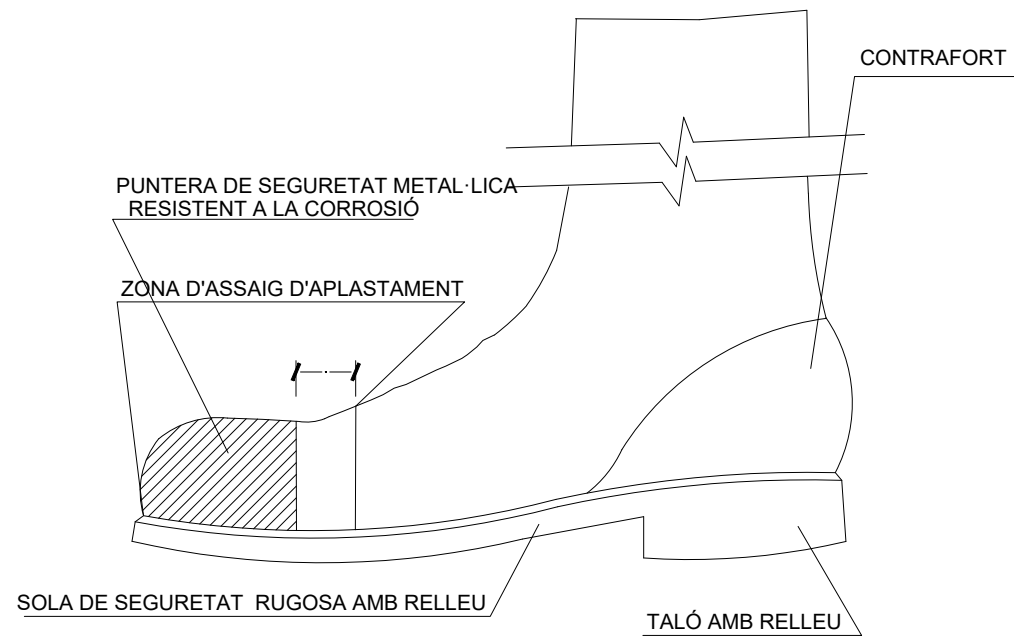
## ULLERES DE SEGURETAT



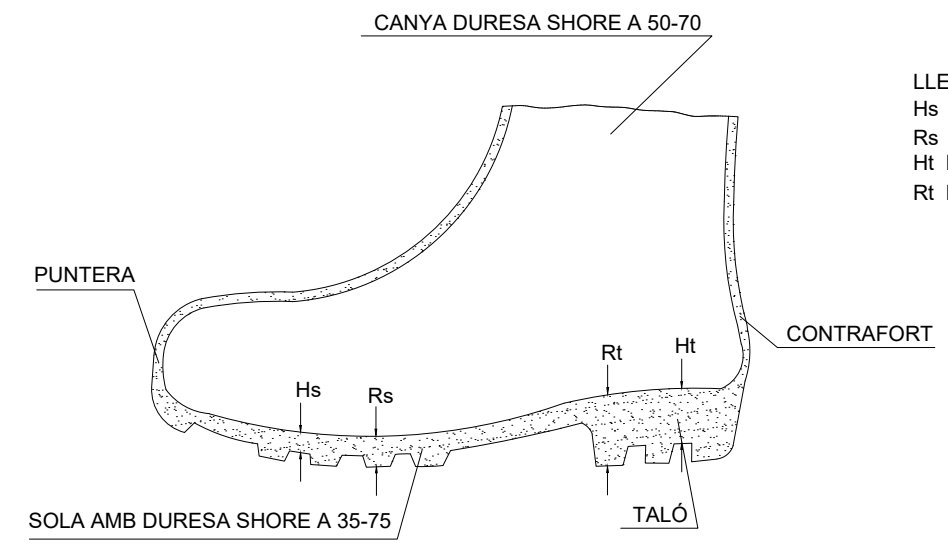


# PROTECCIONS INDIVIDUALS

BOTA DE SEGURETAT CLASE III

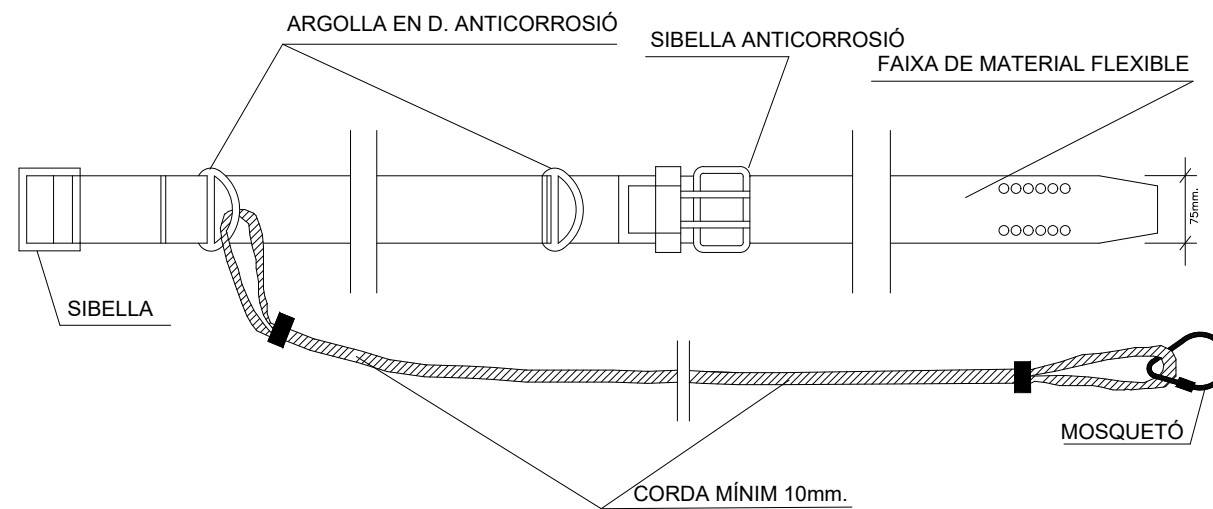


BOTA IMPERMEABLE A L'AIGUA I LA HUMITAT

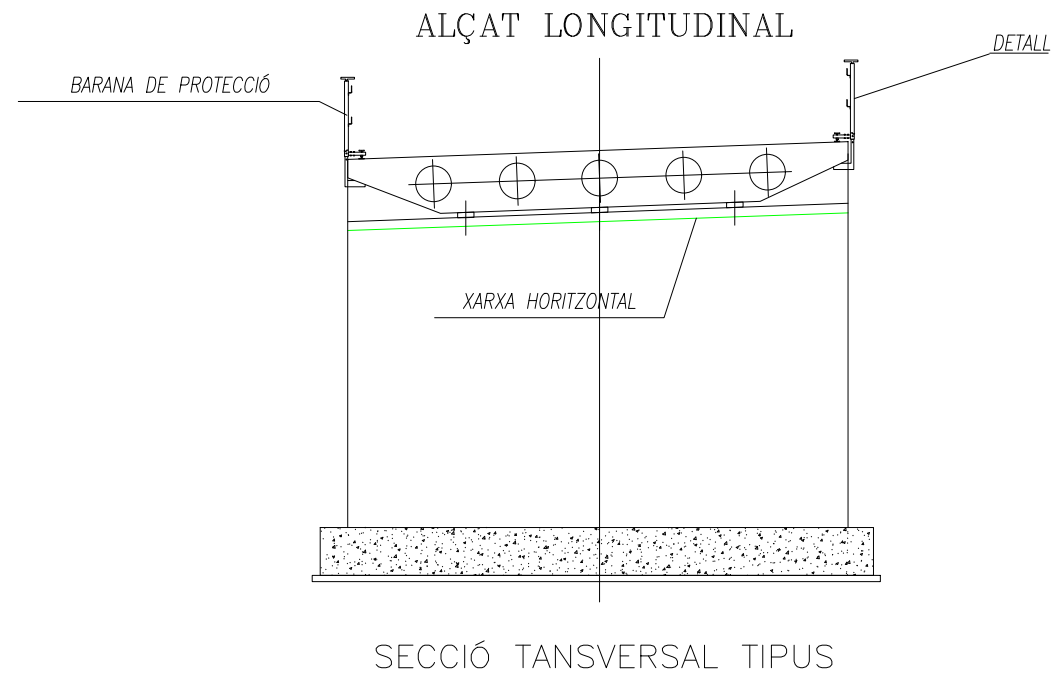
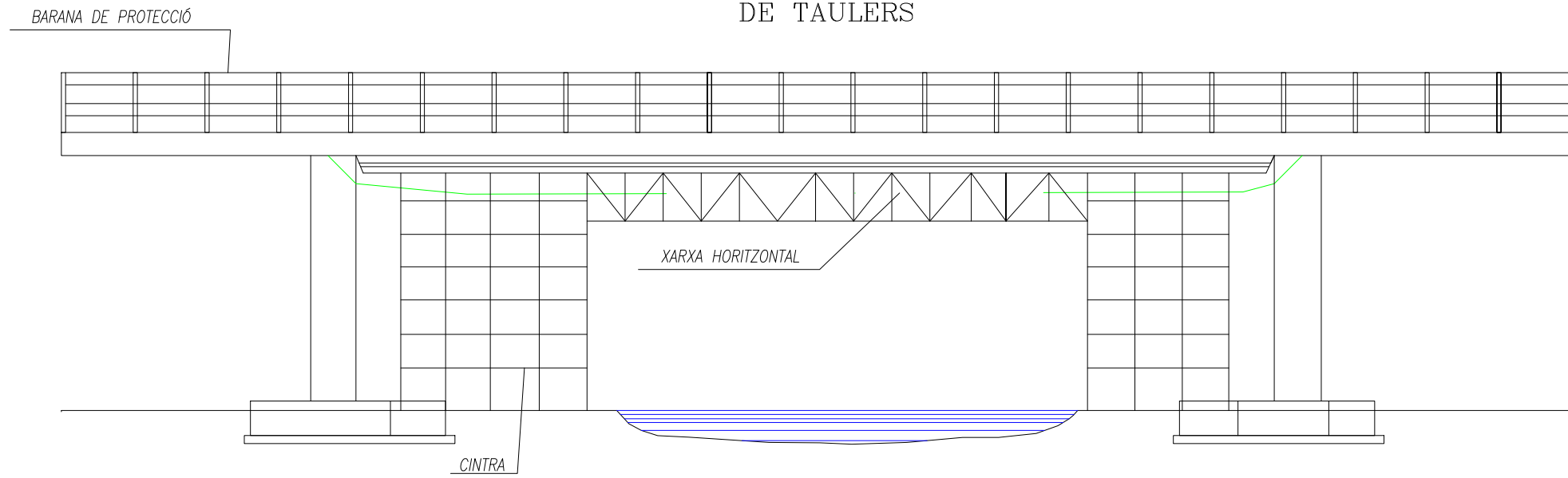


LLEGENDA  
 Hs Relleu de la sola = 5 mm.  
 Rs Resalt de la sola = 9 mm.  
 Ht Relleu del taló = 20 mm.  
 Rt Resalt del taló = 25 mm.

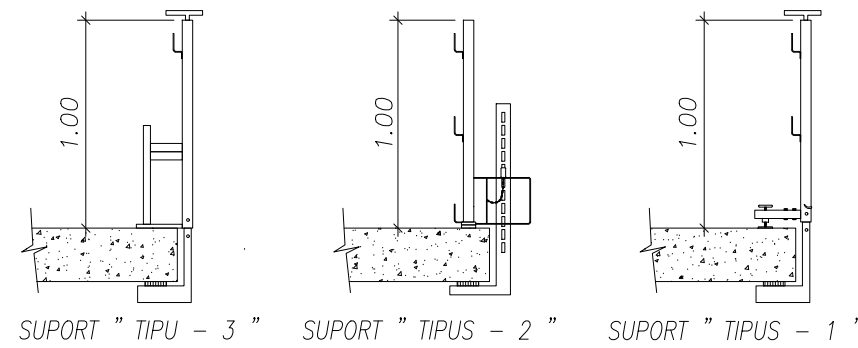
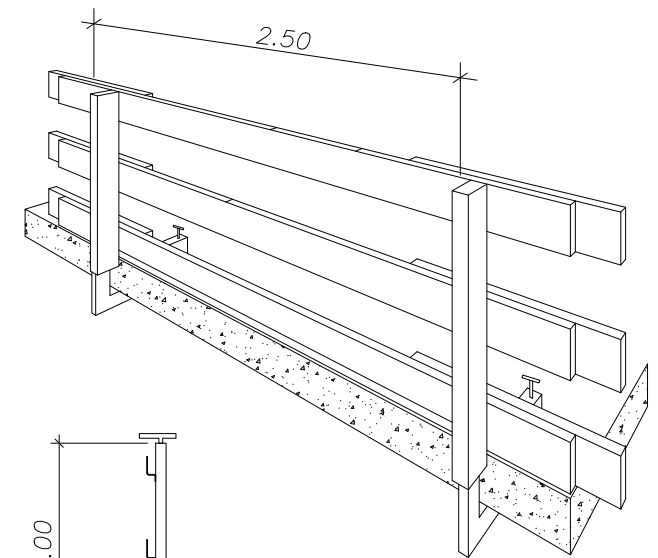
CINTURÓ DE SEGURETAT CLASSE A. TIPUS 2

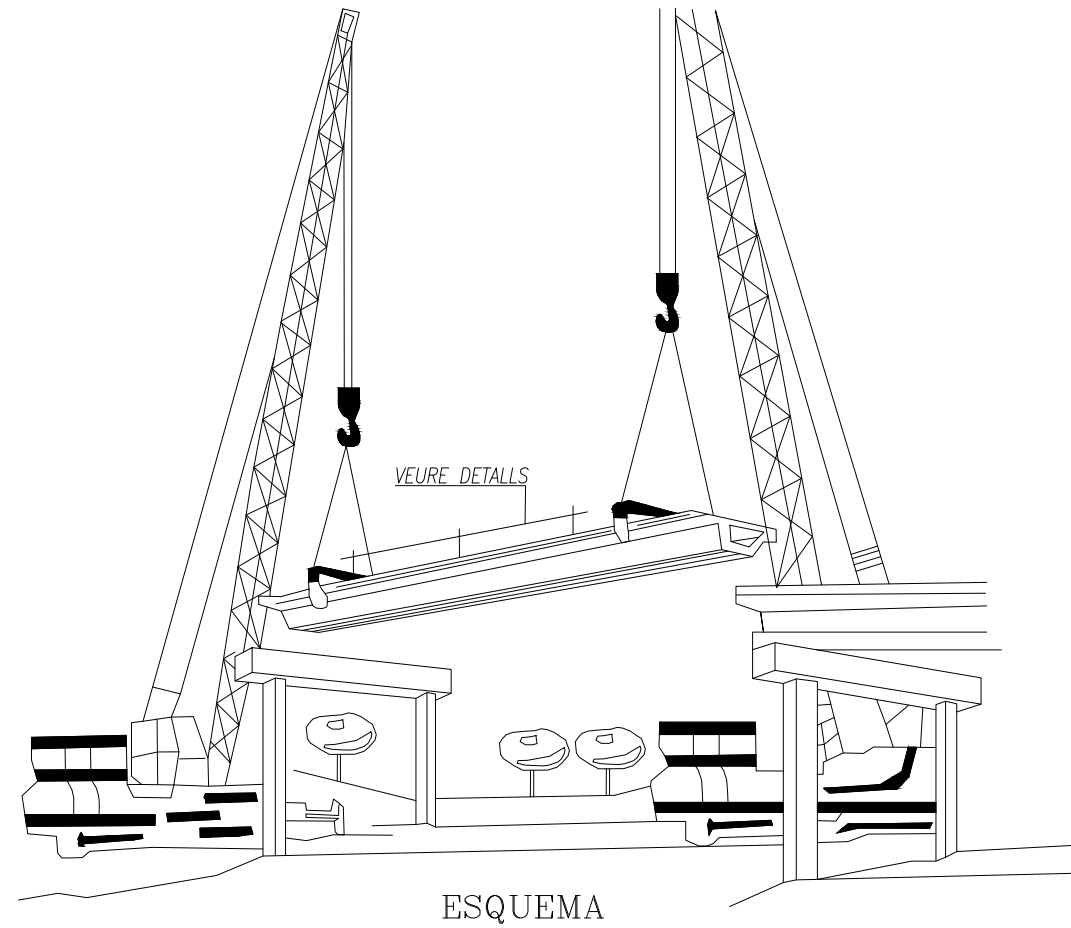


# PROTECCIONS EN CONSTRUCCIÓ DE TAULERS

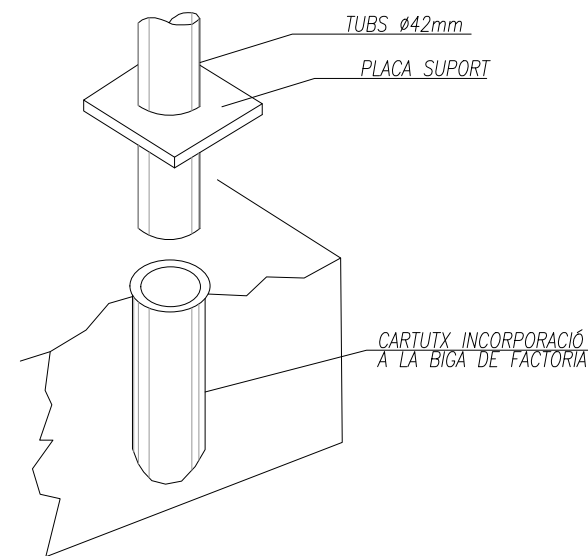
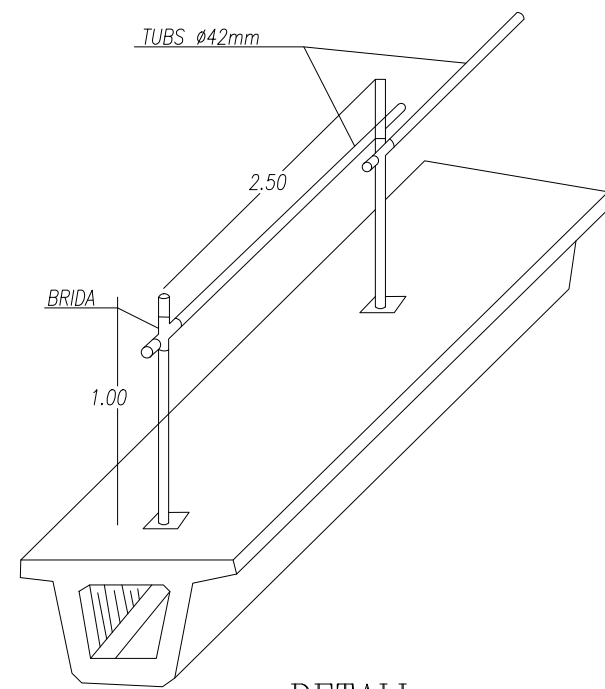
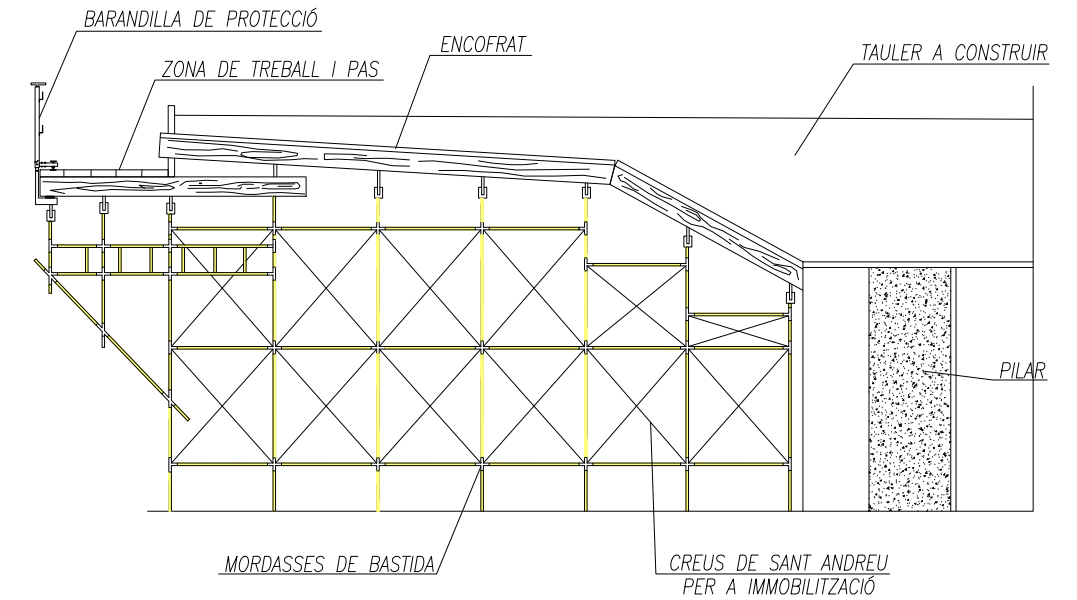


## DETALL





## PROTECCIÓ EN CONSTRUCCIÓ DE TAULERS



## LÍNEA D'ANCLATGE DE CINTURÓ DE SEGURETAT EN BIGUES

figura 1

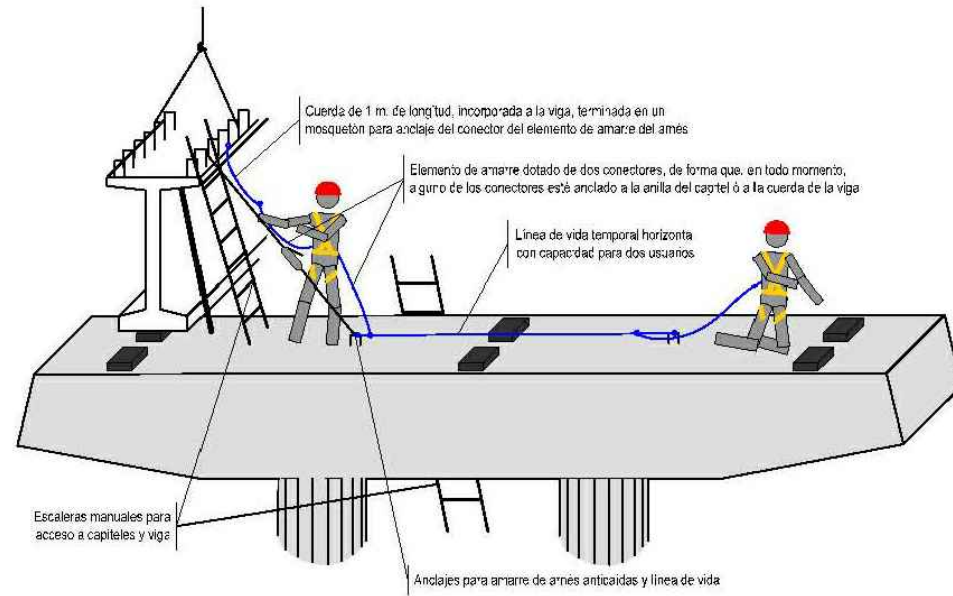


foto 1



figura 2

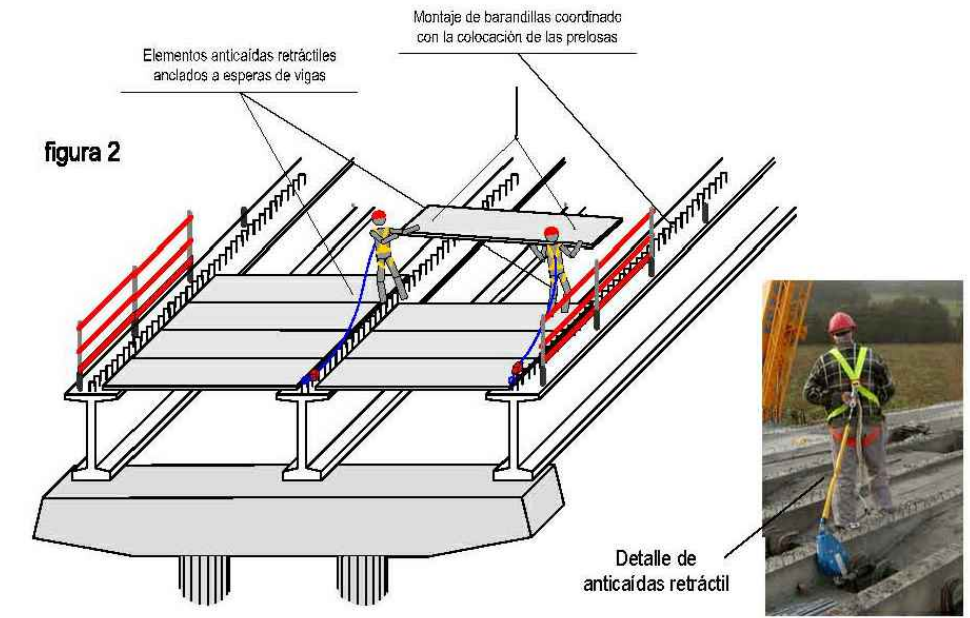


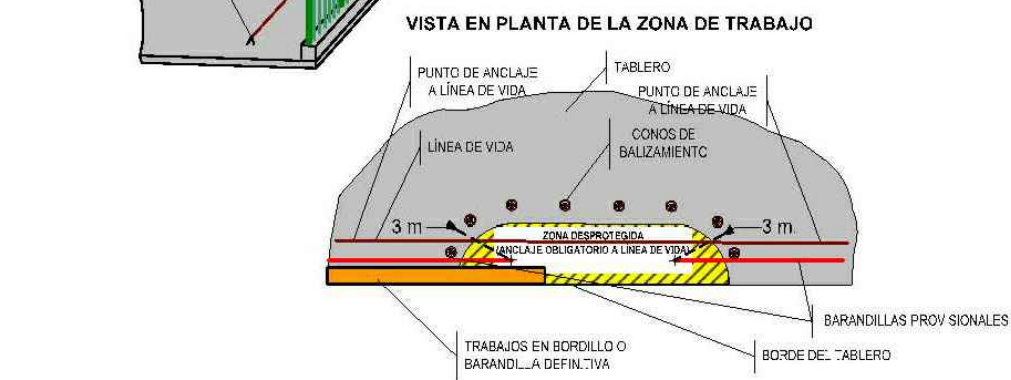
foto 2



figura 3



figura 4



MIRA 200EA MOSQUETONES MIRA 10A



foto 3

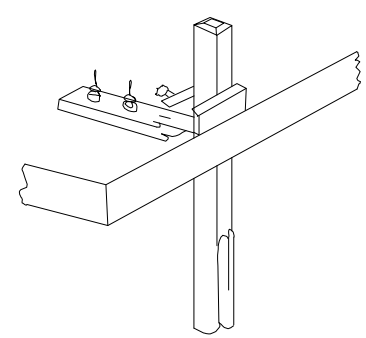
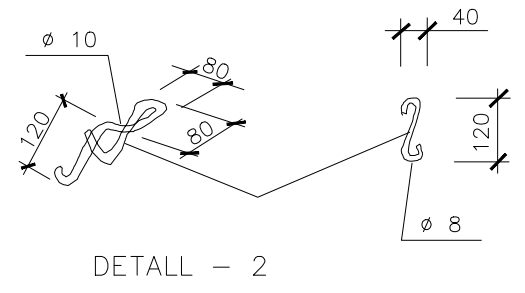
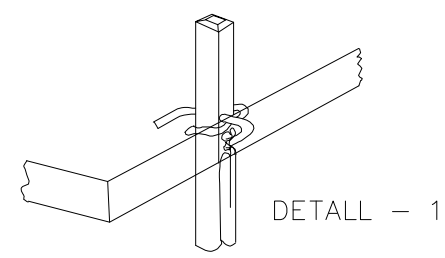
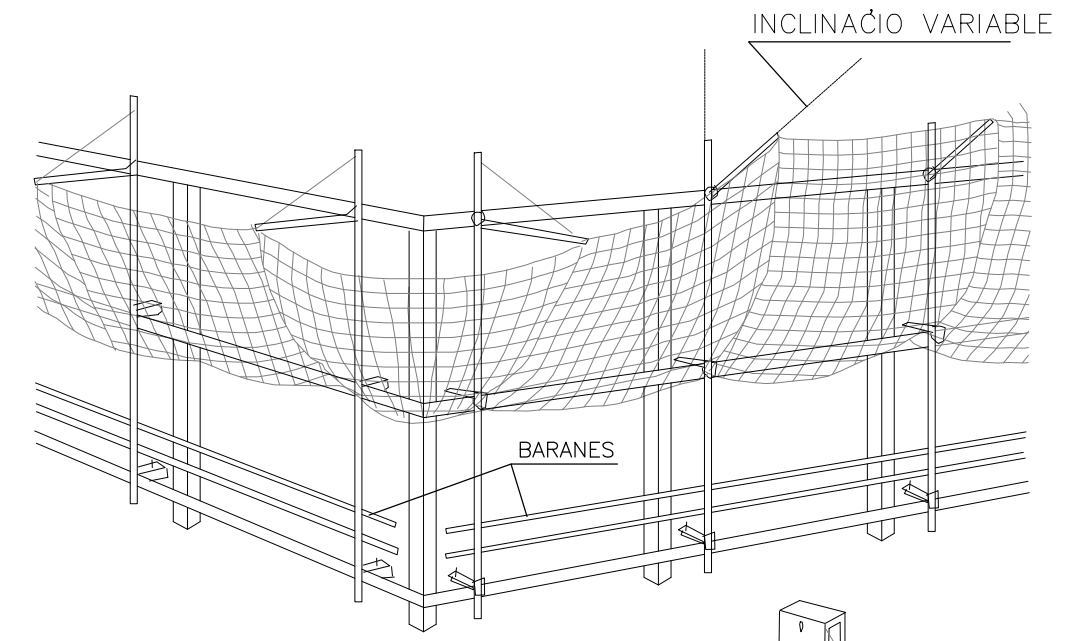


foto 4

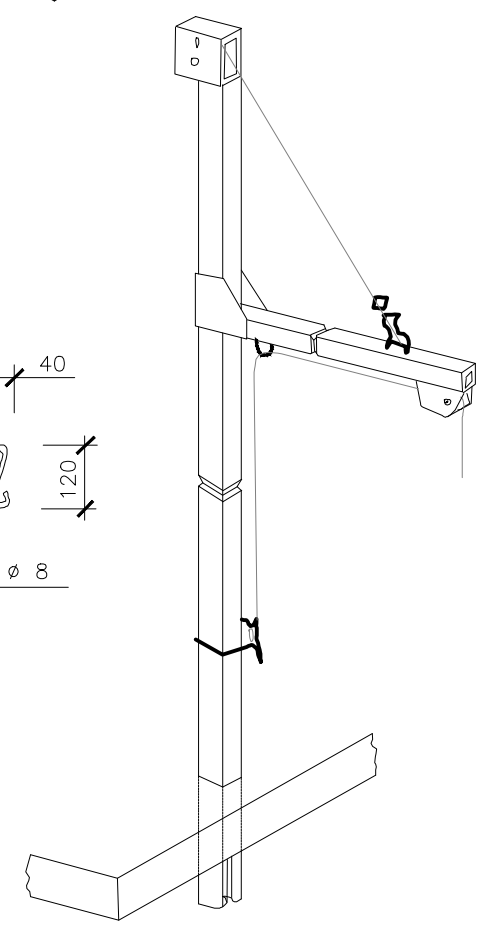




PROTECCIO DE BUI TS HORIZONTALS AMB XARXA

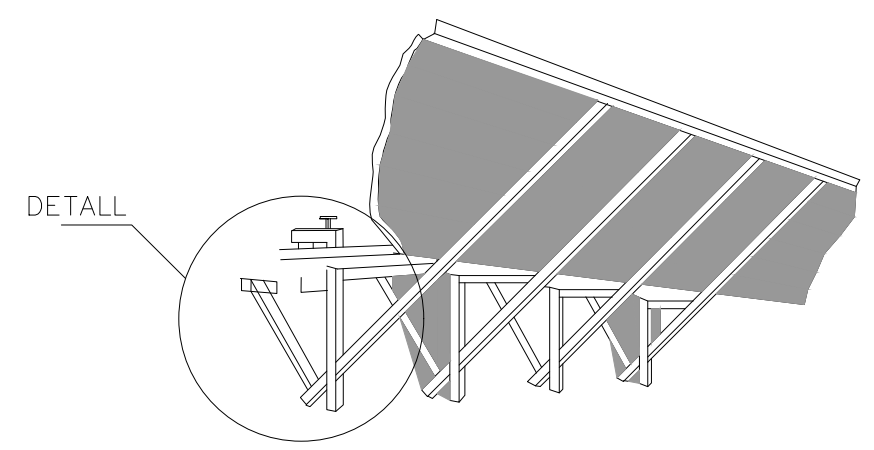


DETALL - 3



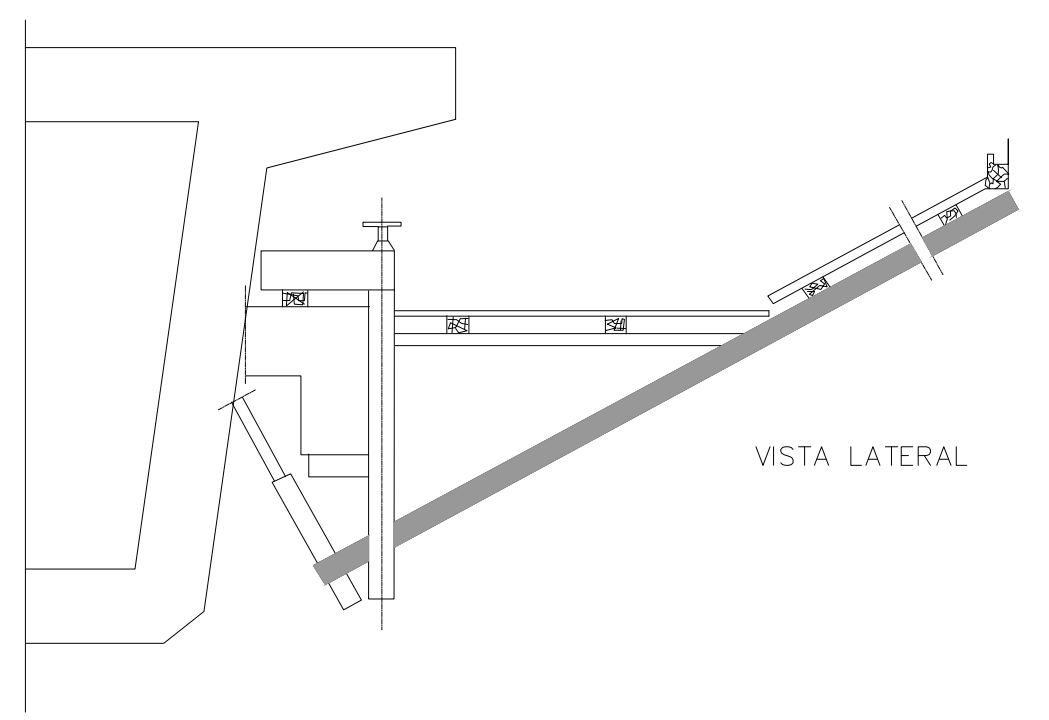
DETALL - 4

MARQUESINES DE PROTECCIO



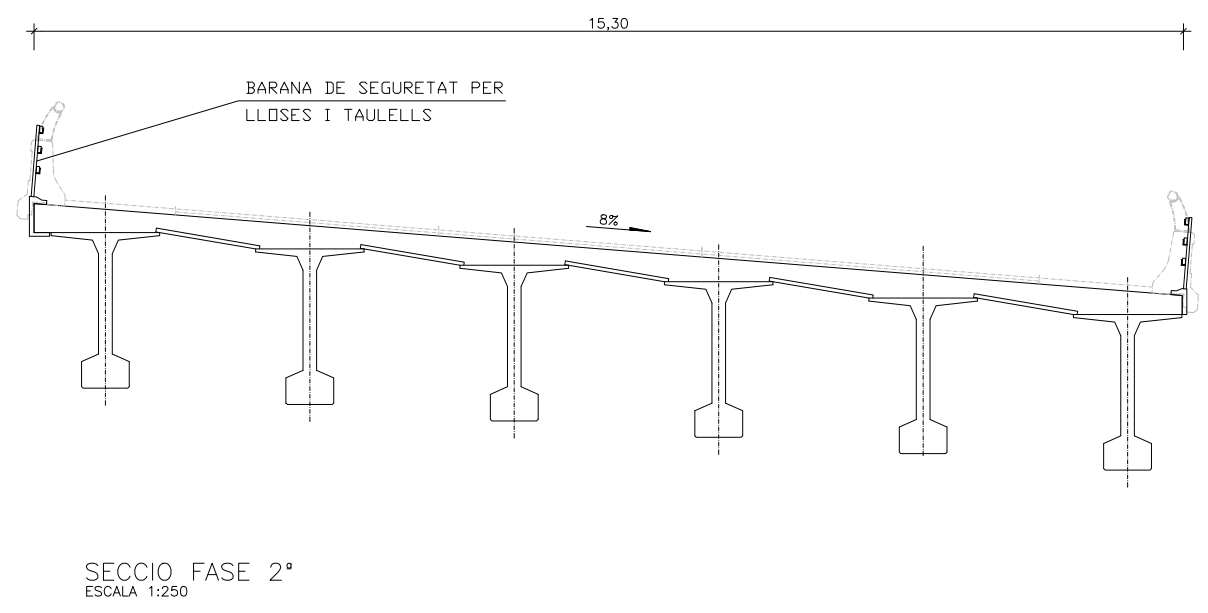
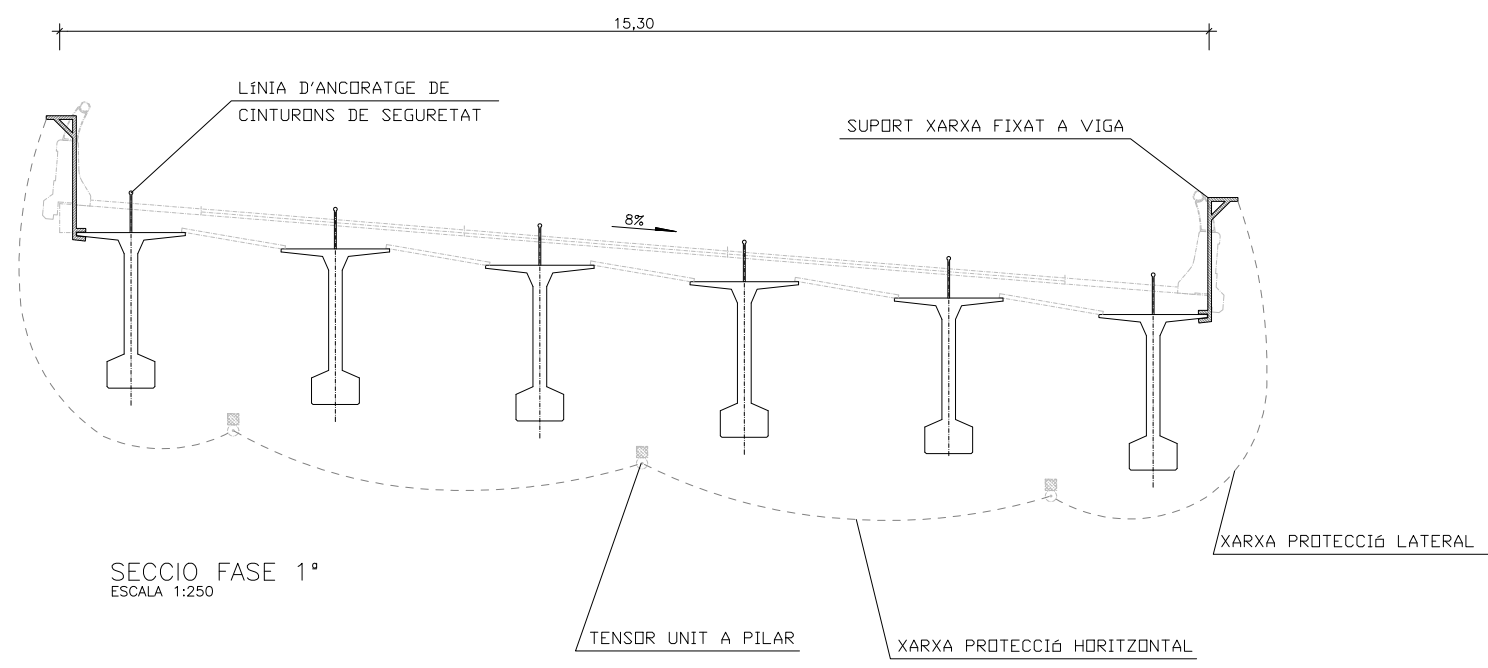
LA LONGITUD DEL VOLADIU SERA DE 2,50m.

ES RECOMENA UNA SEPARACIO ENTRE MORDASSES DE 2m. MAXIM ELS PANYS DE PARET DE Taulons ES MONTARAN SALTEJATS I SOLAPATS UNS AMB LES ALTRES.



VISTA LATERAL

PROTECCIONS  
EN VIADUCTE





## **Annex 18. Justificació de preus**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **ÍNDEX**

1	JUSTIFICACIÓ DE PREUS .....	1
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## **1 JUSTIFICACIÓ DE PREUS**

En el present annex s'inclou la justificació dels preus de les unitats d'obra que figuren al pressupost del projecte.

La justificació de preus es mostra a continuació.

## JUSTIFICACIÓ DE PREUS

Pàg.: 1

### MA D'OBRA

CODI	UA	DESCRIPCIÓ	PREU
A0112000	h	Cap de colla	23,36000 €
A0121000	h	Oficial 1a	22,05000 €
A012H000	h	Oficial 1a electricista	19,45000 €
A012N000	h	Oficial 1a d'obra pública	18,82000 €
A012P000	h	Oficial 1a jardiner	26,47000 €
A013H000	h	Ajudant electricista	16,56000 €
A013M000	h	Ajudant muntador	16,59000 €
A013U001	h	Ajudant	19,22000 €
A0140000	h	Manobre	18,41000 €
A0150000	h	Manobre especialista	19,04000 €
A0160000	h	Peó	18,83000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 2

### MAQUINÀRIA

CODI	UA	DESCRIPCIÓ	PREU
C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	51,07000 €
C110U025	h	Retroexcavadora de 95 hp, amb martell de 800 kg a 1500 kg	65,76000 €
C110U040	h	Compressor portàtil, amb dos martells pneumàtics de 20 kg a 30 kg	16,89000 €
C110U075	h	Equip de màquina de serra de disc de diamant per a tallar	14,96000 €
C110U085	h	Fresadora de paviment	101,18000 €
C1313330	h	Retroexcavadora sobre pneumàtics de 8 a 10 t	45,86000 €
C131U000	h	Pala carregadora de 110 hp, tipus CAT-926 o equivalent	54,20000 €
C131U001	h	Pala carregadora de 170 hp, tipus CAT-950 o equivalent	67,45000 €
C131U015	h	Excavadora-carregadora de 110 hp, tipus CAT-212 o equivalent	64,80000 €
C131U017	h	Excavadora-carregadora de 385 hp, tipus CAT-245 o equivalent	147,81000 €
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	40,31000 €
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	45,92000 €
C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	57,14000 €
C131U060	h	Excavadora sobre erugues amb escarificador (D-7)	70,39000 €
C131U062	h	Excavadora sobre erugues amb escarificador (D-9)	118,47000 €
C133A0J0	h	Picó vibrant amb placa de 30x30 cm	5,01000 €
C133U001	h	Motoanivelladora de 125 hp	55,73000 €
C133U002	h	Motoanivelladora de 150 hp	59,84000 €
C133U005	h	Corró vibratori autopropulsat de 6 a 8 t	46,75000 €
C133U030	h	Corró vibratori autopropulsat de 12 a 14 t	61,06000 €
C133U040	h	Corró vibratori autopropulsat de 14 a 18 t	67,79000 €
C133U070	h	Picó vibrant dúplex de 1300 kg	8,08000 €
C133U080	h	Picó vibrant amb placa de 60 cm d'amplària	5,71000 €
C1501700	h	Camió per a transport de 7 t	32,22000 €
C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	38,29000 €
C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	40,02000 €
C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	50,11000 €
C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	75,62000 €
C1501U03	h	Camió tractor de 450 hp, de 36 t (17,5 m3)	82,36000 €
C1502U10	h	Camió cisterna de 6000 l	39,04000 €
C1502U20	h	Camió cisterna de 10000 l	44,86000 €
C1503000	h	Camió grua	40,92000 €
C1503U10	h	Camió grua de 5 t	39,49000 €
C1503U20	h	Camió grua de 10 t	45,80000 €
C150GU10	h	Grua autopropulsada de 12 t	51,67000 €
C150GU20	h	Grua autopropulsada de 24 t	76,19000 €
C150GU30	h	Grua autopropulsada de 40 t	98,64000 €
C150GU40	h	Grua autopropulsada de 80 t	140,60000 €
C150GU50	h	Grua autopropulsada de 100 t	147,11000 €
C150U004	h	Furgoneta de 3500 kg	7,62000 €
C1700006	h	Vibrador intern de formigó	1,68000 €
C1701U10	h	Camió amb bomba de formigonar	96,71000 €
C1702DU0	h	Bituminadora automotriu per a reg asfàltic	29,41000 €
C1709B0U	h	Estenedora per a paviments de mescla bituminosa	55,22000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 3

### MAQUINÀRIA

CODI	UA	DESCRIPCIÓ	PREU
C170E00U	h	Escombradora autopropulsada	39,92000 €
C170U035	h	Piconadora autopropulsada de 14 a 16 t	64,58000 €
C170U051	h	Corró vibratori autopropulsat pneumàtic	68,34000 €
C17A20QU	h	Planta de formigó per a 60 m3/h	83,75000 €
C1B02AU0	h	Màquina per a pintar marques vials, autopropulsada	35,45000 €
C1B0AU05	h	Màquina per a clavar muntants metàl·lics	25,53000 €
C1B0AU10	h	Compressor portàtil amb accessoris per a pintar marques vials	16,07000 €
C2005U00	h	Regle vibratori per a formigonat de soleres	3,76000 €
C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	2,75000 €
C200SU00	h	Equip i elements auxiliars per a tall oxiacetilènic	3,83000 €
C200U001	h	Motoserra per a la tala d'arbres	2,71000 €
C200U002	h	Màquina per a doblegar rodó d'acer	2,27000 €
C200U003	h	Cisalla elèctrica	2,44000 €
C200U010	h	Màquina taladradora	2,16000 €
C200U101	h	Bombí per a proves de canonades	3,90000 €
C3E62000	h	Martell percussor d'efecte doble amb motor	219,88000 €
C3H1U002	h	Equip de personal i maquinària per a perforació i extracció, inclòs trepant, llots tixotròpics, encamisat i formigonat de piló complet	192,11000 €
CR22U001	h	Tractor amb equip per a tractament del subsòl	50,71000 €
CR71U010	h	Hidrosembradora muntada sobre camió	36,38000 €
CZ11U000	h	Grup electrògen de 45/60 kVA, amb consums inclosos	4,82000 €
CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	6,69000 €
CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	17,38000 €
CZ11UU005	h	Màquina de confecció d'unions soldades de tubs de polietilè	4,09000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 4

### MATERIALS

CODI	UA	DESCRIPCIÓ	PREU
B0111000	m3	Aigua	1,60000 €
B031U100	m3	Sorra de pedrera de 0 a 3 mm	21,25000 €
B032U010	m3	Sauló sense garbellar, inclòs cànon per extracció i transport a l'obra	14,31000 €
B032U100	m3	Material granulat filtrant per a darrera d'alçats de murs, estreps i voltes d'estructures, inclòs transport a l'obra	13,35000 €
B033U030	m3	Grava de pedrera de pedra granítica, de 20 a 40 mm, per a drenos	16,02000 €
B037200U	m3	Tot-u artificial, inclòs transport a l'obra	17,13000 €
B039U020	m3	Barreja de granulat per a grava-ciment de granulometria GC25 o GC-20, mesurat després de la compactació	18,43000 €
B03DU001	m3	Terra procedent de préstec, inclòs cànon per extracció i transport a l'obra	3,29000 €
B03DU103	m3	Sòl seleccionat tipus 2 procedent de préstec, inclòs transport a l'obra	4,68000 €
B03DU104	m3	Sòl seleccionat tipus 3 procedent de préstec, inclòs transport a l'obra	5,92000 €
B0441200	m3	Bloc de pedra granítica per a escullera de 400 a 800 kg, inclòs transport a l'obra	17,43000 €
B051U012	t	Ciment portland CEM I 32,5 N segons UNE-EN 197-1	84,49000 €
B055U001	t	Betum asfàltic tipus B 50/70	395,18000 €
B055U024	kg	Emulsió bituminosa catiònica al 50% de betum, tipus C50BF5 IMP	0,30000 €
B055U050	kg	Emulsió bituminosa catiònica en dissolució al 50% per a impermeabilitzacions	0,88000 €
B055U320	kg	Emulsió bituminosa termoadherent al 60% de betum, tipus C60B4 TER o C60B3 TER	0,31000 €
B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	57,38000 €
B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	61,34000 €
B060U430	m3	Formigó HA-25, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	66,78000 €
B060U440	m3	Formigó HA-25, consistència fluida i granulat màxim 20 mm, inclòs transport a l'obra	69,34000 €
B060U450	m3	Formigó HA-30, consistència fluida i granulat màxim 20 mm, inclòs transport a l'obra	73,17000 €
B064300C	m3	Formigó HM-20/P/20/I de consistència plàstica, grandària màxima del granulat 20 mm, amb >= 200 kg/m3 de ciment, apte per a classe d'exposició I	55,00000 €
B064500B	m3	Formigó HM-20/B/40/I de consistència tova, grandària màxima del granulat 40 mm, amb >= 200 kg/m3 de ciment, apte per a classe d'exposició I	53,60000 €
B0710150	t	Morter per a ram de paleta, classe M 5 (5 N/mm2), en sacs, de designació (G) segons norma UNE-EN 998-2	30,76000 €
B071U005	m3	Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	85,10000 €
B071U007	m3	Morter de ciment de Classe M-7,5 (7,5 N/mm2) segons la Norma UNE 998-2	87,43000 €
B071U010	m3	Morter de ciment de Classe M-10 (10 N/mm2) segons la Norma UNE 998-2	89,78000 €
B071U102	dm3	Morter sense retracció de consistència fluida, per a rebliments i ancoratges	1,83000 €
B0A142U0	kg	Filferro recuit de diàmetre 1,6 mm	1,23000 €
B0A3UC10	kg	Clau acer	1,32000 €
B0B2U002	kg	Acer en barres corrugades B 500 S de límit elàstic >= 500 N/mm2	0,63000 €
B0D21030	m	Tauló de fusta de pi per a 10 usos	0,33000 €
B0D2U002	m	Amortització de tauló de fusta de pi per a 1 ús	2,92000 €
B0D31000	m3	Llata de fusta de pi	240,99000 €
B0D629AU	cu	Puntal metàl·lic i telescòpic per a 5 m d'alçària i 150 usos	21,45000 €
B0D7UC02	m2	Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	1,30000 €
B0D7UC11	m2	Amortització de tauler encadellat de fusta de pi de 22 mm, per a 3 usos	3,61000 €
B0DAU012	m2	Lloseta prefabricada amb entramat metàl·lic autoportant, per a encofrat perdut de ponts amb voladius fins a 2,50 m	49,25000 €
B0DFU001	m3	Amortització de cindri metàl·lica	7,24000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 5

### MATERIALS

CODI	UA	DESCRIPCIÓ	PREU
B0DZA000	l	Desencofrant	2,46000 €
B0DZU005	u	Materials auxiliars per a encofrar	1,66000 €
B3H28261	m2	Palplanxa recuperable d'acer al carboni, per a 25 usos, amb forma U, de fins a 600 mm d'amplada útil, amb un moment resistent de fins a 800 cm3/m de paret, amb unió encadellada	5,67000 €
B3Z5U002	m	Amortització de tub metàl·lic per a formigonat de pilons	0,56000 €
B3Z5U100	m2	Amortització de tub metàl·lic recuperable d'entubació de pilons	9,18000 €
B3Z5U130	m	Tub d'acer roscat de 50 mm de diàmetre per assaig cross-hole en pilons de qualsevol diàmetre.	3,53000 €
B4PAG900	m	Imposta prefabricada de formigó armat per terminació de cantell de viaducte de 1500 mm de llargada i amb faldó de 375 mm.	47,87000 €
B4PAU915	m	Biga prefabricada de formigó pretesat, tipus artesa, de 220 cm de cantell, 160 cm de base i 297 cm d'ample superior, inclòs transport a l'obra.	1.780,79000 €
B4PZU012	dm3	Neoprè armat per a recolzaments	13,39000 €
B4PZZ060	u	Broc prefabricat de formigó en massa per a tub de DN500mm, segons plànols	104,36000 €
B711U010	m2	Làmina bituminosa de quitrà modificat amb cautxú sintètic i resines, amb feltre teixit de polipropilè	8,57000 €
B774U006	m2	Làmina drenant de polietilè d'alta densitat amb nòduls de 9 mm d'alçada, feltre de polipropilè i làmina impermeabilitzant de polietilè, amb resistència a la compressió de 400 kN/m2	7,07000 €
B7B1U001	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 125 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1500 N	1,12000 €
B7B1U002	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 150 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1750 N	1,45000 €
B7J1U216	m	Junt de dilatació exterior, formada per perfil de cautxú armat amb angulars i làmines d'acer embegudes, per a un recorregut de 170 mm, inclòs pern d'ancoratge i reblerts amb morter sintètic	246,03000 €
B7Z1U002	u	Clau adhesiu per a fixació de làmina de polietilè amb nòduls	1,23000 €
B7Z1U010	m	Banda autoadhesiva de cautxú butil de 4 cm d'amplària per a segellat de làmina de polietilè	1,55000 €
B8ZBU100	kg	Pintura acrílica en solució aquosa o amb dissolvent, per a marques vials	2,50000 €
B8ZBU300	kg	Pintura de dos components en fred de llarga durada, per a marques vials	3,05000 €
B8ZBUU01	kg	Microesferes de vidre	0,89000 €
B8ZBUUR1	kg	Microesferes de vidre 100 % reciclades	0,89000 €
B9651UC5	m	Vorada de calçada C5 25x15 prefabricada de formigó, d'acord amb la UNE 127340 i UNE EN 1340	3,91000 €
B9651UC9	m	Vorada de calçada C9 13x25 prefabricada de formigó, d'acord amb la UNE 127340 i UNE EN 1340	7,81000 €
B974U012	m	Rigola de morter de ciment de color blanc, de 20 cm d'amplada i 8 cm de gruix	3,31000 €
B9F1UC10	m2	Llambordí prefabricat de formigó de 8 cm de gruix, de qualsevol forma i dimensions, sèrie 1	8,07000 €
B9H1U020	t	Mescla bituminosa en calent AC 22 S per a capa intermitja, inclòs filler, sense incloure betum, a peu de planta asfàltica	22,38000 €
B9H1U120	t	Mescla bituminosa en calent AC22 G, per a capa de base, inclòs filler, sense incloure betum, a peu de planta asfàltica	22,34000 €
B9H1U512	t	Mescla bituminosa en calent AC16 D per a capa de trànsit, inclòs filler, sense incloure betum, a peu de planta asfàltica	23,75000 €
B9H1U612	t	Mescla bituminosa en calent AC16 S per a capa de trànsit, inclòs filler, sense incloure betum, a peu de planta asfàltica	23,79000 €
BB1AU120	m	Àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2., d'1,00 m d'alçada amb muntants cada 2,50 m, amb tres (3) travessers de perfil tubular, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, segons Plec de Prescripcions Tècniques i detalls plànols	171,49000 €
BB1AU125	u	Extrem d'àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2., d'1,00 m d'alçada, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, segons Plec de Prescripcions Tècniques i detalls plànols	246,03000 €
BBC1U010	u	Fita quilomètrica amb placa de 40x60 cm, amb revestiment reflectant EG classe RA1, inclosos elements de fixació al suport	46,63000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 6

### MATERIALS

CODI	UA	DESCRIPCIÓ	PREU
BBM0U301	m	Barrera prefabricada de formigó, tipus BHDPJ2/0a (New Jersey o equivalent) amb perfil a les dues cares, en mòduls de 2 m, inclòs transport a l'obra	65,24000 €
BBM1U102	u	Placa triangular d'acer galvanitzat, de 135 cm, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	100,48000 €
BBM1U111	u	Placa circular d'acer galvanitzat, de 90 cm de diàmetre, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	108,95000 €
BBM1U121	u	Placa octogonal d'acer galvanitzat, de 90 cm de doble apotema, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	102,96000 €
BBM1U132	u	Placa d'acer galvanitzat de 60x60 cm, d'indicacions generals i carrils, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	49,77000 €
BBM21003	m	Barrera de seguretat metàl·lica simple, amb nivell de contenció N2, amplària de treball W5, índex de severitat A i deflexió dinàmica 1,6 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, inclouent tanca de secció doble ona, tensor posterior, part proporcional de separador, pal de perfil C-120 cada 4 m (BMSNA4/C), elements de fixació, material auxiliar i captafars, amb una alçada de 750 mm	23,74000 €
BBM2U583	u	Extrem de 8 m mínim de barrera de seguretat metàl·lica de qualsevol tipus, amb abatiment o encastament en el talús del desmunt, galvanitzada en calent, inclouent tanca de secció doble ona, pals de perfil tubulars de 120x55 mm cada 2 m, separadors, peça en angle, topall final, elements de fixació, material auxiliar i captafars	313,34000 €
BBM2X503	m	Barrera de seguretat metàl·lica simple, tipus AS_BMSNC2/C o equivalent, amb nivell de contenció H1, amplària de treball W4, índex de severitat A i deflexió dinàmica 1,1 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, inclouent dues tanques sobreposades de secció doble ona, part proporcional de separadors, pal de perfil C-120 cada 2 m (BMSNC2/C), elements de fixació, material auxiliar i captafars, amb una alçada de 1200 mm.	55,73000 €
BBM5U451	m2	Placa d'alumini superior a 0,25 m2 i fins a 0,50 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	251,43000 €
BBM5U452	m2	Placa d'alumini superior a 0,50 m2 i fins a 1,00 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	217,69000 €
BBM5U454	m2	Placa o rètol en lames d'alumini superior a 1,50 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	170,70000 €
BBM5U462	m2	Placa d'alumini superior a 0,10 m2 i fins a 0,25 m2, d'identificació de carreteres, amb revestiment reflectant HI classe RA2	270,86000 €
BBMZU105	m	Suport de tub d'acer galvanitzat de 80x40x2 mm, per a senyals de trànsit	9,30000 €
BBMZU106	m	Suport de tub d'acer galvanitzat de 100x50x3 mm, per a senyals de trànsit	19,76000 €
BBMZU126	u	Pp de placa d'acer S355JR amb 4 pern rosats d'ancoratge, galvanitzat en calent, per a fonamentació de suport d'alumini	38,34000 €
BBMZU601	u	Part proporcional de brides d'alumini i elements de fixació al suport de senyals de trànsit	0,70000 €
BBMZU611	m	Pal d'alumini de 90 mm de diàmetre, designació MC del Plec de Prescripcions, per a suport de senyals de trànsit	23,89000 €
BBMZU612	m	Pal d'alumini de 114 mm de diàmetre, designació MD del Plec de Prescripcions, per a suport de senyals de trànsit	30,47000 €
BBMZU613	m	Pal d'alumini de 114 o 140 mm de diàmetre, designació ME del Plec de Prescripcions, per a suport de senyals de trànsit	54,86000 €
BBMZU614	m	Pal d'alumini de 140 mm de diàmetre, designació MF del Plec de Prescripcions, per a suport de senyals de trànsit	91,73000 €
BBMZU621	u	Base d'acer galvanitzat per a subjecció de pal de suport de 90 mm de diàmetre al fonament de senyals de trànsit	67,54000 €
BBMZU623	u	Base d'acer galvanitzat per a subjecció de pal de suport de 140 mm de diàmetre al fonament de senyals de trànsit	87,87000 €
BD52U002	m	Baixant per a talussos de peces prefabricades de formigó en forma d'U, de 40x13 cm interiors mínim	26,69000 €
BD5AU200	m	Tub corrugat de PVC de doble paret, de D= 210 mm, ranurat en un arc de 108° a 220°, per a drenatge	8,69000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 7

### MATERIALS

CODI	UA	DESCRIPCIÓ	PREU
BD5ZUC01	u	Marc i reixa de 70x30 cm de fosa dúctil, per a 25 t de càrrega de ruptura	71,74000 €
BD75U050	m	Tub de formigó vibropresat de diàmetre interior 50 cm	14,96000 €
BDGZB610	m	Banda continua de senyalització per a canalitzacions soterrades de 30 cm d'amplària, de polipropilè	0,44000 €
BDGZFN50	m	Fil guia per a conductes de canalitzacions de serveis, de nylon, de 5 mm de gruix	0,14000 €
BDGZP900	u	Part proporcional de separadors, connectors i obturadors de canalitzacions de serveis de 90 mm de diàmetre nominal	0,21000 €
BDK21495	u	Pericó de registre de formigó prefabricat sense fons de 40x40x45 cm, per a instal·lacions de serveis	13,04000 €
BDKZH9B0	u	Bastiment quadrat i tapa quadrada de fosa dúctil per a pericó de serveis, recolzada, pas lliure de 400x400 mm i classe B125 segons norma UNE-EN 124	28,82000 €
BFA1U106	m	Tub de PVC, DN 63 mm, PN 6 bar, amb unions de junt elàstica, inclòs p.p. de peces especials i accessoris	0,88000 €
BFA1U107	m	Tub de PVC, DN 75 mm, PN 6 bar, amb unions de junt elàstica, inclòs p.p. de peces especials i accessoris	1,42000 €
BFA1X001	m	Canaló circular de PVC amb òxid de titani, de desenvolupament 250 mm, color gris clar, unió enganxada amb adhesiu, segons UNE-EN 607. Inclús suports, cantonades, tapes, acabaments finals, peces de connexió a baixants i peces especials.	5,45000 €
BFB1U109	m	Tub de polietilè d'alta densitat, tipus PE-50A, DN 90 mm, PN 6, inclòs p.p. de peces especials i accessoris	2,68000 €
BG21032U	m	Tub rígid plàstic de diàmetre nominal exterior 20 mm, lliure d'halògens amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, tipus FPKU-H0 de Rehau o equivalent	0,61000 €
BG21U032	m	Tub rígid de PVC de 32 mm de diàmetre nominal, aïllant i no propagador de la flama, amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, i una rigidesa dielèctrica de 2000 V, inclòs p.p. de peces especials i accessoris	1,51000 €
BG22TH10	m	Tub corbable corrugat de polietilè, de doble capa, llisa la interior i corrugada l'exterior, de 90 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 20 J, resistència a compressió de 450 N, per a canalitzacions soterrades	1,44000 €
BG22U100	m	Tub flexible corrugat de PVC de diàmetre 100 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 2 J, resistència a compressió de 250 N, per a canalitzacions soterrades	1,94000 €
BG31230U	m	Cable amb conductor de coure (classe 2 o classe 5), designació R Z1 0,6/1 kV 2x2,5 segons UNE 21123, tipus EXZHELLENT de Grupo General Cable o equivalent, inclòs marcatge indeleble i material auxiliar necessari	0,55000 €
BG312550	m	Cable amb conductor de coure de 0,6/1 kV de tensió assignada, amb designació RZ1-K (AS), tetrapolar, de secció 4 x 6 mm <sup>2</sup> , amb coberta del cable de poliolefines amb baixa emissió fums	2,68000 €
BG321170	m	Cable amb conductor de coure 450/750 V de tensió assignada, amb designació H07V-K, unipolar, de secció 1 x 16 mm <sup>2</sup> , amb aïllament PVC	1,53000 €
BG380900	m	Conductor de coure nu, unipolar de secció 1x35 mm <sup>2</sup>	1,27000 €
BG38U035	m	Conductor de coure nu, unipolar d'1x35 mm <sup>2</sup>	1,29000 €
BG3ZU010	u	Terminal per a cable de coure de 35 mm <sup>2</sup>	2,66000 €
BG46U010	u	Caixa de connexions i tallacircuits per a una o dues lampades	11,13000 €
BGD13220	u	Piqueta de connexió a terra d'acer i recobriments de coure, de 2000 mm de llargària, de 14,6 mm de diàmetre, de 300 µm	16,59000 €
BGD2U010	u	Placa de presa de terra de 500 x 500 x 3 mm	14,90000 €
BGDZU020	u	Cartutx per a soldadura Cadweld	1,39000 €
BGDZU030	u	Sals de sulfat de sodi i magnesi	0,77000 €
BGY38000	u	Part proporcional d'elements especials per a conductors de coure nus	0,15000 €
BGYD1000	u	Part proporcional d'elements especials per a piquetes de connexió a terra	4,04000 €
BHM1U035	u	Columna metàl·lica troncocònica totalment galvanitzada de 8 m d'alçària, planxa de 3 mm, amb base platina, per anar muntada amb pern d'ancoratge sobre dau de formigó	233,01000 €
BHM1U040	u	Columna metàl·lica troncocònica totalment galvanitzada de 9 m d'alçària, planxa de 4 mm, amb base platina, per anar muntada amb pern d'ancoratge sobre dau de formigó.	262,49000 €

## JUSTIFICACIÓ DE PREUS

Pàg.: 8

### MATERIALS

CODI	UA	DESCRIPCIÓ	PREU
BHMZU010	u	Conjunt de quatre pern per a cimentació	16,97000 €
BHQCU010	u	Llumenera LED model Nath S Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 94 W, corrent de LED 800 mA, amb accessori per fixar vertical i acoblat a l'extrem del suport. Totalment col·locat.	381,89000 €
BHQCU020	u	Lluminaia LED model Nath S Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 81W, corrent de LED 700 mA, amb accessoris de muntatge i petit material.	552,18000 €
BR34J000	kg	Bioactivador microbià	6,39000 €
BR361100	kg	Estabilitzant sintètic de base acrílica	8,06000 €
BR3B6U00	kg	Adob mineral d'alliberament molt lent (15-8-11%+2MgO) GR o similar	0,80000 €
BR3PAN00	kg	Encoixinament protector per a hidrosembres de fibra semicorta	0,90000 €
BR4UJJ00	kg	Barreja d'hidrosembra composta per d'espècies herbàcies adaptades agroclimàticament	3,68000 €
BVA41XPN1	u	Unitat completa per la prova de càrrega del nou pont segons disseny aprovat.	6.428,57000 €



## JUSTIFICACIÓ DE PREUS

Pàg.: 9

### ELEMENTS COMPOSTOS

CODI	UA	DESCRIPCIÓ	PREU
D9H1U512	t	Mescla bituminosa en calent AC16 surf B50/70 D, inclòs filler, estesa i compactada, sense incloure betum	Rend.: 65,000 33,51000 €
		Unitats	Preu Parcial Import
Ma d'obra			
A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 0,67846
A0150000	h	Manobre especialista	4,000 /R x 19,04000 = 1,17169
A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,35938
		Subtotal:	2,20953 2,20953
Maquinària			
C1709B0U	h	Estenedora per a paviments de mescla bituminosa	1,000 /R x 55,22000 = 0,84954
C170U035	h	Piconadora autopropulsada de 14 a 16 t	1,000 /R x 64,58000 = 0,99354
C170U051	h	Corró vibratori autopulsat pneumàtic	1,000 /R x 68,34000 = 1,05138
C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	4,000 /R x 75,62000 = 4,65354
		Subtotal:	7,54800 7,54800
Materials			
B9H1U512	t	Mescla bituminosa en calent AC16 D per a capa de trànsit, inclòs filler, sense incloure betum, a peu de planta asfàltica	1,000 x 23,75000 = 23,75000
		Subtotal:	23,75000 23,75000
		COST DIRECTE	33,50753
		COST EXECUCIÓ MATERIAL	33,50753

## JUSTIFICACIÓ DE PREUS

Pàg.: 10

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
P-1	F2221774	m	Excavació de rasa per a pas d'instal·lacions de 40 cm d'amplària i 70 cm de fondària, reblert i compactació amb terres seleccionades de la pròpia excavació, sense pedres, amb retroexcavadora	Rend.: 1,000 9,14 €
		Unitats	Preu Parcial Import	
Ma d'obra				
	A0150000	h	Manobre especialista	0,125 /R x 19,04000 = 2,38000
	A0140000	h	Manobre	0,125 /R x 18,41000 = 2,30125
		Subtotal:	4,68125 4,68125	
Maquinària				
	C1313330	h	Retroexcavadora sobre pneumàtics de 8 a 10 t	0,0725 /R x 45,86000 = 3,32485
	C133A0J0	h	Picó vibrant amb placa de 30x30 cm	0,125 /R x 5,01000 = 0,62625
		Subtotal:	3,95110 3,95110	
		DESPESES AUXILIARS	1,50 %	0,07022
		COST DIRECTE		8,70257
		DESPESES INDIRECTES	5,00 %	0,43513
		COST EXECUCIÓ MATERIAL		9,13770
P-2	FDG51337	m	Canalització amb un tub corbable corrugat de polietilè de 90 mm de diàmetre nominal, de doble capa, i dau de recobriments de 40x30 cm amb formigó HM-20/P/20/I, fil guia a cada tub, part proporcional d'accessoris d'unió, separadors i obturadors	Rend.: 1,000 9,83 €
		Unitats	Preu Parcial Import	
Ma d'obra				
	A0140000	h	Manobre	0,020 /R x 18,41000 = 0,36820
	A0121000	h	Oficial 1a	0,010 /R x 22,05000 = 0,22050
		Subtotal:	0,58870 0,58870	
Materials				
	B064300C	m3	Formigó HM-20/P/20/I de consistència plàstica, grandària màxima del granulat 20 mm, amb >= 200 kg/m3 de ciment, apte per a classe d'exposició I	0,1254 x 55,00000 = 6,89700
	BDGZFN50	m	Fil guia per a conductes de canalitzacions de serveis, de nylon, de 5 mm de gruix	1,020 x 0,14000 = 0,14280
	BDGZP900	u	Part proporcional de separadors, connectors i obturadors de canalitzacions de serveis de 90 mm de diàmetre nominal	1,010 x 0,21000 = 0,21210
	BG22TH10	m	Tub corbable corrugat de polietilè, de doble capa, llisa la interior i corrugada l'exterior, de 90 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 20 J, resistència a compressió de 450 N, per a canalitzacions soterrades	1,050 x 1,44000 = 1,51200
		Subtotal:	8,76390 8,76390	



## JUSTIFICACIÓ DE PREUS

Pàg.: 11

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU	
			DESPESES AUXILIARS	1,50 %	0,00883
			COST DIRECTE		9,36143
			DESPESES INDIRECTES	5,00 %	0,46807
			<b>COST EXECUCIÓ MATERIAL</b>		<b>9,82950</b>

<b>P-3</b>	<b>FDG52337</b>	m	Canalització amb dos tubs corbables corrugats de polietilè de 90 mm de diàmetre nominal, de doble capa, i dau de recobriments de 40x30 cm amb formigó HM-20/P/20/I, fil guia a cada tub, part proporcional d'accessoris d'unió, separadors i obturadors	<b>Rend.: 1,000</b>	<b>11,72</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0121000	h	Oficial 1a	0,015 /R x 22,05000 =	0,33075
A0140000	h	Manobre	0,030 /R x 18,41000 =	0,55230
		<b>Subtotal:</b>		<b>0,88305</b>
<b>Materials</b>				
B064300C	m3	Formigó HM-20/P/20/I de consistència plàstica, grandària màxima del granulat 20 mm, amb >= 200 kg/m3 de ciment, apte per a classe d'exposició I	0,1188 x 55,00000 =	6,53400
BDGZFN50	m	Fil guia per a conductes de canalitzacions de serveis, de nylon, de 5 mm de gruix	2,040 x 0,14000 =	0,28560
BDGZP900	u	Part proporcional de separadors, conectors i obturadors de canalitzacions de serveis de 90 mm de diàmetre nominal	2,020 x 0,21000 =	0,42420
BG22TH10	m	Tub corbable corrugat de polietilè, de doble capa, llisa la interior i corrugada l'exterior, de 90 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 20 J, resistència a compressió de 450 N, per a canalitzacions soterrades	2,100 x 1,44000 =	3,02400
		<b>Subtotal:</b>		<b>10,26780</b>
		DESPESES AUXILIARS	1,50 %	0,01325
		COST DIRECTE		11,16410
		DESPESES INDIRECTES	5,00 %	0,55820
		<b>COST EXECUCIÓ MATERIAL</b>		<b>11,72230</b>

<b>P-4</b>	<b>FDGZIE01</b>	m	Banda contínua de plàstic de color, de 30 cm d'amplària, col·locada al llarg de la rasa a 25 cm per sobre de la canonada, per a malla senyalitzadora	<b>Rend.: 1,000</b>	<b>0,65</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A013M000	h	Ajudant muntador	0,010 /R x 16,59000 =	0,16590
		<b>Subtotal:</b>		<b>0,16590</b>
<b>Materials</b>				
BDGZB610	m	Banda continua de senyalització per a canalitzacions soterrades de 30 cm d'amplària, de polipropilè	1,020 x 0,44000 =	0,44880
		<b>Subtotal:</b>		<b>0,44880</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 12

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU	
			DESPESES AUXILIARS	1,50 %	0,00249
			COST DIRECTE		0,61719
			DESPESES INDIRECTES	5,00 %	0,03086
			<b>COST EXECUCIÓ MATERIAL</b>		<b>0,64805</b>

<b>P-5</b>	<b>FDK262B7</b>	u	Pericó de registre de formigó prefabricat sense fons de 40x40x45 cm, per a instal·lacions de serveis, col·locat sobre solera de formigó HM-20/B/40/I de 15 cm de gruix i reblert lateral amb terra de la mateixa excavació	<b>Rend.: 1,000</b>	<b>55,13</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A012N000	h	Oficial 1a d'obra pública	0,500 /R x 18,82000 =	9,41000
A0140000	h	Manobre	1,000 /R x 18,41000 =	18,41000
		<b>Subtotal:</b>		<b>27,82000</b>
<b>Maquinària</b>				
C1503000	h	Camió grua	0,200 /R x 40,92000 =	8,18400
		<b>Subtotal:</b>		<b>8,18400</b>
<b>Materials</b>				
BDK21495	u	Pericó de registre de formigó prefabricat sense fons de 40x40x45 cm, per a instal·lacions de serveis	1,000 x 13,04000 =	13,04000
B064500B	m3	Formigó HM-20/B/40/I de consistència tova, grandària màxima del granulat 40 mm, amb >= 200 kg/m3 de ciment, apte per a classe d'exposició I	0,0567 x 53,60000 =	3,03912
		<b>Subtotal:</b>		<b>16,07912</b>
		DESPESES AUXILIARS	1,50 %	0,41730
		COST DIRECTE		52,50042
		DESPESES INDIRECTES	5,00 %	2,62502
		<b>COST EXECUCIÓ MATERIAL</b>		<b>55,12544</b>

<b>P-6</b>	<b>FDKZH9B4</b>	u	Bastiment i tapa quadrada de fosa dúctil, per a pericó de serveis, recolzada, pas lliure de 400x400 mm i classe B125 segons norma UNE-EN 124, col·locat amb morter	<b>Rend.: 1,000</b>	<b>44,25</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A012N000	h	Oficial 1a d'obra pública	0,350 /R x 18,82000 =	6,58700
A0140000	h	Manobre	0,350 /R x 18,41000 =	6,44350
		<b>Subtotal:</b>		<b>13,03050</b>
<b>Materials</b>				
B0710150	t	Morter per a ram de paleta, classe M 5 (5 N/mm2), en sacs, de designació (G) segons norma UNE-EN 998-2	0,0032 x 30,76000 =	0,09843
BDKZH9B0	u	Bastiment quadrat i tapa quadrada de fosa dúctil per a pericó de serveis, recolzada, pas lliure de 400x400 mm i classe B125 segons norma UNE-EN 124	1,000 x 28,82000 =	28,82000

## JUSTIFICACIÓ DE PREUS

Pàg.: 13

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Subtotal:				28,91843
				28,91843
				0,19546
				42,14439
				2,10722
<b>COST EXECUCIÓ MATERIAL</b>				<b>44,25161</b>

<b>P-7</b>	<b>FG312554</b>	m	Cable amb conductor de coure de 0,6/1 kV de tensió assignada, amb designació RZ1-K (AS), tetrapolar, de secció 4 x 6 mm2, amb coberta del cable de poliolefines amb baixa emissió fums, col·locat en tub	<b>Rend.: 1,000</b>	<b>4,41</b>	<b>€</b>
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Ma d'obra		Unitats	Preu	Parcial	Import
A012H000	h	0,040 /R x	19,45000 =	0,77800	
A013H000	h	0,040 /R x	16,56000 =	0,66240	
Subtotal:				1,44040	1,44040

Materials		Unitats	Preu	Parcial	Import
BG312550	m	1,020 x	2,68000 =	2,73360	
Subtotal:				2,73360	2,73360

				0,02161
				4,19561
				0,20978
<b>COST EXECUCIÓ MATERIAL</b>				<b>4,40539</b>

<b>P-8</b>	<b>FG321174</b>	m	Cable amb conductor de coure 450/750 V de tensió assignada, amb designació H07V-K, unipolar, de secció 1 x 16 mm2, amb aïllament PVC, col·locat en tub	<b>Rend.: 1,000</b>	<b>3,56</b>	<b>€</b>
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Ma d'obra		Unitats	Preu	Parcial	Import
A012H000	h	0,050 /R x	19,45000 =	0,97250	
A013H000	h	0,050 /R x	16,56000 =	0,82800	
Subtotal:				1,80050	1,80050

Materials		Unitats	Preu	Parcial	Import
BG321170	m	1,020 x	1,53000 =	1,56060	
Subtotal:				1,56060	1,56060

				0,13396
				29,69444
				1,48472
<b>COST EXECUCIÓ MATERIAL</b>				<b>31,17916</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 14

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
				0,02701
				3,38811
				0,16941
<b>COST EXECUCIÓ MATERIAL</b>				<b>3,55751</b>

<b>P-9</b>	<b>FG380907</b>	m	Conductor de coure nu, unipolar de secció 1x35 mm2, muntat en malla de connexió a terra	<b>Rend.: 1,000</b>	<b>9,19</b>	<b>€</b>
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Ma d'obra		Unitats	Preu	Parcial	Import
A012H000	h	0,200 /R x	19,45000 =	3,89000	
A013H000	h	0,200 /R x	16,56000 =	3,31200	
Subtotal:				7,20200	7,20200

Materials		Unitats	Preu	Parcial	Import
BG380900	m	1,020 x	1,27000 =	1,29540	
BGY38000	u	1,000 x	0,15000 =	0,15000	
Subtotal:				1,44540	1,44540

				0,10803
				8,75543
				0,43777
<b>COST EXECUCIÓ MATERIAL</b>				<b>9,19320</b>

<b>P-10</b>	<b>FGD1322E</b>	u	Piqueta de connexió a terra d'acer, amb recobriments de coure 300 µm de gruix, de 2000 mm llargària de 14,6 mm de diàmetre, clavada a terra	<b>Rend.: 1,000</b>	<b>31,18</b>	<b>€</b>
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Ma d'obra		Unitats	Preu	Parcial	Import
A012H000	h	0,248 /R x	19,45000 =	4,82360	
A013H000	h	0,248 /R x	16,56000 =	4,10688	
Subtotal:				8,93048	8,93048

Materials		Unitats	Preu	Parcial	Import
BGD13220	u	1,000 x	16,59000 =	16,59000	
BGYD1000	u	1,000 x	4,04000 =	4,04000	
Subtotal:				20,63000	20,63000

				0,13396
				29,69444
				1,48472
<b>COST EXECUCIÓ MATERIAL</b>				<b>31,17916</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 15

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-11</b>	<b>G219U030</b>	m2	Demolició de voreres amb base de formigó o paviment de formigó, amb un gruix de 20 cm de cota mitja, incloses càrrega i transport a l'abocador, cànon d'abocament i manteniment de l'abocador	<b>Rend.: 16,000</b> <b>5,88 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra				
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 1,19000
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,29200
			Subtotal:	1,48200
Maquinària				
	C131U001	h	Pala carregadora de 170 hp, tipus CAT-950 o equivalent	0,100 /R x 67,45000 = 0,42156
	C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,200 /R x 40,02000 = 0,50025
	C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	1,000 /R x 51,07000 = 3,19188
			Subtotal:	4,11369
			COST DIRECTE	5,59569
			DESPESES INDIRECTES 5,00 %	0,27978
			<b>COST EXECUCIÓ MATERIAL</b>	<b>5,87547</b>
<b>P-12</b>	<b>G219U040</b>	m2	Demolició de paviment de mescla bituminosa, incloses càrrega i transport a l'abocador, cànon d'abocament i manteniment de l'abocador	<b>Rend.: 21,000</b> <b>4,48 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra				
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,90667
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,22248
			Subtotal:	1,12915
Maquinària				
	C131U001	h	Pala carregadora de 170 hp, tipus CAT-950 o equivalent	0,100 /R x 67,45000 = 0,32119
	C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	1,000 /R x 51,07000 = 2,43190
	C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,200 /R x 40,02000 = 0,38114
			Subtotal:	3,13423
			COST DIRECTE	4,26338
			DESPESES INDIRECTES 5,00 %	0,21317
			<b>COST EXECUCIÓ MATERIAL</b>	<b>4,47655</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 16

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-13</b>	<b>G219U100</b>	m	Tall amb serra de disc de paviment de mescles bituminoses o formigó, de 20 cm a 30 cm de fondària	<b>Rend.: 8,000</b> <b>5,47 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra				
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 2,75625
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,58400
			Subtotal:	3,34025
Maquinària				
	C110U075	h	Equip de màquina de serra de disc de diamant per a tallar	1,000 /R x 14,96000 = 1,87000
			Subtotal:	1,87000
			COST DIRECTE	5,21025
			DESPESES INDIRECTES 5,00 %	0,26051
			<b>COST EXECUCIÓ MATERIAL</b>	<b>5,47076</b>
<b>P-14</b>	<b>G219U105</b>	m	Tall amb serra de disc de paviment de mescles bituminoses o formigó, fins a una fondària de 20 cm	<b>Rend.: 12,000</b> <b>3,65 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra				
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 1,83750
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,38933
			Subtotal:	2,22683
Maquinària				
	C110U075	h	Equip de màquina de serra de disc de diamant per a tallar	1,000 /R x 14,96000 = 1,24667
			Subtotal:	1,24667
			COST DIRECTE	3,47350
			DESPESES INDIRECTES 5,00 %	0,17368
			<b>COST EXECUCIÓ MATERIAL</b>	<b>3,64718</b>
<b>P-15</b>	<b>G219U202</b>	m2	Fresat per cm de gruix de paviment de mescles bituminoses, inclòs càrrega mecànica o manual i transport dels materials resultants a la central per a reciclat de la mescla, inclosa la neteja de la superfície	<b>Rend.: 1.500,000</b> <b>0,34 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra				
	A0112000	h	Cap de colla	0,300 /R x 23,36000 = 0,00467
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,01470
	A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 0,02539
			Subtotal:	0,04476
Maquinària				

## JUSTIFICACIÓ DE PREUS

Pàg.: 17

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	C131U000	h	Pala carregadora de 110 hp, tipus CAT-926 o equivalent	1,000 /R x 54,20000 = 0,03613
	C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	3,000 /R x 75,62000 = 0,15124
	C170E00U	h	Escombradora autopropulsada	1,000 /R x 39,92000 = 0,02661
	C110U085	h	Fresadora de paviment	1,000 /R x 101,18000 = 0,06745
			Subtotal:	0,28143
			COST DIRECTE	0,32619
			DESPESES INDIRECTES 5,00 %	0,01631
			<b>COST EXECUCIÓ MATERIAL</b>	<b>0,34250</b>

<b>P-16</b>	<b>G21B1002</b>	m	Desmuntatge, càrrega i transport a magatzem o abocador de barrera de seguretat metàl·lica de secció doble ona tipus BMSNA4 o BMSNR4, inclòs part proporcional de suports	<b>Rend.: 42,000</b>	<b>3,48</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 0,90667	
A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,52500	
A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,11124	
		Subtotal:	1,54291	1,54291
Maquinària				
C200SU00	h	Equip i elements auxiliars per a tall oxiacetilenic	1,000 /R x 3,83000 = 0,09119	
C131U015	h	Excavadora-carregadora de 110 hp, tipus CAT-212 o equivalent	0,500 /R x 64,80000 = 0,77143	
C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	1,000 /R x 38,29000 = 0,91167	
		Subtotal:	1,77429	1,77429
		COST DIRECTE		3,31720
		DESPESES INDIRECTES 5,00 %		0,16586
		<b>COST EXECUCIÓ MATERIAL</b>		<b>3,48306</b>

<b>P-17</b>	<b>G21B3002</b>	u	Desmuntatge, càrrega i transport a magatzem de senyal vertical de trànsit existent, de qualsevol tipus, inclòs suports i demolició de fonamentacions, càrrega i transport a l'abocador dels materials resultants	<b>Rend.: 4,000</b>	<b>35,33</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 9,52000	
A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 5,51250	
A0112000	h	Cap de colla	0,200 /R x 23,36000 = 1,16800	
		Subtotal:	16,20050	16,20050
Maquinària				
C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	0,250 /R x 38,29000 = 2,39313	
C1503U10	h	Camió grua de 5 t	1,000 /R x 39,49000 = 9,87250	

## JUSTIFICACIÓ DE PREUS

Pàg.: 18

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	C200SU00	h	Equip i elements auxiliars per a tall oxiacetilenic	1,000 /R x 3,83000 = 0,95750
	C110U040	h	Compressor portàtil, amb dos martells pneumàtics de 20 kg a 30 kg	1,000 /R x 16,89000 = 4,22250
			Subtotal:	17,44563
			COST DIRECTE	33,64613
			DESPESES INDIRECTES 5,00 %	1,68231
			<b>COST EXECUCIÓ MATERIAL</b>	<b>35,32844</b>

<b>P-18</b>	<b>G221U010</b>	m3	Excavació de terra vegetal, inclosa càrrega, transport a l'abocador, aplec o lloc d'ús i manteniment fins la seva utilització, inclòs cànon d'abocament i manteniment de l'abocador	<b>Rend.: 97,556</b>	<b>1,92</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,04789	
A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,19517	
		Subtotal:	0,24306	0,24306
Maquinària				
C131U000	h	Pala carregadora de 110 hp, tipus CAT-926 o equivalent	1,000 /R x 54,20000 = 0,55558	
C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	2,000 /R x 50,11000 = 1,02731	
		Subtotal:	1,58289	1,58289
		COST DIRECTE		1,82595
		DESPESES INDIRECTES 5,00 %		0,09130
		<b>COST EXECUCIÓ MATERIAL</b>		<b>1,91725</b>

<b>P-19</b>	<b>G221U112</b>	m3	Excavació de terreny no classificat en zones de desmunt, incloses parts proporcionals de roca, amb mitjans mecànics, amb càrrega i transport a l'abocador o lloc d'ús, inclòs cànon d'abocament i manteniment de l'abocador	<b>Rend.: 170,000</b>	<b>2,94</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	h	Cap de colla	0,250 /R x 23,36000 = 0,03435	
A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,11200	
		Subtotal:	0,14635	0,14635
Maquinària				
C110U025	h	Retroexcavadora de 95 hp, amb martell de 800 kg a 1500 kg	0,500 /R x 65,76000 = 0,19341	
C131U017	h	Excavadora-carregadora de 385 hp, tipus CAT-245 o equivalent	1,000 /R x 147,81000 = 0,86947	
C1501U03	h	Camió tractor de 450 hp, de 36 t (17,5 m3)	3,000 /R x 82,36000 = 1,45341	
C131U062	h	Excavadora sobre erugues amb escarificador (D-9)	0,200 /R x 118,47000 = 0,13938	
		Subtotal:	2,65567	2,65567

## JUSTIFICACIÓ DE PREUS

Pàg.: 19

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	2,80202
			DESPESES INDIRECTES 5,00 %	0,14010
			<b>COST EXECUCIÓ MATERIAL</b>	<b>2,94212</b>

<b>P-20</b>	<b>G226U020</b>	m3	Terraplenat amb sòl procedent de préstec, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric	<b>Rend.: 171,000</b>	<b>5,53</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0112000	h	Cap de colla	0,198 /R x 23,36000 =	0,02705
A0150000	h	Manobre especialista	1,007 /R x 19,04000 =	0,11212
		<b>Subtotal:</b>		<b>0,13917</b>
<b>Maquinària</b>				
C131U060	h	Excavadora sobre erugues amb escarificador (D-7)	1,007 /R x 70,39000 =	0,41452
C133U002	h	Motoanivelladora de 150 hp	0,495 /R x 59,84000 =	0,17322
C1502U10	h	Camió cisterna de 6000 l	0,495 /R x 39,04000 =	0,11301
C133U040	h	Corró vibratori autopropulsat de 14 a 18 t	1,007 /R x 67,79000 =	0,39921
		<b>Subtotal:</b>		<b>1,09996</b>
<b>Materials</b>				
B03DU001	m3	Terra procedent de préstec, inclòs cànon per extracció i transport a l'obra	1,200 x 3,29000 =	3,94800
B0111000	m3	Aigua	0,050 x 1,60000 =	0,08000
		<b>Subtotal:</b>		<b>4,02800</b>
		COST DIRECTE		5,26713
		DESPESES INDIRECTES 5,00 %		0,26336
		<b>COST EXECUCIÓ MATERIAL</b>		<b>5,53049</b>

<b>P-21</b>	<b>G226U030</b>	m3	Terraplenat, pedraplenat o reblert tot-u amb sòl procedent de la pròpia obra, inclòs selecció, matxuqueix, garbellat, càrregues i transports intermedis, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric	<b>Rend.: 171,000</b>	<b>1,39</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0150000	h	Manobre especialista	1,007 /R x 19,04000 =	0,11212
A0112000	h	Cap de colla	0,198 /R x 23,36000 =	0,02705
		<b>Subtotal:</b>		<b>0,13917</b>
<b>Maquinària</b>				
C1502U10	h	Camió cisterna de 6000 l	0,495 /R x 39,04000 =	0,11301
C133U002	h	Motoanivelladora de 150 hp	0,495 /R x 59,84000 =	0,17322
C131U060	h	Excavadora sobre erugues amb escarificador (D-7)	1,007 /R x 70,39000 =	0,41452
C133U040	h	Corró vibratori autopropulsat de 14 a 18 t	1,007 /R x 67,79000 =	0,39921

## JUSTIFICACIÓ DE PREUS

Pàg.: 20

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			Subtotal:	1,09996
				1,09996
			Subtotal:	0,08000
				0,08000

<b>P-22</b>	<b>G227U110</b>	m3	Esplanada amb sòl seleccionat tipus 2, procedent de préstec, segons condicions del Plec de Prescripcions Tècniques, en coronació de terraplens o sobre desmunt, estesa i compactada al 100% del PM, mesurat sobre perfil teòric	<b>Rend.: 149,000</b>	<b>7,48</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0112000	h	Cap de colla	0,255 /R x 23,36000 =	0,03998
A0140000	h	Manobre	1,005 /R x 18,41000 =	0,12417
		<b>Subtotal:</b>		<b>0,16415</b>
<b>Maquinària</b>				
C131U060	h	Excavadora sobre erugues amb escarificador (D-7)	1,005 /R x 70,39000 =	0,47478
C133U002	h	Motoanivelladora de 150 hp	0,495 /R x 59,84000 =	0,19880
C1502U10	h	Camió cisterna de 6000 l	0,495 /R x 39,04000 =	0,12970
C133U040	h	Corró vibratori autopropulsat de 14 a 18 t	1,005 /R x 67,79000 =	0,45724
		<b>Subtotal:</b>		<b>1,26052</b>
<b>Materials</b>				
B0111000	m3	Aigua	0,050 x 1,60000 =	0,08000
B03DU103	m3	Sòl seleccionat tipus 2 procedent de préstec, inclòs transport a l'obra	1,200 x 4,68000 =	5,61600
		<b>Subtotal:</b>		<b>5,69600</b>
		COST DIRECTE		7,12067
		DESPESES INDIRECTES 5,00 %		0,35603
		<b>COST EXECUCIÓ MATERIAL</b>		<b>7,47670</b>

<b>P-23</b>	<b>G228U060</b>	m3	Rebliment al darrera d'alçats d'estreps d'estructures de formigó i obres de drenatge transversal amb tubs metàl·lics corrugats i voltes prefabricats de formigó, amb sòl seleccionat tipus 3, procedent de préstec, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric	<b>Rend.: 66,000</b>	<b>10,17</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0112000	h	Cap de colla	0,300 /R x 23,36000 =	0,10618
A0150000	h	Manobre especialista	1,998 /R x 19,04000 =	0,57639



## JUSTIFICACIÓ DE PREUS

Pàg.: 21

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU		
Subtotal:									0,68257	0,68257	
Maquinària											
	C133U005	h	Corró vibratori autopropulsat de 6 a 8 t	1,002	/R x	46,75000	=	0,70975			
	C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	1,002	/R x	57,14000	=	0,86749			
	C133U070	h	Picó vibrant dúplex de 1300 kg	1,002	/R x	8,08000	=	0,12267			
	C1502U10	h	Camió cisterna de 6000 l	0,198	/R x	39,04000	=	0,11712			
Subtotal:									1,81703	1,81703	
Materials											
	B0111000	m3	Aigua	0,050	x	1,60000	=	0,08000			
	B03DU104	m3	Sòl seleccionat tipus 3 procedent de préstec, inclòs transport a l'obra	1,200	x	5,92000	=	7,10400			
Subtotal:									7,18400	7,18400	
									COST DIRECTE	9,68360	
									DESPESES INDIRECTES	5,00 %	0,48418
									<b>COST EXECUCIÓ MATERIAL</b>	<b>10,16778</b>	

<b>P-24</b>	<b>G228U075</b>	m3	Rebliment de grava-ciment, amb el 4% en pes de ciment, al darrera d'alçats d'estreps de formigó, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric	<b>Rend.: 22,000</b>					<b>44,20</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
	A0150000	h	Manobre especialista	2,000	/R x	19,04000	=	1,73091		
	A0112000	h	Cap de colla	0,250	/R x	23,36000	=	0,26545		
Subtotal:									1,99636	1,99636
Maquinària										
	C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	1,000	/R x	57,14000	=	2,59727		
	C1502U10	h	Camió cisterna de 6000 l	0,500	/R x	39,04000	=	0,88727		
	C17A20QU	h	Planta de formigó per a 60 m3/h	0,500	/R x	83,75000	=	1,90341		
	C133U070	h	Picó vibrant dúplex de 1300 kg	1,000	/R x	8,08000	=	0,36727		
	C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	2,000	/R x	75,62000	=	6,87455		
Subtotal:									12,62977	12,62977
Materials										
	B051U012	t	Ciment pòrtland CEM I 32,5 N segons UNE-EN 197-1	0,090	x	84,49000	=	7,60410		
	B039U020	m3	Barreja de granulat per a grava-ciment de granulometria GC25 o GC-20, mesurat després de la compactació	1,050	x	18,43000	=	19,35150		
	B0111000	m3	Aigua	0,320	x	1,60000	=	0,51200		
Subtotal:									27,46760	27,46760

## JUSTIFICACIÓ DE PREUS

Pàg.: 22

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU		
									COST DIRECTE	42,09373	
									DESPESES INDIRECTES	5,00 %	2,10469
									<b>COST EXECUCIÓ MATERIAL</b>	<b>44,19842</b>	

<b>P-25</b>	<b>G229U020</b>	m3	Rebliment amb material granular filtrant al darrera d'alçats de murs i estreps d'estructures, obres de drenatge transversal amb tubs metàl·lics corrugats i testeres i voltes prefabricats de formigó, inclòs estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric	<b>Rend.: 12,000</b>					<b>22,24</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
	A0112000	h	Cap de colla	0,250	/R x	23,36000	=	0,48667		
	A0150000	h	Manobre especialista	1,000	/R x	19,04000	=	1,58667		
Subtotal:									2,07334	2,07334

Maquinària										
	C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,500	/R x	40,31000	=	1,67958		
	C133U070	h	Picó vibrant dúplex de 1300 kg	1,000	/R x	8,08000	=	0,67333		
	C1502U10	h	Camió cisterna de 6000 l	0,200	/R x	39,04000	=	0,65067		
Subtotal:									3,00358	3,00358

Materials										
	B0111000	m3	Aigua	0,050	x	1,60000	=	0,08000		
	B032U100	m3	Material granulat filtrant per a darrera d'alçats de murs, estreps i voltes d'estructures, inclòs transport a l'obra	1,200	x	13,35000	=	16,02000		
Subtotal:									16,10000	16,10000

									COST DIRECTE	21,17692	
									DESPESES INDIRECTES	5,00 %	1,05885
									<b>COST EXECUCIÓ MATERIAL</b>	<b>22,23577</b>	

<b>P-26</b>	<b>G22DU120</b>	m2	Esbrossada en qualsevol tipus de terreny, amb part proporcional de zones boscoses, deixant la llenya a disposició de l'Administració, definides als plànols, mesurat sobre perfil teòric, inclosa arrancada o tala d'arbres, soca, càrrega i transport a l'abocador o aplec, cànon d'abocament i manteniment de l'abocador	<b>Rend.: 510,000</b>					<b>0,46</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
	A0150000	h	Manobre especialista	3,000	/R x	19,04000	=	0,11200		
	A0121000	h	Oficial 1a	3,000	/R x	22,05000	=	0,12971		
	A0112000	h	Cap de colla	0,500	/R x	23,36000	=	0,02290		
Subtotal:									0,26461	0,26461

Maquinària

## JUSTIFICACIÓ DE PREUS

Pàg.: 23

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU
	C200U001	h	Motoserra per a la tala d'arbres	3,000	/R x	2,71000 =	0,01594
	C131U001	h	Pala carregadora de 170 hp, tipus CAT-950 o equivalent	0,200	/R x	67,45000 =	0,02645
	C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	0,200	/R x	57,14000 =	0,02241
	C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	1,000	/R x	40,02000 =	0,07847
	C131U060	h	Excavadora sobre erugues amb escarificador (D-7)	0,200	/R x	70,39000 =	0,02760
			Subtotal:				0,17087
			COST DIRECTE				0,43548
			DESPESES INDIRECTES	5,00	%		0,02177
			<b>COST EXECUCIÓ MATERIAL</b>				<b>0,45725</b>

<b>P-27</b>	<b>G251X001</b>	u	Trasllat tub PVC de diàmetre 2'' vertical. Inclou excavació amb serveis, excavació en rasa, dau de formigó HM-20, tub de PVC de diàmetre 50 i reblliment amb material d'obra.	<b>Rend.: 1,000</b>			<b>66,88</b>	<b>€</b>
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				Unitats		Preu	Parcial	Import
<b>Ma d'obra</b>								
	A0150000	h	Manobre especialista	0,500	/R x	19,04000 =	9,52000	
	A0112000	h	Cap de colla	0,200	/R x	23,36000 =	4,67200	
	A0121000	h	Oficial 1a	0,200	/R x	22,05000 =	4,41000	
			Subtotal:				18,60200	18,60200
<b>Maquinària</b>								
	C110U025	h	Retroexcavadora de 95 hp, amb martell de 800 kg a 1500 kg	0,150	/R x	65,76000 =	9,86400	
	C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,080	/R x	50,11000 =	4,00880	
	C1700006	h	Vibrador intern de formigó	0,150	/R x	1,68000 =	0,25200	
	C1701U10	h	Camió amb bomba de formigonar	0,100	/R x	96,71000 =	9,67100	
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	0,200	/R x	17,38000 =	3,47600	
			Subtotal:				27,27180	27,27180
<b>Materials</b>								
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,271	x	61,34000 =	16,62314	
	B0111000	m3	Aigua	0,200	x	1,60000 =	0,32000	
	BFA1U106	m	Tub de PVC, DN 63 mm, PN 6 bar, amb unions de junt elàstica, inclòs p.p. de peces especials i accessoris	1,000	x	0,88000 =	0,88000	
			Subtotal:				17,82314	17,82314
			COST DIRECTE				63,69694	
			DESPESES INDIRECTES	5,00	%		3,18485	
			<b>COST EXECUCIÓ MATERIAL</b>				<b>66,88179</b>	

## JUSTIFICACIÓ DE PREUS

Pàg.: 24

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU	
<b>P-28</b>	<b>G3E5U030</b>	m3	Execució de piló de d>=100 cm, tipus CPI-4, d'extracció amb entubació recuperable, incloent excavació amb parts proporcionals de trepant, entubació, tubs d'acer per assaig crosshole, formigó HA-25, col·locació d'armadures (sense subministrament, elaboració i muntatge d'acer), càrrega i transport a l'abocador, cànon d'abocament i manteniment de l'abocador	<b>Rend.: 2,000</b>			<b>307,34</b>	<b>€</b>
			Unitats			Preu	Parcial	Import
<b>Ma d'obra</b>								
	A0150000	h	Manobre especialista	1,400	/R x	19,04000 =	13,32800	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000 =	11,02500	
	A0112000	h	Cap de colla	0,500	/R x	23,36000 =	5,84000	
			Subtotal:				30,19300	30,19300
<b>Maquinària</b>								
	C3H1U002	h	Equip de personal i maquinària per a perforació i extracció, inclòs trepant, llots tixotrópics, encamisat i formigonat de piló complet	1,000	/R x	192,11000 =	96,05500	
	C1701U10	h	Camió amb bomba de formigonar	0,200	/R x	96,71000 =	9,67100	
	C150GU20	h	Grua autopropulsada de 24 t	0,100	/R x	76,19000 =	3,80950	
	C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,170	/R x	45,92000 =	3,90320	
	C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	0,170	/R x	38,29000 =	3,25465	
			Subtotal:				116,69335	116,69335
<b>Materials</b>								
	B3Z5U130	m	Tub d'acer rosca de 50 mm de diàmetre per assaig cross-hole en pilons de qualsevol diàmetre.	8,000	x	3,53000 =	28,24000	
	B3Z5U100	m2	Amortització de tub metàl·lic recuperable d'entubació de pilons	4,000	x	9,18000 =	36,72000	
	B3Z5U002	m	Amortització de tub metàl·lic per a formigonat de pilons	2,000	x	0,56000 =	1,12000	
	B060U440	m3	Formigó HA-25, consistència fluida i granulat màxim 20 mm, inclòs transport a l'obra	1,150	x	69,34000 =	79,74100	
			Subtotal:				145,82100	145,82100
			COST DIRECTE				292,70735	
			DESPESES INDIRECTES	5,00	%		14,63537	
			<b>COST EXECUCIÓ MATERIAL</b>				<b>307,34272</b>	

<b>P-29</b>	<b>G3EZU12X</b>	m	Enderroc de cap de piló de diàmetre 125 cm, amb mitjans mecànics o manuals, inclòs càrrega, transport a l'abocador, cànon d'abocament i manteniment de l'abocador	<b>Rend.: 0,900</b>			<b>159,41</b>	<b>€</b>
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				Unitats		Preu	Parcial	Import
<b>Ma d'obra</b>								
	A0112000	h	Cap de colla	0,200	/R x	23,36000 =	5,19111	
	A0150000	h	Manobre especialista	2,000	/R x	19,04000 =	42,31111	
	A0140000	h	Manobre	1,000	/R x	18,41000 =	20,45556	



## JUSTIFICACIÓ DE PREUS

Pàg.: 25

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU	
							Subtotal:	67,95778	67,95778
Maquinària									
	C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	1,000	/R x	51,07000	=	56,74444	
	C110U040	h	Compressor portàtil, amb dos martells pneumàtics de 20 kg a 30 kg	1,000	/R x	16,89000	=	18,76667	
	C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,150	/R x	50,11000	=	8,35167	
							Subtotal:	83,86278	83,86278
							COST DIRECTE		151,82056
							DESPESES INDIRECTES	5,00 %	7,59103
							<b>COST EXECUCIÓ MATERIAL</b>		<b>159,41159</b>

<b>P-30</b>	<b>G3H2U010</b>	m2	Clavament i extracció individual de palplanxes recuperables d'acer al carboni amb forma de U, fins a 600 mm d'amplada útil, amb un moment resistent de fins a 800 cm3/m de pared, amb unió encadellada, clavades a una fondària de fins a 4 m en terreny de sorres	<b>Rend.: 4,000</b>				<b>108,64</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A0112000	h	Cap de colla	0,500	/R x	23,36000	=	2,92000	
	A0150000	h	Manobre especialista	1,000	/R x	19,04000	=	4,76000	
							Subtotal:	7,68000	7,68000
Maquinària									
	C150GU40	h	Grua autopropulsada de 80 t	1,000	/R x	140,60000	=	35,15000	
	C3E62000	h	Martell percussor d'efecte doble amb motor	1,000	/R x	219,88000	=	54,97000	
							Subtotal:	90,12000	90,12000
Materials									
	B3H28261	m2	Palplanxa recuperable d'acer al carboni, per a 25 usos, amb forma U, de fins a 600 mm d'amplada útil, amb un moment resistent de fins a 800 cm3/m de pared, amb unió encadellada	1,000	x	5,67000	=	5,67000	
							Subtotal:	5,67000	5,67000
							COST DIRECTE		103,47000
							DESPESES INDIRECTES	5,00 %	5,17350
							<b>COST EXECUCIÓ MATERIAL</b>		<b>108,64350</b>

<b>P-31</b>	<b>G3J2U030</b>	m3	Escullera amb bloc de pedra granítica de 400 a 800 kg, inclòs subministrament i col·locació, mesurat sobre perfil teòric segons plànols	<b>Rend.: 8,000</b>				<b>28,91</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A0150000	h	Manobre especialista	1,000	/R x	19,04000	=	2,38000	
	A0112000	h	Cap de colla	0,200	/R x	23,36000	=	0,58400	

## JUSTIFICACIÓ DE PREUS

Pàg.: 26

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU	
							Subtotal:	2,96400	2,96400
Maquinària									
	C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	1,000	/R x	57,14000	=	7,14250	
							Subtotal:	7,14250	7,14250
Materials									
	B0441200	m3	Bloc de pedra granítica per a escullera de 400 a 800 kg, inclòs transport a l'obra	1,000	x	17,43000	=	17,43000	
							Subtotal:	17,43000	17,43000
							COST DIRECTE		27,53650
							DESPESES INDIRECTES	5,00 %	1,37683
							<b>COST EXECUCIÓ MATERIAL</b>		<b>28,91333</b>

<b>P-32</b>	<b>G3Z1U030</b>	m3	Formigó de 15 N/mm2 de resistència característica a la compressió per a regularització sota fonaments o reblliments, inclòs la preparació de la base d'assentament, col·locació i vibrat	<b>Rend.: 16,000</b>				<b>72,24</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	1,20125	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	1,37813	
	A0112000	h	Cap de colla	0,250	/R x	23,36000	=	0,36500	
	A0140000	h	Manobre	2,000	/R x	18,41000	=	2,30125	
							Subtotal:	5,24563	5,24563
Maquinària									
	C1700006	h	Vibrador intern de formigó	2,000	/R x	1,68000	=	0,21000	
	C1701U10	h	Camió amb bomba de formigonar	0,333	/R x	96,71000	=	2,01278	
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	1,000	/R x	17,38000	=	1,08625	
							Subtotal:	3,30903	3,30903
Materials									
	B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	1,050	x	57,38000	=	60,24900	
							Subtotal:	60,24900	60,24900
							COST DIRECTE		68,80366
							DESPESES INDIRECTES	5,00 %	3,44018
							<b>COST EXECUCIÓ MATERIAL</b>		<b>72,24384</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 27

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-33</b>	<b>G450U040</b>	m3	Formigó HM-20 per a fonaments i encepats, inclòs col·locació, vibrat i curat	<b>Rend.: 25,000      77,10 €</b>
		Unitats	Preu	Parcial      Import
<b>Ma d'obra</b>				
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,93440
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 1,76400
	A013U001	h	Ajudant	2,000 /R x 19,22000 = 1,53760
	A0140000	h	Manobre	2,000 /R x 18,41000 = 1,47280
			<b>Subtotal:</b>	<b>5,70880      5,70880</b>
<b>Maquinària</b>				
	C1701U10	h	Camió amb bomba de formigonar	0,600 /R x 96,71000 = 2,32104
	C1700006	h	Vibrador intern de formigó	2,400 /R x 1,68000 = 0,16128
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	1,200 /R x 17,38000 = 0,83424
			<b>Subtotal:</b>	<b>3,31656      3,31656</b>
<b>Materials</b>				
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	1,050 x 61,34000 = 64,40700
			<b>Subtotal:</b>	<b>64,40700      64,40700</b>
			<b>COST DIRECTE</b>	<b>73,43236</b>
			<b>DESPESES INDIRECTES</b> 5,00 %	<b>3,67162</b>
			<b>COST EXECUCIÓ MATERIAL</b>	<b>77,10398</b>

<b>P-34</b>	<b>G450U055</b>	m3	Formigó HA-30 per a fonaments i enceps, inclòs col·locació, vibrat i curat	<b>Rend.: 25,000      90,15 €</b>
		Unitats	Preu	Parcial      Import
<b>Ma d'obra</b>				
	A013U001	h	Ajudant	2,000 /R x 19,22000 = 1,53760
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 1,76400
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,93440
	A0140000	h	Manobre	2,000 /R x 18,41000 = 1,47280
			<b>Subtotal:</b>	<b>5,70880      5,70880</b>
<b>Maquinària</b>				
	C1700006	h	Vibrador intern de formigó	2,400 /R x 1,68000 = 0,16128
	C1701U10	h	Camió amb bomba de formigonar	0,600 /R x 96,71000 = 2,32104
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	1,200 /R x 17,38000 = 0,83424
			<b>Subtotal:</b>	<b>3,31656      3,31656</b>
<b>Materials</b>				
	B060U450	m3	Formigó HA-30, consistència fluida i granulat màxim 20 mm, inclòs transport a l'obra	1,050 x 73,17000 = 76,82850
			<b>Subtotal:</b>	<b>76,82850      76,82850</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 28

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			<b>COST DIRECTE</b>	<b>85,85386</b>
			<b>DESPESES INDIRECTES</b> 5,00 %	<b>4,29269</b>
			<b>COST EXECUCIÓ MATERIAL</b>	<b>90,14655</b>
<b>P-35</b>	<b>G450U070</b>	m3	Formigó HA-30 per a alçats, piles i taulers, inclòs col·locació, vibrat i curat	<b>Rend.: 37,000      96,44 €</b>
		Unitats	Preu	Parcial      Import
<b>Ma d'obra</b>				
	A0121000	h	Oficial 1a	4,000 /R x 22,05000 = 2,38378
	A013U001	h	Ajudant	2,000 /R x 19,22000 = 1,03892
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,63135
	A0140000	h	Manobre	6,000 /R x 18,41000 = 2,98541
			<b>Subtotal:</b>	<b>7,03946      7,03946</b>
<b>Maquinària</b>				
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	2,400 /R x 17,38000 = 1,12735
	C1700006	h	Vibrador intern de formigó	8,000 /R x 1,68000 = 0,36324
	C1701U10	h	Camió amb bomba de formigonar	2,400 /R x 96,71000 = 6,27308
	CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,200 /R x 6,69000 = 0,21697
			<b>Subtotal:</b>	<b>7,98064      7,98064</b>
<b>Materials</b>				
	B060U450	m3	Formigó HA-30, consistència fluida i granulat màxim 20 mm, inclòs transport a l'obra	1,050 x 73,17000 = 76,82850
			<b>Subtotal:</b>	<b>76,82850      76,82850</b>
			<b>COST DIRECTE</b>	<b>91,84860</b>
			<b>DESPESES INDIRECTES</b> 5,00 %	<b>4,59243</b>
			<b>COST EXECUCIÓ MATERIAL</b>	<b>96,44103</b>

<b>P-36</b>	<b>G4B0U020</b>	kg	Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat	<b>Rend.: 435,000      0,93 €</b>
		Unitats	Preu	Parcial      Import
<b>Ma d'obra</b>				
	A013U001	h	Ajudant	2,000 /R x 19,22000 = 0,08837
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 0,10138
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,01074
			<b>Subtotal:</b>	<b>0,20049      0,20049</b>
<b>Maquinària</b>				
	C1503U10	h	Camió grua de 5 t	0,100 /R x 39,49000 = 0,00908
	C200U002	h	Màquina per a doblegar rodó d'acer	0,500 /R x 2,27000 = 0,00261
	C200U003	h	Cisalla elèctrica	0,500 /R x 2,44000 = 0,00280
			<b>Subtotal:</b>	<b>0,01449      0,01449</b>
<b>Materials</b>				

## JUSTIFICACIÓ DE PREUS

Pàg.: 29

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU
	B0A142U0	kg	Filferro recuit de diàmetre 1,6 mm	0,010	x	1,23000	=	0,01230
	B0B2U002	kg	Acer en barres corrugades B 500 S de límit elàstic >= 500 N/mm2	1,050	x	0,63000	=	0,66150
Subtotal:								0,67380
COST DIRECTE								0,88878
DESPESES INDIRECTES 5,00 %								0,04444
<b>COST EXECUCIÓ MATERIAL</b>								<b>0,93322</b>

**P-37 G4D0U010** m2 Encofrat i desencofrat pla en parament no vist **Rend.: 9,000** **32,14 €**

				Unitats	Preu	Parcial	Import	
Ma d'obra								
	A0112000	h	Cap de colla	1,000	/R x 23,36000	= 2,59556		
	A0121000	h	Oficial 1a	4,000	/R x 22,05000	= 9,80000		
	A013U001	h	Ajudant	3,000	/R x 19,22000	= 6,40667		
	A0140000	h	Manobre	3,000	/R x 18,41000	= 6,13667		
Subtotal:								24,93890
Maquinària								
	CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000	/R x 6,69000	= 0,74333		
	C150GU10	h	Grua autopropulsada de 12 t	0,200	/R x 51,67000	= 1,14822		
Subtotal:								1,89155
Materials								
	B0DZU005	u	Materials auxiliars per a encofrar	0,400	x 1,66000	= 0,66400		
	B0D21030	m	Tauló de fusta de pi per a 10 usos	3,000	x 0,33000	= 0,99000		
	B0D629AU	cu	Puntal metàl·lic i telescòpic per a 5 m d'alçària i 150 usos	0,030	x 21,45000	= 0,64350		
	B0DZA000	l	Desencofrant	0,075	x 2,46000	= 0,18450		
	B0D7UC02	m2	Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	1,000	x 1,30000	= 1,30000		
Subtotal:								3,78200
COST DIRECTE								30,61245
DESPESES INDIRECTES 5,00 %								1,53062
<b>COST EXECUCIÓ MATERIAL</b>								<b>32,14307</b>

**P-38 G4D0U015** m2 Encofrat i desencofrat pla en parament vist **Rend.: 8,500** **36,23 €**

				Unitats	Preu	Parcial	Import	
Ma d'obra								
	A013U001	h	Ajudant	3,000	/R x 19,22000	= 6,78353		
	A0140000	h	Manobre	3,000	/R x 18,41000	= 6,49765		
	A0112000	h	Cap de colla	1,000	/R x 23,36000	= 2,74824		
	A0121000	h	Oficial 1a	4,000	/R x 22,05000	= 10,37647		
Subtotal:								26,40589

## JUSTIFICACIÓ DE PREUS

Pàg.: 30

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU
Maquinària								
	C150GU10	h	Grua autopropulsada de 12 t	0,200	/R x 51,67000	= 1,21576		
	CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000	/R x 6,69000	= 0,78706		
Subtotal:								2,00282
Materials								
	B0D7UC11	m2	Amortització de tauler encadellat de fusta de pi de 22 mm, per a 3 usos	1,000	x 3,61000	= 3,61000		
	B0DZA000	l	Desencofrant	0,075	x 2,46000	= 0,18450		
	B0DZU005	u	Materials auxiliars per a encofrar	0,400	x 1,66000	= 0,66400		
	B0D629AU	cu	Puntal metàl·lic i telescòpic per a 5 m d'alçària i 150 usos	0,030	x 21,45000	= 0,64350		
	B0D21030	m	Tauló de fusta de pi per a 10 usos	3,000	x 0,33000	= 0,99000		
Subtotal:								6,09200
COST DIRECTE								34,50071
DESPESES INDIRECTES 5,00 %								1,72504
<b>COST EXECUCIÓ MATERIAL</b>								<b>36,22575</b>

**P-39 G4D0U020** m2 Encofrat i desencofrat corb en parament no vist **Rend.: 7,000** **50,96 €**

				Unitats	Preu	Parcial	Import	
Ma d'obra								
	A0121000	h	Oficial 1a	4,000	/R x 22,05000	= 12,60000		
	A0112000	h	Cap de colla	1,000	/R x 23,36000	= 3,33714		
	A013U001	h	Ajudant	3,000	/R x 19,22000	= 8,23714		
	A0140000	h	Manobre	3,000	/R x 18,41000	= 7,89000		
Subtotal:								32,06428
Maquinària								
	C150GU10	h	Grua autopropulsada de 12 t	0,300	/R x 51,67000	= 2,21443		
	CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000	/R x 6,69000	= 0,95571		
Subtotal:								3,17014
Materials								
	B0D21030	m	Tauló de fusta de pi per a 10 usos	1,000	x 0,33000	= 0,33000		
	B0D31000	m3	Llata de fusta de pi	0,022	x 240,99000	= 5,30178		
	B0D629AU	cu	Puntal metàl·lic i telescòpic per a 5 m d'alçària i 150 usos	0,030	x 21,45000	= 0,64350		
	B0DZU005	u	Materials auxiliars per a encofrar	0,600	x 1,66000	= 0,99600		
	B0DZA000	l	Desencofrant	0,075	x 2,46000	= 0,18450		
	B0D2U002	m	Amortització de tauló de fusta de pi per a 1 ús	2,000	x 2,92000	= 5,84000		
Subtotal:								13,29578

## JUSTIFICACIÓ DE PREUS

Pàg.: 31

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	48,53020
			DESPESES INDIRECTES 5,00 %	2,42651
			<b>COST EXECUCIÓ MATERIAL</b>	<b>50,95671</b>

**P-40 G4D0U025** m2 Encofrat i desencofrat corb en parament vist **Rend.: 6,000** **59,15 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	1,000 /R x	23,36000 =	3,89333	
A0121000	4,000 /R x	22,05000 =	14,70000	
A013U001	3,000 /R x	19,22000 =	9,61000	
A0140000	3,000 /R x	18,41000 =	9,20500	
	Subtotal:		37,40833	37,40833
Maquinària				
CZ11U001	1,000 /R x	6,69000 =	1,11500	
C150GU10	0,300 /R x	51,67000 =	2,58350	
	Subtotal:		3,69850	3,69850
Materials				
B0D629AU	0,030 x	21,45000 =	0,64350	
B0DZA000	0,075 x	2,46000 =	0,18450	
B0D31000	0,030 x	240,99000 =	7,22970	
B0D2U002	2,000 x	2,92000 =	5,84000	
B0D21030	1,000 x	0,33000 =	0,33000	
B0DZU005	0,600 x	1,66000 =	0,99600	
	Subtotal:		15,22370	15,22370
			COST DIRECTE	56,33053
			DESPESES INDIRECTES 5,00 %	2,81653
			<b>COST EXECUCIÓ MATERIAL</b>	<b>59,14706</b>

**P-41 G4D8U032** m2 Encofrat perdut pla per a biga tipus artesa amb voladius de taulers fins a 2,50 m, de lloses prefabricades amb entramat metàl·lic autoportant, inclòs col·locació **Rend.: 34,000** **59,28 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	1,000 /R x	23,36000 =	0,68706	
A0121000	3,000 /R x	22,05000 =	1,94559	
A013U001	2,000 /R x	19,22000 =	1,13059	
A0140000	1,000 /R x	18,41000 =	0,54147	
	Subtotal:		4,30471	4,30471
Maquinària				

## JUSTIFICACIÓ DE PREUS

Pàg.: 32

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	C150GU30	h	Grua autopropulsada de 40 t	1,000 /R x 98,64000 = 2,90118
			Subtotal:	2,90118 2,90118
			Materials	
	B0DAU012	m2	Lloseta prefabricada amb entramat metàl·lic autoportant, per a encofrat perdut de ponts amb voladius fins a 2,50 m	1,000 x 49,25000 = 49,25000
			Subtotal:	49,25000 49,25000
			COST DIRECTE	56,45589
			DESPESES INDIRECTES 5,00 %	2,82279
			<b>COST EXECUCIÓ MATERIAL</b>	<b>59,27868</b>

**P-42 G4DEU010** m3 Subministrament, muntatge i desmuntatge de cindri, inclosa la preparació de la base **Rend.: 67,000** **11,88 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
A0121000	4,002 /R x	22,05000 =	1,31708	
A013U001	3,000 /R x	19,22000 =	0,86060	
A0150000	1,998 /R x	19,04000 =	0,56779	
A0112000	1,002 /R x	23,36000 =	0,34935	
	Subtotal:		3,09482	3,09482
Maquinària				
C131U020	0,126 /R x	40,31000 =	0,07581	
C150GU10	0,498 /R x	51,67000 =	0,38405	
	Subtotal:		0,45986	0,45986
Materials				
B0D21030	0,150 x	0,33000 =	0,04950	
B0DFU001	1,000 x	7,24000 =	7,24000	
B032U010	0,033 x	14,31000 =	0,47223	
	Subtotal:		7,76173	7,76173
			COST DIRECTE	11,31641
			DESPESES INDIRECTES 5,00 %	0,56582
			<b>COST EXECUCIÓ MATERIAL</b>	<b>11,88223</b>

**P-43 G4L1U21X** m Biga prefabricada de formigó amb armadures pretesades, tipus artesa, de 220 cm de cantell, 160 cm de base i 307 cm d'ample superior, totalment col·locada **Rend.: 4,750** **1.976,36 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	1,000 /R x	23,36000 =	4,91789	
A0121000	4,000 /R x	22,05000 =	18,56842	

## JUSTIFICACIÓ DE PREUS

Pàg.: 33

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	A0150000	h	Manobre especialista	4,000 /R x 19,04000 = 16,03368
			Subtotal:	39,51999
Maquinària				
	C150GU50	h	Grua autopropulsada de 100 t	2,000 /R x 147,11000 = 61,94105
			Subtotal:	61,94105
Materials				
	B4PAU915	m	Biga prefabricada de formigó pretesat, tipus artesa, de 220 cm de cantell, 160 cm de base i 297 cm d'ample superior, inclòs transport a l'obra.	1,000 x 1.780,79000 = 1.780,79000
			Subtotal:	1.780,79000
			COST DIRECTE	1.882,25104
			DESPESES INDIRECTES 5,00 %	94,11255
			<b>COST EXECUCIÓ MATERIAL</b>	<b>1.976,36359</b>

**P-44 G4L50060** u Subministre i col·locació de broc prefabricat de formigó en massa per a tub de formigó de DN500mm, amb totes les feines adients **Rend.: 1,000** **156,83 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
	A0112000	h	Cap de colla	0,100 /R x 23,36000 = 2,33600
	A0150000	h	Manobre especialista	0,750 /R x 19,04000 = 14,28000
	A0121000	h	Oficial 1a	0,750 /R x 22,05000 = 16,53750
			Subtotal:	33,15350
Maquinària				
	C1503U10	h	Camió grua de 5 t	0,300 /R x 39,49000 = 11,84700
			Subtotal:	11,84700
Materials				
	B4PZZ060	u	Broc prefabricat de formigó en massa per a tub de DN500mm, segons plànols	1,000 x 104,36000 = 104,36000
			Subtotal:	104,36000
			COST DIRECTE	149,36050
			DESPESES INDIRECTES 5,00 %	7,46803
			<b>COST EXECUCIÓ MATERIAL</b>	<b>156,82853</b>

**P-45 G4Z5U00X** m Subministre i col·locació d'imposta prefabricada de formigó armat de 0,70x0,18 m, totalment col·locada i acabada **Rend.: 1,000** **62,01 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
	A0140000	h	Manobre	0,300 /R x 18,41000 = 5,52300
	A0121000	h	Oficial 1a	0,150 /R x 22,05000 = 3,30750
			Subtotal:	8,83050

## JUSTIFICACIÓ DE PREUS

Pàg.: 34

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Maquinària				
	C1503U20	h	Camió grua de 10 t	0,400 /R x 45,80000 = 18,32000
			Subtotal:	18,32000
Materials				
	B4PAG900	m	Imposta prefabricada de formigó armat per terminació de cantell de viaducte de 1500 mm de llargada i amb faldó de 375 mm.	0,6666 x 47,87000 = 31,91014
			Subtotal:	31,91014
			COST DIRECTE	59,06064
			DESPESES INDIRECTES 5,00 %	2,95303
			<b>COST EXECUCIÓ MATERIAL</b>	<b>62,01367</b>

**P-46 G4Z7U016** m Formació de junt de dilatació per a taulers de ponts, amb perfil de cautxú armat, per a absorbir moviments de 170 mm com a màxim, col·locat amb adhesiu i fixacions mecàniques, inclòs formació de la caixa **Rend.: 0,500** **495,35 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
	A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 76,16000
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 44,10000
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 46,72000
			Subtotal:	166,98000
Maquinària				
	CZ11U000	h	Grup electrògen de 45/60 kVA, amb consums inclosos	1,000 /R x 4,82000 = 9,64000
	C200U010	h	Màquina taladradora	1,000 /R x 2,16000 = 4,32000
	C110U075	h	Equip de màquina de serra de disc de diamant per a tallar	0,333 /R x 14,96000 = 9,96336
	C110U040	h	Compressor portàtil, amb dos martells pneumàtics de 20 kg a 30 kg	0,667 /R x 16,89000 = 22,53126
			Subtotal:	46,45462
Materials				
	B7J1U216	m	Junt de dilatació exterior, formada per perfil de cautxú armat amb angulars i làmines d'acer embegudes, per a un recorregut de 170 mm, inclòs pern d'ancoratge i reberts amb morter sintètic	1,050 x 246,03000 = 258,33150
			Subtotal:	258,33150

COST DIRECTE 471,76612  
DESPESES INDIRECTES 5,00 % 23,58831  
**COST EXECUCIÓ MATERIAL 495,35443**

## JUSTIFICACIÓ DE PREUS

Pàg.: 35

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU
<b>P-47</b>	<b>G4ZBU020</b>	dm3	Suport de neoprè armat per a recolzaments, inclòs part proporcional de morter d'anivellament, col·locat	<b>Rend.: 13,000</b>			<b>18,76 €</b>
				Unitats	Preu	Parcial	Import
Ma d'obra							
	A0140000	h	Manobre	1,000 /R x	18,41000 =	1,41615	
	A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	1,69615	
	A0112000	h	Cap de colla	0,250 /R x	23,36000 =	0,44923	
			Subtotal:			3,56153	3,56153
Materials							
	B4PZU012	dm3	Neoprè armat per a recolzaments	1,000 x	13,39000 =	13,39000	
	B071U102	dm3	Morter sense retracció de consistència fluida, per a reblliments i ancoratges	0,500 x	1,83000 =	0,91500	
			Subtotal:			14,30500	14,30500
			COST DIRECTE				17,86653
			DESPESES INDIRECTES	5,00 %			0,89333
			<b>COST EXECUCIÓ MATERIAL</b>				<b>18,75986</b>
<b>P-48</b>	<b>G711U002</b>	m2	Membrana flexible de gruix 1,5 mm d'una làmina bituminosa de quitrà modificat amb cautxú sintètic i resines, protegida amb feltre teixit de polipropilè, incloent emprimació prèvia, per a impermeabilització de tauler de pont, inclòs pèrdues per retalls i encavalcaments, totalment acabada	<b>Rend.: 38,000</b>			<b>12,53 €</b>
				Unitats	Preu	Parcial	Import
Ma d'obra							
	A0112000	h	Cap de colla	0,250 /R x	23,36000 =	0,15368	
	A0121000	h	Oficial 1a	2,000 /R x	22,05000 =	1,16053	
	A013U001	h	Ajudant	2,000 /R x	19,22000 =	1,01158	
			Subtotal:			2,32579	2,32579
Materials							
	B055U024	kg	Emulsió bituminosa catiònica al 50% de betum, tipus C50BF5 IMP	0,600 x	0,30000 =	0,18000	
	B711U010	m2	Làmina bituminosa de quitrà modificat amb cautxú sintètic i resines, amb feltre teixit de polipropilè	1,100 x	8,57000 =	9,42700	
			Subtotal:			9,60700	9,60700
			COST DIRECTE				11,93279
			DESPESES INDIRECTES	5,00 %			0,59664
			<b>COST EXECUCIÓ MATERIAL</b>				<b>12,52943</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 36

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU
<b>P-49</b>	<b>G774U006</b>	m2	Làmina drenant de polietilè d'alta densitat amb nòduls de 9 mm d'alçada, feltre de polipropilè i làmina impermeabilitzant de polietilè, amb resistència a la compressió de 400 kN/m2, per a drenatge de murs, inclòs pèrdues per retalls i encavalcaments, totalment col·locada	<b>Rend.: 26,000</b>			<b>15,53 €</b>
				Unitats	Preu	Parcial	Import
Ma d'obra							
	A0112000	h	Cap de colla	0,500 /R x	23,36000 =	0,44923	
	A0121000	h	Oficial 1a	2,000 /R x	22,05000 =	1,69615	
	A013U001	h	Ajudant	2,000 /R x	19,22000 =	1,47846	
			Subtotal:			3,62384	3,62384
Materials							
	B774U006	m2	Làmina drenant de polietilè d'alta densitat amb nòduls de 9 mm d'alçada, feltre de polipropilè i làmina impermeabilitzant de polietilè, amb resistència a la compressió de 400 kN/m2	1,100 x	7,07000 =	7,77700	
	B7Z1U002	u	Clau adhesiu per a fixació de làmina de polietilè amb nòduls	2,000 x	1,23000 =	2,46000	
	B7Z1U010	m	Banda autoadhesiva de cautxú butil de 4 cm d'amplària per a segellat de làmina de polietilè	0,600 x	1,55000 =	0,93000	
			Subtotal:			11,16700	11,16700
			COST DIRECTE				14,79084
			DESPESES INDIRECTES	5,00 %			0,73954
			<b>COST EXECUCIÓ MATERIAL</b>				<b>15,53038</b>
<b>P-50</b>	<b>G781U010</b>	m2	Impermeabilització de paraments verticals i horitzontals de formigó, amb 1,8 kg/m2 emulsió bituminosa catiònica	<b>Rend.: 25,000</b>			<b>3,46 €</b>
				Unitats	Preu	Parcial	Import
Ma d'obra							
	A0112000	h	Cap de colla	0,200 /R x	23,36000 =	0,18688	
	A0150000	h	Manobre especialista	2,000 /R x	19,04000 =	1,52320	
			Subtotal:			1,71008	1,71008
Materials							
	B055U050	kg	Emulsió bituminosa catiònica en dissolució al 50% per a impermeabilitzacions	1,800 x	0,88000 =	1,58400	
			Subtotal:			1,58400	1,58400
			COST DIRECTE				3,29408
			DESPESES INDIRECTES	5,00 %			0,16470
			<b>COST EXECUCIÓ MATERIAL</b>				<b>3,45878</b>



## JUSTIFICACIÓ DE PREUS

Pàg.: 37

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
P-51	G7B1U010	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 125 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1500 N, inclòs pèrdues per retalls i encavalcaments, regularització i anivellament de superfície d'assentament, totalment col·locat	Rend.: 55,000 2,13 €
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A0112000	h	Cap de colla	0,100 /R x 23,36000 = 0,04247
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,40091
	A013U001	h	Ajudant	1,000 /R x 19,22000 = 0,34945
			Subtotal:	0,79283      0,79283
Materials				
	B7B1U001	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 125 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1500 N	1,100 x 1,12000 = 1,23200
			Subtotal:	1,23200      1,23200
COST DIRECTE				2,02483
DESPESES INDIRECTES      5,00 %				0,10124
<b>COST EXECUCIÓ MATERIAL</b>				<b>2,12607</b>

P-52	G7B1U020	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 140 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació 1300 N, inclòs pèrdues per retalls i encavalcaments, regularització i anivellament de superfície d'assentament, totalment col·locat	Rend.: 55,000 2,51 €
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A013U001	h	Ajudant	1,000 /R x 19,22000 = 0,34945
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,40091
	A0112000	h	Cap de colla	0,100 /R x 23,36000 = 0,04247
			Subtotal:	0,79283      0,79283
Materials				
	B7B1U002	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 150 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1750 N	1,100 x 1,45000 = 1,59500
			Subtotal:	1,59500      1,59500
COST DIRECTE				2,38783
DESPESES INDIRECTES      5,00 %				0,11939
<b>COST EXECUCIÓ MATERIAL</b>				<b>2,50722</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 38

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
P-53	G921U020	m3	Base de tot-u artificial, estesa, humectació i compactació, mesurat sobre perfil teòric	Rend.: 140,000 22,97 €
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,13600
	A0112000	h	Cap de colla	0,500 /R x 23,36000 = 0,08343
			Subtotal:	0,21943      0,21943
Maquinària				
	C133U030	h	Corró vibratori autopropulsat de 12 a 14 t	1,000 /R x 61,06000 = 0,43614
	C1502U20	h	Camió cisterna de 10000 l	0,500 /R x 44,86000 = 0,16021
	C133U002	h	Motoanivelladora de 150 hp	1,000 /R x 59,84000 = 0,42743
			Subtotal:	1,02378      1,02378
Materials				
	B037200U	m3	Tot-u artificial, inclòs transport a l'obra	1,200 x 17,13000 = 20,55600
	B0111000	m3	Aigua	0,050 x 1,60000 = 0,08000
			Subtotal:	20,63600      20,63600
COST DIRECTE				21,87921
DESPESES INDIRECTES      5,00 %				1,09396
<b>COST EXECUCIÓ MATERIAL</b>				<b>22,97317</b>

P-54	G922U011	m	Revestiment de berma amb sòl seleccionat compactat al 95% PM, Dmax 16 mm	Rend.: 1,000 7,82 €
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A0112000	h	Cap de colla	0,030 /R x 23,36000 = 0,70080
	A0150000	h	Manobre especialista	0,088 /R x 19,04000 = 1,67552
			Subtotal:	2,37632      2,37632
Maquinària				
	C1502U20	h	Camió cisterna de 10000 l	0,030 /R x 44,86000 = 1,34580
	C133U030	h	Corró vibratori autopropulsat de 12 a 14 t	0,030 /R x 61,06000 = 1,83180
	C133U001	h	Motoanivelladora de 125 hp	0,030 /R x 55,73000 = 1,67190
			Subtotal:	4,84950      4,84950
Materials				
	B03DU103	m3	Sòl seleccionat tipus 2 procedent de préstec, inclòs transport a l'obra	0,047 x 4,68000 = 0,21996
	B0111000	m3	Aigua	0,0025 x 1,60000 = 0,00400
			Subtotal:	0,22396      0,22396



## JUSTIFICACIÓ DE PREUS

Pàg.: 39

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	7,44978
			DESPESES INDIRECTES 5,00 %	0,37249
			<b>COST EXECUCIÓ MATERIAL</b>	<b>7,82227</b>

<b>P-55</b>	<b>G96500C5</b>	m	Vorada de calçada bicapa de secció normalitzada C5 25x15 de peces prefabricades de formigó rectes i corbes, d'acord amb la UNE 127340 i UNE EN 1340, inclosa excavació i base de formigó de 20 N/mm2 de resistència característica a la compressió, rejuntat amb morter i totes les feines adients, totalment col·locada	<b>Rend.: 35,000</b>	<b>19,92</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0140000	h	Manobre	6,000 /R x	18,41000 =	3,15600	
A0121000	h	Oficial 1a	4,000 /R x	22,05000 =	2,52000	
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	0,66743	
		<b>Subtotal:</b>			<b>6,34343</b>	<b>6,34343</b>
<b>Maquinària</b>						
C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,251 /R x	50,11000 =	0,35936	
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,251 /R x	40,31000 =	0,28908	
CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000 /R x	6,69000 =	0,19114	
C1700006	h	Vibrador intern de formigó	1,000 /R x	1,68000 =	0,04800	
		<b>Subtotal:</b>			<b>0,88758</b>	<b>0,88758</b>
<b>Materials</b>						
B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,081 x	61,34000 =	4,96854	
B0DZU005	u	Materials auxiliars per a encofrar	0,100 x	1,66000 =	0,16600	
B071U005	m3	Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	0,021 x	85,10000 =	1,78710	
B0DZA000	l	Desencofrant	0,020 x	2,46000 =	0,04920	
B9651UC5	m	Vorada de calçada C5 25x15 prefabricada de formigó, d'acord amb la UNE 127340 i UNE EN 1340	1,050 x	3,91000 =	4,10550	
B0D21030	m	Tauló de fusta de pi per a 10 usos	2,000 x	0,33000 =	0,66000	
		<b>Subtotal:</b>			<b>11,73634</b>	<b>11,73634</b>
			COST DIRECTE		18,96735	
			DESPESES INDIRECTES 5,00 %		0,94837	
			<b>COST EXECUCIÓ MATERIAL</b>		<b>19,91572</b>	

<b>P-56</b>	<b>G96500C9</b>	m	Vorada de calçada bicapa de secció normalitzada C9 13x25 de peces prefabricades de formigó rectes i corbes, d'acord amb la UNE 127340 i UNE EN 1340, inclosa excavació i base de formigó de 20 N/mm2 de resistència característica a la compressió, rejuntat amb morter i totes les feines adients, totalment col·locada	<b>Rend.: 29,000</b>	<b>26,54</b>	<b>€</b>
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## JUSTIFICACIÓ DE PREUS

Pàg.: 40

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>							
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	0,80552		
A0121000	h	Oficial 1a	4,000 /R x	22,05000 =	3,04138		
A0140000	h	Manobre	6,000 /R x	18,41000 =	3,80897		
		<b>Subtotal:</b>				<b>7,65587</b>	<b>7,65587</b>
<b>Maquinària</b>							
CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000 /R x	6,69000 =	0,23069		
C1700006	h	Vibrador intern de formigó	1,000 /R x	1,68000 =	0,05793		
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,250 /R x	40,31000 =	0,34750		
C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,250 /R x	50,11000 =	0,43198		
		<b>Subtotal:</b>				<b>1,06810</b>	<b>1,06810</b>
<b>Materials</b>							
B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,090 x	61,34000 =	5,52060		
B0DZU005	u	Materials auxiliars per a encofrar	0,100 x	1,66000 =	0,16600		
B0DZA000	l	Desencofrant	0,020 x	2,46000 =	0,04920		
B9651UC9	m	Vorada de calçada C9 13x25 prefabricada de formigó, d'acord amb la UNE 127340 i UNE EN 1340	1,050 x	7,81000 =	8,20050		
B0D21030	m	Tauló de fusta de pi per a 10 usos	2,000 x	0,33000 =	0,66000		
B071U005	m3	Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	0,023 x	85,10000 =	1,95730		
		<b>Subtotal:</b>				<b>16,55360</b>	<b>16,55360</b>
			COST DIRECTE		25,27757		
			DESPESES INDIRECTES 5,00 %		1,26388		
			<b>COST EXECUCIÓ MATERIAL</b>		<b>26,54145</b>		

<b>P-57</b>	<b>G974U012</b>	m	Rigola prefabricada de morter de ciment blanc de 20 cm d'amplada i 8 cm de gruix, adossada a la vorera, inclosa excavació, base de formigó de 15 N/mm2 de resistència característica a la compressió i totes les feines adients, totalment col·locada	<b>Rend.: 66,000</b>	<b>12,60</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	0,35394	
A0121000	h	Oficial 1a	4,000 /R x	22,05000 =	1,33636	
A0140000	h	Manobre	6,000 /R x	18,41000 =	1,67364	
		<b>Subtotal:</b>			<b>3,36394</b>	<b>3,36394</b>
<b>Maquinària</b>						
C1503U10	h	Camió grua de 5 t	0,250 /R x	39,49000 =	0,14958	
C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,450 /R x	50,11000 =	0,34166	
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,450 /R x	40,31000 =	0,27484	

## JUSTIFICACIÓ DE PREUS

Pàg.: 41

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU		
Subtotal:									0,76608	0,76608	
Materials											
B071U005	m3		Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	0,005	x	85,10000	=	0,42550			
B060U110	m3		Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,060	x	57,38000	=	3,44280			
B0D21030	m		Tauló de fusta de pi per a 10 usos	1,000	x	0,33000	=	0,33000			
B0DZA000	l		Desencofrant	0,010	x	2,46000	=	0,02460			
B0DZU005	u		Materials auxiliars per a encofrar	0,050	x	1,66000	=	0,08300			
B974U012	m		Rigola de morter de ciment de color blanc, de 20 cm d'amplada i 8 cm de gruix	1,050	x	3,31000	=	3,47550			
B051U012	t		Ciment pòrtland CEM I 32,5 N segons UNE-EN 197-1	0,001	x	84,49000	=	0,08449			
Subtotal:									7,86589	7,86589	
									COST DIRECTE	11,99591	
									DESPESES INDIRECTES	5,00 %	0,59980
									<b>COST EXECUCIÓ MATERIAL</b>	<b>12,59571</b>	

<b>P-58</b>	<b>G9F1U010</b>	m2	Paviment de llambordins prefabricats de formigó de 8 cm de gruix, de forma i dimensions segons plànols, inclòs refinat i compactació del terreny, base de formigó de 15 N/mm2 de resistència característica a la compressió de 10 cm de gruix, lilit de morter de 3 cm i totes les feines adients	<b>Rend.: 10,000</b>					<b>45,87</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
A0121000	h		Oficial 1a	4,000	/R x	22,05000	=	8,82000		
A0112000	h		Cap de colla	1,000	/R x	23,36000	=	2,33600		
A0140000	h		Manobre	7,000	/R x	18,41000	=	12,88700		
Subtotal:									24,04300	24,04300
Maquinària										
C1503U10	h		Camió grua de 5 t	0,300	/R x	39,49000	=	1,18470		
C131U020	h		Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,250	/R x	40,31000	=	1,00775		
C133U080	h		Picó vibrant amb placa de 60 cm d'amplària	1,000	/R x	5,71000	=	0,57100		
C133U070	h		Picó vibrant dúplex de 1300 kg	0,250	/R x	8,08000	=	0,20200		
Subtotal:									2,96545	2,96545
Materials										
B060U110	m3		Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,100	x	57,38000	=	5,73800		
B071U007	m3		Morter de ciment de Classe M-7,5 (7,5 N/mm2) segons la Norma UNE 998-2	0,030	x	87,43000	=	2,62290		
B031U100	m3		Sorra de pedrera de 0 a 3 mm	0,004	x	21,25000	=	0,08500		
B9F1UC10	m2		Llambordí prefabricat de formigó de 8 cm de gruix, de qualsevol forma i dimensions, sèrie 1	1,020	x	8,07000	=	8,23140		

## JUSTIFICACIÓ DE PREUS

Pàg.: 42

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU		
Subtotal:									16,67730	16,67730	
									COST DIRECTE	43,68575	
									DESPESES INDIRECTES	5,00 %	2,18429
									<b>COST EXECUCIÓ MATERIAL</b>	<b>45,87004</b>	

<b>P-59</b>	<b>G9GA0004</b>	m3	Paviment de formigó HM-20, de consistència plàstica o tova, de qualsevol gruix, amb mitjans manuals, incloent estesa, vibratge, acabat superficial, formació de junts tallats en fresc i totes les feines adients	<b>Rend.: 6,000</b>					<b>87,13</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
A0112000	h		Cap de colla	0,250	/R x	23,36000	=	0,97333		
A0150000	h		Manobre especialista	2,000	/R x	19,04000	=	6,34667		
A0121000	h		Oficial 1a	2,000	/R x	22,05000	=	7,35000		
Subtotal:									14,67000	14,67000

Maquinària										
C2005U00	h		Regle vibratori per a formigonat de soleres	1,000	/R x	3,76000	=	0,62667		
Subtotal:									0,62667	0,62667

Materials											
B0D7UC02	m2		Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	1,000	x	1,30000	=	1,30000			
B0D21030	m		Tauló de fusta de pi per a 10 usos	5,000	x	0,33000	=	1,65000			
B0A3UC10	kg		Clau acer	0,250	x	1,32000	=	0,33000			
B060U310	m3		Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	1,050	x	61,34000	=	64,40700			
Subtotal:									67,68700	67,68700	
									COST DIRECTE	82,98367	
									DESPESES INDIRECTES	5,00 %	4,14918
									<b>COST EXECUCIÓ MATERIAL</b>	<b>87,13285</b>	

<b>P-60</b>	<b>G9H1U020</b>	t	Mescla bituminosa en calent AC 22 bin B 50/70 S, inclòs filler, estesa i compactada, sense incloure betum	<b>Rend.: 70,000</b>					<b>33,01</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import	
Ma d'obra										
A0112000	h		Cap de colla	1,000	/R x	23,36000	=	0,33371		
A0121000	h		Oficial 1a	2,000	/R x	22,05000	=	0,63000		
A0150000	h		Manobre especialista	4,000	/R x	19,04000	=	1,08800		
Subtotal:									2,05171	2,05171
Maquinària										
C1501U01	h		Camió de 400 hp, de 32 t (15,4 m3)	4,000	/R x	75,62000	=	4,32114		
C1709B0U	h		Estenedora per a paviments de mescla bituminosa	1,000	/R x	55,22000	=	0,78886		

## JUSTIFICACIÓ DE PREUS

Pàg.: 43

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU
	C170U051	h	Corró vibratori autopropulsat pneumàtic	1,000	/R x	68,34000	=	0,97629
	C170U035	h	Piconadora autopropulsada de 14 a 16 t	1,000	/R x	64,58000	=	0,92257
			Subtotal:					7,00886
								7,00886
Materials								
	B9H1U020	t	Mescla bituminosa en calent AC 22 S per a capa intermitja, inclòs filler, sense incloure betum, a peu de planta asfàltica	1,000	x	22,38000	=	22,38000
			Subtotal:					22,38000
								22,38000
			COST DIRECTE					31,44057
			DESPESES INDIRECTES	5,00	%			1,57203
			<b>COST EXECUCIÓ MATERIAL</b>					<b>33,01260</b>

**P-61 G9H1U120 t** Mescla bituminosa en calent AC22 base B 50/70 G, inclòs filler, estesa i compactada, sense incloure betum **Rend.: 70,000 32,97 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
	A0150000	h	Manobre especialista	4,000 /R x 19,04000 = 1,08800
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,33371
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 0,63000
			Subtotal:	2,05171
				2,05171

	Unitats	Preu	Parcial	Import
Maquinària				
	C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	4,000 /R x 75,62000 = 4,32114
	C170U051	h	Corró vibratori autopropulsat pneumàtic	1,000 /R x 68,34000 = 0,97629
	C1709B0U	h	Estenedora per a paviments de mescla bituminosa	1,000 /R x 55,22000 = 0,78886
	C170U035	h	Piconadora autopropulsada de 14 a 16 t	1,000 /R x 64,58000 = 0,92257
			Subtotal:	7,00886
				7,00886

	Unitats	Preu	Parcial	Import
Materials				
	B9H1U120	t	Mescla bituminosa en calent AC22 G, per a capa de base, inclòs filler, sense incloure betum, a peu de planta asfàltica	1,000 x 22,34000 = 22,34000
			Subtotal:	22,34000
				22,34000
			COST DIRECTE	31,40057
			DESPESES INDIRECTES	5,00 % 1,57003
			<b>COST EXECUCIÓ MATERIAL</b>	<b>32,97060</b>

**P-62 G9H1U612 t** Mescla bituminosa en calent AC16 surf B 50/70 S, inclòs filler, estesa i compactada, sense incloure betum **Rend.: 65,000 35,22 €**

	Unitats	Preu	Parcial	Import
Ma d'obra				
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 0,67846
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 0,35938

## JUSTIFICACIÓ DE PREUS

Pàg.: 44

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU
	A0150000	h	Manobre especialista	4,000	/R x	19,04000	=	1,17169
			Subtotal:					2,20953
								2,20953
Maquinària								
	C1501U01	h	Camió de 400 hp, de 32 t (15,4 m3)	4,000	/R x	75,62000	=	4,65354
	C1709B0U	h	Estenedora per a paviments de mescla bituminosa	1,000	/R x	55,22000	=	0,84954
	C170U035	h	Piconadora autopropulsada de 14 a 16 t	1,000	/R x	64,58000	=	0,99354
	C170U051	h	Corró vibratori autopropulsat pneumàtic	1,000	/R x	68,34000	=	1,05138
			Subtotal:					7,54800
								7,54800
Materials								
	B9H1U612	t	Mescla bituminosa en calent AC16 S per a capa de trànsit, inclòs filler, sense incloure betum, a peu de planta asfàltica	1,000	x	23,79000	=	23,79000
			Subtotal:					23,79000
								23,79000
			COST DIRECTE					33,54753
			DESPESES INDIRECTES	5,00	%			1,67738
			<b>COST EXECUCIÓ MATERIAL</b>					<b>35,22491</b>

**P-63 G9H1U712 t** Increment de qualitat d'àrids en capa de trànsit per a mescles tipus AC16surf **Rend.: 1,000 3,52 €**

	Unitats	Preu	Parcial	Import
Materials				
	D9H1U512	t	Mescla bituminosa en calent AC16 surf B50/70 D, inclòs filler, estesa i compactada, sense incloure betum	0,100 x 33,50753 = 3,35075
			Subtotal:	3,35075
				3,35075

	Unitats	Preu	Parcial	Import
			COST DIRECTE	3,35075
			DESPESES INDIRECTES	5,00 % 0,16754
			<b>COST EXECUCIÓ MATERIAL</b>	<b>3,51829</b>

**P-64 G9H1U732 t** Increment de qualitat de regularitat superficial en capa de trànsit per a mescles tipus AC16surf **Rend.: 1,000 1,76 €**

	Unitats	Preu	Parcial	Import
Materials				
	D9H1U512	t	Mescla bituminosa en calent AC16 surf B50/70 D, inclòs filler, estesa i compactada, sense incloure betum	0,050 x 33,50753 = 1,67538
			Subtotal:	1,67538
				1,67538

	Unitats	Preu	Parcial	Import
			COST DIRECTE	1,67538
			DESPESES INDIRECTES	5,00 % 0,08377
			<b>COST EXECUCIÓ MATERIAL</b>	<b>1,75915</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 45

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-65</b>	<b>G9HA0010</b>	t	Betum asfàltic tipus B 50/70, per a mescles bituminoses	<b>Rend.: 1,000</b> <b>414,94 €</b>
			Unitats	Preu
			Parcial	Import
Materials	B055U001	t	Betum asfàltic tipus B 50/70	1,000 x 395,18000 = 395,18000
			Subtotal:	395,18000
			COST DIRECTE	395,18000
			DESPESES INDIRECTES	5,00 % 19,75900
			<b>COST EXECUCIÓ MATERIAL</b>	<b>414,93900</b>
<b>P-66</b>	<b>G9J1U010</b>	m2	Reg emprimació amb emulsió catiònica, tipus C50BF5 IMP	<b>Rend.: 600,000</b> <b>0,50 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,03173
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,03675
			Subtotal:	0,06848
Maquinària	C1702DU0	h	Bituminadora automotriu per a reg asfàltic	1,000 /R x 29,41000 = 0,04902
			Subtotal:	0,04902
Materials	B055U024	kg	Emulsió bituminosa catiònica al 50% de betum, tipus C50BF5 IMP	1,200 x 0,30000 = 0,36000
			Subtotal:	0,36000
			COST DIRECTE	0,47750
			DESPESES INDIRECTES	5,00 % 0,02388
			<b>COST EXECUCIÓ MATERIAL</b>	<b>0,50138</b>

<b>P-67</b>	<b>G9J1U320</b>	m2	Reg d'adherència amb emulsió termoadherent, tipus C60B4 TER o C60B3 TER sobre ferm nou	<b>Rend.: 700,000</b> <b>0,36 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,03150
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,02720
			Subtotal:	0,05870
Maquinària	C1702DU0	h	Bituminadora automotriu per a reg asfàltic	1,000 /R x 29,41000 = 0,04201
	C170E00U	h	Escombradora autopropulsada	1,000 /R x 39,92000 = 0,05703
			Subtotal:	0,09904
Materials				

## JUSTIFICACIÓ DE PREUS

Pàg.: 46

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	B055U320	kg	Emulsió bituminosa termoadherent al 60% de betum, tipus C60B4 TER o C60B3 TER	0,600 x 0,31000 = 0,18600
			Subtotal:	0,18600
			COST DIRECTE	0,34374
			DESPESES INDIRECTES	5,00 % 0,01719
			<b>COST EXECUCIÓ MATERIAL</b>	<b>0,36093</b>
<b>P-68</b>	<b>G9J1U325</b>	m2	Reg d'adherència amb emulsió termoadherent, tipus C60B4 TER o C60B3 TER, sobre ferm vell	<b>Rend.: 700,000</b> <b>0,39 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 0,02720
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,03150
			Subtotal:	0,05870
Maquinària	C170E00U	h	Escombradora autopropulsada	1,000 /R x 39,92000 = 0,05703
	C1702DU0	h	Bituminadora automotriu per a reg asfàltic	1,000 /R x 29,41000 = 0,04201
			Subtotal:	0,09904
Materials	B055U320	kg	Emulsió bituminosa termoadherent al 60% de betum, tipus C60B4 TER o C60B3 TER	0,700 x 0,31000 = 0,21700
			Subtotal:	0,21700
			COST DIRECTE	0,37474
			DESPESES INDIRECTES	5,00 % 0,01874
			<b>COST EXECUCIÓ MATERIAL</b>	<b>0,39348</b>

<b>P-69</b>	<b>GB1AU120</b>	m	Àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, index de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2,, d'1,00 m d'alçària amb muntants cada 2,50 m, amb tres (3) travessers de perfil tubular, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, totalment col·locat segons Plec de Prescripcions Tècniques i detalls plànols	<b>Rend.: 2,500</b> <b>220,31 €</b>
			Unitats	Preu
			Parcial	Import
Ma d'obra	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 9,34400
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 8,82000
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 7,61600
			Subtotal:	25,78000
Maquinària	C1503U10	h	Camió grua de 5 t	0,500 /R x 39,49000 = 7,89800
	CZ11U001	h	Grup elèctric de 80/100 kVA, amb consums inclosos	1,000 /R x 6,69000 = 2,67600

## JUSTIFICACIÓ DE PREUS

Pàg.: 47

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU
	C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	1,000	/R x	2,75000	=	1,10000	
									Subtotal:
									11,67400
<b>Materials</b>									
	BB1AU120	m	Àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2,, d'1,00 m d'alçària amb muntants cada 2,50 m, amb tres (3) travessers de perfil tubular, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, segons Plec de Prescripcions Tècniques i detalls plànols	1,000	x	171,49000	=	171,49000	
	B071U007	m3	Mortor de ciment de Classe M-7,5 (7,5 N/mm2) segons la Norma UNE 998-2	0,010	x	87,43000	=	0,87430	
									Subtotal:
									172,36430
									209,81830
									10,49092
									<b>220,30922</b>
<b>COST EXECUCIÓ MATERIAL</b>									

<b>P-70</b>	<b>GB1AU125</b>	u	Extrem d'àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2,, d'1,00 m d'alçària, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, totalment col·locat segons Plec de Prescripcions Tècniques i detalls plànols	<b>Rend.: 1,500</b>					<b>324,79</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>							
	A0112000	h	Cap de colla	1,000	/R x	23,36000	= 15,57333
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	= 14,70000
	A0150000	h	Manobre especialista	1,000	/R x	19,04000	= 12,69333
							Subtotal:
							42,96666
<b>Maquinària</b>							
	C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	1,000	/R x	2,75000	= 1,83333
	C1503U10	h	Camió grua de 5 t	0,500	/R x	39,49000	= 13,16333
	CZ11U001	h	Grup electrògen de 80/100 kVA, amb consums inclosos	1,000	/R x	6,69000	= 4,46000
							Subtotal:
							19,45666
<b>Materials</b>							
	BB1AU125	u	Extrem d'àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2,, d'1,00 m d'alçària, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, segons Plec de Prescripcions Tècniques i detalls plànols	1,000	x	246,03000	= 246,03000
	B071U007	m3	Mortor de ciment de Classe M-7,5 (7,5 N/mm2) segons la Norma UNE 998-2	0,010	x	87,43000	= 0,87430

## JUSTIFICACIÓ DE PREUS

Pàg.: 48

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU
									Subtotal:
									246,90430
									246,90430
									COST DIRECTE
									309,32762
									DESPESES INDIRECTES
									5,00 %
									15,46638
									<b>COST EXECUCIÓ MATERIAL</b>
									<b>324,79400</b>

<b>P-71</b>	<b>GB2A1003</b>	m	Barrera de seguretat metàl·lica simple, amb nivell de contenció N2, amplària de treball W5, índex de severitat A i deflexió dinàmica 1,6 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent tanca de secció doble ona, tensor posterior, part proporcional de separador, pal de perfil C-120 cada 4 m (BMSNA4/C), elements de fixació, material auxiliar i captafars, amb una alçària de 750 mm, inclòs enclavament i soldadures, totalment col·locada en recta o corbada de qualsevol radi	<b>Rend.: 25,000</b>					<b>31,90</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import		
<b>Ma d'obra</b>									
	A0112000	h	Cap de colla	1,000	/R x	23,36000	= 0,93440		
	A0150000	h	Manobre especialista	2,000	/R x	19,04000	= 1,52320		
	A0121000	h	Oficial 1a	2,000	/R x	22,05000	= 1,76400		
							Subtotal:		
							4,22160		
<b>Maquinària</b>									
	CZ11U000	h	Grup electrògen de 45/60 kVA, amb consums inclosos	1,000	/R x	4,82000	= 0,19280		
	C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	1,000	/R x	2,75000	= 0,11000		
	C1B0AU05	h	Màquina per a clavar muntants metàl·lics	1,000	/R x	25,53000	= 1,02120		
	C150U004	h	Furgoneta de 3500 kg	1,000	/R x	7,62000	= 0,30480		
	C1503U10	h	Camió grua de 5 t	0,500	/R x	39,49000	= 0,78980		
							Subtotal:		
							2,41860		
<b>Materials</b>									
	BBM21003	m	Barrera de seguretat metàl·lica simple, amb nivell de contenció N2, amplària de treball W5, índex de severitat A i deflexió dinàmica 1,6 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent tanca de secció doble ona, tensor posterior, part proporcional de separador, pal de perfil C-120 cada 4 m (BMSNA4/C), elements de fixació, material auxiliar i captafars, amb una alçària de 750 mm	1,000	x	23,74000	= 23,74000		
									Subtotal:
									23,74000
									COST DIRECTE
									30,38020
									DESPESES INDIRECTES
									5,00 %
									1,51901
									<b>COST EXECUCIÓ MATERIAL</b>
									<b>31,89921</b>



## JUSTIFICACIÓ DE PREUS

Pàg.: 49

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
P-72	GB2AU583	u	Extrem de 8 m mínim de barrera de seguretat metàl·lica de qualsevol tipus, amb abatiment o encastament en el talús del desmunt, galvanitzada en calent, incloent tanca de secció doble ona, pals de perfil tubulars de 120x55 mm cada 2 m, separadors, peça en angle, topall final, elements de fixació, material auxiliar i captafars, inclòs enclavament, totalment col·locat	<b>Rend.: 1,250</b> <b>523,11 €</b>
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 30,46400
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 18,68800
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 35,28000
			Subtotal:	84,43200      84,43200
Maquinària				
	C1503U10	h	Camió grua de 5 t	0,500 /R x 39,49000 = 15,79600
	CZ11U000	h	Grup electrògen de 45/60 kVA, amb consums inclosos	1,000 /R x 4,82000 = 3,85600
	C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	1,000 /R x 2,75000 = 2,20000
	C150U004	h	Furgoneta de 3500 kg	1,000 /R x 7,62000 = 6,09600
	C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	1,000 /R x 45,92000 = 36,73600
	C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	0,500 /R x 38,29000 = 15,31600
	C1B0AU05	h	Màquina per a clavar muntants metàl·lics	1,000 /R x 25,53000 = 20,42400
			Subtotal:	100,42400      100,42400
Materials				
	BBM2U583	u	Extrem de 8 m mínim de barrera de seguretat metàl·lica de qualsevol tipus, amb abatiment o encastament en el talús del desmunt, galvanitzada en calent, incloent tanca de secció doble ona, pals de perfil tubulars de 120x55 mm cada 2 m, separadors, peça en angle, topall final, elements de fixació, material auxiliar i captafars	1,000 x 313,34000 = 313,34000
			Subtotal:	313,34000      313,34000
				COST DIRECTE      498,19600
				DESPESES INDIRECTES      5,00 %      24,90980
				<b>COST EXECUCIÓ MATERIAL      523,10580</b>

P-73	GB2AX021	m	Barrera de seguretat metàl·lica simple, tipus AS_BMSNC2/C o equivalent, amb nivell de contenció H1, amplària de treball W4, índex de severitat A i deflexió dinàmica 1,1 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent dues tanques sobreposades de secció doble ona, part propocional de separadors, pal de perfil C-120 cada 2 m (BMSNC2/C), elements de fixació, material auxiliar i captafars, amb una alçària de 1200 mm, inclòs enclavament i soldadures, totalment col·locada en recta o corbada de qualsevol radi.	<b>Rend.: 20,750</b> <b>66,92 €</b>
				Unitats      Preu      Parcial      Import

## JUSTIFICACIÓ DE PREUS

Pàg.: 50

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Ma d'obra				
	A0112000	h	Cap de colla	1,000 /R x 23,36000 = 1,12578
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 2,12530
	A0150000	h	Manobre especialista	2,000 /R x 19,04000 = 1,83518
			Subtotal:	5,08626      5,08626
Maquinària				
	C1503U10	h	Camió grua de 5 t	0,500 /R x 39,49000 = 0,95157
	C150U004	h	Furgoneta de 3500 kg	1,000 /R x 7,62000 = 0,36723
	C200PU00	h	Equip i elements auxiliars per a soldadura elèctrica	1,000 /R x 2,75000 = 0,13253
	CZ11U000	h	Grup electrògen de 45/60 kVA, amb consums inclosos	1,000 /R x 4,82000 = 0,23229
	C1B0AU05	h	Màquina per a clavar muntants metàl·lics	1,000 /R x 25,53000 = 1,23036
			Subtotal:	2,91398      2,91398
Materials				
	BBM2X503	m	Barrera de seguretat metàl·lica simple, tipus AS_BMSNC2/C o equivalent, amb nivell de contenció H1, amplària de treball W4, índex de severitat A i deflexió dinàmica 1,1 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent dues tanques sobreposades de secció doble ona, part propocional de separadors, pal de perfil C-120 cada 2 m (BMSNC2/C), elements de fixació, material auxiliar i captafars, amb una alçària de 1200 mm.	1,000 x 55,73000 = 55,73000
			Subtotal:	55,73000      55,73000
				COST DIRECTE      63,73024
				DESPESES INDIRECTES      5,00 %      3,18651
				<b>COST EXECUCIÓ MATERIAL      66,91675</b>

P-74	GB2CU001	m	Barrera de seguretat doble, prefabricada de formigó, per a ús temporal, tipus BHDPJ2/0a (New Jersey o equivalent), amb perfil a les dues cares, en mòduls de 2 m, de dimensions i detalls segons plànols, totalment col·locada	<b>Rend.: 10,000</b> <b>81,64 €</b>
				Unitats      Preu      Parcial      Import
Ma d'obra				
	A0140000	h	Manobre	2,000 /R x 18,41000 = 3,68200
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 = 4,41000
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,46720
			Subtotal:	8,55920      8,55920
Maquinària				
	C1503U10	h	Camió grua de 5 t	1,000 /R x 39,49000 = 3,94900
			Subtotal:	3,94900      3,94900
Materials				
	BBM0U301	m	Barrera prefabricada de formigó, tipus BHDPJ2/0a (New Jersey o equivalent) amb perfil a les dues cares, en mòduls de 2 m, inclòs transport a l'obra	1,000 x 65,24000 = 65,24000
			Subtotal:	65,24000      65,24000

## JUSTIFICACIÓ DE PREUS

Pàg.: 51

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	77,74820
			DESPESES INDIRECTES 5,00 %	3,88741
			<b>COST EXECUCIÓ MATERIAL</b>	<b>81,63561</b>

<b>P-75</b>	<b>GBA1U210</b>	m	Pintat amb dues capes de faixa de 10 cm d'amplada sobre paviments, amb pintura acrílica en solució aquosa o amb dissolvent i reflectant amb microesferes de vidre, incloent el premarcatge.	<b>Rend.: 495,000</b>	<b>0,79</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0150000	h	Manobre especialista	2,000 /R x	19,04000 =	0,07693	
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	0,04719	
A0121000	h	Oficial 1a	3,000 /R x	22,05000 =	0,13364	
		Subtotal:			0,25776	0,25776
<b>Maquinària</b>						
C1B02AU0	h	Màquina per a pintar marques vials, autopropulsada	1,000 /R x	35,45000 =	0,07162	
C150U004	h	Furgoneta de 3500 kg	1,000 /R x	7,62000 =	0,01539	
		Subtotal:			0,08701	0,08701
<b>Materials</b>						
B8ZBU100	kg	Pintura acrílica en solució aquosa o amb dissolvent, per a marques vials	0,140 x	2,50000 =	0,35000	
B8ZBUU01	kg	Microesferes de vidre	0,060 x	0,89000 =	0,05340	
		Subtotal:			0,40340	0,40340
					COST DIRECTE	0,74817
					DESPESES INDIRECTES 5,00 %	0,03741
					<b>COST EXECUCIÓ MATERIAL</b>	<b>0,78558</b>

<b>P-76</b>	<b>GBA1U220</b>	m	Pintat amb dues capes de faixa de 15 cm d'amplada sobre paviments, amb pintura acrílica en solució aquosa o amb dissolvent i reflectant amb microesferes de vidre, incloent el premarcatge.	<b>Rend.: 625,000</b>	<b>0,92</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0150000	h	Manobre especialista	2,000 /R x	19,04000 =	0,06093	
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	0,03738	
A0121000	h	Oficial 1a	3,000 /R x	22,05000 =	0,10584	
		Subtotal:			0,20415	0,20415
<b>Maquinària</b>						
C1B02AU0	h	Màquina per a pintar marques vials, autopropulsada	1,000 /R x	35,45000 =	0,05672	
C150U004	h	Furgoneta de 3500 kg	1,000 /R x	7,62000 =	0,01219	
		Subtotal:			0,06891	0,06891
<b>Materials</b>						

## JUSTIFICACIÓ DE PREUS

Pàg.: 52

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
B8ZBUU01	kg	Microesferes de vidre	0,090 x 0,89000 =	0,08010
B8ZBU100	kg	Pintura acrílica en solució aquosa o amb dissolvent, per a marques vials	0,210 x 2,50000 =	0,52500
		Subtotal:		0,60510

				COST DIRECTE	0,87816
				DESPESES INDIRECTES 5,00 %	0,04391
				<b>COST EXECUCIÓ MATERIAL</b>	<b>0,92207</b>

<b>P-77</b>	<b>GBA3V301</b>	m2	Pintat manual de senyal de stop o cedi el pas, fletxes, lletres, símbols, zebraats, franges de vèrtexs d'illetes sobre el paviment, amb pintura de dos components en fred de llarga durada i reflectant amb microesferes de vidre 100 % reciclat, incloent el premarcatge	<b>Rend.: 14,000</b>	<b>21,40</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0121000	h	Oficial 1a	3,000 /R x	22,05000 =	4,72500	
A0112000	h	Cap de colla	1,000 /R x	23,36000 =	1,66857	
A0150000	h	Manobre especialista	2,000 /R x	19,04000 =	2,72000	
		Subtotal:			9,11357	9,11357
<b>Maquinària</b>						
C1B0AU10	h	Compressor portàtil amb accessoris per a pintar marques vials	1,000 /R x	16,07000 =	1,14786	
C150U004	h	Furgoneta de 3500 kg	1,000 /R x	7,62000 =	0,54429	
		Subtotal:			1,69215	1,69215
<b>Materials</b>						
B8ZBU300	kg	Pintura de dos components en fred de llarga durada, per a marques vials	3,000 x	3,05000 =	9,15000	
B8ZBUUR1	kg	Microesferes de vidre 100 % reciclades	0,480 x	0,89000 =	0,42720	
		Subtotal:			9,57720	9,57720
					COST DIRECTE	20,38292
					DESPESES INDIRECTES 5,00 %	1,01915
					<b>COST EXECUCIÓ MATERIAL</b>	<b>21,40207</b>

<b>P-78</b>	<b>GBB1U102</b>	u	Placa triangular d'acer galvanitzat de 135 cm de costat, per a senyals de trànsit, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 3,000</b>	<b>123,40</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A013U001	h	Ajudant	1,000 /R x	19,22000 =	6,40667	
A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	7,35000	
		Subtotal:			13,75667	13,75667



## JUSTIFICACIÓ DE PREUS

Pàg.: 53

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU	
Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	3,29083	
								Subtotal:	3,29083
Materials									
	BBM1U102	u	Placa triangular d'acer galvanitzat, de 135 cm, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	1,000	x	100,48000	=	100,48000	
								Subtotal:	100,48000
								COST DIRECTE	117,52750
								DESPESES INDIRECTES	5,00 %
								<b>COST EXECUCIÓ MATERIAL</b>	<b>123,40388</b>

<b>P-79</b>	<b>GBB1U111</b>	u	Placa circular d'acer galvanitzat de 90 cm de diàmetre, per a senyals de trànsit, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 3,750</b>				<b>128,72</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import		
Ma d'obra									
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	5,12533	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	5,88000	
								Subtotal:	11,00533
Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	2,63267	
								Subtotal:	2,63267
Materials									
	BBM1U111	u	Placa circular d'acer galvanitzat, de 90 cm de diàmetre, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	1,000	x	108,95000	=	108,95000	
								Subtotal:	108,95000
								COST DIRECTE	122,58800
								DESPESES INDIRECTES	5,00 %
								<b>COST EXECUCIÓ MATERIAL</b>	<b>128,71740</b>

<b>P-80</b>	<b>GBB1U121</b>	u	Placa octogonal d'acer galvanitzat de 90 cm de doble apotema, per a senyals de trànsit, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 3,000</b>				<b>126,01</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import	
Ma d'obra								
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	6,40667
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	7,35000

## JUSTIFICACIÓ DE PREUS

Pàg.: 54

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU		
Subtotal:									13,75667	13,75667
Maquinària										
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	3,29083		
								Subtotal:	3,29083	
Materials										
	BBM1U121	u	Placa octogonal d'acer galvanitzat, de 90 cm de doble apotema, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	1,000	x	102,96000	=	102,96000		
								Subtotal:	102,96000	
								COST DIRECTE	120,00750	
								DESPESES INDIRECTES	5,00 %	
								<b>COST EXECUCIÓ MATERIAL</b>	<b>126,00788</b>	

<b>P-81</b>	<b>GBB1U132</b>	u	Placa d'acer galvanitzat de 60x60 cm, per a senyals de trànsit d'indicacions generals (S-1/S-29) i carrils (S-50/S-63), amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 4,000</b>				<b>65,68</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import		
Ma d'obra									
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	5,51250	
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	4,80500	
								Subtotal:	10,31750
Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	2,46813	
								Subtotal:	2,46813
Materials									
	BBM1U132	u	Placa d'acer galvanitzat de 60x60 cm, d'indicacions generals i carrils, amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport	1,000	x	49,77000	=	49,77000	
								Subtotal:	49,77000
								COST DIRECTE	62,55563
								DESPESES INDIRECTES	5,00 %
								<b>COST EXECUCIÓ MATERIAL</b>	<b>65,68341</b>

<b>P-82</b>	<b>GBB5U651</b>	m2	Placa d'alumini superior a 0,25 m2 i fins a 0,50 m2, per a senyals de trànsit d'orientació: presenyaltització (S-200), direcció (S-300), localització (S-500), confirmació (S-600) i ús específic en poblat (S-700), amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 1,500</b>				<b>322,89</b>	<b>€</b>
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				Unitats	Preu	Parcial	Import
Ma d'obra							

## JUSTIFICACIÓ DE PREUS

Pàg.: 55

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	12,81333	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	14,70000	
			Subtotal:					27,51333	27,51333
Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	6,58167	
			Subtotal:					6,58167	6,58167
Materials									
	BBMZU601	u	Part proporcional de brides d'alumini i elements de fixació al suport de senyals de trànsit	31,420	x	0,70000	=	21,99400	
	BBM5U451	m2	Placa d'alumini superior a 0,25 m2 i fins a 0,50 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	1,000	x	251,43000	=	251,43000	
			Subtotal:					273,42400	273,42400
			COST DIRECTE						307,51900
			DESPESES INDIRECTES	5,00	%				15,37595
			<b>COST EXECUCIÓ MATERIAL</b>						<b>322,89495</b>

<b>P-83</b>	<b>GBB5U652</b>	m2	Placa d'alumini superior a 0,50 m2 i fins a 1,00 m2, per a senyals de trànsit d'orientació: presenyalització (S-200), direcció (S-300), localització (S-500), confirmació (S-600) i ús específic en poblat (S-700), amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 2,500</b>					<b>274,94</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	8,82000	
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	7,68800	
			Subtotal:					16,50800	16,50800
Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	3,94900	
			Subtotal:					3,94900	3,94900
Materials									
	BBM5U452	m2	Placa d'alumini superior a 0,50 m2 i fins a 1,00 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	1,000	x	217,69000	=	217,69000	
	BBMZU601	u	Part proporcional de brides d'alumini i elements de fixació al suport de senyals de trànsit	33,860	x	0,70000	=	23,70200	
			Subtotal:					241,39200	241,39200

## JUSTIFICACIÓ DE PREUS

Pàg.: 56

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ						PREU	
									COST DIRECTE	261,84900
									DESPESES INDIRECTES	13,09245
									5,00 %	
									<b>COST EXECUCIÓ MATERIAL</b>	<b>274,94145</b>

<b>P-84</b>	<b>GBB5U654</b>	m2	Placa o rètol en lames d'alumini superior a 1,50 m2, per a senyals de trànsit d'orientació: presenyalització (S-200), direcció (S-300), localització (S-500), confirmació (S-600) i ús específic en poblat (S-700), amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 3,350</b>					<b>221,64</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	6,58209	
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	5,73731	
			Subtotal:					12,31940	12,31940

Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	2,94701	
			Subtotal:					2,94701	2,94701

Materials									
	BBMZU601	u	Part proporcional de brides d'alumini i elements de fixació al suport de senyals de trànsit	35,880	x	0,70000	=	25,11600	
	BBM5U454	m2	Placa o rètol en lames d'alumini superior a 1,50 m2, d'orientació: presenyalització, direcció, localització, confirmació i ús específic en poblat, amb revestiment reflectant HI classe RA2	1,000	x	170,70000	=	170,70000	
			Subtotal:					195,81600	195,81600

			COST DIRECTE						211,08241
			DESPESES INDIRECTES	5,00	%				10,55412
			<b>COST EXECUCIÓ MATERIAL</b>						<b>221,63653</b>

<b>P-85</b>	<b>GBB5U662</b>	m2	Placa d'alumini superior a 0,10 m2 i fins a 0,25 m2, per a senyals de trànsit d'orientació: identificació de carreteres (S-400/S-460), amb revestiment reflectant HI classe RA2, inclosos elements de fixació al suport, sense incloure el suport, totalment col·locada	<b>Rend.: 0,750</b>					<b>396,75</b>	<b>€</b>
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				Unitats		Preu		Parcial	Import
Ma d'obra									
	A013U001	h	Ajudant	1,000	/R x	19,22000	=	25,62667	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	29,40000	
			Subtotal:					55,02667	55,02667

Maquinària									
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	13,16333	
			Subtotal:					13,16333	13,16333

## JUSTIFICACIÓ DE PREUS

Pàg.: 57

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>Materials</b>				
	BBMZU601	u	Part proporcional de brides d'alumini i elements de fixació al suport de senyals de trànsit	55,443 x 0,70000 = 38,81010
	BBM5U462	m2	Placa d'alumini superior a 0,10 m2 i fins a 0,25 m2, d'identificació de carreteres, amb revestiment reflectant HI classe RA2	1,000 x 270,86000 = 270,86000
Subtotal:				309,67010
COST DIRECTE				377,86010
DESPESES INDIRECTES 5,00 %				18,89301
<b>COST EXECUCIÓ MATERIAL</b>				<b>396,75311</b>
<b>P-86</b>	<b>GBBVU001</b>	m3	Fonamentació per a plaques i panells de senyalització vertical d'alumini, amb formigó HM-20, inclosa excavació, càrrega i transport a l'abocador del material sobrant i col·locació dels pernns d'ancoratge roscats (sense el subministre), segons plànols, totalment acabada	<b>Rend.: 1,250</b> <b>187,34 €</b>
<b>Ma d'obra</b>				
	A0112000	h	Cap de colla	0,300 /R x 23,36000 = 5,60640
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 17,64000
	A0140000	h	Manobre	1,000 /R x 18,41000 = 14,72800
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 = 15,23200
Subtotal:				53,20640
<b>Maquinària</b>				
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	1,000 /R x 17,38000 = 13,90400
	C1700006	h	Vibrador intern de formigó	2,000 /R x 1,68000 = 2,68800
	C131U028	h	Retroexcavadora de 95 hp, tipus CAT-446 o equivalent	0,300 /R x 57,14000 = 13,71360
	C110U025	h	Retroexcavadora de 95 hp, amb martell de 800 kg a 1500 kg	0,100 /R x 65,76000 = 5,26080
	C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	0,400 /R x 50,11000 = 16,03520
Subtotal:				51,60160
<b>Materials</b>				
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	1,200 x 61,34000 = 73,60800
Subtotal:				73,60800
COST DIRECTE				178,41600
DESPESES INDIRECTES 5,00 %				8,92080
<b>COST EXECUCIÓ MATERIAL</b>				<b>187,33680</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 58

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-87</b>	<b>GBBVU103</b>	u	Base d'acer galvanitzat per a subjecció al fonament del suport de 90 mm de diàmetre de senyals de trànsit, col·locat, inclòs el subministre (sense col·locació) dels pernns roscats d'ancoratge del fonament	<b>Rend.: 4,000</b> <b>124,60 €</b>
<b>Ma d'obra</b>				
	A013U001	h	Ajudant	1,000 /R x 19,22000 = 4,80500
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 5,51250
Subtotal:				10,31750
<b>Maquinària</b>				
	C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 = 2,46813
Subtotal:				2,46813
<b>Materials</b>				
	BBMZU621	u	Base d'acer galvanitzat per a subjecció de pal de suport de 90 mm de diàmetre al fonament de senyals de trànsit	1,000 x 67,54000 = 67,54000
	BBMZU126	u	Pp de placa d'acer S355JR amb 4 pernns roscats d'ancoratge, galvanitzat en calent, per a fonamentació de suport d'alumini	1,000 x 38,34000 = 38,34000
Subtotal:				105,88000
COST DIRECTE				118,66563
DESPESES INDIRECTES 5,00 %				5,93328
<b>COST EXECUCIÓ MATERIAL</b>				<b>124,59891</b>
<b>P-88</b>	<b>GBBVU107</b>	u	Base d'acer galvanitzat per a subjecció al fonament del suport de 140 mm de diàmetre de senyals de trànsit, col·locat, inclòs el subministre (sense col·locació) dels pernns roscats d'ancoratge del fonament	<b>Rend.: 2,500</b> <b>174,13 €</b>
<b>Ma d'obra</b>				
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 8,82000
	A013U001	h	Ajudant	1,000 /R x 19,22000 = 7,68800
Subtotal:				16,50800
<b>Maquinària</b>				
	C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 = 3,94900
Subtotal:				3,94900
<b>Materials</b>				
	BBMZU126	u	Pp de placa d'acer S355JR amb 4 pernns roscats d'ancoratge, galvanitzat en calent, per a fonamentació de suport d'alumini	1,500 x 38,34000 = 57,51000
	BBMZU623	u	Base d'acer galvanitzat per a subjecció de pal de suport de 140 mm de diàmetre al fonament de senyals de trànsit	1,000 x 87,87000 = 87,87000

## JUSTIFICACIÓ DE PREUS

Pàg.: 59

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Subtotal:				145,38000
COST DIRECTE				165,83700
DESPESES INDIRECTES 5,00 %				8,29185
<b>COST EXECUCIÓ MATERIAL</b>				<b>174,12885</b>

**P-89 GBBVU203** m Pal d'alumini extrusionat de 90 mm de diàmetre, segons designació MC del Plec de Prescripcions Tècniques, per a suport de senyals de trànsit, col·locat **Rend.: 21,000** **27,64 €**

	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A0121000	h	Oficial 1a	1,000 /R x 22,05000 =	1,05000
A013U001	h	Ajudant	1,000 /R x 19,22000 =	0,91524
Subtotal:				1,96524
<b>Maquinària</b>				
C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 =	0,47012
Subtotal:				0,47012
<b>Materials</b>				
BBMZU611	m	Pal d'alumini de 90 mm de diàmetre, designació MC del Plec de Prescripcions, per a suport de senyals de trànsit	1,000 x 23,89000 =	23,89000
Subtotal:				23,89000
COST DIRECTE				26,32536
DESPESES INDIRECTES 5,00 %				1,31627
<b>COST EXECUCIÓ MATERIAL</b>				<b>27,64163</b>

**P-90 GBBVU205** m Pal d'alumini extrusionat de 114 mm de diàmetre, segons designació MD del Plec de Prescripcions Tècniques, per a suport de senyals de trànsit, col·locat **Rend.: 17,000** **35,15 €**

	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A013U001	h	Ajudant	1,000 /R x 19,22000 =	1,13059
A0121000	h	Oficial 1a	1,000 /R x 22,05000 =	1,29706
Subtotal:				2,42765
<b>Maquinària</b>				
C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 =	0,58074
Subtotal:				0,58074
<b>Materials</b>				
BBMZU612	m	Pal d'alumini de 114 mm de diàmetre, designació MD del Plec de Prescripcions, per a suport de senyals de trànsit	1,000 x 30,47000 =	30,47000
Subtotal:				30,47000

## JUSTIFICACIÓ DE PREUS

Pàg.: 60

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
COST DIRECTE				33,47839
DESPESES INDIRECTES 5,00 %				1,67392
<b>COST EXECUCIÓ MATERIAL</b>				<b>35,15231</b>

**P-91 GBBVU206** m Pal d'alumini extrusionat de 114 o 140 mm de diàmetre, segons designació ME del Plec de Prescripcions Tècniques, per a suport de senyals de trànsit, col·locat **Rend.: 12,000** **62,08 €**

	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A013U001	h	Ajudant	1,000 /R x 19,22000 =	1,60167
A0121000	h	Oficial 1a	1,000 /R x 22,05000 =	1,83750
Subtotal:				3,43917
<b>Maquinària</b>				
C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 =	0,82271
Subtotal:				0,82271
<b>Materials</b>				
BBMZU613	m	Pal d'alumini de 114 o 140 mm de diàmetre, designació ME del Plec de Prescripcions, per a suport de senyals de trànsit	1,000 x 54,86000 =	54,86000
Subtotal:				54,86000
COST DIRECTE				59,12188
DESPESES INDIRECTES 5,00 %				2,95609
<b>COST EXECUCIÓ MATERIAL</b>				<b>62,07797</b>

**P-92 GBBVU207** m Pal d'alumini extrusionat de 140 mm de diàmetre, segons designació MF del Plec de Prescripcions Tècniques, per a suport de senyals de trànsit, col·locat **Rend.: 10,000** **101,69 €**

	Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>				
A013U001	h	Ajudant	1,000 /R x 19,22000 =	1,92200
A0121000	h	Oficial 1a	1,000 /R x 22,05000 =	2,20500
Subtotal:				4,12700
<b>Maquinària</b>				
C1503U10	h	Camió grua de 5 t	0,250 /R x 39,49000 =	0,98725
Subtotal:				0,98725
<b>Materials</b>				
BBMZU614	m	Pal d'alumini de 140 mm de diàmetre, designació MF del Plec de Prescripcions, per a suport de senyals de trànsit	1,000 x 91,73000 =	91,73000
Subtotal:				91,73000

## JUSTIFICACIÓ DE PREUS

Pàg.: 61

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	96,84425
			DESPESES INDIRECTES 5,00 %	4,84221
			<b>COST EXECUCIÓ MATERIAL</b>	<b>101,68646</b>

<b>P-93</b>	<b>GBBZU005</b>	u	Suport rectangular d'acer galvanitzat de 100x50x3 mm, per a la col·locació d'una senyal de trànsit en carreteres, inclòs fonamentació i col·locació	<b>Rend.: 2,500</b>	<b>107,03</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0121000	h	Oficial 1a	1,000	/R x 22,05000 =	8,82000	
A0150000	h	Manobre especialista	1,000	/R x 19,04000 =	7,61600	
		Subtotal:			16,43600	16,43600
<b>Maquinària</b>						
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,250	/R x 45,92000 =	4,59200	
C1503U10	h	Camió grua de 5 t	0,200	/R x 39,49000 =	3,15920	
		Subtotal:			7,75120	7,75120
<b>Materials</b>						
BBMZU106	m	Suport de tub d'acer galvanitzat de 100x50x3 mm, per a senyals de trànsit	3,500	x 19,76000 =	69,16000	
B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,140	x 61,34000 =	8,58760	
		Subtotal:			77,74760	77,74760
					COST DIRECTE	101,93480
					DESPESES INDIRECTES 5,00 %	5,09674
					<b>COST EXECUCIÓ MATERIAL</b>	<b>107,03154</b>

<b>P-94</b>	<b>GBBZU006</b>	u	Suport rectangular d'acer galvanitzat de 100x50x3 mm, per a la col·locació de dues senyals de trànsit en carreteres, inclòs fonamentació i col·locació	<b>Rend.: 2,500</b>	<b>127,96</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0150000	h	Manobre especialista	1,000	/R x 19,04000 =	7,61600	
A0121000	h	Oficial 1a	1,000	/R x 22,05000 =	8,82000	
		Subtotal:			16,43600	16,43600
<b>Maquinària</b>						
C1503U10	h	Camió grua de 5 t	0,200	/R x 39,49000 =	3,15920	
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,250	/R x 45,92000 =	4,59200	
		Subtotal:			7,75120	7,75120
<b>Materials</b>						
BBMZU106	m	Suport de tub d'acer galvanitzat de 100x50x3 mm, per a senyals de trànsit	4,400	x 19,76000 =	86,94400	

## JUSTIFICACIÓ DE PREUS

Pàg.: 62

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
B060U310	m3		Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,175 x 61,34000 = 10,73450
			Subtotal:	97,67850
			COST DIRECTE	121,86570
			DESPESES INDIRECTES 5,00 %	6,09329
			<b>COST EXECUCIÓ MATERIAL</b>	<b>127,95899</b>

<b>P-95</b>	<b>GBC1U010</b>	u	Fita quilomètrica amb placa de 40x60 cm, amb revestiment reflectant EG classe RA1, inclòs suport rectangular d'acer galvanitzat de 80x40x2 mm, elements de fixació i fonament de suport, totalment col·locada	<b>Rend.: 4,500</b>	<b>112,23</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0150000	h	Manobre especialista	1,500	/R x 19,04000 =	6,34667	
A0121000	h	Oficial 1a	2,500	/R x 22,05000 =	12,25000	
A013U001	h	Ajudant	1,000	/R x 19,22000 =	4,27111	
		Subtotal:			22,86778	22,86778
<b>Maquinària</b>						
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,375	/R x 40,31000 =	3,35917	
C1503U10	h	Camió grua de 5 t	0,550	/R x 39,49000 =	4,82656	
		Subtotal:			8,18573	8,18573
<b>Materials</b>						
BBC1U010	u	Fita quilomètrica amb placa de 40x60 cm, amb revestiment reflectant EG classe RA1, inclosos elements de fixació al suport	1,000	x 46,63000 =	46,63000	
BBMZU105	m	Suport de tub d'acer galvanitzat de 80x40x2 mm, per a senyals de trànsit	2,400	x 9,30000 =	22,32000	
B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,120	x 57,38000 =	6,88560	
		Subtotal:			75,83560	75,83560
					COST DIRECTE	106,88911
					DESPESES INDIRECTES 5,00 %	5,34446
					<b>COST EXECUCIÓ MATERIAL</b>	<b>112,23357</b>

<b>P-96</b>	<b>GD56U515</b>	m	Cuneta triangular de 1,00 m d'amplària i 0,25 m de fondària, sense revestir, inclòs excavació en terreny no classificat, refinat, càrrega i transport a l'abocador dels materials resultants	<b>Rend.: 1,000</b>	<b>4,84</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0150000	h	Manobre especialista	0,0477	/R x 19,04000 =	0,90821	
A0112000	h	Cap de colla	0,0095	/R x 23,36000 =	0,22192	

## JUSTIFICACIÓ DE PREUS

Pàg.: 63

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Subtotal:				1,13013
Maquinària				1,13013
C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,0238 /R x 40,02000 =	0,95248
C133U001	h	Motoanivelladora de 125 hp	0,012 /R x 55,73000 =	0,66876
C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	0,0095 /R x 51,07000 =	0,48517
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,030 /R x 45,92000 =	1,37760
Subtotal:				3,48401
COST DIRECTE				4,61414
DESPESES INDIRECTES 5,00 %				0,23071
<b>COST EXECUCIÓ MATERIAL</b>				<b>4,84485</b>

<b>P-97</b>	<b>GD56U516</b>	m	Cuneta triangular d'1,20 m d'amplària i 0,30 m de fondària, sense revestir, inclòs excavació en terreny no classificat, refinat, càrrega i transport a l'abocador dels materials resultants	<b>Rend.: 21,000</b>	<b>5,23</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	h	Cap de colla	0,200 /R x 23,36000 =	0,22248
A0150000	h	Manobre especialista	1,001 /R x 19,04000 =	0,90757
Subtotal:				1,13005
Maquinària				
C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,499 /R x 40,02000 =	0,95095
C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	0,200 /R x 51,07000 =	0,48638
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,801 /R x 45,92000 =	1,75152
C133U001	h	Motoanivelladora de 125 hp	0,251 /R x 55,73000 =	0,66611
Subtotal:				3,85496
COST DIRECTE				4,98501
DESPESES INDIRECTES 5,00 %				0,24925
<b>COST EXECUCIÓ MATERIAL</b>				<b>5,23426</b>

<b>P-98</b>	<b>GD56U902</b>	m	Cuneta trapezoïdal de terres, de 1,55m d'amplada total, 0,50 m de base i 0,35 m de fondària, sense revestir, inclòs excavació en terreny no classificat, refinat, càrrega i transport a l'abocador dels materials resultants.	<b>Rend.: 13,500</b>	<b>7,22</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0150000	h	Manobre especialista	0,950 /R x 19,04000 =	1,33985
A0112000	h	Cap de colla	0,170 /R x 23,36000 =	0,29416
Subtotal:				1,63401

## JUSTIFICACIÓ DE PREUS

Pàg.: 64

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
Maquinària				
C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	0,180 /R x 51,07000 =	0,68093
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,750 /R x 45,92000 =	2,55111
C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,400 /R x 40,02000 =	1,18578
C133U001	h	Motoanivelladora de 125 hp	0,200 /R x 55,73000 =	0,82563
Subtotal:				5,24345
COST DIRECTE				6,87746
DESPESES INDIRECTES 5,00 %				0,34387
<b>COST EXECUCIÓ MATERIAL</b>				<b>7,22133</b>

<b>P-99</b>	<b>GD57U515</b>	m	Cuneta triangular, d'1,00 m d'amplada i 0,20 m de fondària, amb un revestiment mínim de 15 cm de formigó de 15 N/mm2 de resistència característica a compressió, inclòs excavació de terreny no classificat, refinat, càrrega i transport a l'abocador dels materials resultants	<b>Rend.: 1,000</b>	<b>20,27</b>	<b>€</b>
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	Unitats	Preu	Parcial	Import
Ma d'obra				
A0112000	h	Cap de colla	0,0125 /R x 23,36000 =	0,29200
A013U001	h	Ajudant	0,070 /R x 19,22000 =	1,34540
A0121000	h	Oficial 1a	0,0833 /R x 22,05000 =	1,83677
A0150000	h	Manobre especialista	0,040 /R x 19,04000 =	0,76160
Subtotal:				4,23577
Maquinària				
C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,030 /R x 45,92000 =	1,37760
C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	0,008 /R x 51,07000 =	0,40856
C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	0,020 /R x 40,02000 =	0,80040
C133U001	h	Motoanivelladora de 125 hp	0,010 /R x 55,73000 =	0,55730
Subtotal:				3,14386
Materials				
B0A142U0	kg	Filferro recuit de diàmetre 1,6 mm	0,025 x 1,23000 =	0,03075
B0D21030	m	Tauló de fusta de pi per a 10 usos	0,700 x 0,33000 =	0,23100
B0D7UC02	m2	Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	0,240 x 1,30000 =	0,31200
B0DZA000	l	Desencofrant	0,025 x 2,46000 =	0,06150
B0A3UC10	kg	Clau acer	0,075 x 1,32000 =	0,09900
B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,195 x 57,38000 =	11,18910
Subtotal:				11,92335



## JUSTIFICACIÓ DE PREUS

Pàg.: 65

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	19,30298
			DESPESES INDIRECTES 5,00 %	0,96515
			<b>COST EXECUCIÓ MATERIAL</b>	<b>20,26813</b>

<b>P-100</b>	<b>GD57U6AA</b>	m	Cuneta profunda trapezoïdal d'1,55/0,50 m d'amplada i 0,35 m de fondària, amb un revestiment mínim de 15 cm de formigó de 20 N/mm2 de resistència característica a compressió, inclòs excavació de terreny no classificat, refinat, càrrega i transport a l'abocador dels materials resultants	<b>Rend.: 16,850</b>	<b>37,17</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
	A0112000	h	Cap de colla	0,300 /R x 23,36000 =	0,41591	
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 =	1,12997	
	A013U001	h	Ajudant	2,000 /R x 19,22000 =	2,28131	
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 =	2,61721	
			Subtotal:		6,44440	6,44440
<b>Maquinària</b>						
	C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	1,000 /R x 40,02000 =	2,37507	
	C110U015	h	Retroexcavadora de 74 hp, amb martell de 200 kg a 400 kg	0,300 /R x 51,07000 =	0,90926	
	C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	1,000 /R x 45,92000 =	2,72522	
			Subtotal:		6,00955	6,00955
<b>Materials</b>						
	B0A142U0	kg	Filferro recuit de diàmetre 1,6 mm	0,300 x 1,23000 =	0,36900	
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,350 x 61,34000 =	21,46900	
	B0A3UC10	kg	Clau acer	0,100 x 1,32000 =	0,13200	
	B0D7UC02	m2	Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	0,380 x 1,30000 =	0,49400	
	B0DZA000	l	Desencofrant	0,040 x 2,46000 =	0,09840	
	B0D21030	m	Tauló de fusta de pi per a 10 usos	1,150 x 0,33000 =	0,37950	
			Subtotal:		22,94190	22,94190
			COST DIRECTE		35,39585	
			DESPESES INDIRECTES 5,00 %		1,76979	
			<b>COST EXECUCIÓ MATERIAL</b>		<b>37,16564</b>	

<b>P-101</b>	<b>GD5AU220</b>	m	Drenatge amb tub de PVC de doble paret, de diàmetre 200 mm, ranurat parcial en un arc de 108° a 220° i SN 4 kN/m2, inclòs excavació, transport a abocador, base de formigó, tub, geotextil i reblert de material filtrant, segons plànols	<b>Rend.: 30,000</b>	<b>30,03</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						

## JUSTIFICACIÓ DE PREUS

Pàg.: 66

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
	A0150000	h	Manobre especialista	3,000 /R x 19,04000 = 1,90400
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 = 0,73500
	A0112000	h	Cap de colla	0,200 /R x 23,36000 = 0,15573
			Subtotal:	2,79473 2,79473

<b>Maquinària</b>						
	C15018U1	h	Camió de 200 hp, de 15 t (7,3 m3)	1,000 /R x 40,02000 =	1,33400	
	C133U080	h	Picó vibrant amb placa de 60 cm d'amplària	1,000 /R x 5,71000 =	0,19033	
	C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	2,000 /R x 40,31000 =	2,68733	
			Subtotal:		4,21166	4,21166

<b>Materials</b>						
	B033U030	m3	Grava de pedrera de pedra granítica, de 20 a 40 mm, per a drens	0,330 x 16,02000 =	5,28660	
	BD5AU200	m	Tub corrugat de PVC de doble paret, de D= 210 mm, ranurat en un arc de 108° a 220°, per a drenatge	1,030 x 8,69000 =	8,95070	
	B7B1U002	m2	Feltre geotextil no teixit de polipropilè, amb un pes mínim de 150 g/m2, 100% foradat per ambdues cares, amb resistència a la perforació igual o superior a 1750 N	2,500 x 1,45000 =	3,62500	
	B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,065 x 57,38000 =	3,72970	
			Subtotal:		21,59200	21,59200

			COST DIRECTE		28,59839	
			DESPESES INDIRECTES 5,00 %		1,42992	
			<b>COST EXECUCIÓ MATERIAL</b>		<b>30,02831</b>	

<b>P-102</b>	<b>GD5GU020</b>	m	Baixant per a talussos de peces prefabricades de formigó en forma d'U, de 40x13 cm interiors mínim, inclòs excavació, transport a l'abocador i base mínima de 10 cm de gruix de formigó de 15 N/mm2 de resistència característica a la compressió, segons plànols	<b>Rend.: 11,000</b>	<b>42,38</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
	A0150000	h	Manobre especialista	1,000 /R x 19,04000 =	1,73091	
	A0121000	h	Oficial 1a	2,000 /R x 22,05000 =	4,00909	
	A0112000	h	Cap de colla	0,250 /R x 23,36000 =	0,53091	
			Subtotal:		6,27091	6,27091

<b>Maquinària</b>						
	C15018U0	h	Camió de 150 hp, de 12 t (5,8 m3)	0,100 /R x 38,29000 =	0,34809	
	C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	0,100 /R x 45,92000 =	0,41745	
	C150GU10	h	Grua autopropulsada de 12 t	0,200 /R x 51,67000 =	0,93945	
			Subtotal:		1,70499	1,70499

<b>Materials</b>						
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## JUSTIFICACIÓ DE PREUS

Pàg.: 67

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU	
	BD52U002	m	Baixant per a talussos de peces prefabricades de formigó en forma d'U, de 40x13 cm interiors mínim	1,050	x	26,69000	=	28,02450	
	B071U005	m3	Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	0,004	x	85,10000	=	0,34040	
	B060U110	m3	Formigó de 15 N/mm2 de resistència característica a la compressió, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,070	x	57,38000	=	4,01660	
Subtotal:								32,38150	
COST DIRECTE								40,35740	
DESPESES INDIRECTES 5,00 %								2,01787	
<b>COST EXECUCIÓ MATERIAL</b>								<b>42,37527</b>	
<b>P-103</b>	<b>GD5JU01X</b>	u	Pou d'embornal de 55x55 cm i 1,00 m d'alçària, amb formigó HM-20, inclòs solera, entroncament amb tub de desguàs i bastiment i reixa de fosa dúctil per a 25 t de càrrega de ruptura, segons plànols	<b>Rend.: 0,800</b>				<b>278,94 €</b>	
				Unitats		Preu		Parcial	Import
<b>Ma d'obra</b>									
	A0112000	h	Cap de colla	0,200	/R x	23,36000	=	5,84000	
	A0150000	h	Manobre especialista	1,000	/R x	19,04000	=	23,80000	
	A0121000	h	Oficial 1a	2,000	/R x	22,05000	=	55,12500	
Subtotal:								84,76500	84,76500
<b>Maquinària</b>									
	C1700006	h	Vibrador intern de formigó	2,000	/R x	1,68000	=	4,20000	
	C1503U10	h	Camió grua de 5 t	0,250	/R x	39,49000	=	12,34063	
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	1,000	/R x	17,38000	=	21,72500	
Subtotal:								38,26563	38,26563
<b>Materials</b>									
	B0D21030	m	Tauló de fusta de pi per a 10 usos	4,400	x	0,33000	=	1,45200	
	B0D7UC02	m2	Amortització de tauler de fusta de pi de 22 mm, per a 10 usos	2,200	x	1,30000	=	2,86000	
	B0A3UC10	kg	Clau acer	0,350	x	1,32000	=	0,46200	
	B071U005	m3	Morter de ciment de Classe M-5 (5 N/mm2) segons la Norma UNE 998-2	0,020	x	85,10000	=	1,70200	
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	1,050	x	61,34000	=	64,40700	
	BD5ZUC01	u	Marc i reixa de 70x30 cm de fosa dúctil, per a 25 t de càrrega de ruptura	1,000	x	71,74000	=	71,74000	
Subtotal:								142,62300	142,62300
COST DIRECTE								265,65363	
DESPESES INDIRECTES 5,00 %								13,28268	
<b>COST EXECUCIÓ MATERIAL</b>								<b>278,93631</b>	

## JUSTIFICACIÓ DE PREUS

Pàg.: 68

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ					PREU	
<b>P-104</b>	<b>GD75U030</b>	m	Canalització amb tub de formigó vibropressat de 50 cm de diàmetre, classe N segons UNE 127916, inclòs base i reblert per sobre de la generatriu superior amb formigó de 20 N/mm2 de resistència característica a la compressió, segons plànols	<b>Rend.: 13,500</b>				<b>63,93 €</b>	
				Unitats		Preu		Parcial	Import
<b>Ma d'obra</b>									
	A0150000	h	Manobre especialista	2,960	/R x	19,04000	=	4,17470	
	A0121000	h	Oficial 1a	1,480	/R x	22,05000	=	2,41733	
	A0112000	h	Cap de colla	0,370	/R x	23,36000	=	0,64024	
Subtotal:								7,23227	7,23227
<b>Maquinària</b>									
	CZ12U00A	h	Compressor portàtil de 7/10 m3/min de cabal	0,480	/R x	17,38000	=	0,61796	
	C1503U10	h	Camió grua de 5 t	1,000	/R x	39,49000	=	2,92519	
	C1700006	h	Vibrador intern de formigó	0,960	/R x	1,68000	=	0,11947	
Subtotal:								3,66262	3,66262
<b>Materials</b>									
	BD75U050	m	Tub de formigó vibropressat de diàmetre interior 50 cm	1,050	x	14,96000	=	15,70800	
	B071U010	m3	Morter de ciment de Classe M-10 (10 N/mm2) segons la Norma UNE 998-2	0,004	x	89,78000	=	0,35912	
	B060U310	m3	Formigó HM-20, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,553	x	61,34000	=	33,92102	
Subtotal:								49,98814	49,98814
COST DIRECTE								60,88303	
DESPESES INDIRECTES 5,00 %								3,04415	
<b>COST EXECUCIÓ MATERIAL</b>								<b>63,92718</b>	
<b>P-105</b>	<b>GFA1U107</b>	m	Tub de PVC de DN 75 mm, per a PN 6 bar, amb unions de junt elàstica, inclòs part proporcional d'accessoris i peces especials d'acer amb protecció contra la corrosió, col·locat al fons de la rasa i provat	<b>Rend.: 54,990</b>				<b>3,13 €</b>	
				Unitats		Preu		Parcial	Import
<b>Ma d'obra</b>									
	A0150000	h	Manobre especialista	2,000	/R x	19,04000	=	0,69249	
	A0121000	h	Oficial 1a	1,000	/R x	22,05000	=	0,40098	
	A0112000	h	Cap de colla	0,500	/R x	23,36000	=	0,21240	
Subtotal:								1,30587	1,30587
<b>Maquinària</b>									
	C1502U10	h	Camió cisterna de 6000 l	0,110	/R x	39,04000	=	0,07809	
	C200U101	h	Bombí per a proves de canonades	0,110	/R x	3,90000	=	0,00780	
	C1503U10	h	Camió grua de 5 t	0,161	/R x	39,49000	=	0,11562	
Subtotal:								0,20151	0,20151
<b>Materials</b>									

## JUSTIFICACIÓ DE PREUS

Pàg.: 69

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU
	BFA1U107	m	Tub de PVC, DN 75 mm, PN 6 bar, amb unions de junt elàstica, inclòs p.p. de peces especials i accessoris	1,030	x	1,42000 =	1,46260
	B0111000	m3	Aigua	0,008	x	1,60000 =	0,01280
				Subtotal:			1,47540
				COST DIRECTE			2,98278
				DESPESES INDIRECTES	5,00 %		0,14914
				<b>COST EXECUCIÓ MATERIAL</b>			<b>3,13192</b>

<b>P-106</b>	<b>GFA1X001</b>	m	Canaló circular de PVC amb òxid de titani, de desenvolupament 250 mm i diàmetre 75 mm, color gris clar, unió enganxada amb adhesiu, segons UNE-EN-607. Inclòs suports, cantonades, tapes, acabaments finals, peces de connexió a baixants i peces especials.	<b>Rend.: 1,000</b>			<b>15,78</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import	
<b>Ma d'obra</b>							
	A013U001	h	Ajudant	0,232 /R x	19,22000 =	4,45904	
	A0121000	h	Oficial 1a	0,232 /R x	22,05000 =	5,11560	
				Subtotal:		9,57464	
<b>Materials</b>							
	BFA1X001	m	Canaló circular de PVC amb òxid de titani, de desenvolupament 250 mm, color gris clar, unió enganxada amb adhesiu, segons UNE-EN 607. Inclús suports, cantonades, tapes, acabaments finals, peces de connexió a baixants i peces especials.	1,000	x	5,45000 =	5,45000
				Subtotal:		5,45000	
				COST DIRECTE		15,02464	
				DESPESES INDIRECTES	5,00 %	0,75123	
				<b>COST EXECUCIÓ MATERIAL</b>		<b>15,77587</b>	

<b>P-107</b>	<b>GFB1U109</b>	m	Tub de polietilè d'alta densitat, tipus PE-50A, de DN 90 mm per a PN 6 bar, amb unions termosoldades, inclòs part proporcional d'accessoris i peces especials de polietilè, col·locat al fons de la rasa i provat	<b>Rend.: 70,200</b>			<b>4,35</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
	A013U001	h	Ajudant	2,000 /R x	19,22000 =	0,54758
	A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	0,31410
	A0112000	h	Cap de colla	0,200 /R x	23,36000 =	0,06655
				Subtotal:		0,92823
<b>Maquinària</b>						
	C1502U10	h	Camió cisterna de 6000 l	0,326 /R x	39,04000 =	0,18130
	CZ1UU005	h	Màquina de confecció d'unions soldades de tubs de polietilè	0,391 /R x	4,09000 =	0,02278

## JUSTIFICACIÓ DE PREUS

Pàg.: 70

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ				PREU
	C1503U10	h	Camió grua de 5 t	0,391 /R x	39,49000 =	0,21995	
	C200U101	h	Bombí per a proves de canonades	0,326 /R x	3,90000 =	0,01811	
				Subtotal:		0,44214	
				<b>Materials</b>			
	B0111000	m3	Aigua	0,008	x	1,60000 =	0,01280
	BFB1U109	m	Tub de polietilè d'alta densitat, tipus PE-50A, DN 90 mm, PN 6, inclòs p.p. de peces especials i accessoris	1,030	x	2,68000 =	2,76040
				Subtotal:		2,77320	
				COST DIRECTE		4,14357	
				DESPESES INDIRECTES	5,00 %	0,20718	
				<b>COST EXECUCIÓ MATERIAL</b>		<b>4,35075</b>	

<b>P-108</b>	<b>GHM1U035</b>	u	Columna de planxa d'acer galvanitzat, de forma troncocònica de 8,00 m d'alçària, coronament sense platina, amb base platina i porta, col·locada sobre dau de formigó, inclosa l'execució de la fonamentació, gruament, anivellament, instal·lació de presa de terra, instal·lació elèctrica completa de l'interior del suport i transport de terres sobrants a l'abocador	<b>Rend.: 1,000</b>			<b>486,65</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
	A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	22,05000
	A0112000	h	Cap de colla	0,500 /R x	23,36000 =	11,68000
	A013U001	h	Ajudant	1,000 /R x	19,22000 =	19,22000
	A0140000	h	Manobre	1,000 /R x	18,41000 =	18,41000
				Subtotal:		71,36000
<b>Maquinària</b>						
	C1501700	h	Camió per a transport de 7 t	0,220 /R x	32,22000 =	7,08840
	C1503U20	h	Camió grua de 10 t	1,000 /R x	45,80000 =	45,80000
	C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,200 /R x	40,31000 =	8,06200
				Subtotal:		60,95040

			Unitats	Preu	Parcial	Import	
<b>Materials</b>							
	B060U430	m3	Formigó HA-25, consistència plàstica i granulat màxim 20 mm, inclòs transport a l'obra	0,540	x	66,78000 =	36,06120
	BGDZU030	u	Sals de sulfat de sodi i magnesi	1,000	x	0,77000 =	0,77000
	BGDZU020	u	Cartutx per a soldadura Cadweld	1,000	x	1,39000 =	1,39000
	BGD2U010	u	Placa de presa de terra de 500 x 500 x 3 mm	1,000	x	14,90000 =	14,90000
	BG3ZU010	u	Terminal per a cable de coure de 35 mm2	2,000	x	2,66000 =	5,32000
	BG31230U	m	Cable amb conductor de coure (classe 2 o classe 5), designació R Z1 0,6/1 kV 2x2,5 segons UNE 21123, tipus EXZHELLENT de Grupo General Cable o equivalent, inclòs marcatge indeleble i material auxiliar necessari	9,600	x	0,55000 =	5,28000
	BG21U032	m	Tub rígid de PVC de 32 mm de diàmetre nominal, aïllant i no propagador de la flama, amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, i una rigidesa dielèctrica de	0,600	x	1,51000 =	0,90600

## JUSTIFICACIÓ DE PREUS

Pàg.: 71

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			2000 V, inclòs p.p. de peces especials i accessoris	
BG46U010	u	Caixa de connexions i tallacircuits per a una o dues lampades	1,000 x 11,13000 =	11,13000
BHMZU010	u	Conjunt de quatre pernys per a cimentació	1,000 x 16,97000 =	16,97000
BG38U035	m	Conductor de coure nu, unipolar d'1x35 mm2	2,400 x 1,29000 =	3,09600
BHM1U035	u	Columna metàl·lica troncocònica totalment galvanitzada de 8 m d'alçària, planxa de 3 mm, amb base platina, per anar muntada amb pernys d'ancoratge sobre dau de formigó	1,000 x 233,01000 =	233,01000
BG22U100	m	Tub flexible corrugat de PVC de diàmetre 100 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 2 J, resistència a compressió de 250 N, per a canalitzacions soterrades	1,200 x 1,94000 =	2,32800
Subtotal:				331,16120
COST DIRECTE				463,47160
DESPESES INDIRECTES 5,00 %				23,17358
<b>COST EXECUCIÓ MATERIAL</b>				<b>486,64518</b>

<b>P-109</b>	<b>GHM1U040</b>	u	Columna de planxa d'acer galvanitzat, de forma troncocònica de 9,00 m d'alçària, coronament sense platina, amb base platina i porta, col·locada sobre dau de formigó, inclosa l'execució de la fonamentació, gruament, anivellament, instal·lació de presa de terra, instal·lació elèctrica completa de l'interior del suport i transport de terres sobrants a l'abocador	<b>Rend.: 1,000</b>	<b>518,29 €</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	22,05000	
A0140000	h	Manobre	1,000 /R x	18,41000 =	18,41000	
A013U001	h	Ajudant	1,000 /R x	19,22000 =	19,22000	
A0112000	h	Cap de colla	0,500 /R x	23,36000 =	11,68000	
Subtotal:					71,36000	71,36000
<b>Maquinària</b>						
C1503U20	h	Camió grua de 10 t	1,000 /R x	45,80000 =	45,80000	
C131U020	h	Retroexcavadora de 50 hp, tipus CAT-416 o equivalent	0,200 /R x	40,31000 =	8,06200	
C1501700	h	Camió per a transport de 7 t	0,220 /R x	32,22000 =	7,08840	
Subtotal:					60,95040	60,95040
<b>Materials</b>						
BGDZU030	u	Sals de sulfat de sodi i magnesi	1,000 x	0,77000 =	0,77000	
BG46U010	u	Caixa de connexions i tallacircuits per a una o dues lampades	1,000 x	11,13000 =	11,13000	
BG22U100	m	Tub flexible corrugat de PVC de diàmetre 100 mm de diàmetre nominal, aïllant i no propagador de la flama, resistència a l'impacte de 2 J, resistència a compressió de 250 N, per a canalitzacions soterrades	1,200 x	1,94000 =	2,32800	
BHM1U040	u	Columna metàl·lica troncocònica totalment galvanitzada de 9 m d'alçària, planxa de 4 mm, amb base platina, per anar muntada amb pernys d'ancoratge sobre dau de formigó.	1,000 x	262,49000 =	262,49000	

## JUSTIFICACIÓ DE PREUS

Pàg.: 72

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
BG21U032	m	Tub rígid de PVC de 32 mm de diàmetre nominal, aïllant i no propagador de la flama, amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, i una rigidesa dielèctrica de 2000 V, inclòs p.p. de peces especials i accessoris	0,600 x 1,51000 =	0,90600
B060U430	m3	Formigó HA-25, consistència plàstica i granulats màxim 20 mm, inclòs transport a l'obra	0,540 x 66,78000 =	36,06120
BGDZU020	u	Cartutx per a soldadura Cadweld	1,000 x 1,39000 =	1,39000
BG3ZU010	u	Terminal per a cable de coure de 35 mm2	2,000 x 2,66000 =	5,32000
BG38U035	m	Conductor de coure nu, unipolar d'1x35 mm2	2,400 x 1,29000 =	3,09600
BGD2U010	u	Placa de presa de terra de 500 x 500 x 3 mm	1,000 x 14,90000 =	14,90000
BG31230U	m	Cable amb conductor de coure (classe 2 o classe 5), designació R Z1 0,6/1 kV 2x2,5 segons UNE 21123, tipus EXZHELLENT de Grupo General Cable o equivalent, inclòs marcatge indeleble i material auxiliar necessari	10,800 x 0,55000 =	5,94000
BHMZU010	u	Conjunt de quatre pernys per a cimentació	1,000 x 16,97000 =	16,97000
Subtotal:				361,30120
COST DIRECTE				493,61160
DESPESES INDIRECTES 5,00 %				24,68058
<b>COST EXECUCIÓ MATERIAL</b>				<b>518,29218</b>

<b>P-110</b>	<b>GHQCX010</b>	u	Llumenera LED model Nath S Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 94 W, corrent de LED 800 mA, amb accessori per fixar vertical i acoblat a l'extrem del suport. Totalment col·locat.	<b>Rend.: 4,000</b>	<b>413,10 €</b>
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			Unitats	Preu	Parcial	Import
<b>Ma d'obra</b>						
A013U001	h	Ajudant	1,000 /R x	19,22000 =	4,80500	
A0121000	h	Oficial 1a	1,000 /R x	22,05000 =	5,51250	
Subtotal:					10,31750	10,31750
<b>Materials</b>						
BG21032U	m	Tub rígid plàstic de diàmetre nominal exterior 20 mm, lliure d'halògens amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, tipus FPKU-H0 de Rehau o equivalent	2,000 x	0,61000 =	1,22000	
BHQCU010	u	Llumenera LED model Nath S Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 94 W, corrent de LED 800 mA, amb accessori per fixar vertical i acoblat a l'extrem del suport. Totalment col·locat.	1,000 x	381,89000 =	381,89000	
Subtotal:					383,11000	383,11000

## JUSTIFICACIÓ DE PREUS

Pàg.: 73

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
			COST DIRECTE	393,42750
			DESPESES INDIRECTES 5,00 %	19,67138
			<b>COST EXECUCIÓ MATERIAL</b>	<b>413,09888</b>

<b>P-111</b>	<b>GHQCX020</b>	u	Lluminària LED model Nath L Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 193W, corrent de LED 530 mA, amb accessoris de muntatge i petit material. Totalment col·locada.	<b>Rend.: 0,230</b>	<b>769,48</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
Ma d'obra						
	A013U001	h	Ajudant	1,000 /R x 19,22000 =	83,56522	
	A0121000	h	Oficial 1a	1,000 /R x 22,05000 =	95,86957	
			Subtotal:		179,43479	179,43479

			Unitats	Preu	Parcial	Import
Materials						
	BG21032U	m	Tub rígid plàstic de diàmetre nominal exterior 20 mm, lliure d'halògens amb una resistència a l'impacte de 2 J, resistència a compressió de 1250 N, tipus FPKU-H0 de Rehau o equivalent	2,000 x 0,61000 =	1,22000	
	BHQU020	u	Lluminària LED model Nath S Istanium o similar, de fundició injectada d'alumini, amb òptica RJ, temperatura de color 3000K, potència de 81W, corrent de LED 700 mA, amb accessoris de muntatge i petit material.	1,000 x 552,18000 =	552,18000	
			Subtotal:		553,40000	553,40000

			COST DIRECTE	732,83479
			DESPESES INDIRECTES 5,00 %	36,64174
			<b>COST EXECUCIÓ MATERIAL</b>	<b>769,47653</b>

<b>P-112</b>	<b>GNN2X02X</b>	u	Bomba submergible d'esgotament per a aigües amb sòlids en suspensió de fins a 50 mm de diàmetre, potència d'1,5 kW amb una alçada i cabal de bombeig màxim de 10 metres i 30 m3/h, respectivament. Màxima profunditat d'immersió de 5 metres. Tot inclòs.	<b>Rend.: 1,000</b>	<b>576,90</b>	<b>€</b>
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			COST DIRECTE	549,42857
			DESPESES INDIRECTES 5,00 %	27,47143
			<b>COST EXECUCIÓ MATERIAL</b>	<b>576,90000</b>

<b>P-113</b>	<b>GNN2X03X</b>	u	Regulador automàtic de ph amb armari metàl·lic de protecció, instal·lat a la zona d'obres. Tot inclòs.	<b>Rend.: 1,000</b>	<b>1.875,60</b>	<b>€</b>
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			COST DIRECTE	1.786,28571
			DESPESES INDIRECTES 5,00 %	89,31429
			<b>COST EXECUCIÓ MATERIAL</b>	<b>1.875,60000</b>

## JUSTIFICACIÓ DE PREUS

Pàg.: 74

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ	PREU
<b>P-114</b>	<b>GR3PU010</b>	m3	Estesa de terra vegetal procedent de l'obra sobre talussos de terraplens i desmunts de qualsevol pendent i alçada, inclòs càrrega, transport des del lloc d'aplec fins al lloc d'utilització i refinat manual dels talussos	<b>Rend.: 81,400</b> <b>2,86</b> €

			Unitats	Preu	Parcial	Import
Ma d'obra						
	A0160000	h	Peó	1,000 /R x 18,83000 =	0,23133	
	A0112000	h	Cap de colla	0,250 /R x 23,36000 =	0,07174	
			Subtotal:		0,30307	0,30307

			Unitats	Preu	Parcial	Import
Maquinària						
	CR22U001	h	Tractor amb equip per a tractament del subsòl	1,000 /R x 50,71000 =	0,62297	
	C131U025	h	Retroexcavadora de 74 hp, tipus CAT-428 o equivalent	1,000 /R x 45,92000 =	0,56413	
	C15019U0	h	Camió de 250 hp, de 20 t (9,6 m3)	2,000 /R x 50,11000 =	1,23120	
			Subtotal:		2,41830	2,41830

			COST DIRECTE	2,72137
			DESPESES INDIRECTES 5,00 %	0,13607
			<b>COST EXECUCIÓ MATERIAL</b>	<b>2,85744</b>

<b>P-115</b>	<b>GR720001</b>	m2	Hidrosembra de capa herbàcia en dues fases amb espècies adaptades agroclimàticament a la zona, inclòs el subministrament de tots els components necessaris (llavors, mulch, estabilitzant, bioactivador, adobs), regs d'arrelament, així com el manteniment necessari fins a la recepció de l'obra	<b>Rend.: 220,000</b>	<b>1,19</b>	<b>€</b>
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			Unitats	Preu	Parcial	Import
Ma d'obra						
	A0112000	h	Cap de colla	0,400 /R x 23,36000 =	0,04247	
	A012P000	h	Oficial 1a jardiner	2,000 /R x 26,47000 =	0,24064	
			Subtotal:		0,28311	0,28311

			Unitats	Preu	Parcial	Import
Maquinària						
	CR71U010	h	Hidrosebradora muntada sobre camió	1,000 /R x 36,38000 =	0,16536	
			Subtotal:		0,16536	0,16536

			Unitats	Preu	Parcial	Import
Materials						
	BR4UJJ00	kg	Barreja d'hidrosembra composta per d'espècies herbàcies adaptades agroclimàticament	0,030 x 3,68000 =	0,11040	
	B0111000	m3	Aigua	0,018 x 1,60000 =	0,02880	
	BR34J000	kg	Bioactivador microbià	0,020 x 6,39000 =	0,12780	
	BR361100	kg	Estabilitzant sintètic de base acrílica	0,032 x 8,06000 =	0,25792	
	BR3PAN00	kg	Encoixinament protector per a hidrosembres de fibra semicurta	0,160 x 0,90000 =	0,14400	
	BR3B6U00	kg	Adob mineral d'alliberament molt lent (15-8-11%+2MgO) GR o similar	0,020 x 0,80000 =	0,01600	
			Subtotal:		0,68492	0,68492

## JUSTIFICACIÓ DE PREUS

Pàg.: 75

### PARTIDES D'OBRA

NÚM	CODI	UA	DESCRIPCIÓ		PREU
				COST DIRECTE	1,13339
				DESPESES INDIRECTES 5,00 %	0,05667
				<b>COST EXECUCIÓ MATERIAL</b>	<b>1,19006</b>
<b>P-116</b>	<b>J4V1X1PN</b>	u	Unitat completa per la prova de càrrega del nou pont segons disseny aprovat.	<b>Rend.: 1,000</b>	<b>6.750,00 €</b>
				Unitats	Preu
				Parcial	Import
	Materials				
	BVA41XPN1	u	Unitat completa per la prova de càrrega del nou pont segons disseny aprovat.	1,000 x 6.428,57000 =	6.428,57000
				Subtotal:	6.428,57000
				COST DIRECTE	6.428,57000
				DESPESES INDIRECTES 5,00 %	321,42850
				<b>COST EXECUCIÓ MATERIAL</b>	<b>6.749,99850</b>
<b>P-117</b>	<b>PPA0U001</b>	pa	Partida alçada de cobrament íntegre per a la seguretat vial, senyalització, abalisament i desviaments provisionals durant l'execució de les obres, segons indicació de la Direcció de l'Obra	<b>Rend.: 1,000</b>	<b>24.799,10 €</b>
				COST DIRECTE	23.618,19048
				DESPESES INDIRECTES 5,00 %	1.180,90952
				<b>COST EXECUCIÓ MATERIAL</b>	<b>24.799,1000</b>
<b>P-118</b>	<b>PPA0U002</b>	pa	Partida alçada de cobrament íntegre per a la Seguretat i Salut de les obres.	<b>Rend.: 1,000</b>	<b>35.576,79 €</b>
				COST DIRECTE	33.882,65714
				DESPESES INDIRECTES 5,00 %	1.694,13286
				<b>COST EXECUCIÓ MATERIAL</b>	<b>35.576,7900</b>
<b>P-119</b>	<b>PPA0U003</b>	pa	Partida alçada de cobrament íntegre per a la Gestió de Residus de les obres.	<b>Rend.: 1,000</b>	<b>88.950,99 €</b>
				COST DIRECTE	84.715,22857
				DESPESES INDIRECTES 5,00 %	4.235,76143
				<b>COST EXECUCIÓ MATERIAL</b>	<b>88.950,9900</b>
<b>P-120</b>	<b>PPA0U006</b>	pa	Partida alçada de cobrament íntegre per al condicionament de quadre de control i maniobra de l'enllumenat públic existent, per adaptar-lo a l'ampliació de la línia d'enllumenat projectades, inclòs materials i connexions deixant l'instal·lació totalment acabada i provada.	<b>Rend.: 1,000</b>	<b>500,00 €</b>
				COST DIRECTE	476,19048
				DESPESES INDIRECTES 5,00 %	23,80952
				<b>COST EXECUCIÓ MATERIAL</b>	<b>500,0000</b>



## **Annex 19. Pla de control de qualitat**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **ÍNDEX**

<b>1</b>	<b>INTRODUCCIÓ.....</b>	<b>1</b>
1.1	DESCRIPCIÓ DEL PROJECTE .....	1
1.2	DADES GENERALS.....	1
1.3	CONDICIONANTS AMBIENTALS I D'EXECUCIÓ.....	2
1.3.1	Protecció de l'aigua subterrània .....	2
<b>2</b>	<b>IDENTIFICACIÓ I INTEGRACIÓ DELS ANTECEDENTS ADMINISTRATIUS I TÈCNICS.....</b>	<b>5</b>
2.1	TAULA D'IDENTIFICACIÓ I INTEGRACIÓ DE LES DADES DE PARTIDA .....	5
2.2	COMPLIMENT DE PRESCRIPCIONS AMBIENTALS. REQUERIMENTS AMBIENTALS APLICABLES.....	7
<b>3</b>	<b>ACTIVITATS IMPORTANTES A CONTROLAR .....</b>	<b>11</b>
<b>4</b>	<b>MATERIALS IMPORTANTES A CONTROLAR .....</b>	<b>14</b>
<b>5</b>	<b>PLA D'ASSAIGS.....</b>	<b>14</b>
<b>6</b>	<b>SITUACIONS D'EMERGÈNCIA AMBIENTAL.....</b>	<b>15</b>

APÈNDIX 1: PLA DE CONTROL DE QUALITAT

APÈNDIX 2: SITUACIONS D'EMERGÈNCIA AMBIENTAL



## 1 INTRODUCCIÓ

L'objecte del present annex és identificar els documents anteriors al present Projecte Constructiu amb incidència sobre el mateix i que s'han utilitzat com a punt de partida per a la seva elaboració, procedint a la integració en el present document dels condicionants existents.

### 1.1 DESCRIPCIÓ DEL PROJECTE

El projecte tracta sobre el condicionament d'un nou tram de la carretera GIP-5129 entre la intersecció de la N-260 i el PK 1+240 de la carretera existent. Les actuacions plantejades consisteixen en l'execució d'una nova variant que substitueixi l'actual travessia de la GIP-5129 i un nou pont sobre el riu Manol per tal de substituir el gual existent.

### 1.2 DADES GENERALS

Les obres del present projecte es situen íntegrament al terme municipal de Vilafant, a la comarca de l'Alt Empordà, província de Girona. El terme municipal de Vilafant té una extensió de 8,36 km<sup>2</sup> amb una població de 5.394 habitants. Es troba a una altitud de 54 metres i limita al sud amb el municipi de Santa Llogaia d'Àlguema, al sud-oest amb Borrassà, al nord-oest amb Avinyonet de Puigventós, al nord amb Llers i a l'est amb el municipi de Figueres que és capital de comarca.

Pel que fa al clima de la zona, la zona de projecte té un clima Mediterrani de tipus Prelitoral Nord. La distribució de la precipitació és irregular amb un total anual escàs d'aproximadament 700 mm. A l'estiu són freqüents les tempestes que provenen des del Pirineu Oriental i s'acosten cap a la tarda. Aquestes tempestes són de gran intensitat horària i diària i poden causar grans inundacions a la zona compresa entre els rius Manol, Muga i Llobregat d'Empordà. Els estius són força calorosos i els hiverns relativament freds i ventosos. Les temperatures màximes es produeixen als mesos de juliol i agost amb una temperatura màxima mitjana de prop de 29°C. Per altra banda, el mes més fred de l'any és gener amb una temperatura mínima mitjana de 4°C. D'aquesta manera, l'amplitud tèrmica es pot considerar alta. La tramuntana és el vent predominant a l'àmbit d'estudi. Aquest vent del nord, fred i sec bufa al llarg de tot l'any, tot i que es presenta amb particular incidència entre els mesos de novembre i març. Quan la tramuntana es presenta a l'estiu, especialment al mes de juny, pot comportar-se com un vent sec i caldejat, que es coneix amb el nom de Tramuntana calenta i pot contribuir a importants episodis d'incendis forestals.

La gran diversitat de la flora de l'Alt Empordà ve derivada pel seu clima i la seva geografia. La coincidència en un espai reduït d'ambients de muntanya i de plana, juntament amb la presència d'un sector d'aiguamolls i d'un extens litoral, proporciona una gran varietat d'hàbitats que són la base de la diversitat del paisatge vegetal de la comarca. La vegetació espontània dominant són els alzinars i les suredes, els boscos caducifolis de rouredes i fagedes en els indrets més humits i

plujosos, i els matollars, prats i herbeis a la plana litoral i al fons de les planes al·luvials. A més, a la plana i a la terra baixa bona part dels alzinars han estat substituïts per terres de conreu.

La principal fauna de l'Alt Empordà es compon d'una gran varietat de comunitats faunístiques importants i singulars, de tipus invertebrada, herpetològica (amfibis i rèptils), ornitològica (aus), peixos i, finalment, mamífers. A continuació es mostra un llistat de la fauna més singular classificada segons la seva comunitat faunística:

- Invertebrats: el cranc de riu autòcton, la sangonera, els musclos d'aigua dolça i algunes espècies marines com el llamàntol i la llagosta.
- Amfibis i rèptils: el tritó pirinenc, l'escurçó pirinenc, la granota roja, el lluert i altres espècies d'ofidis com la serp d'Esculapi i la serp verda i groga. A més, com a espècie marina cal destacar la presència de la tortuga mediterrània a les costes empordaneses.
- Aus: l'àguila daurada, l'esparver cendrós, el xoriguer petit, la trenca i l'àguila cuabarrada que es localitza als penya-segats septentrionals de la comarca. Finalment, cal esmentar que, tot i que no se n'hagi vist cap, bona part del sector oest de l'Alt Empordà està inclòs en la delimitació de l'àrea afectada pel Pla de recuperació del trencalòs a Catalunya.
- Peixos: la truita comuna, la carpa, el joell, les llises, les anguilles, el barb de muntanya i el fartet com a espècies d'aigua dolça que es troben en alguns indrets com l'embassament de Boadella, els aiguamolls de l'Empordà i alguns cursos hídrics com la Muga. Com a espècies marines, d'entre totes les presents a les costes empordaneses, cal destacar el sard, l'oblada, la salpa, l'escòrpora i el nero o anfós, sense oblidar l'observació del pas del tauró pelegrí en les seves rutes migratòries.
- Mamífers: el mufló, el cérvol, el porc senglar, la llebre o la guineu, a més de races domèstiques autòctones com la vaca fagina, la vaca marinera, el guarà català i la gallina empordanesa.

Des del punt de vista geològic, la zona d'estudi queda emmarcada dintre de la Depressió tectònica de l'Empordà, a cavall del marge est de la conca de l'Ebre o Depressió Central Catalana. La Depressió de l'Empordà correspon a una fossa tectònica, producte de l'etapa distensiva que afectà al marge mediterrani durant el Neogen i que produí l'enfonsament i el vasculament relatiu dels diferents blocs que han originat el sistema de fosses alineades a la costa.

A la zona estudiada, els materials que formen el reblliment de la Depressió de l'Empordà corresponen bàsicament a lutites vermelles amb gresos i conglomerats.

**Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol**

A continuació es descriuen les característiques geològiques principals dels materials existents al llarg de la traça:

- Quaternari
  - o Qt1. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites (Holocè).
  - o Qt2. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites. Plistocè terminal (Holocè basal).
  - o Qt3. Dipòsit al·luvial de la terrassa fluvial del riu Manol. Graves, sorres i lutites. Plistocè superior.
  - o Qc. Dipòsit col·luvial. Argiles, sorres i llims. (Holocè).
- Terciari
  - o NPLg. Fàcies de ventall al·luvial proximal del ventall al·luvial de Llers. Graves i sorres amb trams d'argiles. (Pliocè).
  - o NPFa. Fàcies de plana al·luvial del Fluvià. Lutites ocres i vermelles amb trams de gresos i conglomerats. (Pliocè superior).

En l'àmbit de projecte no hi ha cap espai inclòs dins del Pla d'Espais d'Interès Natural ni de la Xarxa Natura 2000.

### 1.3 **CONDICIONANTS AMBIENTALS I D'EXECUCIÓ**

Els condicionants ambientals i d'execució a tenir en compte a l'obra vindran determinants per les característiques del projecte (ubicació, treballs a realitzar...).

L'àmbit de l'obra té caràcter amb sensibilitat ambiental variable en el seu traçat. S'haurà de tenir especial atenció en la localització d'abocadors i un control de vessaments procedents de les activitats dels treballs per a l'execució de les obres.

El projecte també obliga a prendre un seguit de mesures correctores relacionades amb les activitats de les pròpies empreses i que han de formar part del seu sistema de gestió ambiental. Una de les principals mesures correctores contemplades en el projecte està relacionada amb la protecció de l'aigua subterrània.

#### 1.3.1 **Protecció de l'aigua subterrània**

##### Introducció

La construcció de la fonamentació de la pila 1 del viaducte amb encepats i pilons implica l'excavació per sota del nivell freàtic.

Aquesta construcció per sota del nivell freàtic implica la instal·lació d'un recinte de palplanxes recuperables de 3 m de fondària i el bombament de l'aigua subterrània del seu interior per tal d'executar els pilons i encepats.

L'aigua bombejada patirà una contaminació principalment amb partícules en suspensió degut als treballs d'excavació i buidat del recinte de palplanxes.

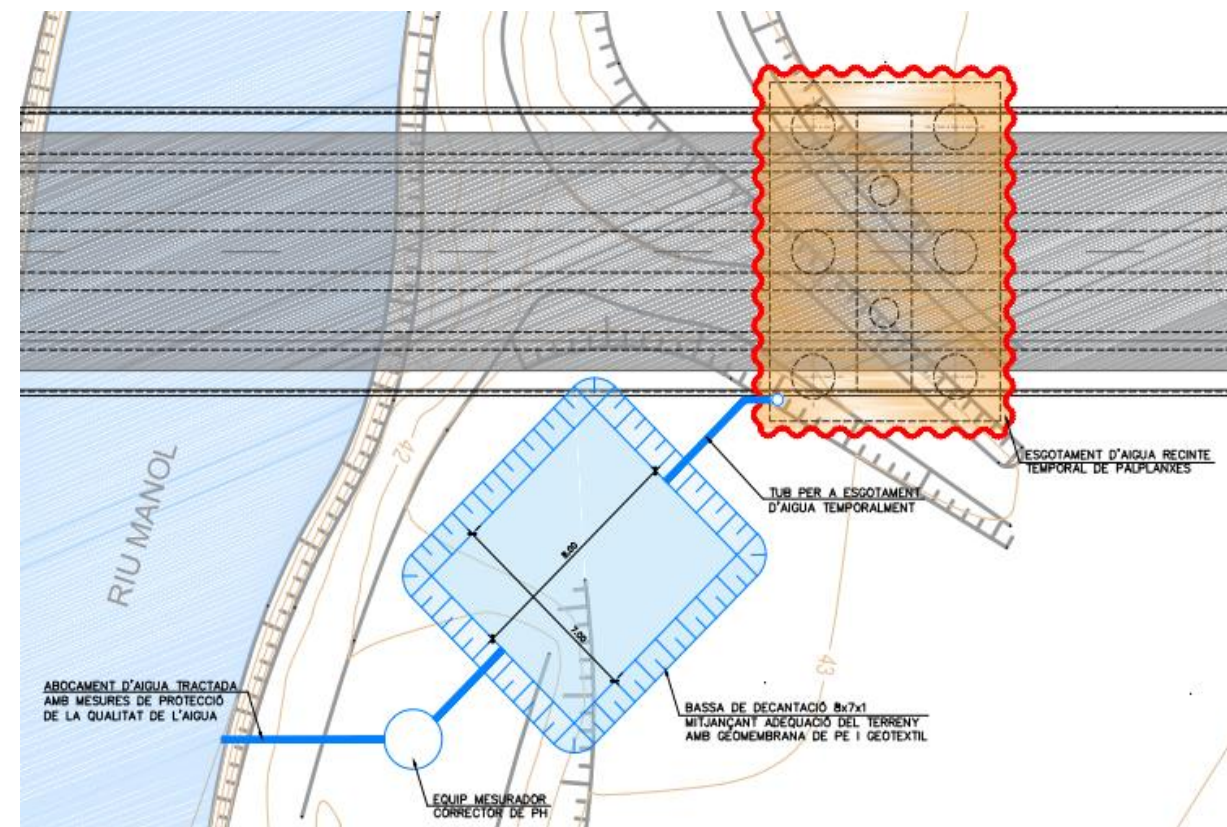
Es projecta un sistema de depuració de l'aigua com a mesura correctora d'impacte ambiental amb l'objectiu de garantir la qualitat de l'aigua abans de que es retorni a l'aigua.

##### Descripció del sistema de depuració d'aigua

La construcció del viaducte pot provocar una contaminació de l'aigua de bombament. El tipus de contaminació que es preveu és de material en suspensió i increment del pH. El sistema de tractament per aquesta contaminació que es basa en disminuir l'augment de pH provocat i decantar els sediments en suspensió.

La solució escollida es la col·locació d'una bassa de decantació col·locada en les proximitats i un sistema de mesura i correcció de pH per a poder tornar l'aigua al sistema de drenatge natural.

A continuació s'extreu l'aigua per bombament es traspassa a la bassa de decantació on es sedimenten les partícules.



Sistema de protecció de l'aigua subterrània bombejada al recinte de palplanxes de la fonamentació de la pila 1 del viaducte.

El sistema utilitzat per a la decantació de partícules és més variable i depèn del tipus d'afluent a tractar. En el cas que ens ocupa i per experiències similars pensem que n'hi haurà prou amb una simple decantació.

Després es mesura el pH i es corregeix en cas de que sigui necessari. El sistema utilitzat darrerament per a rebaixar el pH de l'aigua és mitjançant la injecció de CO<sub>2</sub>. El CO<sub>2</sub> actua com a tampó. Les avantatges d'aquest sistema davant d'altres sistemes tradicionals com ara l'adició d'àcid a l'aigua és la disminució de maneig amb substàncies tòxiques.

Un cop depurada l'aigua provinent del recinte de palplanxes es retorna l'aigua al sistema de drenatge natural de la zona, en aquest cas es retorna directament al riu Manol.

#### Dimensionament de la bassa de decantació

El dimensionament de la bassa de decantació implica dos càlculs:

- Determinació del cabal de bombament del recinte de palplanxes
- Determinació de les dimensions de la bassa de decantació pel cabal determinat.

##### 1- Determinació del cabal de bombament del recinte de palplanxes

Per al càlcul del cabal a extreure del recinte de palplanxes es considera una geometria quadrada de dimensions 8 x 8 m.

La fórmula per al càlcul del cabal de bombament d'un recinte quadrat s'ha extret de la ROM 0,5-05 (*Recomendaciones Geotécnicas para Obras Marítimes y Portuarias ; Ministerio de Fomento Puertos del Estado*) i és:

$$Q = 1,4 \cdot K2 \cdot h \cdot n \cdot B$$

on:

Q = Cabal d'esgotament (m<sup>3</sup>/s)

K2 = Permeabilitat (m/s)

h= Pèrdua de càrrega (m)

n = Número adimensional que depèn de la geometria del medi

B= Longitud de la paret del recinte (m)

i amb uns valors de:

$$K2 = 10^{-3} \text{ m/s}$$

$$h = 3,2 \text{ m}$$

$$n = 0,9$$

$$B = 8 \text{ m}$$

$$Q = 1,4 \cdot 10^{-3} \cdot 3,2 \cdot 0,9 \cdot 8 = 0,0323 \text{ m}^3/\text{s} = 32,3 \text{ L/s}$$

El cabal d'esgotament del recinte serà de 32,3 litres per segon i per tant aquest serà el cabal de bombament necessari.

##### 2- Determinació de les dimensions de la bassa de decantació

Per a calcular l'àrea mínima de la bassa de decantació s'utilitza la següent fórmula:

$$A = 1,2 \cdot Q/Vs$$

on:

A= Àrea requerida per la bassa (m<sup>2</sup>)

Q= Cabal màxim que entra a la bassa (m<sup>3</sup>/s)

Vs= Velocitat de caiguda de les partícules (m/s)

Per a calcular la velocitat de sedimentació o de caiguda d'una partícula s'utilitza la Llei de Stokes:

$$Vs = (g / 18 \cdot \mu) \cdot (S - 1) \cdot D^2$$

on:

Vs= Velocitat de caiguda (m/s)

g= Acceleració de la gravetat (cm/s<sup>2</sup>)

μ= Viscositat cinemàtica de l'aigua (cm<sup>2</sup>/s)

S= Pes específic de la partícula (g/cm<sup>3</sup>)

D= Diàmetre de la partícula (cm)

i amb uns valors de:

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

$$g = 981 \text{ cm/s}^2$$
$$\mu = 0,1308 \text{ cm}^2/\text{s}$$
$$S = 2,65 \text{ g/cm}^3$$
$$D = 0,01 \text{ cm}$$
$$V_s = (981 / 18 \cdot 0,1308) \cdot (2,65 - 1) \cdot 0,012 = 0,06875 \text{ cm/s} = 0,0006875 \text{ m/s}$$

De manera que l'àrea mínima de la bassa és:

$$A = 1,2 \cdot 0,0323 / 0,0006785 = 56,3 \text{ m}^2$$

Pel que fa a la capacitat de la bassa de decantació (volum mínim), aquesta pot ser determinada mitjançant el temps de permanència de l'aigua a la bassa:

$$V = Q \cdot Tr$$

on:

$$V = \text{Capacitat de la bassa de decantació (m}^3\text{)}$$
$$Q = \text{Cabal màxim que entra a la bassa (m}^3\text{/s)}$$
$$Tr = \text{Temps de permanència de l'aigua a la bassa (s)}$$

Per a calcular el temps de permanència de l'aigua a la bassa s'utilitza la següent fórmula:

$$Tr = H / V_s$$

on:

$$H = \text{Alçada mitja de la bassa (m)}$$
$$V_s = \text{Velocitat de caiguda (m/s)}$$

Considerant una alçada de la bassa de 1 metre, es dedueix un valor de Tr de 1.45 segons, i per tant el volum mínim de la bassa serà:

$$V = 0,0323 \cdot 1454,55 = 46,92 \text{ m}^3$$

D'acord amb aquest volum mínim i l'alçada considerada  $h = 1 \text{ m}$ , les dimensions de la bassa seran  $a = 8 \text{ m}$  i  $b = 7 \text{ m}$ , de manera que la superfície ocupada per la bassa serà de  $56 \text{ m}^2$  i el volum de la bassa de  $56 \text{ m}^3$ , de manera que es compleixen amb les dimensions mínimes de superfície i volum determinades anteriorment.

La bassa s'excavarà amb talussos 1H:1V la qual cosa implica un lleuger increment de volum perimetral.

DIMENSIONS BASSA DE DECANTACIÓ:

- Ample: 7,0 m
- Llarg: 8,0 m
- Alçada: 1,0 m
- Talús perimetral: 1H:1V (45°)

En la bassa excavada es farà una adequació de la superfície per a la impermeabilització de bassa de decantació amb geomembrana de PE de gruix mínim 1.5 mm, reforçada amb geotèxtil no teixit de 120 g/m<sup>2</sup>.



## 2 IDENTIFICACIÓ I INTEGRACIÓ DELS ANTECEDENTS ADMINISTRATIUS I TÈCNICS

### 2.1 TAULA D'IDENTIFICACIÓ I INTEGRACIÓ DE LES DADES DE PARTIDA

Taula 1. Identificació i integració de les dades de partida.

	DOCUMENT	PRESCRIPCIÓ	INTEGRACIÓ DE LA PRESCRIPCIÓ
1	PPT 4152-2019	Longitud aproximada: 1100 metres	L'obra de condicionament del vial objecte del present estudi correspon a una nova variant de la carretera GIP-5129, des de la intersecció amb la N-260 fins al PK 1+240 de la via existent. Les obres de la nova variant comporten l'execució d'un nou pont sobre el riu Manol.
		<b>Paràmetres de disseny</b> Tipus de xarxa: Local Tipus de via: Carretera convencional 1+1 Tipus de terreny: Accidentat Velocitat de projecte: 60 km/h	S'han tingut en compte aquestes prescripcions al llarg de la redacció de tot el projecte. A l' <i>Annex Traçat i replanteig</i> , es descriu el traçat en planta i en alçat de la nova obra projectada.
		<b>Estudi de les següents actuacions</b> Secció tipus: implantació d'una secció 6/7. Senyalització i abalisament: instal·lació i/o substitució de l'existent. Sistemes de contenció: instal·lació de nous sistemes de contenció que garanteixin la seguretat viària al llarg del traçat de la nova variant. Ferm: dimensionament d'un nou paquet de ferm compatible amb el trànsit de la via. Drenatge: nou drenatge longitudinal i modelització hidràulica del pont sobre el riu Manol.	S'han tingut en compte aquestes prescripcions al llarg de la redacció de tot el projecte. A l' <i>Annex Senyalització</i> es descriuen els elements necessaris de indicació a implantar en l'obra. A l' <i>Annex Ferms i paviments</i> es defineixen les seccions de ferms del tronc de la futura variant i de la rotonda amb la N-260. A l' <i>Annex Hidrologia i drenatge</i> es defineixen les futures obres de drenatge ubicades al llarg de tot el traçat de l'obra per assegurar la seguretat de la carretera. Es defineixen els cabals associats a les conques que intercepta la nova variant i es realitza la modelització del nou pont sobre el riu Manol per tal d'analitzar la sobrelevació provocada. A l' <i>Annex Traçat i replanteig</i> , es descriu el traçat en planta i en alçat de la nova obra projectada.
		<b>Condicionants a tenir en compte</b> Aplicació de la Norma 6.3 IC 'Rehabilitació de ferms' i el Plec de Prescripcions Tècniques Generals per Obres de Carreteres i Ponts PG 3/75, especialment els articles 542 i 543. Aplicació dels articles del PG-3 i si s'escau del PG-4 per les particularitats del reciclatge del ferm. Justificar en tot cas les variacions o adaptacions que hagin estat necessàries introduir per adaptar-les a les particularitats pròpies d'aquest tram de carretera. On no es plantegi realitzar el tractament de reciclat, les reparacions prèvies a fer en les zones més deteriorades seran fressats i reposicions de ferm amb aglomerat asfàltic. On sigui evident un flonjall, es procedirà a un saneig tenint present la problemàtica pel trànsit que suposa l'execució i el drenatge de la nova secció de ferm.	A l' <i>Annex Ferms i paviments</i> es realitza un estudi del trànsit detallat per a determinar la categoria de trànsit de la via a executar, i dimensionar el ferm segons aquest criteri. A l' <i>Annex Ferms i paviments</i> es defineixen les seccions de ferms del nou vial i dels enllaços. En el <i>Document 2. Plànols</i> es detalla la nova senyalització, abalisament i defenses proposades.

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

DOCUMENT	PRESCRIPCIÓ	INTEGRACIÓ DE LA PRESCRIPCIÓ
	Estudi de l'abalisament existent; plantejament de diferents modificacions d'acord amb la <i>INSTRUCCIÓ DGIM/03/2017</i> sobre criteris d'abalisament.	A l' <i>Annex Senyalització</i> es descriuen els elements necessaris d'indicació a implantar en l'obra.
	Estudi i contrast dels accessos de la via en el tram.	A l' <i>Annex Traçat i replanteig</i> , es descriu el traçat en planta i en alçat de la nova obra projectada.
	Els mètodes constructius proposats hauran de reduir al mínim l'afectació a la via durant l'execució dels treballs; s'estudiarà amb especial cura els desviaments de trànsit necessaris per a l'execució de les obres i s'inclouran aquests conceptes a la partida alçada corresponent.	A l' <i>Annex Organització de les obres</i> es defineixen les fases per a l'execució de les obres de millora i els desviaments necessaris per garantir la circulació pel tronc principal i l'accés als enllaços amb les carreteres contigües a la GIP-5129.
	Per a l'execució de les actuacions de capa de rodament, fressat i les que afectin al trànsit en general, s'hauran d'especificar a la memòria, pla de control de qualitat i plec de prescripcions tècniques particulars les condicions necessàries per fixar-ne la seva execució i abonament.	A l' <i>Annex Ferms i paviments</i> es defineixen les seccions de ferms dels nous carrils i dels enllaços a executar.
	Caracterització del trànsit.	A l' <i>Annex de Ferms i paviments</i> es realitza un estudi del trànsit detallat per a determinar la categoria de trànsit de les vies afectades.
	Estudi específic de la senyalització vertical i horitzontal existent; anàlisi del compliment de la normativa vigent i reestudi de les limitacions de velocitats existents	A l' <i>Annex Senyalització</i> es descriuen els elements necessaris d'indicació a implantar a l'obra
	Estudi de l'afectació dels Serveis existents en el tram d'actuació.	A l' <i>Annex Serveis Afectats</i> es descriu l'estudi realitzat entorn a les instal·lacions i serveis afectats, siguin públics o privats, per les obres del projecte.
	Estudi de totes les superfícies de finques que siguin objecte d'una possible expropiació.	A l' <i>Annex Expropiacions</i> s'estima el valor dels bens i drets afectats a conseqüència de l'execució del present Projecte Constructiu.

## 2.2 COMPLIMENT DE PRESCRIPCIONS AMBIENTALS. REQUERIMENTS AMBIENTALS APLICABLES

Taula 2. Impactes ambientals i mesures correctores d'impacte ambiental.

POSSIBLES IMPACTES	LEGISLACIÓ	MESURES CORRECTORES	REQUERIMENT PQMA
<b>ATMOSFERA</b>			
Contaminació lumínica	No aplicable.		
Emissions de pols	<b>Real Decret 202/1994</b> pel qual es regula la Inspecció Tècnica de Vehicles.	A l'Annex d'Estudi de Seguretat i Salut i s'han disposat les mesures per evitar o disminuir la generació de pols a l'obra.	Especificar les mesures correctores per disminuir la producció de pols durant l'execució de les obres.
Residus	<p><b>Real Decret 833/1988</b>, del 20 de juliol, per el que s'aprova el Reglament per a l'execució de la Llei 20/1986, bàsica de residus tòxics i perillosos.</p> <p><b>Ordre del 28 de febrer de 1989</b>, per el que es regula la gestió d'olis emprats.</p> <p><b>Real Decret 952/1997</b>, del 20 de juny, per el que es modifica el Reglament per a la execució de la Llei 20/1986, del 14 de maig, bàsica de residus tòxics i perillosos, aprovada mitjançant el Real Decret 833/1988, del 20 de juliol.</p> <p><b>Llei 10/1998</b>, de 21 d'abril, de Residus.</p> <p><b>Ordre MAM/304/02</b>, del 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus.</p> <p><b>Ordre del 6 de setembre de 1988</b>, sobre prescripcions en el tractament i eliminació d'olis emprats.</p> <p><b>Llei 6/1993</b>, del 15 de juliol, reguladora dels Residus.</p> <p><b>Decret 201/1994</b>, del 26 de juliol, regulador de les runes i altres residus de la construcció.</p> <p><b>Decret 1/1997</b>, del 7 de gener, sobre la disposició de rebuig dels residus en dipòsits controlats.</p> <p><b>Decret 93/1999</b>, del 6 d'abril, sobre procediments de gestió de residus.</p> <p><b>Decret 161/2001</b>, del 12 de juny, de modificació del Decret 201/1994, del 26 de juliol, regulador dels enderrocs i altres residus de la construcció.</p> <p><b>Decret 219/2001</b>, de l'1 d'agost, pel qual es deroga la disposició addicional tercera del Decret 93/1999, del 6 d'abril, sobre procediments de gestió de residus.</p> <p><b>Llei 15/2003</b>, del 13 de juny, de modificació de la Llei 6/1993, del 15 de juliol, reguladora de residus.</p> <p>El Reglament Metropolità per a la Gestió dels Enderrocs, les Runes i altres residus de la Construcció, aprovat el Consell Metropolità el 6 de febrer de 1997.</p>	<ul style="list-style-type: none"> <li>- Dissenyar considerant la reutilització i reciclatge dels materials de l'obra, quan siguin adequats i no contradiguin la normativa tècnica constructiva. Preveure'n l'aprofitament en la desconstrucció.</li> <li>- Fomentar la utilització de materials que disposin de certificat de qualitat, distintiu de garantia de qualitat ambiental o similar.</li> <li>- Potenciar la utilització de solucions constructives que redueixin o facilitin el manteniment. Utilitzar materials de llarga durabilitat.</li> <li>- Utilitzar components que incorporin algun material reciclat: pneumàtics, llots de depuradora, cendres, reutilització de runes de la pròpia obra, etc.</li> <li>- Avaluar la toxicitat dels materials a utilitzar i actuar al respecte per reduir-ne l'impacte (betums, emulsions, aerosols, fibrociments, CFC's...).</li> <li>- Potenciar l'ús de materials autòctons de la zona.</li> <li>- Integrar l'obra a l'entorn considerant els materials utilitzats en: tipologies d'estructures, excavacions i terraplens, reblerts, etc. L'objectiu és la minimització de l'impacte visual que pugui generar l'obra.</li> <li>- Avaluar i minimitzar els residus generats per les solucions constructives escollides.</li> </ul>	<ul style="list-style-type: none"> <li>-S'identificaran els materials que puguin ser reutilitzats.</li> <li>El contractista haurà de presentar els certificats de qualitat o distintiu de garantia de qualitat ambiental dels materials utilitzats. En el plec de condicions tècniques particulars es definiran les característiques que han de complir els materials.</li> <li>- Tots els materials utilitzats en el Projecte compleixen la normativa existent en matèria de qualitat però també a nivell de durabilitat i resistència als actes vandàlics. A més, les seves característiques permeten el seu reciclatge.</li> <li>- No es preveu l'ús de productes tòxics o contaminants.</li> <li>- Els materials utilitzats a la obra seran dels proveïdors més propers.</li> <li>- Els materials s'escolliran per a que es mantingui la coherència amb l'entorn.</li> </ul>
Energia	Ordenança general del medi ambient.	Afavorir la minimització del consum energètic durant l'execució de les obres de millora.	



POSSIBLES IMPACTES	LEGISLACIÓ	MESURES CORRECTORES	REQUERIMENT PQMA
<b>SOROLL</b>			
Contaminació acústica	<p><b>Real Decret 1367/2007</b>, de 19 d'octubre, pel qual es desenvolupa la Llei 37/2003, de 17 de novembre, del soroll, referent a la zonificació acústica, objectius de qualitat i emissions acústiques.</p> <p><b>Real Decret 524/2006</b>, de 28 d'abril de 2006, pel qual es modifica el Real Decret de 212/2002, de 22 de febrer, pel qual es regulen les emissions sonores a l'entorn relacionades amb determinades màquines de l'ús a l'aire lliure.</p> <p><b>Real Decret 1513/2005</b>, de 16 de desembre, pel qual es desenvolupa la Llei 37/2003, de 17 de novembre, del soroll, referent a l'avaluació i gestió del soroll ambiental. BOE Núm. 301.</p> <p><b>Llei 37/2003</b>, de 17 de novembre, del soroll. BOE Núm. 276.</p> <p><b>Llei 16/2002</b>, de 28 de juny de 2002, de protecció contra la contaminació acústica. DOGC Núm. 3675.</p> <p><b>Real Decret 212/2002</b>, de 22 de febrer, pel qual es regulen les emissions sonores a l'entorn degudes a determinades màquines d'ús a l'aire lliure, d'acord a l'estipulat a la Directiva 2000/14/CE del Consell i del Parlament Europeu, de 8 de maig, amb la finalitat de contribuir a facilitar el funcionament del mercat interior a la Unió Europea i a protegir la salut i el benestar de les persones.</p> <p><b>Decret 199/1995</b>, de 16 de maig, d'aprovació dels mapes de vulnerabilitat i capacitat del territori pel que fa a la contaminació atmosfèrica. DOGC Núm.2077.</p> <p><b>RESOLUCIÓ DE 30 D'OCTUBRE DE 1995</b>, per la qual s'aprova una ordenança municipal tipus, reguladora del soroll i les vibracions. DOGC Núm. 4126.</p> <p><b>Real Decret 2042/1994</b>, de 14 d'octubre, pel qual es regula la Inspecció Tècnica de Vehicles. BOE Núm. 275.</p>	A l'Annex d'Estudi de Seguretat i Salut es descriuen les mesures per a minimitzar les molèsties sobre la població.	Especificar les mesures correctores per respectar els límits acústics normatius vigents.
Vibracions	<p><b>Resolució de 30 d'octubre de 1995</b>, per la qual s'aprova una ordenança municipal tipus, reguladora del soroll i de les vibracions. DOGC Núm. 4126.</p> <p><b>Real Decret 2042/1994</b>, de 14 d'octubre, pel qual es regula la Inspecció Tècnica de Vehicles. BOE Núm. 275.</p>	A l'Annex d'Estudi de Seguretat i Salut es descriuen les mesures per a minimitzar les molèsties sobre l'àmbit públic.	Especificar les mesures correctores per respectar els límits acústics normatius vigents.
<b>MEDI HÍDRIC</b>			
Afectació a cabals ambientals	No aplicable.		
Afectació a cursos fluvials	No aplicable.		
Afectació aqüífers	No aplicable.		
Afectació a aqüífers protegits o hidrologia subterrània	No aplicable.		
<b>VEGETACIÓ</b>			
Afectació HICs	No aplicable.		

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

POSSIBLES IMPACTES	LEGISLACIÓ	MESURES CORRECTORES	REQUERIMENT PQMA
Afectació a vegetació	<b>Llei 8/2005</b> Protecció, Gestió i Ordenació del Paisatge.	Revegetació, control de l'erosió i integració paisatgística: minimització de l'afectació durant les obres, revegetació de superfícies denudades o neoformades, hidrosembra, plantació d'arbres i arbustos, adequació morfològica dels talussos, restauració de zones de ribera, adequació de zones en els enllaços.	
Incendis forestals	<b>Decret 130/1998</b> de mesures de prevenció d'incendis forestals en les àrees d'influència de carreteres.	Gestió dels productes de tala i esbrossada. Manteniment de franges lliures de vegetació. A l' <i>Annex d'Estudi de Seguretat i Salut</i> es descriuen les mesures de prevenció i protecció contra incendis.	
<b>GEOLOGIA</b>			
Balanç de terres	<b>Decret 161/2001</b> , de 12 de juny, de modificació del Decret 201/1994, de 26 de juliol, regulador dels enderroc i altres residus de la construcció. El Reglament Metropolità per a la Gestió dels Enderrocs, les Runes i altres residus de la Construcció, aprovat el Consell Metropolità el 6 de febrer de 1997.	Quantificar els sobrants de terres (desmunts, terraplens, reblerts i excavacions). A l' <i>Annex Moviment de Terres</i> es descriu el balanç de terres que es produirà a l'obra tenint en compte el volum de desmunts i terraplens, així com els reblerts i les excavacions.	S'ha de presentar la documentació de les canteres i dels abocadors legalitzats que s'usaran a l'obra.
Abocadors i préstecs	<b>Decret 161/2001</b> , de 12 de juny, de modificació del Decret 201/1994, de 26 de juliol, regulador dels enderroc i altres residus de la construcció. El Reglament Metropolità per a la Gestió dels Enderrocs, les Runes i altres residus de la Construcció, aprovat pel Consell Metropolità el 6 de febrer de 1997.	A l' <i>Annex de Gestió de Residus</i> s'aporta la informació dels gestors de residus propers a la zona d'actuació.	Escollir els abocadors tenint en compte la legislació vigent i la distància a l'obra.
Afectació a l'orografia de terreny	No aplicable.		
Contaminació al sòl	<b>Llei 6/1993</b> , de 15 de juliol, reguladora de Residus.	Durant la fase d'obra s'evitarà l'abocament dels residus generats per la maquinària d'obra i residus propis de l'obra, establint un sistema de gestió dels residus generats segons la legislació vigent. Les prioritats seran: - Impedir l'abocament d'olis, greixos en netejar els motors de la maquinària. - Impedir l'abocament del formigó i altres residus associats a l'obra. - Impedir l'abocament de qualsevol residu potencialment contaminant del sòl.	
<b>FAUNA</b>			

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

POSSIBLES IMPACTES	LEGISLACIÓ	MESURES CORRECTORES	REQUERIMENT PQMA
Afectació a fauna	No aplicable.		
Connectivitat	No aplicable.		
<b>ENP I ALTRES FIGURES D'INTERÈS CATALOGADES</b>			
Identificar	No aplicable.		
<b>PATRIMONI CULTURAL</b>			
Afectació jaciments arqueològics i paleontològics protegits	No aplicable.		
Afectació a elements del patrimoni arquitectònic	No aplicable.		
<b>PAISATGE</b>			
Impacte paisatgístic	No aplicable.		
<b>POBLACIÓ</b>			
Afectació a la població per la infraestructura	<b>Decret 135/1995 de 24 de març de la llei 20/1991</b> , de 25 de novembre, de promoció d'accessibilitat i supressió.	Es minimitzarà l'impacte acústic (junes d'obres de fàbrica que facin menys soroll, fer que les tapes de clavegueram no coincideixin amb els carrils de circulació, fer ús de paviments drenants, etc).	Es realitzarà un pla d'obres amb la zona afectada d'obra en cada una de les fases així com els itineraris per vianants i vehicles afectats per les obres, si resulten.

### 3 ACTIVITATS IMPORTANTES A CONTROLAR

Aquest apartat consisteix en identificar aquelles activitats crítiques o determinants que cal portar a terme en l'execució del present projecte.

A continuació es mostren els PPI seleccionats per cada PPI de cada activitat:

Activitat: (1) Moviment de terres	PE*
1 - PPI - (1.1) Excavació, esplanació en terreny de trànsit / de sòl	
1 - PI · (1.1.1) Comprovació del replanteig inicial	X
2 - PI · (1.1.2) Retirada del material i transport a la destinació adequada	
3 - PI · (1.1.3) Aplecs de terra vegetal	
4 - PI · (1.1.4) Comprovació del replanteig en execució	
5 - PI · (1.1.5) Caixa de paviment. Comprovació	X
6 - PI · (1.1.6) Geometria de talussos. Comprovació	
7 - PI · (1.1.7) Sanejament a fons de desmunt. Comprovació de fons d'excavació	
8 - PI · (1.1.8) Sanejament de talussos. Comprovació	
2 - PPI - (1.2) Terraplens i pedraplens	
1 - PI · (1.2.1) Comprovació del replanteig inicial	X
2 - PI · (1.2.2) Comprovació del replanteig en execució	
3 - PI · (1.2.3) Assentaments de vessants amb P>10%	
4 - PI · (1.2.4) Procedència i descàrrega del material	
5 - PI · (1.2.5) Comprovació resultats assaigs de compactació	X
6 - PI · (1.2.6) Comprovació de la superfície final	
7 - PI · (1.2.7) Comprovació de la geometria dels talussos	
3 - PPI - (1.3) Excavació i reblert de rases i fonamentacions	
1 - PI · (1.3.1) Comprovació del replanteig	X
2 - PI · (1.3.2) Excavació	
3 - PI · (1.3.3) Comprovació de les cotes finals	
4 - PI · (1.3.4) Qualitat del terreny de fons	
5 - PI · (1.3.5) Extensió del material dels reblerts localitzats	X
6 - PI · (1.3.6) Compactació dels reblerts localitzats	
7 - PI · (1.3.7) Realització dels assaigs	
8 - PI · (1.3.8) Comprovació dels resultats	
Activitat: (5) Drenatge	PE*
1 - PPI - (5.1) Drenatge longitudinal	
1 - PI · (5.1.1) Comprovació del fons excavació de cunetes	X
2 - PI · (5.1.2) Cunetes revestides amb formigó: controlar gruix i distància entre juntes transversals	
3 - PI · (5.1.3) Comprovar que no faltin arquetes i connexions amb baixants	
4 - PI · (5.1.4) Comprovar que el tipus de tub per col·locar és requerit en aquesta zona	
5 - PI · (5.1.5) Fons excavació per a tub col·lector: comprovació de la cota i pendent del llit d'assentament del tub	X
6 - PI · (5.1.6) Comprovació de l'alineació i la rasant del tub	
7 - PI · (5.1.7) Comprovar que estan totes les arquetes i pous. Comprovar la correcta col·locació de les juntes entre tubs i les juntes d'unió amb arquetes i pous i que aquestes siguin estanques	
8 - PI · (5.1.8) Comprovar la compactació del reblert de la rasa sense fer malbé el tub, evitant elements durs i angulosos	

9 - PI · (5.1.9) Realització dels assaigs	
10 - PI · (5.1.10) Comprovació de resultats	
2 - PPI - (5.2) Drenatge transversal. Tubs i canonades	
1 - PI · (5.2.1) Comprovar que el tipus de tub a col·locar és el requerit en aquella zona	
2 - PI · (5.2.2) Fons excavació per a tubs: comprovació de la cota i pendent del llit d'assentament del tub	X
3 - PI · (5.2.3) Comprovació de l'alineació i la rasant del tub col·locat	X
4 - PI · (5.2.4) Comprovar que estan totes les arquetes i pous. Comprovar la correcta col·locació de les juntes d'entroncament amb arquetes i pous i que aquestes siguin estanques	
5 - PI · (5.2.5) Comprovar la compactació del reblert de la rasa sense fer malbé el tub, evitant elements durs i angulosos	
6 - PI · (5.2.6) Realització dels assaigs	
7 - PI · (5.2.7) Comprovació de resultats	

Activitat: (6) Estructures	PE*
1 - PPI - (6.1) Pylons in situ	
1 - PI · (6.1.1) Comprovació del replanteig de l'eix del piló	X
2 - PI · (6.1.2) Perforació	
3 - PI · (6.1.3) Armat del piló	X
4 - PI · (6.1.4) Formigonat del piló	
5 - PI · (6.1.5) Escapçament	
6 - PI · (6.1.6) Comprovació de la posició del pilot escapçat	
7 - PI · (6.1.7) Presa de mostres per fer assaigs	
8 - PI · (6.1.8) Comprovació de resultats	
2 - PPI - (6.2) Micropilons	
1 - PI · (6.2.1) Comprovació del replanteig	X
2 - PI · (6.2.2) Perforació	
3 - PI · (6.2.3) Armat del micropiló	X
4 - PI · (6.2.4) Injecció del morter	
5 - PI · (6.2.5) Comprovació de la posició del micropiló	
6 - PI · (6.2.6) Presa de mostres per fer assaigs	
7 - PI · (6.2.7) Comprovació de resultats	
3 - PPI - (6.3) Murs pantalla in situ	
1 - PI · (6.3.1) Comprovació del replanteig i traçat dels murets guia	X
2 - PI · (6.3.2) Comprovació dels murets guia i la seva alineació en cada panell	
3 - PI · (6.3.3) Comprovació geomètrica de l'excavació	
4 - PI · (6.3.4) Comprovació de l'estabilitat del terreny d'excavació	
5 - PI · (6.3.5) Comprovació de les armadures de les gàbies	X
6 - PI · (6.3.6) Formigonat	
7 - PI · (6.3.7) Comprovació d'armadures de la biga de lligat	
8 - PI · (6.3.8) Presa de mostres per fer assaigs	
9 - PI · (6.3.9) Comprovació de resultats	
4 - PPI - (6.4) Fonamentacions superficials	
1 - PI · (6.4.1) Comprovació del replanteig inicial	X
2 - PI · (6.4.2) Dimensions d'excavació	
3 - PI · (6.4.3) Compactació	
4 - PI · (6.4.4) Estabilitat de talussos d'excavació	
5 - PI · (6.4.5) Cota formigó de neteja	
6 - PI · (6.4.6) Comprovació replanteig inicial de l'encofrat	
7 - PI · (6.4.7) Resistència i estabilitat de l'encofrat	
8 - PI · (6.4.8) Detalls de l'encofrat	
9 - PI · (6.4.9) Comprovació de les armadures	X
10 - PI · (6.4.10) Formigonat	

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

11 - PI · (6.4.11) Juntes de formigonat	
12 - PI · (6.4.12) Superfície de formigó acabat	
13 - PI · (6.4.13) Geometria final	
14 - PI · (6.4.14) Presa de mostres per fer assaigs	
15 - PI · (6.4.15) Comprovació de resultats	
5 - PPI - (6.5) Estreps	
1 - PI · (6.5.1) Comprovació cota inferior de sabata i eixos	X
2 - PI · (6.5.2) Comprovació replanteig inicial de l'encofrat	
3 - PI · (6.5.3) Resistència i estabilitat de l'encofrat	
4 - PI · (6.5.4) Detalls de l'encofrat	
5 - PI · (6.5.5) Comprovació de les armadures	X
6 - PI · (6.5.6) Formigonat	
7 - PI · (6.5.7) Juntes de formigonat	
8 - PI · (6.5.8) Superfície de formigó acabat	
9 - PI · (6.5.9) Geometria final	
10 - PI · (6.5.10) Presa de mostres per fer assaigs	
11 - PI · (6.5.11) Comprovació de resultats	
6 - PPI - (6.6) Lloses in situ	
1 - PI · (6.6.1) Comprovació del replanteig inicial	X
2 - PI · (6.6.2) Condicions particulars de recolzament dels cindris	
3 - PI · (6.6.3) Arriostament dels cindris	
4 - PI · (6.6.4) Cotes cindri, alçats en general i encofrat tauler	X
5 - PI · (6.6.5) Col·locació de recolzaments de neoprè	X
6 - PI · (6.6.6) Comprovar el replanteig inicial de l'encofrat	
7 - PI · (6.6.7) Resistència i estabilitat de l'encofrat	
8 - PI · (6.6.8) Detalls de l'encofrat	
9 - PI · (6.6.9) Comprovació de les armadures	X
10 - PI · (6.6.10) Armat general de les beines de les armadures actives	
11 - PI · (6.6.11) Posició de les beines de les armadures actives	X
12 - PI · (6.6.12) Enfilat de les armadures actives	
13 - PI · (6.6.13) Tesat de les armadures actives	X
14 - PI · (6.6.14) Injecció de les beines de les armadures actives	
15 - PI · (6.6.15) Juntes de formigonat	
16 - PI · (6.6.16) Superfície de formigó acabat	
17 - PI · (6.6.17) Geometria final	
18 - PI · (6.6.18) Presa de mostres per fer assaigs	
19 - PI · (6.6.19) Comprovació de resultats	
7 - PPI - (6.7) Tauler d'elements prefabricats	
1 - PI · (6.7.1) Comprovació del replanteig inicial	X
2 - PI · (6.7.2) Col·locació recolzaments de neoprè	X
3 - PI · (6.7.3) Comprovació del replanteig des prefabricats de formigó	
4 - PI · (6.7.4) Superfície de recolzament dels prefabricats de formigó	
5 - PI · (6.7.5) Col·locació dels elements prefabricats de formigó	
6 - PI · (6.7.6) Juntes, si existeixen, dels prefabricats de formigó	
7 - PI · (6.7.7) Reblert dels laterals dels prefabricats de formigó	
8 - PI · (6.7.8) Comprovació de l'especejament d'armadures. Plantilles de les armadures passives.	
9 - PI · (6.7.9) Comprovació de les armadures passives	
10 - PI · (6.7.10) Col·locació de separadors de les armadures passives	
11 - PI · (6.7.11) Juntes de formigonat	
12 - PI · (6.7.12) Superfície de formigó acabat	
13 - PI · (6.7.13) Geometria final	
14 - PI · (6.7.14) Lloses de continuïtat	
15 - PI · (6.7.15) Replanteig impostes	
16 - PI · (6.7.16) Col·locació impostes	
17 - PI · (6.7.17) Realització dels assaigs	
18 - PI · (6.7.18) Comprovació de resultats	

**Activitat: (8) Fermes i paviments**

**PE\***

1 - PPI - (8.1) Estesa i compactació de tot-u natural i artificial	
1 - PI · (8.1.1) Comprovació del replanteig inicial	
2 - PI · (8.1.2) Anivellament i compactació de la capa inferior	X
3 - PI · (8.1.3) Procedència i aspecte del material	
4 - PI · (8.1.4) Aprovació, per part del laborant, de la compactació de la capa	
5 - PI · (8.1.5) Anivellament final	
6 - PI · (8.1.6) Presa de mostres per fer assaigs	
7 - PI · (8.1.7) Comprovació de resultats	
2 - PPI - (8.2) Estesa i compactació de M.B.C.	
1 - PI · (8.2.1) Anivellament de la capa inferior	
2 - PI · (8.2.2) Reg d'imprimació o d'adherència	X
3 - PI · (8.2.3) Anivellament i replanteig	
4 - PI · (8.2.4) Necessitat de junta longitudinal	
5 - PI · (8.2.5) Necessitat de junta transversal	
6 - PI · (8.2.6) Tractament de les juntes	
7 - PI · (8.2.7) Anivellament final	
8 - PI · (8.2.8) Realització dels assaigs	
9 - PI · (8.2.9) Comprovació de resultats	
3 - PPI - (8.3) Execució de paviments de vorera	
1 - PI · (8.3.1) Juntes entre costats. Talls nets i rectes	
2 - PI · (8.3.2) Planitud ± 6 mm	
3 - PI · (8.3.3) Juntes farcides de morter. Talls nets.	
4 - PI · (8.3.4) Presa de mostres per fer assaigs	
5 - PI · (8.3.5) Comprovació de resultats	

**Activitat: (9) Senyalització i abalisament**

**PE\***

1 - PPI - (9.1) Estesa i compactació de tot-u natural i artificial	
1 - PI · (9.1.1) Ample, llarg i disposició. Senyalització horitzontal	
2 - PI · (9.1.2) Dotació. Senyalització horitzontal	
3 - PI · (9.1.3) Comprovació del replanteig. Senyalització vertical	
4 - PI · (9.1.4) Fonamentació i ancoratges, Senyalització vertical	
5 - PI · (9.1.5) Elements col·locats. Senyalització vertical	
6 - PI · (9.1.6) Captafars, fites d'aresta, pals. Abalisament	
7 - PI · (9.1.7) Comprovació del replanteig. Barreres metàl·liques semirígides	
8 - PI · (9.1.8) Col·locació de la barrera. Barreres metàl·liques semirígides	
9 - PI · (9.1.9) Realització dels assaigs	
10 - PI · (9.1.10) Comprovació de resultats	

**Activitat: (10) Reparació de serveis, obres complementàries i altres**

**PE\***

1 - PPI - (10.1) Canalització de serveis	
1 - PI · (10.1.1) Comprovació de replanteig	
2 - PI · (10.1.2) Comprovació rasant fons d'excavació	
3 - PI · (10.1.3) Estabilitat de talussos i accessos al fons	
4 - PI · (10.1.4) Col·locació de serveis	
5 - PI · (10.1.5) Reblert i compactació	
6 - PI · (10.1.6) Realització dels assaigs	
7 - PI · (10.1.7) Comprovació de resultats	



**Activitat: (99) Gestió mediambiental de les activitats d'obra**

**PE\***

1 - PPI - (AX) EMISSIONS ATMOSFÈRIQUES

- 1 - PI · (AX101).01 Controlar que es rega mentre s'està enderrocant
- 2 - PI · (AX101).02 Controlar que es cobreix la zona de voladura per evitar projeccions
- 3 - PI · (AX102).01 Manipular, emmagatzemar i aplicar correctament les substàncies tòxiques per evitar l'emissió de substàncies tòxiques a l'atmosfera
- 2 - PI · (AX103).01 Controlar que es reguen els trams d'obra en els quals s'està treballant i les zones en les quals es pot generar pols (p.e. instal·lacions de matxuqueix)
- 3 - PI · (AX103).02 Comprovar que la caixa dels camions que transporten terres es cobreix amb lones, inclús en trajectes curts de zones urbanes.
- 4 - PI · (AX103).03 Controlar la velocitat no excessiva de la maquinària/vehICLES d'obra.
- 5 - PI · (AX103).04 Comprovar que es millora el ferm dels camins: pavimentació, compactació.
- 6 - PI · (AX003).05 Comprovar que les zones d'aplec de materials estan correctament condicionades de manera que no es poden arrossegar pel vent.
- 7 - PI · (AX003).06 Comprovar que la maquinària utilitzada a l'obra té al dia les pertinents revisions per assegurar que el funcionament dels motors és correcte i les emissions no superen els límits legals.

2 - PPI - (EX) CONSUM D'ENERGIA

- 1 - PI · (EX101).01 Realitzar seguiments dels consums d'energia elèctrica per identificar desviacions i fixar objectius d'estalvi
- 2 - PI · (EX101).02 Comprovar que es fa un correcte ús de la maquinària: està apagada quan no s'utilitza, es fan trajectes optimitzats i es circula amb una velocitat no excessiva

3 - PPI - (FX) AFECCIÓ A LA FLORA I FAUNA

- 1 - PI · (FX101).01 Comprovar que s'ha fet un pla d'accés i l'ha aprovat la DO
- 2 - PI · (FX102).01 Comprovar que l'àmbit de l'obra no excedeix la franja d'expropiació del projecte i està ben senyalitzada
- 3 - PI · (FX103).01 Protegir els arbres que puguin resultar malmesos degut a les activitats d'obra
- 4 - PI · (FX103).02 Comprovar que la planificació de l'obra ha tingut en compte les èpoques sensibles per a la flora i la fauna

4 - PPI - (HX) AFECCIÓ A LA HIDROLOGIA

- 1 - PI · (HX101).01 Controlar l'enterboliment de l'aigua del riu per treballs o moviments de maquinària a la llera
- 2 - PI · (HX101).02 Controlar que l'abocament d'aigua té autorització administrativa i està correctament realitzada la connexió.
- 3 - PI · (HX102).01 Comprovar que l'extracció d'aigua té autorització administrativa i no se superen els cabals autoritzats.
- 4 - PI · (HX102).02 Comprovar que es fa ús d'aigua no potable (quan sigui possible).
- 5 - PI · (HX103).01 Controlar el consum d'aigua.
- 6 - PI · (HX104).01 Realitzar una inspecció visual dels rius i rieres.
- 7 - PI · (HX104).02 Comprovar documentalment la legalització dels productes plaguicides i fitosanitaris que s'utilitzin.
- 8 - PI · (HX104).03 Comprovar que els materials i màquines que puguin produir vessaments accidentals de substàncies tòxiques, d'olis, gasoil, etc., a la llera o clavegueram, estan apartats dels llocs crítics o suficientment protegits.
- 9 - PI · (HX104).04 Comprovar que les zones de neteja de canaletes no tenen fuites que provoquen escolament als aquífers.
- 10 - PI · (HX105).01 Comprovar l'absència d'obstruccions al drenatge de l'aigua.

5 - PPI - (GX) AFECCIÓ AL PAISATGE

- 1 - PI · (GX101).01 Comprovar que la ubicació del parc de maquinària, de les zones d'aplec de material i de residus provoquin un mínim impacte visual.
- 2 - PI · (GX102).01 Inspeccionar visualment els talussos després de l'estesa de terra vegetal.

6 - PPI - (PX) AFECCIÓ A LA POBLACIÓ

- 1 - PI · (PX101).02 Comprovar que la maquinària passa les revisions de manteniment corresponents i disposa dels certificats CE/ITV.
- 2 - PI · (PX101).03 Comprovar que les activitats més sonores es realitzen en franjes horàries que afecten menys a la població.
- 3 - PI · (PX101).04 Controlar l'horari de l'obra.
- 4 - PI · (PX103).01 Controlar que es garanteix l'accessibilitat i permeabilitat de la població afectada.
- 5 - PI · (PX104).02 Controlar que l'entorn de l'obra està endreçat i net de residus.
- 6 - PI · (PX105).01 Controlar la permanència de la senyalització reglamentària
- 7 - PI · (PX106).01 Comprovar que es fa seguiment arqueològic del moviment de terres i que s'encinten les restes trobades.

7 - PPI - (RX) GENERACIÓ DE RESIDUS

- 1 - PI · (RX001).01 Comprovar el destí legalitzat de les terres sobrants.
- 2 - PI · (RX001).02 Comprovar la correcta segregació i gestió de les restes de poda.
- 3 - PI · (RX001).03 Comprovar la correcta segregació i gestió de residus especials i no especials.
- 4 - PI · (RX001).04 Comprovar la correcta senyalització de la zona d'abassegament de residus
- 5 - PI · (RX001).05 Comprovar el correcte condicionament de la zona d'aplec de residus especials: identificació, temps d'abassegament, condicions d'abassegament.
- 6 - PI · (RX001).06 Comprovar la inclusió de clàusules sobre la gestió dels residus en els contractes de les empreses sots-contractades.
- 7 - PI · (RX001).07 Comprovar documentalment la correcta gestió de residus d'oli per part dels sots-contractistes de maquinària (Fulls Cator).
- 8 - PI · (RX001).08 Comprovar documentalment la correcta gestió dels residus.
- 9 - PI · (RX001).09 Comprovar l'ordre i neteja general de l'obra.
- 10 - PI · (RX001).10 Comprovar que no es cremen residus.

8 - PPI - (SX) AFECCIÓ DEL SÒL I SUBSÒL

- 1 - PI · (SX002).01 Comprovar que existeix un Pla de terres, aprovat per la D.O.
- 2 - PI · (SX003).01 Controlar que el rentat de canaletes de formigó i cubilots es fa en zones correctament condicionades.
- 3 - PI · (SX003).02 Controlar que es retiren les restes de les netejes de canaletes.
- 4 - PI · (SX004).01 Controlar que en les zones d'aplec de materials perillosos (gasoil, olis, desencofrants, pintures) estiguin condicionades.
- 5 - PI · (SX005).01 Comprovar la correcta restauració de les àrees d'ocupació temporal (abocadors temporals, parcs de maquinària, zones d'aplec, límits de l'obra, etc.).
- 6 - PI · (SX006).01 Controlar i evitar possibles fuites d'oli de la maquinària.
- 7 - PI · (SX006).02 Controlar que l'aprovisionament de gasoil de la maquinària a l'obra es fa aplicant mesures adequades per evitar vessaments.
- 8 - PI · (SX006).03 Controlar que es disposa de material absorbent per a fer front a possibles vessaments accidentals d'oli de la maquinària
- 9 - PI · (SX007).01 Comprovar que es fa ús de lavabos químics, o de fosses sèptiques impermeabilitzades, quan no es pugui connectar a la xarxa de clavegueram.
- 10 - PI · (SX007).02 Comprovació que es retiren els residus de les fosses sèptiques.
- 11 - PI · (SX008).01 Comprovació de l'origen legal dels préstecs
- 12 - PI · (SX008).02 Comprovació de la legalització dels abocadors d'obra.

13 - PI · (SX009).01 Comprovar que s'ha fet un pla de reutilització i reciclatge de materials i que l'ha aprovat la DO. X

(\*)Punt espera (PE): No es pot continuar l'activitat fins que el resultat d'aquesta inspecció no hagi estat acceptada.

#### 4 MATERIALS IMPORTANTS A CONTROLAR

A continuació s'indica un llistat dels materials més importants que hi haurà a l'obra, així com una definició del tipus de control que caldrà fer sobre ells. Els tipus de control són els següents:

- Certificat: S'assenyalaran aquells materials dels quals caldrà disposar del certificat de qualitat del producte en el moment del subministrament, sent imprescindible per iniciar la seva col·locació en l'obra. Es fa referència al certificat de qualitat del producte, no al certificat de qualitat de l'empresa fabricant, és a dir, al compromís del proveïdor sobre les característiques de qualitat general del producte subministrat, relacionant les proves i comprovacions realitzades dins del procés de selecció.

- Assaig: S'assenyalaran els materials que per normativa o criteri particular del projectista hagin de ser assajats per part d'un laboratori acreditat.

- Mostra acceptada per la DF: S'assenyalaran aquells pels quals es considera important que la DF comprovi la mostra abans de ser sotmesa a les proves de control, per tal d'assegurar la seva representativitat.

- Traçabilitat: S'assenyalarà quan calgui deixar constància de la localització en obra de cada subministra de material. Obligatori en el cas de formigó.

Aquesta llista no és en cap cas exhaustiva, i pretén exclusivament definir el tipus de control a realitzar sobre els materials identificats com a principals.

N.	Material	Certificat	Assaig	Mostra acceptada per la DF	Traçabilitat
1	Formigó		X	X	X
2	Terres de préstec		X	X	
3	Acer en barres		X	X	
4	Vorades de formigó	X			
5	Rigoles de formigó	X			
6	Mescles bituminoses		X	X	X
7	Tot-u		X	X	

N.	Material	Certificat	Assaig	Mostra acceptada per la DF	Traçabilitat
8	Regs bituminosos		X	X	X
9	Tubs de formigó	X			
10	Tubs plàstics			X	
11	Plaques i suports de senyalització	X			
13	Ciment	X			
14	Sols de préstec		X	X	
15	Plantacions		X	X	

#### 5 PLA D'ASSAIGS

D'acord amb les prescripcions per a la realització de projectes constructius, s'inclou en el present projecte un pla de control de qualitat, desenvolupat amb el mòdul de qualitat del programa TCQ2000.

Aquest pla s'ha realitzat partint de la relació de les partides d'obra del present projecte i dels amidaments.

El procediment seguit en el mòdul Qualitat es compon de les següents fases:

- Creació del Pla de Control de Qualitat "per defecte" en base al pressupost de l'obra.
- Comprovació dels assaigs per cadascuna de les partides d'obra.
- Establiment de les freqüències d'assaig per l'obra.
- Relacions entre unitats d'amidament i freqüències.
- Assignació d'especificacions.
- Coherència amb el pressupost.
- Càlcul del número d'assaigs i assignació dels preus.
- Generació del pressupost del Pla de Control de Qualitat.

Els resultats de deflectòmetre Lacroix, IRI, SCRIM, ECODYN i ZEHNTNER es presentaran amb arxius que s'ajustaran a la Guia per l'elaboració dels formats tipus dels fitxers d'auscultació a nivell de fermes a la xarxa de la Generalitat de Catalunya.

El Pressupost d'Execució Material (PEM) del Pla de Control de Qualitat, ascendeix a la quantitat de **39.446,78 €** el que suposa un 1,68 % respecte al Pressupost d'Execució Material més benefici industrial i despeses generals (2.352.571,95 €).

Les obres projectades consisteixen en el condicionament d'un tram de la carretera GIP-5129 mitjançant l'execució d'un nou traçat i el corresponent nou pont sobre el riu Manol. Com a



conseqüència de la tipologia d'obra, els capítols d'afermats i estructures suposen més del 75% del pressupost total de l'obra. Degut a la importància d'aquests capítols i els assajos associats a la seva execució, queda justificat l'increment del cost del Pla de Control de Qualitat de l'obra, que suposa un 1,68% del pressupost d'execució material de l'obra més benefici industrial i despeses generals.

## **6 SITUACIONS D'EMERGÈNCIA AMBIENTAL**

S'identifiquen les situacions d'emergència que poden esdevenir-se o que poden donar-se en la futura execució de l'obra, amb una valoració de la significança de cada situació en funció de la probabilitat i la gravetat.

Sobre aquelles situacions d'emergència que resultin significatives, el contractista haurà d'elaborar un pla d'emergència a l'obra.

L'imprès degudament emplenat es pot trobar a l'apèndix 2 del present annex.



## **APÈNDIX 1. Pla de control de qualitat**



## PLA DE CONTROL

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 1

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 02 MOVIMENT DE TERRES

**G226U020** Terraplenat amb sòl procedent de préstec, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric (P - 20) 3.242.100 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	1.00	31.70	31.70	1	5.000.000	M3	1.0000	Estadístic	
J03D4204	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104	1.00	36.13	36.13	1	5.000.000	M3	1.0000	Estadístic	
J03D7207	Assaig de piconatge pel mètode del Proctor normal d'una mostra de sòl, segons la norma UNE 103500	2.00	47.92	95.84	1	3.000.000	M3	1.0000	Estadístic	
J03D8208	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501	2.00	64.53	129.06	1	3.000.000	M3	1.0000	Estadístic	
J03DA209	Determinació de l'índex CBR en laboratori, amb la metodologia del Próctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502	1.00	120.95	120.95	1	5.000.000	M3	1.0000	Estadístic	
J03DK10Y	Determinació del contingut de guix d'un sòl, segons la norma NLT 115	1.00	81.06	81.06	1	5.000.000	M3	1.0000	Estadístic	
J03DK20H	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204	1.00	43.16	43.16	1	5.000.000	M3	1.0000	Estadístic	
J03DN10Z	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114	1.00	38.99	38.99	1	5.000.000	M3	1.0000	Estadístic	
J2VGM10X	Assaig de colapse d'un sòl, segons la norma NLT 254	1.00	88.61	88.61	1	5.000.000	M3	1.0000	Estadístic	
J2VGY20X	Determinació del inflament lliure pel mètode del edòmetre, d'una mostra de sòl, segons la norma UNE 103601	1.00	104.16	104.16	1	5.000.000	M3	1.0000	Estadístic	

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 2

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCR10P	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938	10.00	13.65	136.50	5	3.000.000	M2	1.0000	Tram	

**G226U030** Terraplenat, pedraplenat o reblert tot-u amb sòl procedent de la pròpia obra, inclòs selecció, matxuqueix, garbellat, càrregues i transports intermedis, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric (P - 21) 7.466.700 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	2.00	31.70	63.40	1	5.000.000	M3	1.0000	Estadístic	
J03D4204	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104	2.00	36.13	72.26	1	5.000.000	M3	1.0000	Estadístic	
J03D7207	Assaig de piconatge pel mètode del Proctor normal d'una mostra de sòl, segons la norma UNE 103500	3.00	47.92	143.76	1	3.000.000	M3	1.0000	Estadístic	
J03D8208	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501	3.00	64.53	193.59	1	3.000.000	M3	1.0000	Estadístic	
J03DA209	Determinació de l'índex CBR en laboratori, amb la metodologia del Próctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502	2.00	120.95	241.90	1	5.000.000	M3	1.0000	Estadístic	
J03DK10Y	Determinació del contingut de guix d'un sòl, segons la norma NLT 115	2.00	81.06	162.12	1	5.000.000	M3	1.0000	Estadístic	
J03DK20H	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204	2.00	43.16	86.32	1	5.000.000	M3	1.0000	Estadístic	
J03DN10Z	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114	2.00	38.99	77.98	1	5.000.000	M3	1.0000	Estadístic	
J2VGM10X	Assaig de colapse d'un sòl, segons la norma NLT 254	2.00	88.61	177.22	1	5.000.000	M3	1.0000	Estadístic	

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 3

J2VGY20X Determinació del inflament lliure pel mètode del edòmetre, d'una mostra de sòl, segons la norma UNE 103601 2.00 104.16 208.32 1 5.000.000 M3 1.0000 Estadístic

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCR10P	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938	15.00	13.65	204.75	5	3.000.000	M2	1.0000	Tram	
<b>Total</b>	<b>MOVIMENT DE TERRES</b>	<b>01.01.02</b>		<b>2.537.78</b>						

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 03 DRENATGE  
 Títol 4 01 DRENATGE LONGITUDINAL

**GD75U030** Canalització amb tub de formigó vibropressat de 50 cm de diàmetre, classe N segons UNE 127916, inclòs base i reblert per sobre de la generatriu superior amb formigó de 20 N/mm2 de resistència característica a la compressió, segons plànols (P - 104) 25.000 m

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		0.5530	Estadístic

**G450U040** Formigó HM-20 per a fonaments i encepats, inclòs col·locació, vibrat i curat (P - 33) 15.343 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		1.0000	Tram

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 4

**Total** **DRENATGE LONGITUDINAL** **01.01.03.01** **74.48**

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 04 ESTRUCTURES  
 Títol 4 01 OBRES DE FÀBRICA  
 Títol 5 01 VIADUCTE SOBRE EL MANOL  
 Títol 6 01 TAULER

**G450U070** Formigó HA-30 per a alçats, piles i taulers, inclòs col·locació, vibrat i curat (P - 35) 302.000 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060770A	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3	12.00	99.26	1,191.12	3	100.000	M3	1.0000	Tram	

**G480U020** Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat (P - 36) 28.595.840 kg

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J0B21103	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	1.00	82.25	82.25	1	50.000.000	KG	1.0000	Estadístic	
J0B25101	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	1.00	63.26	63.26	1	50.000.000	KG	1.0000	Estadístic	
J0B28103	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	1.00	17.95	17.95	1	50.000.000	KG	1.0000	Estadístic	



**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 5

J0B2G103	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068	1.00	28.29	28.29	1	50,000.000	KG	1.0000	Estadístic
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<b>G781U010</b>	Impermeabilització de paraments verticals i horitzontals de formigó, amb 1,8 kg/m2 emulsió bituminosa catiònica (P - 50)								1,125.300 m2
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J056G30G	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431	1.00	108.86	108.86	Si	1	0.000		0.0018	Estadístic
<b>Total</b>	<b>TAULER 01.01.04.01.01.01</b>								<b>1,491.73</b>	

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	02	ALÇAT D'ESTREPS

<b>G450U070</b>	Formigó HA-30 per a alçats, piles i taulers, inclòs col·locació, vibrat i curat (P - 35)								145.896 m3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060770A	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3	6.00	99.26	595.56		3	100.000	M3	1.0000	Tram

<b>G480U020</b>	Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat (P - 36)								11,311.480 kg
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 6

J0B21103	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	82.25	0.00	1	50,000.000	KG	1.0000	Estadístic
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J0B25101	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	63.26	0.00	1	50,000.000	KG	1.0000	Estadístic
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J0B28103	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	17.95	0.00	1	50,000.000	KG	1.0000	Estadístic
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J0B2G103	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068	0.00	28.29	0.00	1	50,000.000	KG	1.0000	Estadístic
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<b>G781U010</b>	Impermeabilització de paraments verticals i horitzontals de formigó, amb 1,8 kg/m2 emulsió bituminosa catiònica (P - 50)								411.652 m2
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J056G30G	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431	0.00	108.86	0.00	Si	1	0.000		0.0018	Estadístic

<b>GDS5AU220</b>	Drenatge amb tub de PVC de doble paret, de diàmetre 200 mm, ranurat parcial en un arc de 108º a 220º i SN 4 kN/m2, inclòs excavació, transport a abocador, base de formigó, tub, geotextil i rebert de material filtrant, segons plànols (P - 101)								62.200 m
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J0304503	Anàlisi granulomètrica per tamisatge d'una mostra d'àrids, segons la norma UNE-EN 933-1	1.00	31.70	31.70		1	2,000.000	M3	0.2000	Estadístic
J030970B	Determinació de la resistència al desgast mitjançant la màquina de Los Angeles d'una mostra d'àrids gruixuts, segons la norma UNE-EN 1097-2	1.00	79.72	79.72		1	2,000.000	M3	0.2000	Estadístic
J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	1.00	31.70	31.70		1	2,000.000	M3	0.2000	Estadístic
JFA13A0H	Determinació de la temperatura de rebliment Vicat d'una mostra de tub de material plàstic, segons la norma UNE-EN ISO 306	1.00	143.00	143.00	Si	1	0.000		1.0000	Global

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 7

JFA1800A	Assaig a tracció, amb determinació de l'esforç màxim (en el punt de fluència o en el de trencament), segons la norma UNE 53112	1.00	143.98	143.98	Si	1	0.000		1.0000	Global
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JFA19C01	Assaig d'aixafament o de flexió transversal d'un tub de material plàstic de 400 mm de diàmetre, com a màxim, segons plec de prescripcions tècniques generals per a canonades d'abastament d'aigua del MOPT	1.00	212.64	212.64	Si	1	0.000		1.0000	Global
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<b>G228U075</b>	Rebliment de grava-ciment, amb el 4% en pes de ciment, al darrera d'alçats d'estreps de formigó, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric (P - 24)								192.000 m3
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Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCQ10N	Determinació in situ de la humitat i la densitat pel mètode de la sorra d'un sòl, segons la norma UNE 103503	7.00	36.57	255.99		7	3,500.000	M2	4.2000	Tram
J2VCT10R	Determinació de la humitat natural d'un sòl, segons la norma UNE 103300	1.00	8.95	8.95		1	5,000.000	M2	4.2000	Tram

Tipus de Control: Control d'obra acabada

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCT40R	Densitat d'una probeta de sòl-ciment segons la norma UNE-EN 13286-2	7.00	40.00	280.00		7	3,500.000	M2	4.2000	Tram

<b>G229U020</b>	Rebliment amb material granular filtrant al darrera d'alçats de murs i estreps d'estructures, obres de drenatge transversal amb tubs metàl·lics corrugats i testeres i voltes prefabricats de formigó, inclòs estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric (P - 25)								192.000 m3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J0304503	Anàlisi granulomètrica per tamisatge d'una mostra d'àrids, segons la norma UNE-EN 933-1	1.00	31.70	31.70		1	2,000.000	M3	1.0000	Estadístic
J030970B	Determinació de la resistència al desgast mitjançant la màquina de Los Angeles d'una mostra d'àrids gruixuts, segons la norma UNE-EN 1097-2	1.00	79.72	79.72		1	2,000.000	M3	1.0000	Estadístic

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 8

J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	1.00	31.70	31.70		1	2,000.000	M3	1.0000	Estadístic
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<b>G228U060</b>	Rebliment al darrera d'alçats d'estreps d'estructures de formigó i obres de drenatge transversal amb tubs metàl·lics corrugats i voltes prefabricats de formigó, amb sòl seleccionat tipus 3, procedent de préstec, estesa i compactació segons condicions del Plec de Prescripcions Tècniques, mesurat sobre perfil teòric (P - 23)								207.000 m3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J030F60F	Determinació de l'equivalent de sorra d'una mostra d'àrids fins, segons la norma UNE-EN 933-8	1.00	20.74	20.74		1	5,000.000	M3	1.0000	Estadístic
J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	1.00	31.70	31.70		1	5,000.000	M3	1.0000	Estadístic
J03D4204	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104	1.00	36.13	36.13		1	5,000.000	M3	1.0000	Estadístic
J03D8208	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501	1.00	64.53	64.53		1	5,000.000	M3	1.0000	Estadístic
J03DA209	Determinació de l'índex CBR en laboratori, amb la metodologia del Proctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502	1.00	120.95	120.95		1	5,000.000	M3	1.0000	Estadístic
J03DK20H	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204	1.00	43.16	43.16		1	5,000.000	M3	1.0000	Estadístic
J03DN10Z	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114	1.00	38.99	38.99		1	5,000.000	M3	1.0000	Estadístic

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCP10M	Determinació in situ de la humitat d'un sòl, segons la norma NLT 103	1.00	12.77	12.77		1	2,000.000	M2	1.0000	Estadístic
J2VCR10P	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938	3.00	13.65	40.95		3	2,000.000	M2	1.0000	Estadístic



**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 9

J2VCS10Q	Assaig de càrrega in situ, amb placa de 30 cm de diàmetre d'un sòl, segons la norma NLT 357	1.00	136.56	136.56	1	2.000.000	M2	1.0000	Estadístic
<b>Total</b>	<b>ALÇAT D'ESTREPS 01.01.04.01.01.02</b>			<b>2.472.84</b>					

Obra	01 Pressupost GIP-5129
Capítol	01 TRAMIFICAT
Títol 3	04 ESTRUCTURES
Títol 4	01 OBRES DE FÀBRICA
Títol 5	01 VIADUCTE SOBRE EL MANOL
Títol 6	03 ALÇAT PILES

<b>G450U070</b>	Formigó HA-30 per a alçats, piles i taulers, inclòs col·locació, vibrat i curat (P - 35)	48.680	m3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060770A	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3	3.00	99.26	297.78		3	100.000	M3	1.0000	Tram

<b>G480U020</b>	Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat (P - 36)	10.388.040	kg
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J0B21103	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	82.25	0.00		1	50.000.000	KG	1.0000	Estadístic
J0B25101	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	63.26	0.00		1	50.000.000	KG	1.0000	Estadístic

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 10

J0B28103	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	17.95	0.00		1	50.000.000	KG	1.0000	Estadístic
J0B2G103	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068	0.00	28.29	0.00		1	50.000.000	KG	1.0000	Estadístic

<b>G781U010</b>	Impermeabilització de paraments verticals i horitzontals de formigó, amb 1,8 kg/m2 emulsió bituminosa catiònica (P - 50)	104.720	m2
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J056G30G	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431	0.00	108.86	0.00	Si	1	0.000		0.0018	Estadístic

<b>G3J2U030</b>	Escullera amb bloc de pedra granítica de 400 a 800 kg, inclòs subministrament i col·locació, mesurat sobre perfil teòric segons plànols (P - 31)	895.600	m3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J030970B	Determinació de la resistència al desgast mitjançant la màquina de Los Angeles d'una mostra d'àrids gruixuts, segons la norma UNE-EN 1097-2	1.00	79.72	79.72		1	2.000.000	T	2.0000	Estadístic
J030C50C	Determinació de l'estabilitat enfront de dissolucions de sulfat sòdic o sulfat magnèsic d'una mostra d'àrids, segons la norma UNE-EN 1367-2	1.00	80.78	80.78	Si	1	0.000		2.0000	Global
J0421601	Determinació de la resistència a la compressió simple d'una sèrie de 6 provetes de pedra natural, segons la norma UNE-EN 1926	1.00	280.70	280.70		1	2.000.000	T	2.0000	Estadístic
J0434105	Determinació del coeficient d'absorció d'aigua d'una pedra, segons la norma UNE-EN 1925	1.00	128.53	128.53		1	2.000.000	T	2.0000	Estadístic
J0438101	Determinació del pes específic d'una pedra, segons la norma UNE-EN 1936	1.00	138.44	138.44		1	2.000.000	T	2.0000	Estadístic
J043D100	Determinació de la densitat aparent seca d'una pedra	1.00	102.73	102.73	Si	1	0.000		2.0000	Global
<b>Total</b>	<b>ALÇAT PILES 01.01.04.01.01.03</b>			<b>1.108.68</b>						

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 11

Obra	01 Pressupost GIP-5129
Capítol	01 TRAMIFICAT
Títol 3	04 ESTRUCTURES
Títol 4	01 OBRES DE FÀBRICA
Títol 5	01 VIADUCTE SOBRE EL MANOL
Títol 6	04 ACABATS

<b>G4Z7U016</b>	Formació de junt de dilatació per a taulers de ponts, amb perfil de cautxú armat, per a absorbir moviments de 170 mm com a màxim, col·locat amb adhesiu i fixacions mecàniques, inclòs formació de la caixa (P - 46)	18.600	m
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Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J441HH00	Determinació de la força de collament ("parell de collament") d'una unió cargolada	8.00	18.62	148.96		1	2.500	M	1.0000	Tram
J7J1AA00	Assaig de tracció d'un pern d'ancoratge d'un junt de dilatació	2.00	31.42	62.84		1	15.000	M	1.0000	Tram

<b>G4ZBU020</b>	Suport de neoprè armat per a recolzaments, inclòs part proporcional de morter d'anivellament, col·locat (P - 47)	448.800	dm3
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Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J4ZBC205	Determinació del mòdul d'elasticitat transversal (cizallament) d'un recolzament de neoprè armat, segons la norma UNE 53630	1.00	959.95	959.95	Si	1	0.000		1.0000	Global
J4ZBD206	Determinació de la resistència a compressió d'un recolzament de neoprè armat, segons Annex H de la norma UNE-EN 1337-3	1.00	2.414.88	2.414.88	Si	1	0.000		1.0000	Global
J4ZBE507	Determinació de la resistència a la cisalla entre l'elastòmer i les armadures d'un recolzament de neoprè armat o junt de dilatació, segons Annex G de la norma UNE-EN 1337-3	1.00	969.93	969.93	Si	1	0.000		1.0000	Global
J4ZBJ308	Comprovació del comportament dinàmic d'un recolzament de neoprè, segons la norma MELC 1016	1.00	168.93	168.93	Si	1	0.000		1.0000	Global

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 12

J4ZBWV01	Determinació del diagrama tensió-deformació de les plaques d'acer d'armat de neoprè, amb obtenció del límit elàstic i de la tensió de trencament, segons les normes UNE-EN ISO 6892-1	1.00	495.00	495.00	Si	1	0.000		1.0000	Global
J7J160A	Determinació de la resistència a tracció d'una mostra de material elastomèric, segona la norma UNE ISO 37 (tipus 2)	1.00	99.43	99.43	Si	1	0.000		1.0000	Global
J7J1600B	Determinació de l'envelliment al cap de 72 h a 100°C d'una mostra de material elastomèric, segons la norma UNE ISO 188	1.00	324.49	324.49	Si	1	0.000		1.0000	Global
J7J1860C	Determinació de la variació de la duresa experimentada després de l'assaig d'envelliment d'una mostra de material elastomèric, segons la norma UNE ISO 48	1.00	201.24	201.24	Si	1	0.000		1.0000	Global
J7J1G609	Determinació de la deformació remanent a baixa temperatura d'una mostra de material elastomèric, segons la norma UNE ISO 815-2	1.00	172.50	172.50	Si	1	0.000		1.0000	Global
J7J1H603	Determinació del tipus d'elastòmer per espectrofotometria d'infrarojos, segons la norma UNE 53633	1.00	387.30	387.30	Si	1	0.000		1.0000	Global
J7J1K602	Determinació de la resistència a l'esquerdament per ozó d'una mostra de material elastomèric, segons la norma UNE ISO 1431-1	1.00	250.00	250.00	Si	1	0.000		1.0000	Global
<b>Total</b>	<b>ACABATS 01.01.04.01.01.04</b>			<b>6.655.45</b>						

Obra	01 Pressupost GIP-5129
Capítol	01 TRAMIFICAT
Títol 3	04 ESTRUCTURES
Títol 4	01 OBRES DE FÀBRICA
Títol 5	01 VIADUCTE SOBRE EL MANOL
Títol 6	05 FONAMENTACIÓ D'ESTREPS I PILES

<b>G480U020</b>	Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat (P - 36)	81.500.660	kg
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**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 13

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J0B21103	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	2.00	82.25	164.50		1	50,000.000	KG	1.0000	Estadistic
J0B25101	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	2.00	63.26	126.52		1	50,000.000	KG	1.0000	Estadistic
J0B28103	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	2.00	17.95	35.90		1	50,000.000	KG	1.0000	Estadistic
J0B2G103	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068	2.00	28.29	56.58		1	50,000.000	KG	1.0000	Estadistic

**G450U055** Formigó HA-30 per a fonaments i enceps, inclos col·locació, vibrat i curat (P - 34) 295.568 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060770A	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3	9.00	99.26	893.34		3	100.000	M3	1.0000	Tram

**G321U030** Formigó de 15 N/mm2 de resistència característica a la compressió per a regularització sota fonaments o reblliments, inclòs la preparació de la base d'assentament, col·locació i vibrat (P - 32) 24.000 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24		2	0.000		1.0000	Tram

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 14

<b>Total</b>	<b>FONAMENTACIÓ D'ESTREPS I PILES 01.01.04.01.01.</b>			<b>1.314.08</b>						
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Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 05 AFERMATS  
 Títol 4 01 MATERIALS GRANULARS

**G227U110** Espanada amb sòl seleccionat tipus 2, procedent de préstec, segons condicions del Plec de Prescripcions Tècniques, en coronació de terraplens o sobre desmunt, estesa i compactada al 100% del PM, mesurat sobre perfil teòric (P - 22) 7.878.400 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J030F60F	Determinació de l'equivalent de sorra d'una mostra d'àrids fins, segons la norma UNE-EN 933-8	2.00	20.74	41.48		1	5,000.000	M3	1.0000	Estadistic
J03D2202	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101	2.00	31.70	63.40		1	5,000.000	M3	1.0000	Estadistic
J03D4204	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104	2.00	36.13	72.26		1	5,000.000	M3	1.0000	Estadistic
J03D8208	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501	2.00	64.53	129.06		1	5,000.000	M3	1.0000	Estadistic
J03DA209	Determinació de l'índex CBR en laboratori, amb la metodologia del Pròctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502	2.00	120.95	241.90		1	5,000.000	M3	1.0000	Estadistic
J03DK20H	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204	2.00	43.16	86.32		1	5,000.000	M3	1.0000	Estadistic
J03DN10Z	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114	2.00	38.99	77.98		1	5,000.000	M3	1.0000	Estadistic

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
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**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 15

J2VCP10M	Determinació in situ de la humitat d'un sòl, segons la norma NLT 103	14.00	12.77	178.78		1	2,000.000	M2	3.3300	Estadistic
J2VCR10P	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938	42.00	13.65	573.30		3	2,000.000	M2	3.3300	Estadistic
J2VCS10Q	Assaig de càrrega in situ, amb placa de 30 cm de diàmetre d'un sòl, segons la norma NLT 357	14.00	136.56	1,911.84		1	2,000.000	M2	3.3300	Estadistic

**G921U020** Base de tot-u artificial, estesa, humectació i compactació, mesurat sobre perfil teòric (P - 53) 5,369.400 m3

Tipus de Control: Control d'obra acabada

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J2VCQ10N	Determinació in situ de la humitat i la densitat pel mètode de la sorra d'un sòl, segons la norma UNE 103503	4.00	36.57	146.28		1	7,000.000	M2	4.0000	Tram
J2VCT10R	Determinació de la humitat natural d'un sòl, segons la norma UNE 103300	4.00	8.95	35.80		1	7,000.000	M2	4.0000	Tram
J2VCT30R	Assaigs de càrrega vertical de sòls mitjançant placa estàtica de 300 mm de diàmetre nominal, segons la norma UNE 103808	8.00	210.10	1,680.80		2	7,000.000	M2	4.0000	Tram
<b>Total</b>	<b>MATERIALS GRANULARS 01.01.05.01</b>			<b>5.239.20</b>						

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 05 AFERMATS  
 Títol 4 02 AGLOMERATS ASFÀLTICS

**G9H1U612** Mescla bituminosa en calent AC16 surf B 50/70 S, inclòs filler, estesa i compactada, sense incloure betum (P - 62) 1,263.390 t

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J9H1210F	Determinació del contingut de lligant d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-1	1.00	44.57	44.57		1	800.000	T	0.0600	Estadistic

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 16

J9H1310G	Anàlisi granulomètrica del granulat recuperat d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-2	1.00	38.87	38.87		1	800.000	T	0.0600	Estadistic
J9H1N103	Determinació de la sensibilitat a l'aigua (resistència conservada a tracció indirecta després d'immersió) d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-12	1.00	364.63	364.63		1	5,500.000	T	0.0600	Estadistic

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J9H1B401	Control de temperatures en l'execució de paviments de mescla bituminosa en calent, segons la norma UNE-EN 12697-13	1.00	17.07	17.07		1	80.000	T	0.0600	Estadistic
J9H1P104	Presa, confecció de provetes. determinació de la densitat aparent i del contingut de buits d'una mostra de mescla bituminosa, segons les normes UNE-EN 12697-30, UNE-EN 12697-32, UNE-EN 12697-8 i UNE-EN 12697-6	1.00	191.53	191.53		1	180.000	T	0.0600	Estadistic

Tipus de Control: Control d'obra acabada

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J9V1310L	Mesura de la macrotextura superficial d'un paviment mitjançant el mètode volumètric, segons la norma UNE-EN 13036-1	1.00	26.62	26.62		1	1.000	HM	0.0004	Tram
J9V1A10N	Jornada per a mesura de la resistència al lliscament amb determinació del coeficient de fregament transversal (CRTS) i caracterització de la textura d'un paviment mitjançant l'equip Scrim, segons la norma UNE 41201, UNE-EN ISO 13473-1, incloent desplaçament i redacció d'informe	1.00	3,393.00	3,393.00	Si	1	0.000		1.0000	Estadistic
J9V1B30S	Jornada de determinació de l'índex de regularitat internacional (IRI) d'un paviment mitjançant perfilmetre làser d'un paviment de mescla bituminosa, segons la norma NLT 330. Inclou desplaçament i redacció d'informe.	1.00	1,498.18	1,498.18	Si	1	0.000		1.0000	Estadistic
J9V1D00J	Jornada per a mesura de les deflexions d'un ferm mitjançant deflectògraf tipus Lacroix amb càrrega de 13 t, cada 5 m i amb un mínim de 60 determinacions, segons la norma NLT 337, fins a un màxim de 7 km de carril i sense incloure senyalització	1.00	3,931.55	3,931.55	Si	1	0.000		1.0000	Estadistic

**G9H1U020** Mescla bituminosa en calent AC 22 bin B 50/70 S, inclòs filler, estesa i compactada, sense incloure betum (P - 60) 1,310.080 t



**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 17

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1210F	Determinació del contingut de lligant d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-1	1.00	44.57	44.57		1	800.000	T	0.0600	Estadistic
J9H1310G	Anàlisi granulomètrica del granulat recuperat d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-2	1.00	38.87	38.87		1	800.000	T	0.0600	Estadistic
J9H1N103	Determinació de la sensibilitat a l'aigua (resistència conservada a tracció indirecta després d'immersió) d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-12	1.00	364.63	364.63		1	5.500.000	T	0.0600	Estadistic

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1B401	Control de temperatures en l'execució de paviments de mescla bituminosa en calent, segons la norma UNE-EN 12697-13	1.00	17.07	17.07		1	80.000	T	0.0600	Estadistic
J9H1P104	Presca, confecció de proveles, determinació de la densitat aparent i del contingut de buits d'una mostra de mescla bituminosa, segons les normes UNE-EN 12697-30, UNE-EN 12697-32, UNE-EN 12697-8 i UNE-EN 12697-6	1.00	191.53	191.53		1	250.000	T	0.0600	Estadistic

**G9H1U120** Mescla bituminosa en calent AC22 base B 50/70 G, inclòs filler, estesa i compactada, sense incloure betum (P - 61) 737.150 t

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1210F	Determinació del contingut de lligant d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-1	1.00	44.57	44.57		1	800.000	T	0.0600	Estadistic
J9H1310G	Anàlisi granulomètrica del granulat recuperat d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-2	1.00	38.87	38.87		1	800.000	T	0.0600	Estadistic

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 18

J9H1N103	Determinació de la sensibilitat a l'aigua (resistència conservada a tracció indirecta després d'immersió) d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-12	1.00	364.63	364.63		1	5.500.000	T	0.0600	Estadistic
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Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1B401	Control de temperatures en l'execució de paviments de mescla bituminosa en calent, segons la norma UNE-EN 12697-13	1.00	17.07	17.07		1	80.000	T	0.0600	Estadistic
J9H1P104	Presca, confecció de proveles, determinació de la densitat aparent i del contingut de buits d'una mostra de mescla bituminosa, segons les normes UNE-EN 12697-30, UNE-EN 12697-32, UNE-EN 12697-8 i UNE-EN 12697-6	1.00	191.53	191.53		1	250.000	T	0.0600	Estadistic

**G9HA0010** Betum asfàltic tipus B 50/70, per a mescles bituminoses (P - 65) 152.183 t

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J0553102	Determinació de la penetració amb agulla d'una mostra de material bituminós, segons la norma UNE-EN 1426	1.00	59.92	59.92		1	600.000	T	1.0000	Estadistic
J0554103	Determinació del punt de reblaniment pel mètode de l'anella i bola d'una mostra de material bituminós, segons la norma UNE-EN 1427	1.00	58.40	58.40		1	600.000	T	1.0000	Estadistic
J055A209	Determinació de l'índex de penetració d'una mostra de betum asfàltic, segons la norma UNE-EN 12591 i UNE-EN 13924	1.00	62.04	62.04		1	600.000	T	1.0000	Estadistic

**G9J1U010** Reg emprímació amb emulsió catiónica, tipus C50BF5 IMP (P - 66) 13.784.600 m2

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1J10M	Determinació de la dotació de lligant residual, pel mètode de safata, d'una mostra de mescla bituminosa, segons la norma NLT 353	3.00	60.18	180.54		3	7.000.000	M2	0.2800	Estadistic

**G9J1U320** Reg d'adherència amb emulsió termoadherent, tipus C60B4 TER o C60B3 TER sobre ferm nou (P - 67) 12.684.700 m2

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 19

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1J10M	Determinació de la dotació de lligant residual, pel mètode de safata, d'una mostra de mescla bituminosa, segons la norma NLT 353	3.00	60.18	180.54		3	7.000.000	M2	0.2800	Estadistic

**G9J1U325** Reg d'adherència amb emulsió termoadherent, tipus C60B4 TER o C60B3 TER, sobre ferm vell (P - 68) 640.000 m2

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J9H1J10M	Determinació de la dotació de lligant residual, pel mètode de safata, d'una mostra de mescla bituminosa, segons la norma NLT 353	3.00	60.18	180.54		3	7.000.000	M2	1.0000	Estadistic

**Total AGLOMERATS ASFÀLTICS 01.01.05.02 11.541.34**

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 06 SEGURETAT VIÀRIA  
 Títol 4 01 SENYALITZACIÓ HORIZONTAL

**G9A3V301** Pintat manual de senyal de stop o cediu el pas, fletxes, lletres, símbols, zebrats, franges de vèrtex d'illetes sobre el paviment, amb pintura de dos components en fred de llarga durada i reflectant amb microesferes de vidre 100 % reciclat, incloent el premarcatge (P - 77) 29.602 m2

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
JBA1K303	Determinació de la viscositat en marques vials realitzades amb pintures, segons la norma UNE-EN 12802.	1.00	110.00	110.00		1	5.000.000		1.0000	Tram

**Total SENYALITZACIÓ HORIZONTAL 01.01.06.01 110.00**

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 20

Títol 3 06 SEGURETAT VIÀRIA  
 Títol 4 02 SENYALITZACIÓ VERTICAL

**G9BZU005** Suport rectangular d'acer galvanitzat de 100x50x3 mm, per a la col·locació d'una senyal de trànsit en carreteres, inclòs fonamentació i col·locació (P - 93) 25.000 u

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		0.1400	Tram

Tipus de Control: Control d'execució

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
JBA11505	Jornada per a determinació de la visibilitat nocturna mitjançant el coeficient de retrorreflexió d'una marca vial en servei, segons la norma UNE-EN 1436, amb equip puntual i sense incloure senyalització ni mitjans auxiliars	2.00	819.62	1.639.24		1	24.000	U	1.0000	Estadistic
JBB1F916	Jornada de mesura per determinar coordenades cromàtiques i factor de lluminància beta segons la norma UNE-135352. (No inclou permisos ni senyalització)	1.00	1.474.00	1.474.00	Si	1	0.000		3.5000	Estadistic

**G9BZU006** Suport rectangular d'acer galvanitzat de 100x50x3 mm, per a la col·locació de dues senyals de trànsit en carreteres, inclòs fonamentació i col·locació (P - 94) 4.000 u

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		0.1750	Tram

**Total SENYALITZACIÓ VERTICAL 01.01.06.02 3.187.72**

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 06 SEGURETAT VIÀRIA  
 Títol 4 03 SENYALITZACIÓ D'ORIENTACIÓ



**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 21

**GBBVU001** Fonamentació per a plaques i panells de senyalització vertical d'alumini, amb formigó HM-20, inclosa excavació, càrrega i transport a l'abocador del material sobrant i col·locació dels pernns d'ancoratge roscats (sense el subministre), segons plànols, totalment acabada (P - 86) 7.265 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		1.2000	Tram
<b>Total SENYALITZACIÓ D'ORIENTACIÓ 01.01.06.03</b>				<b>37.24</b>						

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 06 SEGURETAT VIÀRIA  
 Títol 4 04 ABALISAMENT I DEFENSES

**GBC1U010** Fita quilomètrica amb placa de 40x60 cm, amb revestiment reflectant EG classe RA1, inclòs suport rectangular d'acer galvanitzat de 80x40x2 mm, elements de fixació i fonament de suport, totalment col·locada (P - 95) 2.000 u

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24	Si	2	0.000		0.1200	Tram

**GB2AX021** Barrera de seguretat metàl·lica simple, tipus AS\_BMSNC2/C o equivalent, amb nivell de contenció H1, amplària de treball W4, índex de severitat A i deflexió dinàmica 1,1 segons UNE-EN 1317-2, amb separador, galvanitzada en calent, incloent dues tanques sobrepassades de secció doble ona, part proporcional de separadors, pal de perfil C-120 cada 2 m (BMSNC2/C), elements de fixació, material auxiliar i captafars, amb una alçària de 1200 mm, inclòs enclavament i soldadures, totalment col·locada en recta o corbada de qualsevol radi. (P - 73) 160.000 m

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
JBM21101	Determinació de les característiques geomètriques d'un element de barrera metàl·lica de seguretat (suport, separador i biona), segons la norma UNE 135121, UNE 135122 i UNE 135123	1.00	50.76	50.76		1	2.000.000		1.0000	Tram

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 22

**GB1AU120** Àmpit metàl·lic amb nivell de contenció H2, amplària de treball W1 i W3, índex de severitat B i A i deflexió dinàmica 0,5 m segons UNE-EN 1317-2, d'1,00 m d'alçària amb muntants cada 2,50 m, amb tres (3) travessers de perfil tubular, tot galvanitzat en calent, inclòs recobriments de les parts metàl·liques, part proporcional de captafars, plaques d'ancoratge i elements de fixació, totalment col·locat segons Plec de Prescripcions Tècniques i detalls plànols (P - 69) 270.000 m

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
JBM21101	Determinació de les característiques geomètriques d'un element de barrera metàl·lica de seguretat (suport, separador i biona), segons la norma UNE 135121, UNE 135122 i UNE 135123	1.00	50.76	50.76		1	2.000.000		1.0000	Tram

**GB2CU001** Barrera de seguretat doble, prefabricada de formigó, per a ús temporal, tipus BHPDJ2/0a (New Jersey o equivalent), amb perfil a les dues cares, en mòduls de 2 m, de dimensions i detalls segons plànols, totalment col·locada (P - 74) 30.000 m

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
JBM21101	Determinació de les característiques geomètriques d'un element de barrera metàl·lica de seguretat (suport, separador i biona), segons la norma UNE 135121, UNE 135122 i UNE 135123	1.00	50.76	50.76		1	2.000.000		1.0000	Tram

**G450U070** Formigó HA-30 per a alçats, piles i taulers, inclòs col·locació, vibrat i curat (P - 35) 63.120 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060770A	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3	3.00	99.26	297.78		3	100.000	M3	1.0000	Tram

**G4B0U020** Acer B 500 S en barres corrugades de límit elàstic no menor de 500 N/mm2, col·locat (P - 36) 6.818.660 kg

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
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**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 23

J0B21103	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	82.25	0.00		1	50.000.000	KG	1.0000	Estadistic
J0B25101	Determinació del límit elàstic per a una deformació romanent del 0,2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	63.26	0.00		1	50.000.000	KG	1.0000	Estadistic
J0B28103	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	0.00	17.95	0.00		1	50.000.000	KG	1.0000	Estadistic
J0B2G103	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068	0.00	28.29	0.00		1	50.000.000	KG	1.0000	Estadistic
<b>Total ABALISAMENT I DEFENSES 01.01.06.04</b>				<b>487.30</b>						

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 07 MESURES CORRECTORES

**GR720001** Hidrosembra de capa herbàcia en dues fases amb espècies adaptades agroclimàticament a la zona, inclòs el subministrament de tots els components necessaris (llavors, mulch, estabilitzant, bioactivador, adobs), regs d'arrelament, així com el manteniment necessari fins a la recepció de l'obra (P - 115) 5.413.800 m2

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J011A200	Anàlisi Standard d'una mostra d'aigua per a reg de plantacions (PH, conductivitat, clorurs, sulfats, carbonats, bicarbonats, duresa, Na, K, Ca, Mg, relació de calci, % sodi del total de cations, carbonat sòdic residual (CSR), relació d'absorció de sodi (SAR)), i bor i ferro total, segons normes vigents	1.00	131.41	131.41	Si	1	0.000		180.000.000	Global
JR3AC201	Anàlisi de compostos d'origen mineral per adob de terra vegetal (humitat, duresa, granulometria, densitat aparent, resistència mecànica, tendència al atapeïment, N, P, K assimilable, Ca, Mg, Na, S, C/N, Cu, Zn, Fe, Bo, Co, Mn i Mo), segons normes UNE	1.00	394.20	394.20	Si	1	0.000		20.000.000	Global

**PLA DE CONTROL DE QUALITAT**

Operacions de Control

Planejament

Pàgina: 24

JR467200	Anàlisi de puresa específica amb informació de la composició	1.00	148.50	148.50	Si	1	0.000		0.0300	Estadistic
JR468200	Percentatge de germinació per espècie	1.00	75.92	75.92	Si	1	0.000		0.0300	Estadistic
JR471150	Amidament i anàlisi del contingut de llavors, aigua, adob, mulch i altres components de la hidrosembra, espècies herbàcies i espècies arbustives, mitjançant el pes de la matèria seca (a 105° C) d'una mostra de la barreja abans de l'aplicació	1.00	542.17	542.17	Si	1	0.000		0.0300	Estadistic

Tipus de Control: Control d'obra acabada

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
JR473170	Determinació del contingut de llavors, mulch i fertilitzant un cop executada la hidrosembra, mitjançant el pes de la matèria seca (a 105° C)	1.00	385.50	385.50		1	10.000.000	M2	0.0300	Tram
<b>Total MESURES CORRECTORES 01.01.07</b>				<b>1.677.70</b>						

Obra 01 Pressupost GIP-5129  
 Capítol 01 TRAMIFICAT  
 Títol 3 08 OBRES COMPLEMENTÀRIES  
 Títol 4 01 URBANITZACIÓ

**G9GA0004** Paviment de formigó HM-20, de consistència plàstica o tova, de qualsevol gruix, amb mitjans manuals, incloent estesa, vibratge, acabat superficial, formació de junts tallats en fresc i totes les feines adients (P - 59) 23.850 m3

Tipus de Control: Control de recepció

Codi Assaig	Descripció	Resultat	Preu	Import	Únic	Nº Assaigs per Lot	Freqüència Lot	Unitat Freqüència	Relació d'Unitats	Tipus de Càlcul
J060120G	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2	2.00	18.62	37.24		2	0.000		1.0000	Tram
<b>Total URBANITZACIÓ 01.01.08.01</b>				<b>37.24</b>						



## **RESUM DEL PLA DE CONTROL**

## RESUM DEL PLA DE CONTROL

Planejament

Pàg.: 1

Tram	Cami Ordinal	Descripció	Import Obra	Import PCQ	%
<b>NIVELL 6: Títol 6</b>					
Titol 6	01.01.04.01.01.01	TAULER	777,684.17	1,491.73	0.19
Titol 6	01.01.04.01.01.02	ALÇAT D'ESTREPS	73,773.69	2,472.84	3.35
Titol 6	01.01.04.01.01.03	ALÇAT PILES	68,943.30	1,108.68	1.61
Titol 6	01.01.04.01.01.04	ACABATS	42,824.17	6,655.45	15.54
Titol 6	01.01.04.01.01.05	FONAMENTACIÓ D'ESTREPS I PILES	338,954.94	1,314.08	0.39
Titol 6	01.01.04.01.01.06	ALTRES	8,032.50	0.00	0.00
<b>Titol 5</b>	<b>01.01.04.01.01</b>	<b>VIADUCTE SOBRE EL MANOL</b>	<b>1,310,212.77</b>	<b>13,042.78</b>	<b>1.00</b>
			<b>1,310,212.77</b>	<b>13,042.78</b>	<b>1.00</b>
<b>NIVELL 5: Títol 5</b>					
Titol 5	01.01.04.01.01	VIADUCTE SOBRE EL MANOL	1,310,212.77	13,042.78	1.00
<b>Titol 4</b>	<b>01.01.04.01</b>	<b>OBRES DE FÀBRICA</b>	<b>1,310,212.77</b>	<b>13,042.78</b>	<b>1.00</b>
Titol 5	01.01.08.02.01	OBRA CIVIL	14,124.11	0.00	0.00
Titol 5	01.01.08.02.02	CONDUCTORS I TERRES	10,301.26	0.00	0.00
Titol 5	01.01.08.02.03	COLUMNES I LLUMINÀRIES	18,978.22	0.00	0.00
Titol 5	01.01.08.02.04	LEGALITZACIÓ I ARMARI	2,380.00	0.00	0.00
<b>Titol 4</b>	<b>01.01.08.02</b>	<b>ENLLUMENAT</b>	<b>45,783.59</b>	<b>0.00</b>	<b>0.00</b>
			<b>1,355,996.36</b>	<b>13,042.78</b>	<b>0.96</b>
<b>NIVELL 4: Títol 4</b>					
Titol 4	01.01.03.01	DRENATGE LONGITUDINAL	43,181.40	74.48	0.17
<b>Titol 3</b>	<b>01.01.03</b>	<b>DRENATGE</b>	<b>43,181.40</b>	<b>74.48</b>	<b>0.17</b>
Titol 4	01.01.04.01	OBRES DE FÀBRICA	1,310,212.77	13,042.78	1.00
<b>Titol 3</b>	<b>01.01.04</b>	<b>ESTRUCTURES</b>	<b>1,310,212.77</b>	<b>13,042.78</b>	<b>1.00</b>
Titol 4	01.01.05.01	MATERIALS GRANULARS	228,993.54	5,239.20	2.29
Titol 4	01.01.05.02	AGLOMERATS ASFÀLTICS	230,350.78	11,541.34	5.01
<b>Titol 3</b>	<b>01.01.05</b>	<b>AFERMATS</b>	<b>459,344.32</b>	<b>16,780.54</b>	<b>3.65</b>
Titol 4	01.01.06.01	SENYALITZACIÓ HORIZONTAL	4,508.49	110.00	2.44
Titol 4	01.01.06.02	SENYALITZACIÓ VERTICAL	9,006.42	3,187.72	35.39
Titol 4	01.01.06.03	SENYALITZACIÓ D'ORIENTACIÓ	7,811.58	37.24	0.48
Titol 4	01.01.06.04	ABALISAMENT I DEFENSES	136,639.17	1,961.30	1.44
<b>Titol 3</b>	<b>01.01.06</b>	<b>SEGURETAT VIÀRIA</b>	<b>157,965.66</b>	<b>5,296.26</b>	<b>3.35</b>
Titol 4	01.01.08.01	URBANITZACIÓ	18,857.92	37.24	0.20
Titol 4	01.01.08.02	ENLLUMENAT	45,783.59	0.00	0.00
<b>Titol 3</b>	<b>01.01.08</b>	<b>OBRES COMPLEMENTÀRIES</b>	<b>64,641.51</b>	<b>37.24</b>	<b>0.06</b>
			<b>2,035,345.66</b>	<b>35,231.30</b>	<b>1.73</b>
<b>NIVELL 3: Títol 3</b>					
Titol 3	01.01.01	TREBALLS PREVIS I ENDERROCS	16,547.94	0.00	0.00
Titol 3	01.01.02	MOVIMENT DE TERRES	93,335.63	2,537.78	2.72
Titol 3	01.01.03	DRENATGE	43,181.40	74.48	0.17
Titol 3	01.01.04	ESTRUCTURES	1,310,212.77	13,042.78	1.00
Titol 3	01.01.05	AFERMATS	459,344.32	16,780.54	3.65
Titol 3	01.01.06	SEGURETAT VIÀRIA	157,965.66	5,296.26	3.35
Titol 3	01.01.07	MESURES CORRECTORES	29,643.73	1,677.70	5.66
Titol 3	01.01.08	OBRES COMPLEMENTÀRIES	64,641.51	37.24	0.06
<b>Capítol</b>	<b>01.01</b>	<b>TRAMIFICAT</b>	<b>2,174,872.96</b>	<b>39,446.78</b>	<b>1.81</b>

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## RESUM DEL PLA DE CONTROL

Planejament

Pàg.: 2

Tram	Cami Ordinal	Descripció	Import Obra	Import PCQ	%
Titol 3	01.02.03	PARTIDES ALÇADES	177,698.99	0.00	0.00
<b>Capítol</b>	<b>01.02</b>	<b>NO TRAMIFICAT</b>	<b>177,698.99</b>	<b>0.00</b>	<b>0.00</b>
			<b>2,352,571.95</b>	<b>39,446.78</b>	<b>1.68</b>
<b>NIVELL 2: Capítol</b>					
Capítol	01.01	TRAMIFICAT	2,174,872.96	39,446.78	1.81
Capítol	01.02	NO TRAMIFICAT	177,698.99	0.00	0.00
<b>Obra</b>	<b>01</b>	<b>Pressupost GIP-5129</b>	<b>2,352,571.95</b>	<b>39,446.78</b>	<b>1.68</b>
			<b>2,352,571.95</b>	<b>39,446.78</b>	<b>1.68</b>
<b>NIVELL 1: Obra</b>					
Obra	01	Pressupost GIP-5129	2,352,571.95	39,446.78	1.68
<b>Obra</b>	<b>01</b>		<b>2,352,571.95</b>	<b>39,446.78</b>	<b>1.68</b>

Els imports de pressupost mostrats en aquest llistat són indicatius i per tant no vàlids a nivell contractual

Els imports estan expressats en PEC sense IVA

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## **PRESSUPOST**



Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

## PRESSUPOST

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Pàg.: 1

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	02	MOVIMENT DE TERRES

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J03DA209	U	Determinació de l'índex CBR en laboratori, amb la metodologia del Próctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502 (P - 10)	120.95	3.000	362.85
2	J03D2202	U	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101 (P - 6)	31.70	3.000	95.10
3	J2VCR10P	U	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938 (P - 30)	13.65	25.000	341.25
4	J2VGY20X	U	Determinació del inflament lliure pel mètode del edòmetre, d'una mostra de sòl, segons la norma UNE 103601 (P - 36)	104.16	3.000	312.48
5	J2VGM10X	U	Assaig de colapse d'un sòl, segons la norma NLT 254 (P - 35)	88.61	3.000	265.83
6	J03DN10Z	U	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114 (P - 13)	38.99	3.000	116.97
7	J03DK10Y	U	Determinació del contingut de guix d'un sòl, segons la norma NLT 115 (P - 11)	81.06	3.000	243.18
8	J03D8208	U	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501 (P - 9)	64.53	5.000	322.65
9	J03D7207	U	Assaig de piconatge pel mètode del Proctor normal d'una mostra de sòl, segons la norma UNE 103500 (P - 8)	47.92	5.000	239.60
10	J03D4204	U	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104 (P - 7)	36.13	3.000	108.39
11	J03DK20H	U	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204 (P - 12)	43.16	3.000	129.48

**TOTAL Títol 3 01.01.02 2,537.78**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	03	DRENATGE
Títol 4	01	DRENATGE LONGITUDINAL

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	4.000	74.48

**TOTAL Títol 4 01.01.03.01 74.48**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	01	TAULER

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J056G30G	U	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431 (P - 21)	108.86	1.000	108.86
2	J0B21103	U	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1	82.25	1.000	82.25

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Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 2

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
3	J060770A	U	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3 (P - 23)	99.26	12.000	1,191.12
4	J0B25101	U	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 25)	63.26	1.000	63.26
5	J0B28103	U	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 26)	17.95	1.000	17.95
6	J0B2G103	U	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068 (P - 27)	28.29	1.000	28.29

**TOTAL Títol 6 01.01.04.01.01.01 1,491.73**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	02	ALÇAT D'ESTREPS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J2VCS10Q	U	Assaig de càrrega in situ, amb placa de 30 cm de diàmetre d'un sòl, segons la norma NLT 357 (P - 31)	136.56	1.000	136.56
2	J2VCP10M	U	Determinació in situ de la humitat d'un sòl, segons la norma NLT 103 (P - 28)	12.77	1.000	12.77
3	J2VCR10P	U	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938 (P - 30)	13.65	3.000	40.95
4	J0304503	U	Anàlisi granulomètrica per tamisatge d'una mostra d'àrids, segons la norma UNE-EN 933-1 (P - 2)	31.70	2.000	63.40
5	J030970B	U	Determinació de la resistència al desgast mitjançant la màquina de Los Angeles d'una mostra d'àrids gruixuts, segons la norma UNE-EN 1097-2 (P - 3)	79.72	2.000	159.44
6	J03D2202	U	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101 (P - 6)	31.70	3.000	95.10
7	J03D8208	U	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501 (P - 9)	64.53	1.000	64.53
8	J03DN10Z	U	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114 (P - 13)	38.99	1.000	38.99
9	J03DK20H	U	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204 (P - 12)	43.16	1.000	43.16
10	J03DA209	U	Determinació de l'índex CBR en laboratori, amb la metodologia del Próctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502 (P - 10)	120.95	1.000	120.95
11	J03D4204	U	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104 (P - 7)	36.13	1.000	36.13
12	J2VCT40R	U	Densitat d'una probeta de sòl-ciment segons la norma UNE-EN 13286-2 (P - 34)	40.00	7.000	280.00
13	J0B28103	U	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 26)	17.95	0.000	0.00
14	J0B2G103	U	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068 (P - 27)	28.29	0.000	0.00

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Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 3

15	J0B21103	U	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 24)	82.25	0.000	0.00
16	J2VCT10R	U	Determinació de la humitat natural d'un sòl, segons la norma UNE 103300 (P - 32)	8.95	1.000	8.95
17	J060770A	U	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3 (P - 23)	99.26	6.000	595.56
18	J0B25101	U	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 25)	63.26	0.000	0.00
19	J056G30G	U	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431 (P - 21)	108.86	0.000	0.00
20	JFA13A0H	U	Determinació de la temperatura de reblaniment Vicat d'una mostra de tub de material plàstic, segons la norma UNE-EN ISO 306 (P - 64)	143.00	1.000	143.00
21	JFA1800A	U	Assaig a tracció, amb determinació de l'esforç màxim (en el punt de fluència o en el de trencament), segons la norma UNE 53112 (P - 65)	143.98	1.000	143.98
22	JFA19C01	U	Assaig d'aixafament o de flexió transversal d'un tub de material plàstic de 400 mm de diàmetre, com a màxim, segons plec de prescripcions tècniques generals per a canonades d'abastament d'aigua del MOPT (P - 66)	212.64	1.000	212.64
23	J030F60F	U	Determinació de l'equivalent de sorra d'una mostra d'àrids fins, segons la norma UNE-EN 933-8 (P - 5)	20.74	1.000	20.74
24	J2VCQ10N	U	Determinació in situ de la humitat i la densitat pel mètode de la sorra d'un sòl, segons la norma UNE 103503 (P - 29)	36.57	7.000	255.99

**TOTAL Títol 6 01.01.04.01.01.02 2,472.84**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	03	ALÇAT PILES

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J0438101	U	Determinació del pes específic d'una pedra, segons la norma UNE-EN 1936 (P - 16)	138.44	1.000	138.44
2	J030970B	U	Determinació de la resistència al desgast mitjançant la màquina de Los Angeles d'una mostra d'àrids gruixuts, segons la norma UNE-EN 1097-2 (P - 3)	79.72	1.000	79.72
3	J0421601	U	Determinació de la resistència a la compressió simple d'una sèrie de 6 provetes de pedra natural, segons la norma UNE-EN 1926 (P - 14)	280.70	1.000	280.70
4	J0434105	U	Determinació del coeficient d'absorció d'aigua d'una pedra, segons la norma UNE-EN 1925 (P - 15)	128.53	1.000	128.53
5	J0B25101	U	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 25)	63.26	0.000	0.00
6	J030C50C	U	Determinació de l'estabilitat enfront de dissolucions de sulfat sòdic o sulfat magnèsic d'una mostra d'àrids, segons la norma UNE-EN 1367-2 (P - 4)	80.78	1.000	80.78
7	J043D100	U	Determinació de la densitat aparent seca d'una pedra (P - 17)	102.73	1.000	102.73
8	J060770A	U	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3 (P -	99.26	3.000	297.78

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Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 4

9	J0B21103	U	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 24)	82.25	0.000	0.00
10	J056G30G	U	Determinació per destil·lació del lligant residual d'una mostra d'emulsió bituminosa, segons la norma UNE-EN 1431 (P - 21)	108.86	0.000	0.00
11	J0B28103	U	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 26)	17.95	0.000	0.00
12	J0B2G103	U	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per a armar formigons, segons la norma UNE 36068 (P - 27)	28.29	0.000	0.00

**TOTAL Títol 6 01.01.04.01.01.03 1,108.68**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	04	ACABATS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J4ZBWV01	U	Determinació del diagrama tensió-deformació de les plaques d'acer d'armat de neoprè, amb obtenció del límit elàstic i de la tensió de trencament, segons les normes UNE-EN ISO 6892-1 (P - 42)	495.00	1.000	495.00
2	J7J1K602	U	Determinació de la resistència a l'esquerdament per ozó d'una mostra de material elastomèric, segons la norma UNE ISO 1431-1 (P - 49)	250.00	1.000	250.00
3	J7J1H603	U	Determinació del tipus d'elastòmer per espectrofotometria d'infrarojos, segons la norma UNE 53633 (P - 48)	387.30	1.000	387.30
4	J7J1G609	U	Determinació de la deformació remanent a baixa temperatura d'una mostra de material elastomèric, segons la norma UNE ISO 815-2 (P - 47)	172.50	1.000	172.50
5	J7J1860C	U	Determinació de la variació de la duresa experimentada després de l'assaig d'envelliment d'una mostra de material elastomèric, segons la norma UNE ISO 48 (P - 45)	201.24	1.000	201.24
6	J7J1160A	U	Determinació de la resistència a tracció d'una mostra de material elastomèric, segons la norma UNE ISO 37 (tipus 2) (P - 43)	99.43	1.000	99.43
7	J4ZBJ308	U	Comprovació del comportament dinàmic d'un recolzament de neoprè, segons la norma MELC 1016 (P - 41)	168.93	1.000	168.93
8	J4ZBE507	U	Determinació de la resistència a la cisalla entre l'elastòmer i les armadures d'un recolzament de neoprè armat o junt de dilatació, segons Annex G de la norma UNE-EN 1337-3 (P - 40)	969.93	1.000	969.93
9	J4ZBD206	U	Determinació de la resistència a compressió d'un recolzament de neoprè armat, segons Annex H de la norma UNE-EN 1337-3 (P - 39)	2,414.88	1.000	2,414.88
10	J4ZBC205	U	Determinació del mòdul d'elasticitat transversal (cizallament) d'un recolzament de neoprè armat, segons a norma UNE 53630 (P - 38)	959.95	1.000	959.95
11	J7J1AA00	U	Assaig de tracció d'un pern d'ancoratge d'un junt de dilatació (P - 46)	31.42	2.000	62.84
12	J441HH00	U	Determinació de la força de collament ('parell de collament') d'una unió cargolada (P - 37)	18.62	8.000	148.96
13	J7J1660B	U	Determinació de l'envelliment al cap de 72 h a 100°C d'una mostra de material elastomèric, segons la norma UNE ISO 188 (P - 44)	324.49	1.000	324.49

**TOTAL Títol 6 01.01.04.01.01.04 6,655.45**

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Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 5

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	04	ESTRUCTURES
Títol 4	01	OBRES DE FÀBRICA
Títol 5	01	VIADUCTE SOBRE EL MANOL
Títol 6	05	FONAMENTACIÓ D'ESTREPS I PILES

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J0B28103	U	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 26)	17.95	2.000	35.90
2	J060770A	U	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3 (P - 23)	99.26	9.000	893.34
3	J0B2G103	U	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068 (P - 27)	28.29	2.000	56.58
4	J0B21103	U	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 24)	82.25	2.000	164.50
5	J0B25101	U	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 25)	63.26	2.000	126.52
6	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	2.000	37.24
<b>TOTAL</b>	<b>Títol 6</b>		<b>01.01.04.01.01.05</b>			<b>1,314.08</b>

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	05	AFERMATS
Títol 4	01	MATERIALS GRANULARS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J2VCT10R	U	Determinació de la humitat natural d'un sòl, segons la norma UNE 103300 (P - 32)	8.95	4.000	35.80
2	J2VCQ10N	U	Determinació in situ de la humitat i la densitat pel mètode de la sorra d'un sòl, segons la norma UNE 103503 (P - 29)	36.57	4.000	146.28
3	J03DA209	U	Determinació de l'índex CBR en laboratori, amb la metodologia del Próctor modificat (a tres punts) d'una mostra de sòl, segons la norma UNE 103502 (P - 10)	120.95	2.000	241.90
4	J2VCR10P	U	Determinació 'in situ' de la humitat i la densitat pel mètode dels isòtops radioactius d'un sòl, segons la norma ASTM D 6938 (P - 30)	13.65	42.000	573.30
5	J2VCP10M	U	Determinació in situ de la humitat d'un sòl, segons la norma NLT 103 (P - 28)	12.77	14.000	178.78
6	J03DN10Z	U	Determinació del contingut de sals solubles (inclòs guix) d'un sòl, segons la norma NLT 114 (P - 13)	38.99	2.000	77.98
7	J2VCT30R	U	Assaigs de càrrega vertical de sòls mitjançant placa estàtica de 300 mm de diàmetre nominal, segons la norma UNE 103808 (P - 33)	210.10	8.000	1,680.80
8	J03DK20H	U	Determinació del contingut de matèria orgànica, pel mètode del permanganat de potàsic d'una mostra de sòl, segons la norma UNE 103204 (P - 12)	43.16	2.000	86.32
9	J03D8208	U	Assaig de piconatge pel mètode del Proctor modificat d'una mostra de sòl, segons la norma UNE 103501 (P - 9)	64.53	2.000	129.06
10	J03D4204	U	Determinació dels límits d'Atterberg (límit líquid i límit plàstic) d'una mostra de sòl, segons la norma UNE 103103 i UNE 103104 (P - 7)	36.13	2.000	72.26

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Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 6

11	J03D2202	U	Anàlisi granulomètrica per tamisatge d'una mostra de sòl, segons la norma UNE 103101 (P - 6)	31.70	2.000	63.40
12	J030F60F	U	Determinació de l'equivalent de sorra d'una mostra d'àrids fins, segons la norma UNE-EN 933-8 (P - 5)	20.74	2.000	41.48
13	J2VCS10Q	U	Assaig de càrrega in situ, amb placa de 30 cm de diàmetre d'un sòl, segons la norma NLT 357 (P - 31)	136.56	14.000	1,911.84

**TOTAL Títol 4 01.01.05.01 5,239.20**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Títol 3	05	AFERMATS
Títol 4	02	AGLOMERATS ASFÀLTICS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J9H1210F	U	Determinació del contingut de lligant d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-1 (P - 50)	44.57	3.000	133.71
2	J9H1P104	U	Presa, confecció de provetes. determinació de la densitat aparent i del contingut de buits d'una mostra de mescla bituminosa, segons les normes UNE-EN 12697-30, UNE-EN 12697-32, UNE-EN 12697-8 i UNE-EN 12697-6 (P - 55)	191.53	3.000	574.59
3	J055A209	U	Determinació de l'índex de penetració d'una mostra de betum asfàltic, segons la norma UNE-EN 12591 i UNE-EN 13924 (P - 20)	62.04	1.000	62.04
4	J9H1B401	U	Control de temperatures en l'execució de paviments de mescla bituminosa en calent, segons la norma UNE-EN 12697-13 (P - 52)	17.07	3.000	51.21
5	J9H1N103	U	Determinació de la sensibilitat a l'aigua (resistència conservada a tracció indirecta després d'immersió) d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-12 (P - 54)	364.63	3.000	1,093.89
6	J0553102	U	Determinació de la penetració amb agulla d'una mostra de material bituminós, segons la norma UNE-EN 1426 (P - 18)	59.92	1.000	59.92
7	J9V1D00J	U	Jornada per a mesura de les deflexions d'un ferm mitjançant deflectògraf tipus Lacroix amb càrrega de 13 t, cada 5 m i amb un mínim de 60 determinacions, segons la norma NLT 337, fins a un màxim de 7 km de carril i sense incloure senyalització (P - 59)	3,931.55	1.000	3,931.55
8	J9H1J10M	U	Determinació de la dotació de lligant residual, pel mètode de safata, d'una mostra de mescla bituminosa, segons la norma NLT 353 (P - 53)	60.18	9.000	541.62
9	J9H1310G	U	Anàlisi granulomètrica del granulat recuperat d'una mostra de mescla bituminosa, segons la norma UNE-EN 12697-2 (P - 51)	38.87	3.000	116.61
10	J9V1B30S	U	Jornada de determinació de l'índex de regularitat internacional (IRI) d'un paviment mitjançant perfilòmetre làser d'un paviment de mescla bituminosa, segons la norma NLT 330. Inclou desplaçament i redacció d'informe. (P - 58)	1,498.18	1.000	1,498.18
11	J9V1A10N	U	Jornada per a mesura de la resistència al lliscament amb determinació del coeficient de fregament transversal (CRTS) i caracterització de la textura d'un paviment mitjançant l'equip Scrim, segons la norma UNE 41201, UNE-EN ISO 13473-1, inclouent desplaçament i redacció d'informe (P - 57)	3,393.00	1.000	3,393.00
12	J9V1310L	U	Mesura de la macrotextura superficial d'un paviment mitjançant el mètode volumètric, segons la norma UNE-EN 13036-1 (P - 56)	26.62	1.000	26.62
13	J0554103	U	Determinació del punt de reblaniment pel mètode de l'anella i bola d'una mostra de material bituminós, segons la norma UNE-EN 1427 (P - 19)	58.40	1.000	58.40

**TOTAL Títol 4 01.01.05.02 11,541.34**

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT

EUR

Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

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Pàg.: 7

Titul 3	06	SEGURETAT VIÀRIA			
Titul 4	01	SENYALITZACIÓ HORIZONTAL			

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	JBA1K303	U	Determinació de la viscositat en marques vials realitzades amb pintures, segons la norma UNE-EN 12802. (P - 61)	110.00	1.000	110.00
<b>TOTAL</b>	<b>Titul 4</b>		<b>01.01.06.01</b>		<b>110.00</b>	

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Titul 3	06	SEGURETAT VIÀRIA
Titul 4	02	SENYALITZACIÓ VERTICAL

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	4.000	74.48
2	JBA11505	U	Jornada per a determinació de la visibilitat nocturna mitjançant el coeficient de retrorreflexió d'una marca vial en servei, segons la norma UNE-EN 1436, amb equip puntual i sense incloure senyalització ni mitjans auxiliars (P - 60)	819.62	2.000	1,639.24
3	JBB1F916	U	Jornada de mesura per determinar coordenades cromàtiques i factor de lluminància beta segons la norma UNE-135352. (No inclou permisos ni senyalització) (P - 62)	1,474.00	1.000	1,474.00
<b>TOTAL</b>	<b>Titul 4</b>		<b>01.01.06.02</b>		<b>3,187.72</b>	

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Titul 3	06	SEGURETAT VIÀRIA
Titul 4	03	SENYALITZACIÓ D'ORIENTACIÓ

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	2.000	37.24
<b>TOTAL</b>	<b>Titul 4</b>		<b>01.01.06.03</b>		<b>37.24</b>	

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Titul 3	06	SEGURETAT VIÀRIA
Titul 4	04	ABALISAMENT I DEFENSES

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J0B25101	U	Determinació del límit elàstic per a una deformació romanent del 0.2%, resistència a la tracció, allargament i estricció d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 25)	63.26	0.000	0.00
2	J0B21103	U	Determinació de les característiques geomètriques d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 24)	82.25	0.000	0.00
3	J060770A	U	Mostreig, realització de con d'Abrams, elaboració de les provetes, cura, recapçament i assaig a compressió d'una sèrie de cinc provetes cilíndriques de 15x30 cm, segons la norma UNE-EN 12350-1, UNE-EN 12350-2, UNE-EN 12390-1, UNE-EN 12390-2 i UNE-EN 12390-3 (P - 23)	99.26	3.000	297.78

EUR

Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà,  
amb nou pont sobre el Manol

## PRESSUPOST

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Pàg.: 8

4	J0B28103	U	Assaig de doblegament-desdobleament d'una proveta d'acer per a armar formigons, segons la norma UNE-EN ISO 15630-1 (P - 26)	17.95	0.000	0.00
5	JBM21101	U	Determinació de les característiques geomètriques d'un element de barrera metàl·lica de seguretat (suport, separador i biona), segons la norma UNE 135121, UNE 135122 i UNE 135123 (P - 63)	50.76	3.000	152.28
6	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	2.000	37.24
7	JBB1F916	U	Jornada de mesura per determinar coordenades cromàtiques i factor de lluminància beta segons la norma UNE-135352. (No inclou permisos ni senyalització) (P - 62)	1,474.00	1.000	1,474.00
8	J0B2G103	U	Determinació de l'àrea de la secció recta transversal equivalent d'una proveta d'acer per armar formigons, segons la norma UNE 36068 (P - 27)	28.29	0.000	0.00

<b>TOTAL</b>	<b>Titul 4</b>		<b>01.01.06.04</b>		<b>1,961.30</b>
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Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Titul 3	07	MESURES CORRECTORES

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J011A200	U	Anàlisi Standard d'una mostra d'aigua per a reg de plantacions (PH, conductivitat, clorurs, sulfats, carbonats, bicarbonats, duresa, Na, K, Ca, Mg, relació de calci, % sodi del total de cations, carbonat sòdic residual (CSR), relació d'absorció de sodi (SAR)), i bor i ferro total, segons normes vigents (P - 1)	131.41	1.000	131.41
2	JR3AC201	U	Anàlisi de compostos d'origen mineral per adob de terra vegetal (humitat, duresa, granulometria, densitat aparent, resistència mecànica, tendència al atapeïment, N, P, K assimilable, Ca, Mg, Na, S, C/N, Cu, Zn, Fe, Bo, Co, Mn i Mo), segons normes UNE (P - 67)	394.20	1.000	394.20
3	JR467200	U	Anàlisi de puresa específica amb informació de la composició (P - 68)	148.50	1.000	148.50
4	JR468200	U	Percentatge de germinació per espècie (P - 69)	75.92	1.000	75.92
5	JR471150	U	Amidament i anàlisi del contingut de llavors, aigua, adob, mulch i altres components de la hidrosemba, espècies herbàcies i espècies arbustives, mitjançant el pes de la materia seca (a 105° C) d'una mostra de la barreja abans de l'aplicació (P - 70)	542.17	1.000	542.17
6	JR473170	U	Determinació del contingut de llavors, mulch i fertilitzant un cop executada la hidrosemba, mitjançant el pes de la materia seca (a 105° C) (P - 71)	385.50	1.000	385.50
<b>TOTAL</b>	<b>Titul 3</b>		<b>01.01.07</b>		<b>1,677.70</b>	

Obra	01	Pressupost GIP-5129
Capítol	01	TRAMIFICAT
Titul 3	08	OBRES COMPLEMENTÀRIES
Titul 4	01	URBANITZACIÓ

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	J060120G	U	Mesura de la consistència pel mètode del con d'Abrams d'una mostra de formigó fresc, segons la norma UNE-EN 12350-2 (P - 22)	18.62	2.000	37.24

<b>TOTAL</b>	<b>Titul 4</b>		<b>01.01.08.01</b>		<b>37.24</b>
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EUR

**PRESSUPOST**

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(\*) Branques incompletes



## RESUM DEL PRESSUPOST




## RESUM DE PRESSUPOST

Pàg.: 1

NIVELL 3: Títol 3			Import
Títol 3	01.01.01	TREBALLS PREVIS I ENDERROCS	0.00
Títol 3	01.01.02	MOVIMENT DE TERRES	2,537.78
Títol 3	01.01.03	DRENATGE	74.48
Títol 3	01.01.04	ESTRUCTURES	13,042.78
Títol 3	01.01.05	AFERMATS	16,780.54
Títol 3	01.01.06	SEGURETAT VIÀRIA	5,296.26
Títol 3	01.01.07	MESURES CORRECTORES	1,677.70
Títol 3	01.01.08	OBRES COMPLEMENTÀRIES	37.24
<b>Capítol</b>	<b>01.01</b>	<b>TRAMIFICAT</b>	<b>39,446.78</b>
Títol 3	01.02.03	PARTIDES ALÇADES	0.00
<b>Capítol</b>	<b>01.02</b>	<b>NO TRAMIFICAT</b>	<b>0.00</b>
			<b>39,446.78</b>
NIVELL 2: Capítol			Import
Capítol	01.01	TRAMIFICAT	39,446.78
Capítol	01.02	NO TRAMIFICAT	0.00
<b>Obra</b>	<b>01</b>	<b>Pressupost GIP-5129</b>	<b>39,446.78</b>
			<b>39,446.78</b>
NIVELL 1: Obra			Import
Obra	01	Pressupost GIP-5129	39,446.78
			<b>39,446.78</b>




## **APÈNDIX 2. Situacions d'emergència ambiental**

		<b>SITUACIONS D'EMERGÈNCIA AMBIENTAL. IDENTIFICACIÓ I AVALUACIÓ</b>		<input type="checkbox"/> EDIFICACIÓ	<input checked="" type="checkbox"/> OBRA CIVIL		
PROJECTE DE CONDICIONAMENT D'UN TRAM DE LA CARRETERA GIP-5129 DE VILAFANT A BORRASSÀ, AMB NOU PONT SOBRE EL MANOL					Pàg: 1/3		
Vec-tor	Codi	Situació d'emergència	Activitat que la produeix	Avaluació			
				Probabilitat	Gravetat	Prob. x Grav.	Significativa (X)

Flora i fauna	FE001	Incendis forestals	Demolició de construccions (talls amb serra de disc). Soldadures. Reposició de l'enllumenat. Reposició de la xarxa elèctrica. Manca de control normes de seguretat i salut de l'obra (fumar a l'obra, abandonament de residus, etc.)	Baixa	Notable	3	X
	FE002	Plagues					
	FE003	Incendis a l'obra	Demolició de construccions (talls amb serra de disc). Soldadures. Reposició de l'enllumenat. Reposició de la xarxa elèctrica. Manca de control normes de seguretat i salut de l'obra (fumar a l'obra, abandonament de residus, etc.)	Baixa	Moderada	2	
Atmosfera	AE001	Emissions de substàncies tòxiques (pols d'amiant, fums)	Pavimentació o impermeabilització amb materials bituminosos. Pintat per marcar els vials	Mitjana	Moderada	3	X
	AE002	Trencament de canonades de gas	Excavacions moviment de terres. Canalitzacions serveis. Reposició gas. Enclavament barreres de seguretat.	Baixa	Moderada	2	
	AE003	Radiacions radioactives					

<b>Intolerable (4 i 5)</b>  <b>Important (3)</b>  <b>Tolerable (1 i 2)</b>	Probabilitat Alta Mitjana Baixa	<table border="1"> <tr><td>3</td><td>4</td><td>5</td></tr> <tr><td>2</td><td>3</td><td>4</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	3	4	5	2	3	4	1	2	3	Es considerarà la situació d'emergència SIGNIFICATIVA quan el resultat de l'avaluació sigui superior o igual a 3. En aquest cas, es marcarà amb una creu a la columna de "Significativa". En les altres situacions, es considerarà NO SIGNIFICATIVA.
		3	4	5								
		2	3	4								
1	2	3										
Trivial    Moderada    Notable												
Gravetat												

		<b>SITUACIONS D'EMERGÈNCIA AMBIENTAL. IDENTIFICACIÓ I AVALUACIÓ</b>		<input type="checkbox"/> EDIFICACIÓ	<input checked="" type="checkbox"/> OBRA CIVIL		
PROJECTE DE CONDICIONAMENT D'UN TRAM DE LA CARRETERA GIP-5129 DE VILAFANT A BORRASSÀ, AMB NOU PONT SOBRE EL MANOL					Pàg: 2/3		
Vec-tor	Codi	Situació d'emergència	Activitat que la produeix	Avaluació			
				Probabilitat	Gravetat	Prob. x Grav.	Significativa (X)

Hidrologia	HE001	Trencament de canonades d'aigua	Excavacions moviment de terres. Canalitzacions serveis. Enclavament barreres de seguretat. Reposició aigua potable. Reposició regs i drenatges.	Baixa	Moderada	2	
	HE002	Vessaments incontrolats a sistemes aquàtics	Pavimentació o impermeabilització amb materials bituminosos. Pintat per marcar els vials. Demolició de construccions. Canalitzacions serveis.	Mitjana	Notable	4	X
	HE003	Inundacions a l'obra					
	HE004	Trencament d'oleoductes					
	HE005	Trencament de la xarxa de clavegueram	Excavacions moviment de terres. Canalitzacions serveis. Enclavament barreres de seguretat.	Baixa	Moderada	2	
Sòl/Subsòl	SE001	Vessaments incontrolats al sòl	Pavimentació o impermeabilització amb materials bituminosos. Pintat per marcar els vials. Demolició de construccions. Canalitzacions serveis.	Mitjana	Notable	4	X
	SE002	Esllavissades i despreniments	Excavacions moviment de terres. Terraplenats moviment de terres.	Baixa	Moderada	2	
Energia	EE001	Talls en línies de subministrament elèctric	Excavacions moviment de terres. Canalitzacions serveis. Enclavament barreres de seguretat. Reposició electricitat. Reposició enllumenat.	Mitjana	Moderada	3	X

<b>Intolerable (4 i 5)</b>  <b>Important (3)</b>  <b>Tolerable (1 i 2)</b>	Probabilitat Alta Mitjana Baixa	<table border="1"> <tr><td>3</td><td>4</td><td>5</td></tr> <tr><td>2</td><td>3</td><td>4</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	3	4	5	2	3	4	1	2	3	Es considerarà la situació d'emergència SIGNIFICATIVA quan el resultat de l'avaluació sigui superior o igual a 3. En aquest cas, es marcarà amb una creu a la columna de "Significativa". En les altres situacions, es considerarà NO SIGNIFICATIVA.
		3	4	5								
		2	3	4								
1	2	3										
Trivial    Moderada    Notable												
Gravetat												

		<b>SITUACIONS D'EMERGÈNCIA AMBIENTAL. IDENTIFICACIÓ I AVALUACIÓ</b>		<input type="checkbox"/> EDIFICACIÓ	<input checked="" type="checkbox"/> OBRA CIVIL
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PROJECTE DE CONDICIONAMENT D'UN TRAM DE LA CARRETERA GIP-5129 DE VILAFANT A BORRASSÀ, AMB NOU PONT SOBRE EL MANOL					Pàg: 3/3
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Vec-tor	Codi	Situació d'emergència	Activitat que la produeix	Avaluació			
				Probabilitat	Gravetat	Prob. x Grav.	Significativa (X)

Població	PE001	Epidèmies i malalties (Per exemple: crisis d'asma per pols)	Pavimentació o impermeabilització amb materials bituminosos. Pintat per marcar els vials. Demolició de construccions. Canalitzacions serveis. Excavacions moviment de terres. Terraplenats moviment de terres.	Baixa	Moderada	2	
	PE002	Talls en línies de comunicació (telèfons, fibra òptica, etc.)	Excavacions moviment de terres. Canalitzacions serveis. Enclavament barreres de seguretat. Reposició telecomunicacions.	Baixa	Moderada	2	
	PE004	Incendis a l'oficina	Manca de control normes de seguretat i salut de l'obra (fumar a l'oficina).	Baixa	Moderada	2	

<b>Intolerable (4 i 5)</b>  <b>Important (3)</b>  <b>Tolerable (1 i 2)</b>	Probabilitat	Alta	<b>3</b>	<b>4</b>	<b>5</b>	Es considerarà la situació d'emergència SIGNIFICATIVA quan el resultat de l'avaluació sigui superior o igual a 3. En aquest cas, es marcarà amb una creu a la columna de "Significativa". En les altres situacions, es considerarà NO SIGNIFICATIVA.
		Mitjana	<b>2</b>	<b>3</b>	<b>4</b>	
		Baixa	<b>1</b>	<b>2</b>	<b>3</b>	
			Trivial	Moderada	Notable	
			Gravetat			



## **Annex 20. Gestió de residus**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## **ÍNDEX**

1	INTRODUCCIÓ .....	1
2	OBJECTIUS .....	1
3	MARC NORMATIU .....	1
4	ESTIMACIÓ DE LA QUANTITAT DELS RESIDUS GENERATS A L'OBRA.....	1
5	MESURES DE MINIMITZACIÓ DE RESIDUS A L'OBRA .....	4
6	MESURES PER A LA PREVENCIÓ DE RESIDUS A L'OBRA .....	4
7	MESURES PER A LA SEPARACIÓ DE RESIDUS .....	6
8	DIPÒSITS I ABOCADORS CONTROLATS .....	8
9	OPERACIONS DE GESTIÓ DE RESIDUS.....	11
10	ASPECTES A TENIR EN COMPTE EN EL PLA DE GESTIÓ DE RESIDUS .....	12
11	PRESSUPOST .....	12

APÈNDIX 1. PLÀNOLS

APÈNDIX 2. PLEC DE PRESCRIPCIONS

APÈNDIX 3. PRESSUPOST

APÈNDIX 4. TAULA SIMULACIÓ RESIDUS



## 1 INTRODUCCIÓ

El present annex pretén presentar de forma clara, una valoració del conjunt de residus generats durant els treballs d'execució de les obres contemplades en el projecte per tal de donar compliment al Reial Decret 105/2008, on es regula la producció i gestió dels residus de construcció i demolició.

## 2 OBJECTIUS

Els objectius generals d'aquest annex consisteixen principalment en:

- Estimar la quantitat de residus de construcció o demolició que es generaran a l'obra, codificats d'acord amb la Llista Europea de Residus.
- Establir les mesures per la prevenció de residus a l'obra.
- Definir les operacions de reutilització, valorització o eliminació als que es destinaran els residus.
- Esmentar les mesures per la separació de residus a l'obra, preveient, si és possible, mitjans i espais per poder fer les separacions en la mateixa obra o, en cas contrari, concedint-la a un gestor de residus autoritzat.
- Definir gràficament les instal·lacions per a l'emmagatzematge, manipulació, separació i altres operacions de gestió dels residus dins de la pròpia obra.
- Redactar les prescripcions del plec de prescripcions tècniques particulars del projecte relatives a l'emmagatzematge, manipulació, separació i a altres operacions de gestió dels residus de la construcció o demolició dins de la pròpia obra.
- Fer un pressupost, que s'incorporarà al Pressupost d'Execució Material de l'obra, relatiu a les mesures de producció i gestió dels residus de construcció i demolició.

## 3 MARC NORMATIU

L'aprovació del Reial Decret 105/2008, d'1 de febrer, on es regula la producció i gestió dels residus de construcció i demolició, estableix un precedent a nivell nacional en la gestió de residus de construcció i enderroc. A l'article 4 d'aquest Reial Decret, s'obliga al productor de residus a incloure en el projecte d'execució de l'obra un estudi de gestió de residus de la construcció i demolició.

La Demarcació de Carreteres del Departament de Política Territorial i Obres Públiques de la Generalitat de Catalunya, com a productor de residus, ha de vetllar pel compliment de la normativa específica vigent, fomentant la prevenció de residus d'obra, la reutilització, el reciclat i altres formes de valorització, tot assegurant un tractament adequat amb l'objecte d'assolir un desenvolupament sostenible de l'activitat de la construcció.

En relació a la classificació dels diferents tipus de residus, és d'aplicació la següent normativa:

- Catàleg europeu de residus (CER), d'1 de gener de 2002.
- Decret 152/2017, de 17 d'octubre, sobre la classificació, la codificació i les vies de gestió dels residus a Catalunya (DOGC núm. 7477 de 19.10.2017) que deroga el Decret 34/1996 de 9 de gener pel qual s'aprova el Catàleg de residus de Catalunya, i el Decret 92/1999 del 6 d'abril, de modificació del Decret 34/1996.

A continuació es llista un resum de les principals Normatives d'aplicació:

- Reial Decret 105/2008, de 1 de febrer, per el que se regula la producció i gestió dels residus de construcció i enderroc.
- Reial Decret 21/2006, de 14 de febrer, pel qual es regula l'adopció de criteris ambientals i d'ecoeficiència en els edificis.
- Reial Decret 396/2006, de 31 de març, pel qual s'estableixen les disposicions mínimes de seguretat i salut aplicables als treballs amb risc d'exposició a l'amiant. (BOE núm. 86 de 11.4.2006).
- Ordre MAM/304/2002, de 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus (BOE núm. 43 de 19.02.2002).
- Decret 89/2010, de 29 de juny, pel qual s'aprova el Programa de gestió de residus de la construcció de Catalunya (PROGROC), es regula la producció i gestió dels residus de la construcció i demolició, i el cànon sobre la deposició controlada dels residus de la construcció. Aquest Decret deroga el Decret 161/2001, de 12 de juny, de modificació del Decret 201/1994 i el Decret 201/1994, de 26 de juliol, regulador dels enderroc i altres residus de la construcció.
- Reial Decret 180/2015, de 13 de març, pel qual es regula el trasllat de residus en l'interior del territori de l'Estat. Aquest Reial Decret deroga parcialment el Reglament per a l'execució de la Llei 20/1986, bàsica de residus tòxics, aprovada pel Reial Decret 833/1988 de 20 de juliol.
- Decret Legislatiu 1/2009, de 21 de juliol, pel qual s'aprova el Text refós de la Llei reguladora dels residus. Aquest Decret Legislatiu deroga la Llei 15/2003, de 13 de juny, de modificació de la Llei 6/1993, de 15 de juliol, reguladora dels residus.
- Resolució de 14 de juny de 2001, de la Secretaria General de Medi Ambiente, per la que es disposa la publicació de l'Acord del Consell de Ministres, de 1 de juny de 2001, pel qual s'aprova el Pla Nacional de Residus de la Construcció i Demolició 2001-2006.
- Llei 22/2011, de 28 de juliol, de residus i sòls contaminants. Aquesta Llei deroga la Llei 10/1998, de 21 d'abril, de residus.

## 4 ESTIMACIÓ DE LA QUANTITAT DELS RESIDUS GENERATS A L'OBRA

Les obres per a l'execució de la variant de la GIP-5129 entre Vilafant i Borrassà es situen en un entorn interurbà i s'inicien en el PK 1+240 de la via existent. Aquestes obres tenen la finalitat de suprimir el gual existent sobre el riu Manol i lliurar Vilafant de trànsit de pas. Les principals obres a

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

projectar són la variant de Vilafant que substitueix l'actual travessia de la GIP-5129 i el pont sobre el riu Manol per tal de substituir el qual existent.

Durant l'execució de les obres es generaran una sèrie de residus de diferents tipus: residus d'excavació, residus d'extracció de les capes de trànsit, és a dir, capes de rodadures i residus de demolició de formigó, i residus derivats de la pròpia execució de l'obra, com són envasos, fustes, sobrants de formigó, metalls, etc.

Per a poder gestionar adequadament els residus generats és necessari realitzar una estimació d'aquests i classificar-los segons la seva tipologia. A més, s'haurà de controlar la quantitat de les terres excavades i, si en aquestes es detecten substàncies contaminants, caldrà portar-les a l'abocador específic de residus especials.

Les següents taules resumeixen la quantitat de residus derivats de les obres a efectuar contemplades en el present projecte, que s'estima es generaran. La classificació dels residus segueix la codificació del Codi Europeu de Residus (CER).

**Taula 1:** Estimació dels residus d'excavació.

RESIDUS D'EXCAVACIÓ						
Material	Codi CER	Tipologia <sup>(2)</sup>		Volum (m <sup>3</sup> )	Volum aparent (m <sup>3</sup> )	Pes residu (T)
		Inert, Especial, Especial	No Especial			
<b>Terrenys naturals</b>						
Grava i sorra compacta	170504 (terres i pedres diferents de les especificades en el codi 170503*)	Inert		8.787,40	11.423,62	15.730,32
Grava i sorra solta				---	---	---
Argiles	010409 (residus de sorra i argiles)	Inert		---	---	---
Terra vegetal	200202 (terra i pedres)	Inert		4.678,10	6.081,53	8.374,27
<b>Rebliments</b>						
Terra vegetal	200202 (terra i pedres)	Inert		---	---	---
Terraplè	170504 (terres i pedres diferents de les especificades en el codi 170503*)	Inert		13.171,30	17.122,69	23.577,94
Pedraplè				---	---	---
<b>Total</b>				---	---	---
<b>Total per tipologies</b>		<b>Inert - dipòsit</b>		---	---	---

<sup>2</sup> Tipologia de residus, d'acord amb la tipologia d'abocadors.

\* Els quals contenen substàncies perilloses.

En cas de detectar elements susceptibles de contenir amiant caldrà demanar, amb suficient antelació els permisos pertinents a l'autoritat laboral competent i complir amb els requisits ambientals i de seguretat i salut exigits per la legislació vigent.

<sup>1</sup> Els productes de l'amiant es classifiquen en dos grans grups, amiant no-friable, on les fibres es troben barrejades amb altres materials, habitualment ciment o cola (el principal producte és el fibrociment: plaques ondulades, panells, dipòsits, conductes d'aire, etc.) i amiant friable (amiant projectat, etc). Les fibres d'amiant s'introdueixen en l'organisme per les vies respiratòries, per tant, el risc d'amiant es en funció de la quantitat de fibres que es troben en suspensió a l'aire.

**Taula 2:** Estimació dels residus d'enderrocs de vials.

RESIDUS ENDERROCS VIALS				
Materials	Tipologia <sup>2</sup>	Volum real	Volum aparent	Pes
Codi CER	Inert, No Especial, Especial	(m <sup>3</sup> )	(m <sup>3</sup> )	(T)
170101 (Formigó)	Inert	---	---	---
170504** (terres i pedres diferents dels especificats en el codi 170503*)	Inert	---	---	---
170302** (barreges bituminoses diferents de les barreges especificades en el codi 170301*)	No Especial	304,92	509,21	611,06
170405 (ferro i acer)	No Especial		3,26	20,57
170203 (plàstic)	No Especial	---	---	---
170904 ** (residus barrejats de construcció i d'enderroc diferents dels especificats en els codis 1709001, 170902 i 170903*)	No Especial <sup>(3)</sup>	---	---	---
<b>Total <sup>(4)</sup></b>			<b>512,47</b>	<b>631,63</b>
<b>Total per tipologies</b>				
		<b>Inert</b>	---	---
		<b>No Especial</b>	512,47	631,63

<sup>2</sup> Tipologia de residus, d'acord amb la tipologia d'abocadors.

<sup>3</sup> Excepte quan es tracti d'un residu admès en dipòsits de terres i runes.

<sup>4</sup> Excepte els residus Especials.

\*\* La gestió d'aquests residus ja està inclosa dins la partida d'excavació de terres i en la partida de demolició de ferm existent en el pressupost de l'obra, d'aquesta manera no està present en el corresponent pressupost de gestió de residus.

**Taula 3:** Estimació dels residus especials per a les activitats d'enderroc.

RESIDUS ESPECIALS PER A LES ACTIVITATS D'ENDERROC	Codi CER	S'ha detectat?		Quantitat		
		Sí <input type="checkbox"/>	No <input type="checkbox"/>	T	m <sup>3</sup>	u
<b>Terres contaminades</b>						
Terra i pedres que contenen substàncies perilloses (terres contaminades)	170503*	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>Amiant<sup>1</sup></b>						
Flocatge amb amiant d'estructures metàl·liques	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Proteccions individuals en l'eliminació d'amiant (filtres, granotes, caretes, etc.)	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Calorifugat de canonades amb amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Plaques de fibrociment amb amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Canonades i baixants de fibrociment amb amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Dipòsits de fibrociment amb amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Envans pluvials de plaques de fibrociment amb amiant.	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Plaques de cel ras que contenen amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Paviments vinílics que contenen amiant	170605*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

RESIDUS ESPECIALS PER A LES ACTIVITATS D'ENDERROC	Codi CER	S'ha detectat?		Quantitat		
		Sí <input type="checkbox"/>	No <input type="checkbox"/>	T	m <sup>3</sup>	u
Total amiant						
<b>Residus d'equips elèctrics i electrònics</b>						
Equips d'aire condicionat o refrigeració amb CFCs o HCFCs	160211*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Residus recollits de manera selectiva</b>						
Tubs fluorescents i làmpades de vapor de mercuri defectuoses	200121*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Altres residus de construcció i demolició</b>						
Fusta tractada amb substàncies perilloses	170204*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Qualsevol element, material o envàs que pugui contenir substàncies perilloses (detergents, combustibles, pintures, vernissos, dissolvents, adhesius, aerosols, etc.).	(dependrà del tipus de residu)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Residus de construcció i demolició que contenen PCB (per exemple, segellants que contenen PCB, revestiments de sols a partir de resines que contenen PCB, envidraments dobles que contenen PCB, condensadors que contenen PCB).	170902*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Altres residus de construcció i demolició (inclosos els residus mesclats) que contenen substàncies perilloses	170903*	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Total</b>						
<b>Total per tipologies</b>	<b>Especial</b>					

\* Els quals contenen substàncies perilloses.

Taula 4: Estimació dels residus de construcció d'obra nova

RESIDUS D'OBRA NOVA			
Codi CER	Tipologia	Volum	Pes
	Inert i No Especial	m <sup>3</sup> Residu	T Residu
170101 Formigó	Inert	40,75	55,18
170107 (Mescles de formigó, maons, teules i materials ceràmics, diferents de les especificades en el codi 170106)	Inert	474,39	593,95
150101 Envasos de paper i cartró	No Especial	16,41	1,15
150104 Envasos metàl·lics	No Especial	0,09	0,01
170201 Fusta	No Especial	94,16	23,54
170203 Plàstic	No Especial	8,40	0,58
170302 Mescles bituminoses diferents de les especificades en el codi 170301	No Especial	44,76	53,71
170405 Ferro i acer	No Especial	4,24	26,75
170407 Metalls mesclats	No Especial	8,48	53,39
170904 Residus mesclats de construcció i demolició diferents dels especificats en els codis 170901, 170902 i 170903	No Especial	4,45	3,56
<b>Total per tipologies</b>			
	<b>Inert</b>	<b>474,39</b>	<b>593,95</b>
	<b>No Especial</b>	<b>180,98</b>	<b>162,70</b>
	<b>TOTAL INERT I NO ESPECIAL</b>	<b>655,37</b>	<b>756,65</b>
Codi CER	Tipologia	Volum	Pes
	Especial	m <sup>3</sup> Residu	T Residu
130205 Olis minerals no clorats de motor, de transmissió mecànica i lubricants	Especial	0,15	0,14
150110 Envasos que contenen substàncies perilloses o estan contaminats per aquestes	Especial	12,73	1,09
150111 Envasos metàl·lics, inclosos els recipients a pressió buits, que contenen una matriu sòlida i porosa perillosa	Especial	1,60	0,25
150202 Absorbents, materials de filtració (inclosos filtres d'oli no especificats en cap altra categoria), draps de neteja i roba protectora contaminada per substàncies perilloses	Especial	0,38	0,02
160103 Pneumàtics fora d'ús	Especial	0,30	0,06
160107 Filtres d'oli	Especial	0,02	0,00
160604 Piles alcalines (excepte 160603)	Especial	0,09	0,22

RESIDUS D'OBRA NOVA			
Codi CER	Tipologia	Volum	Pes
	Inert i No Especial	m <sup>3</sup> Residu	T Residu
160605 Altres piles i acumuladors	Especial	0,46	1,07
170503 Terres i pedres que contenen substàncies perilloses	Especial	7,06	7,73
200201 Residus biodegradables	Especial	272,69	27,27
200301 Mescles de residus municipals	Especial	173,72	28,58
200304 Llots de fosses sèptiques	Especial	1,61	1,61
80311 Residus de pintura i vernís que contenen dissolvents orgànics o altres substàncies perilloses	Especial	0,29	0,47
80317 Residus de tòner per impressió que contenen substàncies perilloses	Especial	0,02	0,01
80318 Residus de tòner per impressió diferents dels especificats en el codi 080317	Especial	0,04	0,01
<b>TOTAL ESPECIAL</b>		<b>471,16</b>	<b>68,53</b>

A l'apèndix 5 s'adjunten les taules de simulació de residus per element.

Codi CER	Tipologia	Densitat(Tones/m3)
170107	Mescles de formigó, maons, teules i materials ceràmics, diferents de les especificades en el codi 170106)	1,25
170904	Residus mesclats de construcció i demolició diferents dels especificats en els codis 170901, 170902 i 170903	0,80
150101	Envasos de paper i cartró	0,07
170201	Fusta	0,25
170203	Plàstic	0,07
170302	Mescles bituminoses diferents de les especificades en el codi 170301	1,20
170405	Ferro i acer	6,30
170407	Metalls mesclats	6,30
150110	Envasos que contenen substàncies perilloses o estan contaminats per aquestes	0,08
150111	Envasos metàl·lics, inclosos els recipients a pressió buits, que contenen una matriu sòlida i porosa perillosa	0,16
150202	Absorbents, materials de filtració (inclosos els filtres d'oli no especificats en cap altra categoria), draps de neteja i roba protectora contaminats per substàncies perilloses	0,07
170503	Terra i pedres que contenen substàncies perilloses	1,50

Taula 5: Estimació residus especials per a les activitats de nova construcció

MODEL D'INVENTARI DE RESIDUS ESPECIALS PER A LES ACTIVITATS DE NOVA CONSTRUCCIÓ (també inclou la part d'obra nova de les reparacions o reformes)	Codi CER	S'Utilitzen?	
		Sí <input checked="" type="checkbox"/>	No <input type="checkbox"/>
RESIDUS D'ENVASOS; ABSORBENTS, DRAPS DE NETEJA; MATERIALS DE FILTRACIÓ I ROBA DE PROTECCIÓ			
- Envasos que contenen substàncies perilloses o estan contaminades per elles (pintures, vernissos, dissolvents, adhesius, silicones, aerosols, etc.)	150101*	X	
RESIDUS DE LA FFDU I DEL DECAPATGE O L'ELIMINACIÓ DE PINTURA I VERNÍS			

MODEL D'INVENTARI DE RESIDUS ESPECIALS PER A LES ACTIVITATS DE NOVA CONSTRUCCIÓ (també inclou la part d'obra nova de les reparacions o reformes)	Codi CER	S'Utilitzen?	
		Sí <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
- Residus de decapat o eliminació de pintura i vernís que contenen dissolvents orgànics o altres substàncies perilloses	080117*		X
- Residus de decapants o desvernissants	080121*		X
- Residus de pintura i vernís que contenen dissolvents orgànics o altres substàncies perilloses	080111*	X	
RESIDUS DE LA FABRICACIÓ, FORMULACIÓ, DISTRIBUCIÓ I UTILITZACIÓ (FFDU) DE PRODUCTES QUÍMICS ORGÀNICS DE BASE			
- Dissolvents	070103* / 070403*/070404*		X
RESIDUS DE LA FFDU D'ADHESIUS I SEGELLANTS (INCLOENT ELS PRODUCTES D'IMPERMEABILITZACIÓ)			
- Residus d'adhesius i segellants que contenen dissolvents orgànics o altres substàncies perilloses	080409*		X
RESIDUS DE LA FFDU DE PLÀSTICS, CAUTXÚ SINTÈTIC I FIBRES ARTIFICIALS			
- Residus que contenen silicones perilloses	070216*		X
ALTRES RESIDUS DE CONSTRUCCIÓ I DEMOLICIÓ			
- Restes de desencofrants	170903*	X	
RESIDUS RECOLLITS DE MANERA SELECTIVA			
- Tubs fluorescents i làmpades de vapor de mercuri defectuoses	200121*	X	

\* Els quals contenen substàncies perilloses.

## 5 MESURES DE MINIMITZACIÓ DE RESIDUS A L'OBRA

El procés de fabricació dels materials i productes de la construcció té un fort impacte que afecta negativament el medi ambient, provocant una disminució de recursos naturals i l'augment de la despesa energètica. L'extracció del material natural, la seva transformació en matèria prima, el procés de fabricació del producte i el consum d'energia, principalment procedent del petroli, originen emissions de tot tipus, molt tòxiques, contaminants i potencialment perilloses per a la salut.

En aquest apartat es pretén identificar totes aquelles accions de minimització a tenir en consideració en el projecte per tal de prevenir la generació de residus de la construcció i demolició durant la fase d'execució o de reduir-ne la seva producció.

En línies generals, les accions que s'han considerat per reduir la generació de residus són les següents:

- Realitzar solucions constructives que s'ajustin al màxim amb els càlculs (per reduir el volum de material i, per tant, d'energia).
- Emprar sistemes constructius industrialitzats i prefabricats que es munten a obra sense gairebé genera residus.
- Considerar l'aplec i reaprofitament de tota la terra vegetal provinent del moviment de terres.
- Reutilitzar els materials procedents de la pròpia obra, procurant que aquests continguin unes característiques físico-químiques adequades i regulades en el Plec de Prescripcions Tècniques.

Tot seguit s'adjunta una fitxa amb les accions de minimització i prevenció que l'equip tècnic responsable ha considerat durant la realització del projecte.

**Taula 6:** Fitxa per a la definició de les accions de prevenció de residus en la fase del projecte.

ACCIONS DE MINIMITZACIÓ I PREVENCió DES DE LA FASE DE PROJECTE		Sí <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
1	S'ha programat el volum de terres excavades per minimitzar els sobrants de terra i per utilitzar-los al mateix emplaçament?	X	
2	Els sistemes constructius són sistemes industrialitzats i prefabricats que es munten a obra sense gairebé generar residus?	X	
3	S'ha optimitzat les seccions resistents, per tendir a reduir el pes de la construcció i, per tant, la quantitat de material a emprar?	X	
4	S'empren sistemes d'encofrat reutilitzables?	X	
5	S'ha detectat aquelles partides que poden admetre materials reutilitzats de la pròpia obra La reutilització dels materials en la pròpia obra, fa que perdin la consideració de residus, cal reutilitzar aquells materials que continguin unes característiques físiques/químiques adequades i regulades en el Plec de Prescripcions Tècniques.	X	
6	S'ha modulad el projecte (paviments, etc.) per minimitzar els retalls?	X	
7	S'ha dissenyat el projecte tenint en compte criteris de desconstrucció o desmuntabilitat? (Considerar en el procés de disseny unir de manera irreversible només aquells materials que tenen el mateix potencial de reciclabilitat, o bé preveure fixacions fàcilment desmuntables, de manera que sigui viable la seva separació una vegada finalitzada la seva vida útil). Per exemple, el formigó té un gran potencial de reciclabilitat i existeixen plantes de reciclatge d'aquest material. Però en el cas que es trobi unit a un material plàstic, la seva reciclabilitat es veurà dificultada si no s'ha previst que aquests materials es puguin separar amb facilitat. - solucions d'impermeabilització o d'aïllament tèrmic no adherit - solucions d'estructures industrialitzades - solucions de paviments continus	X	
8	Des d'un punt de vista de la disminució de la producció dels residus d'una forma global, s'han utilitzat materials que incorporin material reciclat (residus) en la seva producció?		X

## 6 MESURES PER A LA PREVENCió DE RESIDUS A L'OBRA

Actualment, la correcta gestió de qualsevol tipus de residu resultant d'un procés constructiu és una pràctica inexcusable. Això és així, ja no sols com a conducta òbviament desitjable sota la perspectiva de l'aplicació d'una mínima sensibilitat ambiental, sinó també per l'existència d'una rigorosa legislació específica en la matèria.

Les accions de caire particular que s'hauran de tenir present durant l'execució de l'obra per tal de prevenir i reduir la generació de residus són:

- Realitzar la compra ajustada de materials a l'ús que es realitzi, sense generar excedents.
- Optimitzar la quantitat de materials, ajustant-los als estrictament necessaris per a l'execució de l'obra.



Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

- Escollir materials i productes ecològics amb certificacions que garanteixin la menor incidència ambiental en el seu cicle de vida (contingut de reciclat, etc.).
- Comprar materials al major amb envasos d'una dimensió que permeti reduir la producció de residus d'embalatges.
- Donar preferència a proveïdors que envasin els seus productes amb sistemes d'embalatge que tendeixi a minimitzar els residus o en recipients fabricats amb materials reciclats, biodegradables i que poder ser retornables o, com a mínim, reutilitzables.
- Donar preferència a aquells proveïdors de materials que informen a l'usuari de les característiques que es componen i del percentatge de material reciclat que incorporen, oferint garanties que el mateix fabricant es fa responsable de la gestió de residus que generin en l'obra els seus productes (pactant prèviament el percentatge i característiques dels residus que acceptaran en cas de retorn) o, si això no és viable, informació sobre recomanacions per la gestió més idònia dels residus produïts tenint en compte les seves possibilitats de valoració.
- Preveure a l'obra una ubicació per l'emmagatzematge i recollida dels materials per garantir les propietats i l'ordre fins el moment de la seva aplicació.
- Planificar l'arribada de productes segons les necessitats d'execució en cas de no disposar d'espai suficient per aplicar la recomanació anterior.
- Minimitzar el temps d'emmagatzematge gestionant els estocs de manera que s'eviti la producció de residus per trencament de materials.
- Identificar correctament els materials emmagatzemats.
- Emmagatzemar els materials nous en ordre posant especial atenció en el material d'acabats i reservar-los en un lloc on no es deteriorin les seves propietats.
- Programar el volum de terres excavades per minimitzar els sobrants de terres i emprar-los en el mateix emplaçament, i gestionar l'excedent de terres amb un gestor autoritzat.
- Programar l'obra de manera que hi hagi reberts que serveixin per reutilitzar els residus reciclats, com és el cas del tot-ú.
- Utilitzar elements prefabricats reutilitzables per al replanteig de les infraestructures de l'obra.
- Carregar els carretons o els palets de manera adequada perquè el transport no representi un perill potencial per la seguretat dels treballadors i que no es malmetin els materials nous.
- Traçar itineraris en l'interior de l'obra per la circulació de material i assenyalar-los en el plànol general de l'obra.
- Utilitzar sistemes d'encofrat reutilitzables.
- Preveure pas d'instal·lacions, evacuació, etc. durant les tasques d'encofrat per evitar obertures o perforacions posteriors.
- Utilitzar materials reutilitzables en les reserves dels passos de conductes d'instal·lacions, etc.
- Evitar al màxim el número de retalls durant la posada en obra dels tubs i altres materials d'instal·lacions (plàstics, aïllaments, etc.)
- Protegir els materials col·locats durant la fase d'acabat susceptibles de fer-se malbé amb elements de protecció que es puguin reutilitzar o reciclar.
- Realitzar a peu d'obra exclusivament aquelles tasques de pintura que no es puguin realitzar en un taller.

- Calcular amb exactitud la superfícies que es requereixi pintar i preparar només la quantitat de pintura necessària.
- Controlar la preparació de mescleres per les operacions de pintura amb el fi d'evitar errors i, conseqüentment, residus.
- Evitar l'ús de pistoles convencionals d'alta pressió i utilitzar aquelles que redueixen el consum de pintura i la producció de residus.
- Aspirar la pols que caigui al terra i gestionar-la, conjuntament amb l'escama, com a residu especial.
- Rentar les pistoles en màquines rentadores que permetin la recuperació de dissolvent.
- Reciclar els dissolvents per mitjà de destil·ladores o per mitjà d'empreses que proporcionen aquest servei.
- Aprofitar la pintura dels pots en altres obres abans de lliurar-los a un gestor autoritzat.
- Reutilitzar els dissolvents i les substàncies utilitzades en la neteja d'equips i eines.
- Evitar les barreges amb aigua i altres residus no oleaginosos.

Previ a l'inici de les obres es procedirà, per part del Contractista, a la realització d'un pla de gestió de residus; això, dins de l'àmbit més ampli que marca el Pla de Medi Ambient de l'obra imposat per la norma ISO 14001. Aquest haurà d'incloure tots els recursos necessaris per a garantir una correcta prevenció, control i seguiment de tots els possibles supòsits d'abocaments contaminants atribuïbles al desenvolupament previsible del procés constructiu. Així, aquest pla de gestió haurà de donar cobertura com a mínim als següents aspectes:

- Establiment de protocols preventius d'abocaments accidentals

Aquest aspecte, en realitat, representa l'antesala de la gestió pròpiament dita dels residus, per tant, es tracta de reduir la generació d'aquells o, si més no, de que no degenerin en formes més complexes de processar. En aquest sentit tractarà d'evitar-se a les zones d'obra:

- a) L'arribada de materials prescindibles i que finalment s'hagin de traduir inevitablement en residus.
- b) La realització d'operacions susceptibles de resultar contaminants i que, sense perjudici rellevant, puguin ser portades a terme en instal·lacions especialitzades (com el repostatge, manteniment o reparació dels vehicles).
- c) L'emmagatzematge innecessari de materials potencialment contaminants.
- d) La realització de pràctiques de risc (emmagatzematge de substàncies o residus contaminants, manteniment de maquinària, repostatge de vehicles, etc.) sobre superfícies no impermeabilitzades i, molt especialment, allà on puguin provocar episodis de contaminació directa de les línies de drenatge del territori, en els punts a l'efecte dins de l'àmbit de l'obra.
- e) Una cadència excessivament baixa en el ritme de retirada dels residus acumulats en els punts a l'efecte dins de l'àmbit de l'obra.

- Recollida selectiva de residus

Com a norma de caràcter general, s'establirà una obligatorietat de classificar els residus generats en funció del que haurà de ser el seu tractament final. En definitiva, s'apostarà per l'anomenada "recollida selectiva", que és el primer i imprescindible pas cap a la correcta gestió del material residual que, de forma controlada, es generi durant el curs dels treballs.

- Reutilització in situ de materials inerts

Els treballs preparatoris del terreny per a possibilitar la construcció de l'ampliació de calçada, noves estructures i obres de drenatge suposaran una excavació del terreny.

Tot i que ambientalment és desitjable, dins de qualsevol procés constructiu, l'aplicació del recurs de reciclar en origen els materials inerts residuals, cal subratllar que això ha de fer-se sota unes garanties procedimentals adients. Així, i pel que fa a aquest cas en concret, s'adoptarà com a mesura precautòria la realització d'anàlisis de caracterització com a residu de mostres representatives dels materials inerts no estrictament naturals (típicament, les restes del formigó de demolició) que s'hagin d'usar en els reblliments. Òbviament, la superació de qualsevol líndar crític en els paràmetres fixats a la normativa determinarà la no reutilització en origen del material inert i la seva canalització com a residu a un dipòsit controlat. El protocol analític en detall haurà d'ésser definit en funció de la dinàmica de l'obra i la lectura ambiental de la situació que pugui realitzar la DAO. Tot i així, tota actuació que es porti efectivament a terme haurà d'emparar-se en la legislació vigent sobre la gestió de residus.

- Disposició d'espais adequats per a l'emmagatzematge temporal

Per a materialitzar els objectius ja exposats, dins del marc de l'obra s'establiran punts específicament reservats per a l'emmagatzematge de totes i cadascuna de les tipologies de residu contemplades en la recollida selectiva. Aquests espais seran convenientment senyalitzats i físicament adaptats, a l'efecte de que la seva funcionalitat sigui òptima en funció dels tipus de materials o substàncies que hagin d'acollir. Com a ressenya específica en aquest darrer sentit, és important assenyalar que les substàncies líquides hauran de reunir-se sobre soleres impermeables, a les quals s'haurà dotat d'un marge de seguretat suficient com per a evitar vessaments accidentals.

- Correcta Selecció dels Canals d'evacuació i tractament

S'hauran de definir amb la màxima concreció possible les vies que hauran d'utilitzar-se per a retirar de l'àmbit de l'obra, una vegada més, totes i cadascuna de les tipologies de residu recollides selectivament. Sempre que sigui possible, s'apostarà per canalitzar els residus per procediments que comportin el seu reciclatge total o parcial. Quan això no sigui factible, es determinaran els abocadors més adients per a la seva immobilització definitiva o, cas que la seva naturalesa així ho

requereixi, el gestor autoritzat amb capacitat per a donar-li el tractament més adient que condueixi a la seva eliminació.

Tot i valorar altres alternatives, en el present Projecte s'ha decidit canalitzar tot aquests materials al corresponent dipòsit controlat de residus. Independentment que aquest sigui el destí previst a nivell del present Projecte Constructiu per a l'excedent dels materials d'excavació i la runa de demolició, es faculta al Contractista adjudicatari i, de fet es consideraria desitjable, per a que cerqui una sortida "ambientalment productiva" a aquests residus de l'obra; això, sempre respectant la legalitat vigent i supeditant-la a l'aprovació de la Direcció d'Obra i de la DAO.

D'altra banda, pel que fa a la gestió dels residus que requereixin de tractament per part de gestors autoritzats, la DAO haurà de portar un control estricte de les acreditacions legals dels diferents agents implicats, així com de la dinàmica de recollida i transport des dels punts d'emmagatzematge a l'àmbit de l'obra.

- Revisió de final d'obra

Encara que el correcte seguiment dels protocols descrits hauria d'assegurar un marc d'actuació lliure de focus contaminants, a la finalització del procés constructiu, resulta obligada la realització d'una revisió de certificació per part de la DAO de verificació. D'aquesta forma, tots els terrenys implicats directament en l'activitat constructiva hauran de quedar totalment lliures de qualsevol tipus de residu atribuïble a l'activitat desenvolupada; procedint-se, cas d'ésser necessari, a quantes operacions de neteja addicionals fossin precises per a complir amb l'esmentat objectiu. En aquesta dinàmica, s'inclouran també les restes resultants del desmantellament de tots els elements específicament dissenyats per a acollir pràctiques de risc en matèria de contaminació (sòls impermeabilitzats de parcs de maquinària, cubetes per a l'emmagatzematge de determinades substàncies o residus, etc.).

## 7 MESURES PER A LA SEPARACIÓ DE RESIDUS

En aquest apartat es deixa constància de les operacions i de les instal·lacions destinades a la gestió dels residus que cal preveure des de la fase de projecte. Una obra té dos tipus de gestió, la gestió dins de l'obra i fora de l'obra. Per aquest motiu es considera imprescindible fer una reflexió sobre les diferents possibilitats de gestió "internes" i "externes" més adequades per a l'obra objecte d'estudi d'acord a:

- L'espai disponible per realitzar la separació selectiva dels residus a l'obra.
- La possibilitat de reutilització i reciclatge in situ.
- La proximitat de valoritzadors de residus de la construcció i demolició i la distància als dipòsits controlats, els costos econòmics associats a cada opció de gestió, etc.



Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

En qualsevol cas, s'ha de considerar sempre l'abocament en dipòsits controlats com a última opció en la gestió dels residus de construcció i demolició i, s'ha de tendir, per aquest ordre, a la reutilització, al reciclatge o a qualsevol altre tipus de valorització.

Per fer-ho viable, es recomana que la gestió mínima de separació selectiva per a les obres de construcció i demolició estigui formada per la segregació dels residus Inerts, dels residus No Especials i dels residus Especials (aquests sempre han d'anar separats de la resta).

Cal tenir en compte, però, que aquesta gestió mínima pot anar-se ampliant en funció de les possibilitats de valorització (internes i externes) que existeixin a la mateixa obra i a l'entorn proper d'aquesta. En el primer cas, es fa referència a la capacitat que pugi tenir una determinada obra de construcció d'absorbir part dels residus inerts que genera; en el segon cas, a la viabilitat de comptar amb valoritzadors de residus (per exemple, si es té a l'abast recicladors de plàstic, de fusta, de metall, de paper i cartró, etc.).

En cas de generar algun altre residu per causes excepcionals o circumstancials, i aquests és dels contemplats en el Plec de Prescripcions d'Infraestructures i a més a més excedeix als mínims establerts, se li haurà d'efectuar un procés de separació igual que els abans considerats.




La classificació en origen (a la mateixa obra) dels residus de construcció i demolició és el factor que més influeix en el seu destí final. Un contenidor que surt de l'obra amb residus heterogenis té menys opcions de ser valoritzat que un de net, carregat amb un residu homogeni que pot ser transportat directament cap a una central de reciclatge o, fins i tot, si compleix amb les característiques físico-químiques exigides, reutilitzat (en els cas de la runa neta) a mateixa obra on s'ha produït. És a dir, qualsevol operació de reciclatge o de reutilització ha d'estar sotmesa a una destria inicial que permeti disposar d'una matèria primera uniforme i d'un material resultant de qualitat. Quan no sigui viable la classificació selectiva en origen (a la mateixa obra) és obligatori derivar els residus barrejats (inerts i no especials) cap a instal·lacions on es faci un tractament previ i des d'on el residu pugi ser finalment tramés a un gestor autoritzat per la seva valorització o, en el cas més desfavorable, cap a l'abocament a dipòsit controlat.

Per definir les operacions de gestió de residus caldrà deixar constància de:

- El tipus de separació selectiva i el nombre de contenidors en funció de les possibilitats de reutilització, de les tipologies de residu, de l'espai de l'obra, etc.
- La quantitat de material reutilitzat a l'obra procedent del reciclatge in situ dels residus petris generats en el mateix emplaçament. Quantitat de residu petri (m<sup>3</sup>) que s'ha evitat portar a abocador.
- Els models de senyalitzacions emprades per als contenidors segons el tipus de residu que poden contenir.
- Les dades sobre destí dels residus (dades dels gestors de les instal·lacions de valorització, separació, transferència o de dipòsits controlats).

A continuació, s'adjunta una fitxa resum per facilitar la identificació de les operacions de gestió de residus dintre i fora de l'obra, més apropiades per a l'execució dels treballs.

FITXA RESUM DE LA GESTIÓ DELS RESIDUS DINTRE DE L'OBRA		
1	Separació segons tipologia de residu	<p>Especificar el tipus de separació selectiva prevista per tal de preveure un espai a l'obra.</p> <p>Cal recordar que, segons el RD 105/2008, d'1 de febrer, s'ha de preveure una separació en obra de les següents fraccions, quan de forma individualitzada per cadascuna d'elles, la quantitat prevista de generació per al total de l'obra superi les següents quantitats indicades a continuació.</p> <p><input checked="" type="checkbox"/> Formigó: 80 T  <input checked="" type="checkbox"/> Mescles de formigó, Maons, teules, ceràmics: 40 T  <input checked="" type="checkbox"/> Metall: 2 T  <input checked="" type="checkbox"/> Fusta: 1 T  <input type="checkbox"/> Vidre: 1 T  <input checked="" type="checkbox"/> Plàstic: 0.5 T  <input checked="" type="checkbox"/> Paper i Cartró: 0.5 T.</p>
	Especials	<p><input checked="" type="checkbox"/> zona habilitada pels Residus Especials (amb tants bidons com calgui)</p> <p>La legislació de Residus Especials obliga a una zona adequada per a l'emmagatzematge d'aquest tipus de residu.</p> <p>Entre d'altres recomanacions, es destaquen les següents:</p> <ul style="list-style-type: none"> <li>- No tenir-los emmagatzemats a l'obra més de 6 mesos.</li> <li>- El contenidor de residus especials haurà de situar-se en un lloc pla i fora del trànsit habitual de la maquinària d'obra, per tal d'evitar vessaments accidentals.</li> <li>- Senyalitzar correctament els diferents contenidors on s'hagin de situar els envasos dels productes Especials, tenint en compte les incompatibilitats segons els símbols de perillositat representats en les etiquetes.</li> <li>- Tapar els contenidors i protegir-los de la pluja, la radiació, etc.</li> <li>- Emmagatzemar els bidons que contenen líquids perillosos (olis, desencofrants, etc.) en posició vertical i sobre cubetes de retenció de líquids per tal d'evitar fuites.</li> <li>- Impermeabilitzar el terra on se situïn els contenidors de residus especials.</li> </ul>
	Inerts	<p><input checked="" type="checkbox"/> contenidor per Inerts barrejats    <input type="checkbox"/> contenidor per Inerts Formigó  <input type="checkbox"/> contenidor per Inerts Ceràmica    <input type="checkbox"/> contenidor per altres inerts  <input checked="" type="checkbox"/> contenidor o zona d'aplec per terres que van a abocador</p>
	No Especials	<p><input checked="" type="checkbox"/> contenidor per metall                      <input checked="" type="checkbox"/> contenidor per fusta  <input checked="" type="checkbox"/> contenidor per plàstic                      <input checked="" type="checkbox"/> contenidor per paper i cartró  <input type="checkbox"/> contenidor per vidre...                      <input type="checkbox"/> contenidor per ...  <input checked="" type="checkbox"/> contenidor per la resta de residus No Especials barrejats  <input type="checkbox"/> contenidor per TOTS els residus No Especials barrejats</p>
	Inerts + No Especials	<p>Inerts + No Especials:    <input type="checkbox"/> contenidor amb Inerts i No Especials barrejats (**)  (**) Només quan sigui tècnicament inviable. En aquest cas, derivar-ho cap a un gestor que li faci un tractament previ.</p>
2	Reciclatge de residus petris inerts en la pròpia obra	<p>Indicar, si s'escau, la quantitat de residus petris que es preveu matxucar a l'obra per reutilitzar, posteriorment, en el mateix emplaçament.</p> <p>Quantitat de residu que es preveu reciclar i que s'evita portar a abocador:  <i>No es preveu el matxuqueig a l'obra.</i></p> <p>Quantitat d'àrid matxucat resultant: (cal tenir en compte que l'àrid resultant, una vegada matxucat serà, aproximadament, un 30% menor al volum inicial de residus petris)  <i>No es preveu el matxuqueig a l'obra.</i></p>
3	Senyalització contenidors	<p>Els contenidors s'hauran de senyalitzar en funció del tipus de residu que continguin, d'acord amb la separació selectiva prevista.</p>
	Inerts	<p>Residus admesos: ceràmica, formigó, pedres, etc.</p>

FITXA RESUM DE LA GESTIÓ DELS RESIDUS DINTRE DE L'OBRA					
	CODIS CER: 170107, 170504... (codis admesos en els dipòsits de terres i runes)				
No Especials barrejats 	Residus admesos: fusta, metall, plàstic, paper i cartró, cartró-guix, etc. CODIS CER: 170201, 170407, 150101, 170203, 170401... (codis admesos en dipòsits de residus No Especials). Aquest símbol identifica als residus No Especials barrejats, no obstant, en cas d'optar per una separació selectiva més exigent, caldria un cartell específic per a cada tipus de residu:				
	fusta 	ferralla 	paper i cartró 	plàstic 	cables elèctrics 
Especials 	CODIS CER: (els codis dependran dels tipus de residus). Aquest símbol identifica als residus Especials de manera genèrica i pot servir per senyalitzar la zona d'aplec habilitada pels residus Especials, no obstant, a l'hora d'emmagatzemar-los cal tenir en compte els símbols de perillositat que identifiquen a cadascun i senyalitzar els bidons o contenidors d'acord amb la legislació de residus Especials.				

Residus Especials	Quantitat estimada		Gestor		Observacions
	Tones	m3	Codi	Nom	
<input checked="" type="checkbox"/> Instal·lació de gestió de residus especials	68,53	471,16	E-01.89	ATLAS GESTION MEDIOAMBIENTAL, S.A.	

\* La gestió d'aquests residus ja està inclosa dins la partida d'excavació de terres i en la partida de demolició de ferm existent en el pressupost de l'obra, d'aquesta manera no està present en el corresponent pressupost de gestió de residus.

## 8 DIPÒSITS I ABOCADORS CONTROLATS

A partir dels punts abans esmentats, s'ha considerat convenient col·locar com a zona d'abocador un sector situat dins de la pròpia zona d'ocupació de l'obra, un espai amb el menor interès socioeconòmic i paisatgístic amb poca afectació a la flora i la fauna. Aquesta zona també resta prop de l'àmbit d'actuació de l'obra i d'aquesta manera es redueix el trànsit per a les zones poblades i alienes a la traça. S'ha de considerar també que els abocadors de terra han d'estar situats fora dels límits de les zones protegides d'interès comunitari.

Per a la utilització d'abocadors definitius de terres i abans de començar a aportar terres, s'haurà de tramitar les corresponents autoritzacions d'acord amb les directrius establertes en el Decret 396/2006, de 17 d'octubre, pel qual es regula la intervenció ambiental en el procediment de llicència urbanística per a millora de finques rústiques que s'efectuen amb aportació de terres procedents d'obres de la construcció. Tanmateix, aquesta parcel·la quedarà dins del terreny expropiat per l'obra, per que no serà necessari aquest tràmit si es fan els abocaments en aquest punt.

Caldrà definir els límits concrets de les àrees seleccionades que estan previstes per ser ocupades, marcant els límits de manera clara i visible amb cinta i estakes o amb malla taronja, procurant afectar el terreny el mínim possible mentre s'estigui utilitzant aquest.

Respecte a les terres i els materials de runes resultants de les demolicions de paviments de formigó i de mescles bituminoses, hauran de ser transportats a alguna gestora de runes. Les més properes a la zona de les obres són les següents:

- Dipòsits controlats

MODEL DE FITXA RESUM DE GESTIÓ DELS RESIDUS FORA DE L'OBRA						
4	<b>Destí dels residus segons tipologia</b>	<b>Identificar els recicladors, plantes de transferència o dipòsits propers a l'entorn de l'obra on es proposa gestionar els residus de la construcció:</b>				
	<b>Inerts</b>	<b>Quantitat estimada</b>		<b>Gestor</b>		<b>Observacions</b>
		<b>Tones</b>	<b>m3</b>	<b>Codi</b>	<b>Nom</b>	
	<input type="checkbox"/> Reciclatge					
	<input type="checkbox"/> Planta de transferència					
	<input type="checkbox"/> Planta de selecció					
	<input checked="" type="checkbox"/> Dipòsit			E-1667.16	DIPÒSIT DE RUNA TERRA NEGRA, SL	
	Terres i pedres					
	Formigó	55,18	40,75			
	Mescles de formigó, maons...	593,95	474,39			
	<b>Residus No Especials</b>	<b>Quantitat estimada</b>		<b>Gestor</b>		<b>Observacions</b>
		<b>Tones</b>	<b>m3</b>	<b>Codi</b>	<b>Nom</b>	
	Reciclatge:			E-1334.12	FERRALLA I METALLS VILAMALLA SL	
	<input checked="" type="checkbox"/> Reciclatge de metall	100,72	16,07			
	<input checked="" type="checkbox"/> Reciclatge de fusta	23,54	94,16			
	<input checked="" type="checkbox"/> Reciclatge de plàstic	0,58	8,40			
	<input checked="" type="checkbox"/> Reciclatge paper-cartró	1,15	16,41			
	<input type="checkbox"/> Reciclatge altres					
	<input type="checkbox"/> Planta de transferència					
	<input type="checkbox"/> Planta de selecció					
	<input checked="" type="checkbox"/> Dipòsit			E-1667.16	DIPÒSIT DE RUNA TERRA NEGRA, SL	
	Residus barrejats	3,56	4,45			
	Mescles bituminoses	664,77	553,97			

UTE GESTORA DE RUNES DE LA CONSTRUCCIÓ, SA I COSTA BRAVA DE SERVEIS, SA (UTE PERALADA)	
<b>Codi gestor</b> E-1157.10	<b>Codi NIMA</b> 1700069811
<b>Adreça física</b> POL. IND. 9 - PARATGE PUIG D'EN GUIL, PARC. 76 17491 PERALADA	<b>Adreça de correspondència</b> C/ NÀPOLS, 222-224 BA 08013 BARCELONA
<b>Telèfon</b> 934147488	<b>E-mail</b> <a href="mailto:gestora@grc.cat">gestora@grc.cat</a>
<b>Fax</b>	<b>Web</b> <a href="http://www.grc.cat">www.grc.cat</a>

LOCALITZACIÓ	
<b>Veure localització</b> 	<b>Coordenades UTM ETRS89</b> X: 503833 // Y: 4683807

DADES DE L'ACTIVITAT	
<b>Activitat</b>	MONODIPÒSIT CONTROLAT DE TERRES I RUNES.
<b>Operacions autoritzades</b>	T15 Deposició en dipòsit de terres i runes

DIPÒSIT DE RUNA TERRA NEGRA, SL	
<b>Codi gestor</b> E-1667.16	<b>Codi NIMA</b> 1700088079
<b>Adreça física</b> PARATGE PAIRADES 17137 VILADAMAT	<b>Adreça de correspondència</b> C/ PUJADA DE LA CREU, 2 2N 4A 17003 GIRONA
<b>Telèfon</b> 972396152	<b>E-mail</b> <a href="mailto:info@runesemporda.cat">info@runesemporda.cat</a>

LOCALITZACIÓ	
<b>Veure localització</b> 	<b>Coordenades UTM ETRS89</b> X: 503950 // Y: 4664827

DADES DE L'ACTIVITAT	
<b>Activitat</b>	DEPOSICIÓ CONTROLADA.
<b>Operacions autoritzades</b>	T15 Deposició en dipòsit de terres i runes

- [Plantes de reciclatge](#)

ÀRIDS RIUS, SL	
<b>Codi gestor</b> E-988.07	<b>Codi NIMA</b> 1700060331
<b>Adreça física</b> CTRA. FIGUERES- EL FAR D'EMPORDÀ, KM 1 17469 EL FAR D'EMPORDÀ	<b>Adreça de correspondència</b> CTRA. FIGUERES - EL FAR D'EMPORDÀ, KM 1 17469 EL FAR D'EMPORDÀ
<b>Telèfon</b> 972678704	<b>E-mail</b> <a href="mailto:angi@aridsrius.com">angi@aridsrius.com</a>


LOCALITZACIÓ	
<b>Veure localització</b> 	<b>Coordenades UTM ETRS89</b> X: 498601 // Y: 4678644

DADES DE L'ACTIVITAT	
<b>Activitat</b>	PLANTA DE RECICLATGE I TRANSFERÈNCIA D'ENDERROCS I ALTRES RESIDUS DE LA CONTRUCCIÓ I EXCAVACIÓ. RUNES
<b>Operacions autoritzades</b>	V71 Utilització en la construcció

### ARIDFORM MIQUEL, SL

<b>Codi gestor</b> E-1193.10	<b>Codi NIMA</b> 1700070496
<b>Adreça física</b> POL. IND. 3 - -, PARC. 196 17469 FORTIÀ	<b>Adreça de correspondència</b> CTRA. N-II, KM 2.5 17771 SANTA LLOGAIA D'ÀLGUEMA
<b>Telèfon</b> 972501881	<b>E-mail</b> <a href="mailto:jordi@materialmiquel.com">jordi@materialmiquel.com</a>

### LOCALITZACIÓ

Veure localització 	<b>Coordenades UTM ETRS89</b> X: 501554 // Y: 4674969
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### DADES DE L'ACTIVITAT


<b>Activitat</b>
PLANTA DE RECICLATGE RUNES, CRT DE RESIDUS D'AMIANT
<b>Operacions autoritzades</b>
T62 Gestió per un Centre de Recollida i Transferència
V71 Utilització en la construcció

- [Residus no especials](#)

### FERRALLA I METALLS VILAMALLA, SL


<b>Codi gestor</b> E-1334.12	<b>Codi NIMA</b> 1700076542
<b>Adreça física</b> POL. IND. EMPORDA INTERNACIONA - C/ OLOT, 33 17469 VILAMALLA	<b>Adreça de correspondència</b> POL. IND. EMPORDÀ INTERNNAL. - C/ OLOT, 33 17469 VILAMALLA
<b>Telèfon</b> 972525210	<b>E-mail</b> <a href="mailto:administracio@femevi.com">administracio@femevi.com</a>
<b>Fax</b> 972525254	<b>Web</b> <a href="http://www.femevi.com">www.femevi.com</a>

### LOCALITZACIÓ


Veure localització 	<b>Coordenades UTM ETRS89</b> X: 499174 // Y: 4674937
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### DADES DE L'ACTIVITAT

Adaptat al RD 110/2015 de RAEE: Sí
<b>Activitat</b>
DESCONTAMINACIÓ VFU I EMBARCACIONS, CLAS. PREMSAT FILTRES OLI, ..... RECU. DE FERRALLA, PAPER, VIDRE, PLÀSTIC, FUSTA, TÈXTIL I RESIDUS GENERALS MITJANÇANT CLAS., I CRT DE RP I RNP SEGONS RELACIÓ L·LICÈNCIA 18/5/16, I RAEE
<b>Operacions autoritzades</b>
T62 Gestió per un Centre de Recollida i Transferència
V11 Reciclatge de paper i cartó
V12 Reciclatge de plàstics
V14 Reciclatge de vidre
V15 Reciclatge i reutilització de fustes
V41 Recicl.i recup.de metalls o compostos metàl·lics
V55 Reciclatge i recuperació de vehicles fora d'ús

FERROS PERICH, SL	
<b>Codi gestor</b> E-384.97	<b>Codi NIMA</b> 1700036959
<b>Adreça física</b> POL. IND. LA COROMINA - AV. D'ÀLGUEMA, 11 17771 SANTA LLOGAIA D'ÀLGUEMA	<b>Adreça de correspondència</b> POL. IND. LA COROMINA - AV. D'ÀLGUEMA, 11 17771 SANTA LLOGAIA D'ÀLGUEMA
<b>Telèfon</b> 972500624	<b>E-mail</b> <a href="mailto:info@ferrospereich.com">info@ferrospereich.com</a>
<b>Web</b> <a href="http://www.ferrospereich.com">www.ferrospereich.com</a>	
LOCALITZACIÓ	
Veure localització 	<b>Coordenades UTM ETRS89</b> X: 496229 // Y: 4675336
DADES DE L'ACTIVITAT	
Adaptat al RD 110/2015 de RAEE: No	
<b>Activitat</b>	
RECUPERACIÓ DE PAPER, CARTRÓ I FERRALLA MITJANÇANT CLASSIFICACIÓ I PREMSAT, RECUPERACIÓ DE VIDRE I PLÀSTIC MITJANÇANT CLASSIFICACIÓ, DESBALLESTAMENT DE VFU, I EMMAGATZEMATGE DE CABLE, FRIGORÍFICS, BATERIES I RAEE	
<b>Operacions autoritzades</b>	
T62 Gestió per un Centre de Recollida i Transferència	
V11 Reciclatge de paper i cartó	
V12 Reciclatge de plàstics	
V14 Reciclatge de vidre	
V41 Recicl.i recup.de metalls o compostos metàl·lics	
V55 Reciclatge i recuperació de vehicles fora d'ús	

- Residus especials

ATLAS GESTIÓN MEDIOAMBIENTAL, SA	
<b>Codi gestor</b> E-01.89	<b>Codi NIMA</b> 0800311033
<b>Adreça física</b> CAN PALÀ, S/N 08719 CASTELLOLÍ	<b>Adreça de correspondència</b> DIPÒSIT CONTROLAT DE CLASSE III 08719 CASTELLOLÍ
<b>Telèfon</b> 938047131	<b>E-mail</b> <a href="mailto:xmundet@atlasgm.com">xmundet@atlasgm.com</a>
<b>Fax</b> 938032624	<b>Web</b> <a href="http://www.comsaemte.com">www.comsaemte.com</a>
LOCALITZACIÓ	
Veure localització 	<b>Coordenades UTM ETRS89</b> X: 389413 // Y: 4605123
DADES DE L'ACTIVITAT	
<b>Activitat</b>	
DIPÒSIT CONTROLAT PER A RESIDUS PERILLOSO (CLASSE III).	
<b>Operacions autoritzades</b>	
T13 Deposició de residus especials	

## 9 OPERACIONS DE GESTIÓ DE RESIDUS

Les operacions a portar a terme referent a la gestió de residus durant l'execució de l'obra per part del contractista seran les següents:

- Redactar el Pla de Residus definitiu respectant els criteris establert en el present Pla de Gestió de Residus.
- Caracteritzar el terreny mitjançant un estudi geotècnic prèvia implantació i gestió com a residu especial en cas que es tracti d'un terreny contaminat.
- Reciclar materials com l'acer, cristall, paper, cartró, plàstics, reciclatge de matèria orgànica en abonament, etc.



- Definir l'escenari més adequat per l'obra en curs i preveure un emplaçament adequat per situar la zona de classificació, emmagatzematge de residus d'obra, intercanvi amb gestors, de tractament de residus, etc.
- Col·locar un plànol a l'entrada de l'obra on es senyali amb claredat la zona de classificació i disposició dels residus de construcció en els diferents contenidors i els materials que es poden dipositar, a més d'altres propostes dirigides a millorar la gestió dels residus.
- Separar els residus en funció de les possibilitats de valoració.
- Senyalitzar els contenidors indicant el tipus de residu que poden admetre.
- Separar i disposar els residus inerts en contenidors en funció de les possibilitats de recuperació i requisits de gestió (com els elements de guix disminueixen considerablement les possibilitats de reciclatge dels materials petris a causa dels problemes d'expansivitat que ocasionen, es recomana gestionar-los per separat de la fracció pètria anomenada runa neta).
- Matxucar els residus petris en obra per reaprofitar-los en el mateix emplaçament, deixant constància escrita de la quantitat.
- Gestionar els residus inerts mitjançant un gestor autoritzat.
- Disposar de residus en abocador autoritzat de productes perillosos, materials amb contingut d'asbests o amiant, piles i bateries, pintures, restes amb hidrocarburs, olis, etc.
- Reciclar els dissolvents per mitjà de destil·ladores o per mitjà d'empreses que proporcionen aquest servei.
- Dur a terme jornades informatives previ inici de la fase d'execució amb l'objectiu de la sensibilització mediambiental del personal de l'obra o de la subcontracta.
- Vetllar perquè els residus siguin gestionats per la subcontracta que els genera, sobretot en el cas dels residus especials, atenent sempre les instruccions del fabricant i d'acord amb la legislació vigent.

## 10 ASPECTES A TENIR EN COMPTE EN EL PLA DE GESTIÓ DE RESIDUS

Abans del començament de l'obra el contractista haurà de revisar i/o modificar l'Estudi de Gestió de Residus i desenvolupar el Pla corresponent. En qualsevol cas, s'hauran de seguir les prescripcions previstes a la Normativa d'aplicació.

Caldria que el Pla adjuntés els documents d'acceptació amb les empreses de gestió de residus, que hauran d'ésser formalitzats una vegada aprovat aquest document pel promotor i la direcció facultativa.

El Pla de gestió de residus haurà de seguir, com a mínim, el tipus d'operacions de gestió que s'hagi determinat a l'estudi o, en cas contrari, justificar-ho.

## 11 PRESSUPOST

A l'apèndix 3 s'adjunta el pressupost d'execució material (PEM) referent a la gestió de residus.

En ell no s'hi han contemplat aquelles partides que ja inclouen, en el seu cost, la càrrega, transport o cànon d'abocador i que es troben presents al Document núm.4. Pressupost del present projecte, a fi i efecte de no comptabilitzar dues vegades un mateix concepte. Cal remarcar els següents punts:

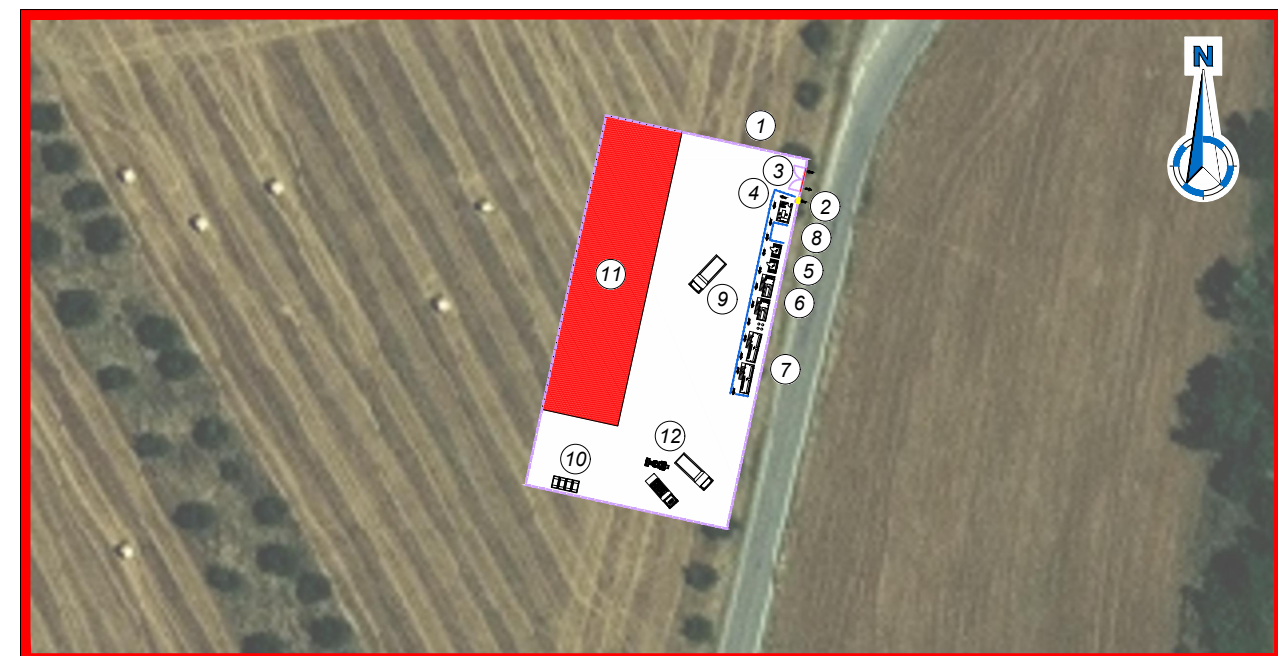
- El cost que suposa la gestió de les terres d'excavació dels moviments de terres queda contemplat al pressupost principal (la càrrega, transport i cànon d'abocador), per tant no se'n fa referència en el pressupost de la gestió de residus.
- El cost que suposa la gestió dels residus provinents dels enderrocs queden contemplats al pressupost principal (la càrrega, transport i cànon d'abocador), per tant no se'n fa referència en el pressupost de la gestió.

El PEM de gestió de residus ascendeix a la quantitat de vuitanta-vuit mil nou-cents cinquanta euros amb noranta-nou cèntims (88.950,99 €).



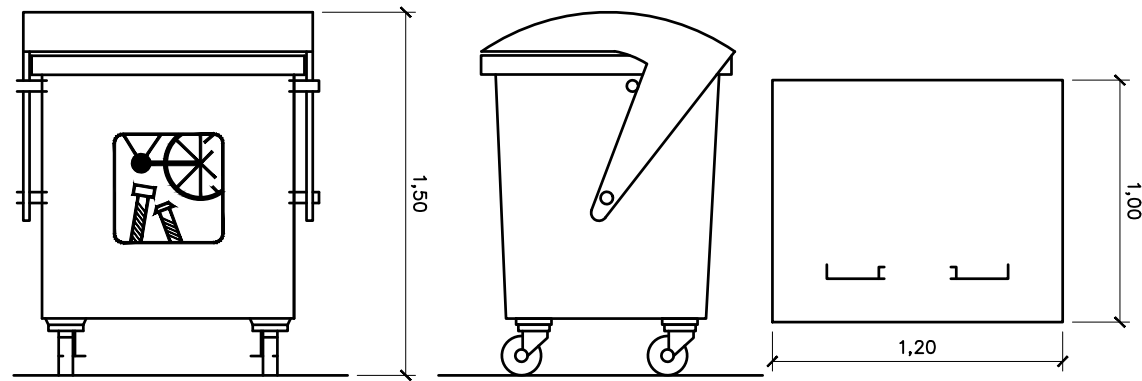
## **APÈNDIX 1. Plànols**



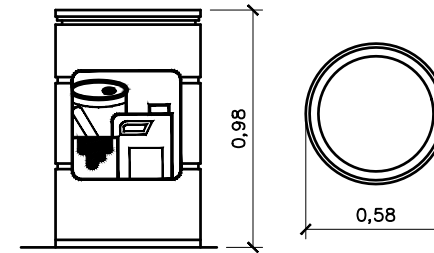


LLEGENDA:	
1 Tancament perimetral del solar	7 Vestidors
2 Accés de personal	8 Grup electrògen
3 Accés de vehicles	9 Tanca de delimitació de zones
4 Control d'accés	10 Zona de gestió de residus
5 Sanitaris	11 Zona d'aplec
6 Menjador	12 Zona aparcament maquinària

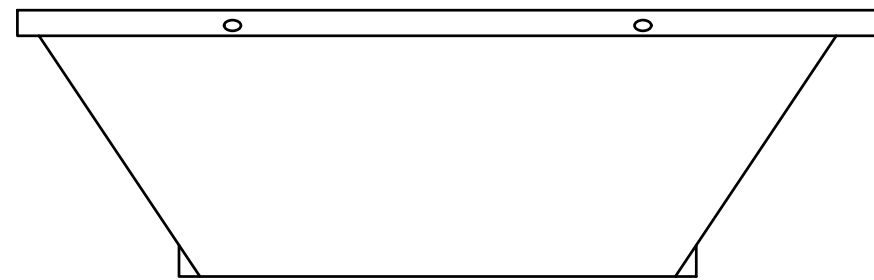




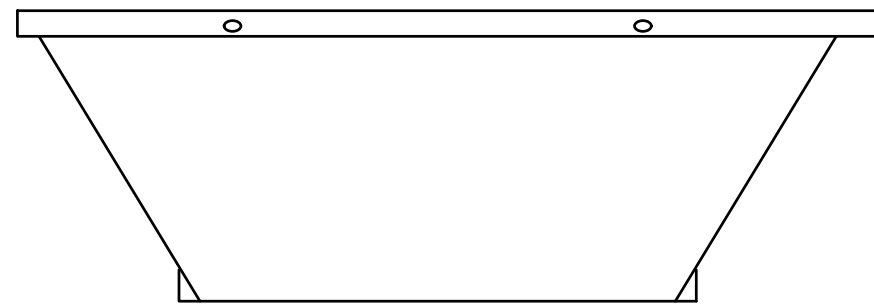
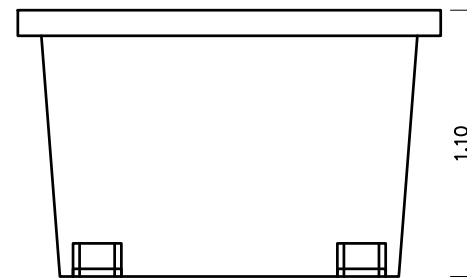
CONTENIDOR DE 1000L. APTE PER A PAPER I  
CARTRÓ, PLÀSTICS.



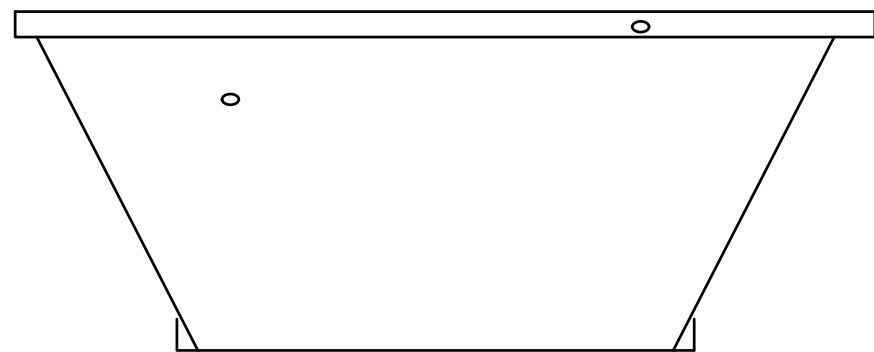
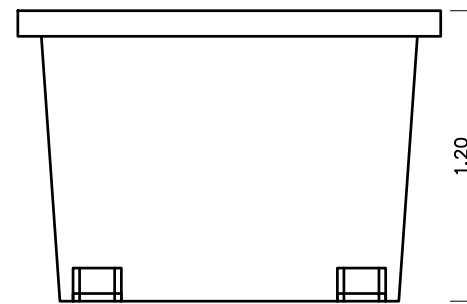
CONTENIDOR ESPECIALS  
CONTENIDOR DE 200L



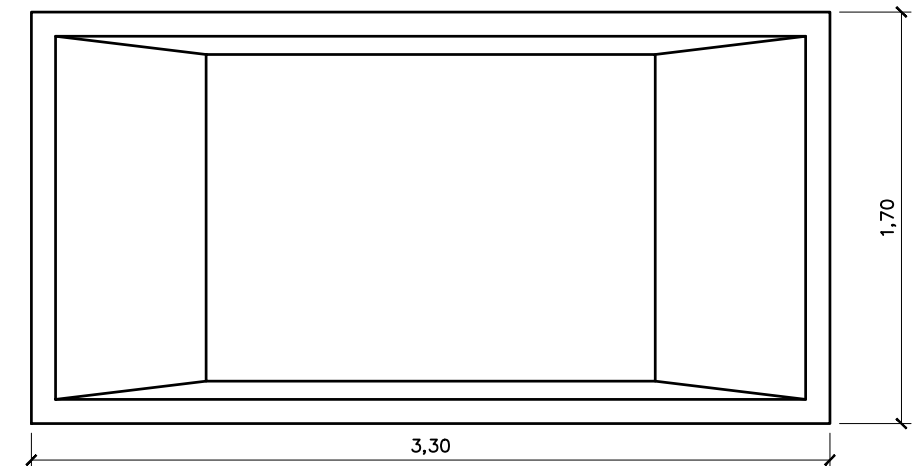
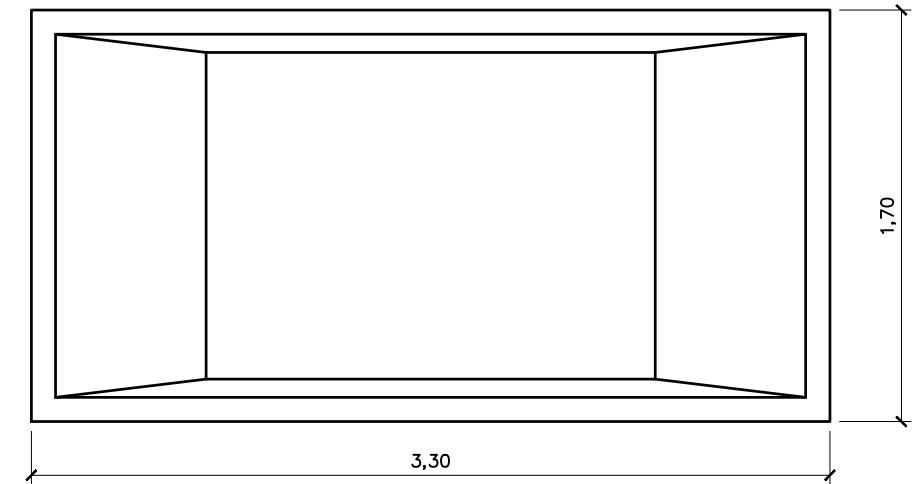
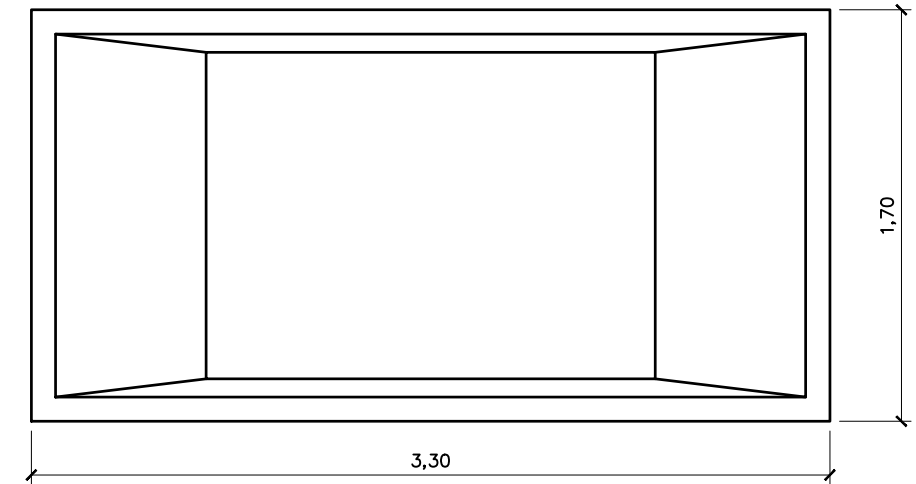
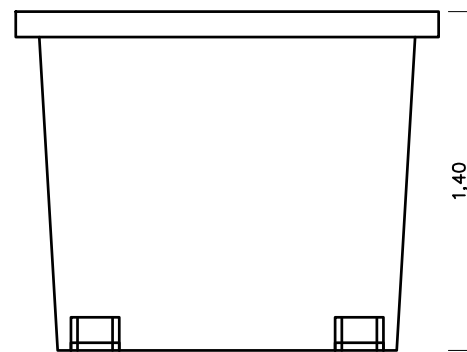
CONTENIDOR DE 5m<sup>3</sup>. APTE PER A  
FORMIGÓ, CERÀMICS, PETRIS, FUSTA I METALLS



CONTENIDOR DE 5m<sup>3</sup> amb tapes. APTE PER A  
PLÀSTICS, PAPER I CARTRÓ, METALLS I FUSTA



CONTENIDOR DE 9m<sup>3</sup>. APTE PER A  
FORMIGÓ, CERÀMICS, PETRIS I FUSTA



## **APÈNDIX 2. Plec de prescripcions**

## **ÍNDEX**

<b>1</b>	<b>GENERAL .....</b>	<b>3</b>
<b>2</b>	<b>DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA .....</b>	<b>3</b>
<b>3</b>	<b>CONDICIONS DEL PROCÉS D'EXECUCIÓ .....</b>	<b>4</b>
<b>4</b>	<b>PLEC DE PRESCRIPCIONS TÈCNIQUES PARTICULARS .....</b>	<b>5</b>

## 1 GENERAL

Les operacions destinades a la tria, classificació, transport i disposició dels residus generats a obra, s'ajustaran al que determina el Pla de Gestió de Residus elaborat per el Contractista, aprovat per la Direcció Facultativa i acceptat per la Propietat.

Si degut a modificacions en l'execució de l'obra o d'altres, cal fer modificacions a la gestió en obra dels residus, aquestes modificacions es documentaran per escrit i seran aprovades si s'escau per la Direcció Facultativa i se'n donarà comunicació per la seva acceptació a la Propietat.

El Pla de Gestió de Residus haurà d'adjuntar els documents d'acceptació amb les empreses de gestió de residus, que hauran de ser formalitzats una vegada aprovat aquest document pel promotor i la direcció facultativa.

Aquest Pla ha d'estar elaborat, com a mínim, en base al tipus d'operacions de gestió que s'hagi determinar a l'Estudi de Gestió de Residus que s'inclou al projecte o, en cas contrari, justificar-ho.

A continuació, s'adjunta el Plec de Prescripcions Particulars que fa referència a la gestió de residus en l'obra.

## 2 DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA

- Residus especials:

Especialment, caldrà que contempli la tria, emmagatzematge, maneig i separació dels residus especials tant de les activitats d'enderroc com de les de construcció.

S'especificaran les següents recomanacions per la tria i emmagatzematge dels residus especials:  
No tenir-los emmagatzemats a l'obra durant un temps superior a 6 mesos.

El contenidor de residus especials haurà de situar-se en un lloc pla i fora del trànsit habitual de la maquinària d'obra, per tal d'evitar vessaments accidentals.

Senyalitzar correctament de manera genèrica la zona d'aplec de residus especials amb el següent grafisme:



Senyalitzar correctament els diferents contenidors o bidons adequats on s'hagin de situar els envasos dels materials potencialment perillosos, tenint en compte les incompatibilitats segons els símbols de perillositat representats en les etiquetes i la legislació de residus especials.

Tapar els contenidors i protegir-los de la pluja, la radiació, etc. i impermeabilitzar el terra sobre el qual es situen:

- Emmagatzemar els bidons que contenen líquids perillosos (olis, desencofrants, etc.) en posició vertical i sobre cubetes de retenció de líquids per tal d'evitar fuites dels mateixos.
- Impermeabilitzar el terra on se situïn els contenidors de residus especials.

- Càrrega i transport de material d'excavació i residus:

L'operació de càrrega s'ha de fer amb les precaucions necessàries per a aconseguir unes condicions de seguretat suficients.

Els vehicles de transport han de portar els elements adequats a fi d'evitar alteracions perjudicials del material.

Durant el transport s'ha de protegir el material de manera que no es produeixin pèrdues en els trajectes utilitzats.

El contenidor ha d'estar adaptat al material que ha de transportar.

El trajecte que s'ha de recórrer ha de complir les condicions d'amplària lliure i de pendent adequades a la maquinària que s'utilitzi.

- Transport a obra:

Transport de terres i material d'excavació o del rebaix, o residus de la construcció, entre dos punts de la mateixa obra o entre dues obres.

Les àrees d'abocada han de ser les que defineixi la Direcció Facultativa.

L'abocada s'ha de fer al lloc i amb el gruix de capa indicats.

Les característiques de les terres han d'estar en funció del seu ús, han de complir les especificacions del seu plec de condicions i cal que tinguin l'aprovació de la Direcció Facultativa.

- Transport a instal·lació externa de gestió de residus:



## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

El material de rebuig que la Direcció Facultativa no accepti per a reutilitzar en obra s'ha de transportar a una instal·lació externa autoritzada, per tal de rebre el tractament definitiu.

El transportista ha de lliurar un certificat on s'indiqui, com a mínim:

- Identificació del productor i posseïdor dels residus
- Identificació de l'obra de la qual prové el residu i el número de llicència
- Identificació del gestor autoritzat que ha gestionat el residu
- Quantitat en t i m<sup>3</sup> del residu gestionat i la seva codificació segons codi CER

- Deposició de residus:

Cada fracció s'ha de dipositar al lloc adequat legalment autoritzat per a que se li apliqui el tipus de tractament especificat en la DT: valorització, emmagatzematge o eliminació.

### 3 CONDICIONS DEL PROCÉS D'EXECUCIÓ

Com a norma general, es procurarà actuar retirant els elements contaminants o perillosos tan aviat com sigui possible, així com els elements a conservar o valoritzables (ceràmics, marbres, etc.). Seguidament, s'actuarà desmuntant aquelles parts accessibles de les obres, senyals, barreres, i altres elements que ho permetin i, per últim, es procedirà a l'enderroc de tots els altres elements.

El dipòsit temporal dels residus, es realitzarà en sacs industrials iguals o inferiors a 1 m<sup>3</sup> o bé, en contenidors metàl·lics específics amb la ubicació i condicions que estableixin les ordenances municipals. La zona d'apilament on es situïn els contenidors o sacs, també haurà d'estar en llocs degudament senyalitzats i separats de la resta de residus.

El dipòsit temporal de residus valoritzables (fustes, plàstics, ferro, etc.), que es realitzi en contenidors o zones d'apilament, s'haurà de senyalitzar i separar de la resta de residus de manera correcta.

La manipulació dels materials s'ha de fer amb les proteccions adequades a la perillositat del mateix.

Els contenidors hauran d'estar pintats de colors que destaquin la seva visibilitat, especialment a la nit, i contar amb una banda de material reflectant de, com a mínim 15 centímetres al llarg de tot el seu perímetre. A la vegada, tant als contenidors com als sacs industrials, haurà d'aparèixer la següent informació:

- Raó social
- CIF
- Telèfon del titular del contenidor/envàs
- Número d'inscripció al Registre de Transportistes de Residus

El responsable de la obra a la que dona servei el contenidor adoptarà les mesures necessàries per evitar el dipòsit de residus aliens a la mateixa. Els contenidors romandran tancats o coberts, com a mínim, fora de l'horari de treball, per evitar el dipòsit de residus aliens a les obres a les que donen servei.

L'equip d'obra haurà d'establir els medis humans, tècnics i procediments de separació que es dedicaran a cada tipus de residu de la construcció.

S'hauran d'atendre els criteris municipals establerts (ordenances, condicionants de la llicència d'obra), especialment si obliguen a la separació en origen de determinades matèries objecte de reciclatge o dipòsit. En aquest últim cas, s'haurà d'assegurar per part del contractista realitzar una avaluació econòmica de les condicions en les que és viable aquesta operació. I també, considerar les possibilitats reals de dur-la a terme:

- Que la obra o construcció ho permeti
- Que disposi de plantes de reciclatge/gestors adequats

La direcció d'obra serà la responsable de la decisió a prendre i la seva justificació a les autoritats locals o autonòmiques pertinents.

S'haurà d'assegurar durant la contractació de la gestió dels residus de la construcció, que el destí final (planta de reciclatge, abocador controlat, planta de triatge, planta de transvassament, etc.) són centres amb l'autorització autonòmica del Consell de Medi Ambient. Així mateix, es realitzarà un estricte control documental, de manera que els transportistes i gestors dels residus hauran d'aportar els certificats de cada retirada i entrega al destí final.

Per aquells residus (terres, petris, etc.) que siguin reutilitzats per a altres obres o projectes de restauració, s'haurà d'aportar evidència documental del destí final.

La gestió (tan documental com operativa) dels residus perillosos que es trobin en una obra d'enderroc o es generin en una obra nova, es regirà conforme a la legislació nacional vigent, la legislació autonòmica i els requisits de les ordenances.

Així mateix, els residus de caràcter urbà generats a les obres (restes de menjars, envasos, llots de fosses sèptiques, etc.), seran gestionats acord amb allò marcat per la legislació i autoritats municipals.

Pel que fa als residus amb amiant, es seguiran els passos marcats per la ordre MAM/304/2002, de 8 de febrer, per la que es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus. En qualsevol cas, sempre es complirà el Real Decret 108/1991, d'1 de febrer, sobre la prevenció i reducció de la contaminació del medi ambient produïda per l'amiant.

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Les restes del rentat de canaletes i cubes de formigó, seran tractats com a residus "escombraria".

S'evitarà en tot moment la contaminació amb productes tòxics o perillosos dels plàstics i restes de fusta per la seva adequada segregació, així com la contaminació dels apilaments o contenidors de residus amb components perillosos.

Les terres superficials que poden tenir un ús posterior per jardineria o recuperació de sòls degradats, serà retirada i emmagatzemada durant el menor temps possible a una alçada no superior a 2 metres. S'evitarà la humitat excessiva, la manipulació, i la contaminació amb altres materials.

### 4 PLEC DE PRESCRIPCIONS TÈCNIQUES PARTICULARS

#### I - PARTIDES D'OBRA DE GESTIÓ DE RESIDUS

#### I2 - DEMOLICIONS, ENDERROCS, MOVIMENTS DE TERRES I GESTIÓ DE RESIDUS

#### I2R - GESTIÓ DE RESIDUS

#### I2R2 - CLASSIFICACIÓ DE RESIDUS

0.- ELEMENTS QUE CONTEMPLA EL PLEC  
I2R24200.

#### 1.- DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA EXECUTADES

Operacions destinades a la gestió dels residus generats en l'obra: residu de construcció o demolició o material d'excavació.

S'han considerat les operacions següents:

- Classificació dels residus en obra

#### CLASSIFICACIÓ DE RESIDUS:

S'han de separar els residus en les fraccions mínimes següents si es supera el límit especificat, d'acord amb el que especifica l'article 5.5 del REAL DECRETO 105/2008:

- Formigó LER 170101 (formigó):  $\geq 80$  t
- Maons, teules, ceràmics LER 170103 (teules i materials ceràmics):  $\geq 40$  t
- Metall LER 170407 (metalls barrejats)  $\geq 2$  t
- Fusta LER 170201 (fusta):  $\geq 1$  t
- Vidre LER 170202 (vidre):  $\geq 1$  t
- Plàstic LER 170203 (plàstic)  $\geq 0,5$  t
- Paper i cartró LER 150101 (envasos de paper i cartró):  $\geq 0,5$  t

Els materials que no superin aquest límits o que no es corresponguin amb cap de les fraccions anteriors, han de quedar separats com a mínim en les fraccions següents:

- Inerts LER 170107 (mesclades de formigó, maons, teules i materials ceràmics que no contenen substàncies perilloses)
- No especials LER 170904 (residus barrejats de construcció i demolició que no contenen, mercuri, PCB ni substàncies perilloses)
- Especials LER 170903\* (altres residus de construcció i demolició (inclosos els residus barrejats, que contenen substàncies perilloses)

Els residus separats en les fraccions establertes al 'Pla de Gestió de Residus de la Construcció i Enderroc' de l'obra, s'emmagatzemaran en els espais previstos a l'obra per a aquesta finalitat.

Els contenidors han d'estar senyalitzats clarament, en funció del tipus de residu que continguin, d'acord amb la separació selectiva prevista.

Els materials destinats a ser reutilitzats han de quedar separats, en funció del seu destí final.

#### RESIDUS ESPECIALS:

Els residus especials sempre s'han de separar.

Els residus especials s'han de dipositar en una zona d'emmagatzematge separada de la resta.

Temps màxim d'emmagatzematge: 6 mesos.

Els materials potencialment perillosos han d'estar separats per tipus compatibles i emmagatzemats en bidons o contenidors adequats, amb indicació del tipus de perillositat.

El contenidor de residus especials ha de situar-se en un lloc pla, fora del trànsit habitual de la maquinària d'obra, per tal d'evitar vessaments accidentals

Cal senyalitzar convenientment els diferents contenidors de residus especials, tenint en compte les incompatibilitats segons els símbols de perillositat representat en les etiquetes.

Els contenidors de residus especials han d'estar tapats i protegits de la pluja i la radiació solar excessiva.

Els bidons que contenen líquids perillosos (olis, desencofrants, etc.) s'han d'emmagatzemar en posició vertical i sobre cubetes de retenció de líquids per tal d'evitar fuites.

Els contenidors de residus especials s'han de col·locar sobre un terra impermeabilitzat.

#### 2.- CONDICIONS DEL PROCÉS D'EXECUCIÓ

##### RESIDUS DE LA CONSTRUCCIÓ:

La manipulació dels materials s'ha de fer amb les proteccions adequades a la perillositat del mateix.

#### 3.- UNITAT I CRITERIS D'AMIDAMENT

##### CLASSIFICACIÓ DE RESIDUS:

m3 de volum realment classificat d'acord amb les especificacions del 'Pla de Gestió de Residus de Construcció i Enderrocs' de l'obra.

#### 4.- NORMATIVA DE COMPLIMENT OBLIGATORI

Reial Decret 105/2008, de 1 de febrer, per el que se regula la producció i gestió dels residus de construcció i enderroc.

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

Ordre MAM/304/2002, de 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus (BOE núm. 43 de 19.02.2002).

Correcció d'errors de la Ordre MAM/304/2002, de 8 de febrer, per la que es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus.

Real Decret 108/1991, d'1 de febrer, sobre la prevenció i reducció de la contaminació del medi ambient produïda per l'amiant.

Decret 89/2010, de 29 de juny, pel qual s'aprova el Programa de gestió de residus de la construcció de Catalunya (PROGROC), es regula la producció i gestió dels residus de la construcció i demolició, i el cànon sobre la deposició controlada dels residus de la construcció.

### **I2 - DEMOLICIONS, ENDERROCS, MOVIMENTS DE TERRES I GESTIÓ DE RESIDUS**

#### **I2R - GESTIÓ DE RESIDUS**

#### **I2R5 - TRANSPORT DE RESIDUS DE CONSTRUCCIÓ O DEMOLICIÓ A INSTAL·LACIÓ AUTORITZADA DE GESTIÓ DE RESIDUS**

0.- ELEMENTS QUE CONTEMPLA EL PLEC  
I2R540S0.

#### 1.- DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA EXECUTADES

Operacions destinades a la gestió dels residus generats en l'obra: residu de construcció o demolició o material d'excavació.

S'han considerat les operacions següents:

- Transport o càrrega i transport del residu: material procedent d'excavació o residu de construcció o demolició.
- Subministrament i recollida del contenidor dels residus.

#### RESIDUS ESPECIALS:

Els residus especials sempre s'han de separar.

Els residus especials s'han de dipositar en una zona d'emmagatzematge separada de la resta.

Temps màxim d'emmagatzematge: 6 mesos.

Els materials potencialment perillosos han d'estar separats per tipus compatibles i emmagatzemats en bidons o contenidors adequats, amb indicació del tipus de perillositat.

El contenidor de residus especials ha de situar-se en un lloc pla, fora del trànsit habitual de la maquinària d'obra, per tal d'evitar vessaments accidentals

Cal senyalitzar convenientment els diferents contenidors de residus especials, tenint en compte les incompatibilitats segons els símbols de perillositat representat en les etiquetes.

Els contenidors de residus especials han d'estar tapats i protegits de la pluja i la radiació solar excessiva.

Els bidons que contenen líquids perillosos (olis, desencofrants, etc.) s'han d'emmagatzemar en posició vertical i sobre cubetes de retenció de líquids per tal d'evitar fuites.

Els contenidors de residus especials s'han de col·locar sobre un terra impermeabilitzat.

#### CÀRREGA I TRANSPORT DE MATERIAL D'EXCAVACIÓ I RESIDUS:

L'operació de càrrega s'ha de fer amb les precaucions necessàries per a aconseguir unes condicions de seguretat suficients.

Els vehicles de transport han de portar els elements adequats a fi d'evitar alteracions perjudicials del material.

El contenidor ha d'estar adaptat al material que ha de transportar.

El trajecte que s'ha de recórrer ha de complir les condicions d'amplària lliure i de pendent adequades a la maquinària que s'utilitzi.

#### TRANSPORT A OBRA:

Transport de terres i material d'excavació o del rebaix, o residus de la construcció, entre dos punts de la mateixa obra o entre dues obres.

Les àrees d'abocada han de ser les que defineixi el 'Pla de Gestió de Residus de la Construcció i Enderrocs' de l'obra.

L'abocada s'ha de fer al lloc i amb el gruix de capa indicats al 'Pla de Gestió de Residus de la Construcció i els Enderrocs' de l'obra.

Les terres han de complir les especificacions del seu plec de condicions en funció del seu ús, i cal que tinguin l'aprovació de la Direcció Facultativa.

#### TRANSPORT A INSTAL·LACIÓ EXTERNA DE GESTIÓ DE RESIDUS:

El material de rebuig que el 'Pla de Gestió de Residus de la Construcció i els Enderrocs' i el que la DF no accepti per a reutilitzar en obra, s'ha de transportar a una instal·lació externa autoritzada, per tal de rebre el tractament definitiu.

El contractista ha de lliurar al promotor un certificat on s'indiqui, com a mínim:

- Identificació del productor dels residus
- Identificació del posseïdor dels residus
- Identificació de l'obra de la qual prové el residu i en el seu cas, el número de llicència d'obra
- Identificació del gestor autoritzat que ha rebut el residu i si aquest no fa la gestió de valorització o eliminació final del residu, la identificació, cal indicar també qui farà aquesta gestió
- Quantitat en t i m3 del residu gestionat i la seva codificació segons codi CER

#### 2.- CONDICIONS DEL PROCÉS D'EXECUCIÓ

#### CÀRREGA I TRANSPORT DE MATERIAL D'EXCAVACIÓ I RESIDUS:

El transport s'ha de realitzar en un vehicle adequat, per al material que es desitgi transportar, proveït dels elements que calen per al seu desplaçament correcte.

Durant el transport s'ha de protegir el material de manera que no es produeixin pèrdues en els trajectes utilitzats.

#### RESIDUS DE LA CONSTRUCCIÓ:

La manipulació dels materials s'ha de fer amb les proteccions adequades a la perillositat del mateix.

### 3.- UNITAT I CRITERIS D'AMIDAMENT

#### TRANSPORT DE MATERIAL D'EXCAVACIÓ O RESIDUS:

m<sup>3</sup> de volum amidat amb el criteri de la partida d'obra d'excavació que li correspongui, incrementat amb el coeficient d'esponjament indicat en el plec de condicions tècniques, o qualsevol altre acceptat prèviament i expressament per la Direcció Facultativa.

La unitat d'obra no inclou les despeses d'abocament ni de manteniment de l'abocador.

#### RESIDUS DE LA CONSTRUCCIÓ:

Es considera un increment per esponjament d'un 35%.

### 4.- NORMATIVA DE COMPLIMENT OBLIGATORI

Reial Decret 105/2008, de 1 de febrer, per el que se regula la producció i gestió dels residus de construcció i enderroc.

Ordre MAM/304/2002, de 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus (BOE núm. 43 de 19.02.2002).

Correcció d'errors de la Ordre MAM/304/2002, de 8 de febrer, per la que es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus.

Real Decret 108/1991, d'1 de febrer, sobre la prevenció i reducció de la contaminació del medi ambient produïda per l'amiant.

Decret 89/2010, de 29 de juny, pel qual s'aprova el Programa de gestió de residus de la construcció de Catalunya (PROGROC), es regula la producció i gestió dels residus de la construcció i demolició, i el cànon sobre la deposició controlada dels residus de la construcció.

## **I2 - DEMOLICIONS, ENDERROCS, MOVIMENTS DE TERRES I GESTIÓ DE RESIDUS**

### **I2R - GESTIÓ DE RESIDUS**

#### **I2R6 - CÀRREGA I TRANSPORT DE RESIDUS DE CONSTRUCCIÓ O DEMOLICIÓ A INSTAL·LACIÓ AUTORITZADA DE GESTIÓ DE RESIDUS**

#### 0.- ELEMENTS QUE CONTEMPLA EL PLEC

I2R642J0, I2R642M0.

#### 1.- DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA EXECUTADES

Operacions destinades a la gestió dels residus generats en l'obra: residu de construcció o demolició o material d'excavació.

S'han considerat les operacions següents:

- Transport o càrrega i transport del residu: material procedent d'excavació o residu de construcció o demolició
- Subministrament i recollida del contenidor dels residus

#### CÀRREGA I TRANSPORT DE MATERIAL D'EXCAVACIÓ I RESIDUS:

L'operació de càrrega s'ha de fer amb les precaucions necessàries per a aconseguir unes condicions de seguretat suficients.

Els vehicles de transport han de portar els elements adequats a fi d'evitar alteracions perjudicials del material.

El contenidor ha d'estar adaptat al material que ha de transportar.

El trajecte que s'ha de recórrer ha de complir les condicions d'amplària lliure i de pendent adequades a la maquinària que s'utilitzi.

#### TRANSPORT A OBRA:

Transport de terres i material d'excavació o del rebaix, o residus de la construcció, entre dos punts de la mateixa obra o entre dues obres.

Les àrees d'abocada han de ser les que defineixi el 'Pla de Gestió de Residus de la Construcció i Enderrocs' de l'obra.

L'abocada s'ha de fer al lloc i amb el gruix de capa indicats al 'Pla de Gestió de Residus de la Construcció i els Enderrocs' de l'obra.

Les terres han de complir les especificacions del seu plec de condicions en funció del seu ús, i cal que tinguin l'aprovació de la Direcció Facultativa.

#### TRANSPORT A INSTAL·LACIÓ EXTERNA DE GESTIÓ DE RESIDUS:

El material de rebuig que el 'Pla de Gestió de Residus de la Construcció i els Enderrocs' i el que la DF no accepti per a reutilitzar en obra, s'ha de transportar a una instal·lació externa autoritzada, per tal de rebre el tractament definitiu.

El contractista ha de lliurar al promotor un certificat on s'indiqui, com a mínim:

- Identificació del productor dels residus
- Identificació del posseïdor dels residus
- Identificació de l'obra de la qual prové el residu i en el seu cas, el número de llicència d'obra
- Identificació del gestor autoritzat que ha rebut el residu i si aquet no fa la gestió de valorització o eliminació final del residu, la identificació, cal indicar també qui farà aquesta gestió
- Quantitat en t i m<sup>3</sup> del residu gestionat i la seva codificació segons codi LER

#### 2.- CONDICIONS DEL PROCÉS D'EXECUCIÓ

##### CÀRREGA I TRANSPORT DE MATERIAL D'EXCAVACIÓ I RESIDUS:

El transport s'ha de realitzar en un vehicle adequat, per al material que es desitgi transportar, proveït dels elements que calen per al seu desplaçament correcte.

Durant el transport s'ha de protegir el material de manera que no es produeixin pèrdues en els trajectes utilitzats.

##### RESIDUS DE LA CONSTRUCCIÓ:

La manipulació dels materials s'ha de fer amb les proteccions adequades a la perillositat del mateix.

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

### 3.- UNITAT I CRITERIS D'AMIDAMENT

#### TRANSPORT DE MATERIAL D'EXCAVACIÓ O RESIDUS:

m3 de volum amidat amb el criteri de la partida d'obra d'excavació que li correspongui, incrementat amb el coeficient d'esponjament indicat en el plec de condicions tècniques, o qualsevol altre acceptat prèviament i expressament per la DF.

La unitat d'obra no inclou les despeses d'abocament ni de manteniment de l'abocador.

#### RESIDUS DE LA CONSTRUCCIÓ:

Es considera un increment per esponjament d'un 35%.

### 4.- NORMATIVA DE COMPLIMENT OBLIGATORI

Reial Decret 105/2008, de 1 de febrer, per el que se regula la producció i gestió dels residus de construcció i enderroc.

Ordre MAM/304/2002, de 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus (BOE núm. 43 de 19.02.2002).

Correcció d'errors de la Ordre MAM/304/2002, de 8 de febrer, per la que es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus.

Real Decret 108/1991, d'1 de febrer, sobre la prevenció i reducció de la contaminació del medi ambient produïda per l'amiant.

Decret 89/2010, de 29 de juny, pel qual s'aprova el Programa de gestió de residus de la construcció de Catalunya (PROGROC), es regula la producció i gestió dels residus de la construcció i demolició, i el cànon sobre la deposició controlada dels residus de la construcció.

## **I2 - DEMOLICIONS, ENDERROCS, MOVIMENTS DE TERRES I GESTIÓ DE RESIDUS**

### **I2R - GESTIÓ DE RESIDUS**

#### **I2RA - DISPOSICIÓ DE RESIDUS A INSTAL·LACIÓ AUTORIZADA DE GESTIÓ DE RESIDUS**

#### 0.- ELEMENTS QUE CONTEMPLA EL PLEC

I2RA73G1, I2RA75A0, I2RA6680, I2RA6890, I2RA6770, I2RA6960, I2RA8E00.

#### 1.- DEFINICIÓ I CONDICIONS DE LES PARTIDES D'OBRA EXECUTADES

Operacions destinades a la gestió dels residus generats en l'obra: residu de construcció o demolició o material d'excavació.

S'han considerat les operacions següents:

- Deposició del residu no reutilitzat en la instal·lació autoritzada de gestió on se li aplicarà el tractament de valorització, selecció i emmagatzematge o eliminació

#### DISPOSICIÓ DE RESIDUS:

Cada fracció s'ha de dipositar al lloc adequat legalment autoritzat per a que se li apliqui el tipus de tractament especificat en la DT: valorització, emmagatzematge o eliminació.

### 2.- CONDICIONS DEL PROCÉS D'EXECUCIÓ

#### RESIDUS DE LA CONSTRUCCIÓ:

La manipulació dels materials s'ha de fer amb les proteccions adequades a la perillositat del mateix.

### 3.- UNITAT I CRITERIS D'AMIDAMENT

#### DISPOSICIÓ DE RESIDUS DE CONSTRUCCIÓ O DEMOLICIÓ INERTS O NO ESPECIALS I DE MATERIAL D'EXCAVACIÓ:

m3 de volum de cada tipus de residu dipositat a l'abocador o centre de recollida corresponent.

#### DISPOSICIÓ DE RESIDUS DE CONSTRUCCIÓ O DEMOLICIÓ ESPECIALS:

kg de pes de cada tipus de residu dipositat a l'abocador o centre de recollida corresponent.

#### DISPOSICIÓ DE RESIDUS:

La unitat d'obra inclou totes les despeses per la disposició de cada tipus de residu al centre corresponent.

Inclou el cànon d'abocament del residu a dipòsit controlat segons el que determina la Llei 8/2008, el pagament del qual queda suspès segons la Llei 7/2011.

La empresa receptora del residu ha de facilitar al constructor la informació necessària per complimentar el certificat de disposició de residus, d'acord amb l'article 5.3 del REAL DECRETO 105/2008.

### 4.- NORMATIVA DE COMPLIMENT OBLIGATORI

Reial Decret 105/2008, de 1 de febrer, per el que se regula la producció i gestió dels residus de construcció i enderroc.

Ordre MAM/304/2002, de 8 de febrer, per la qual es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus (BOE núm. 43 de 19.02.2002).

Correcció d'errors de la Ordre MAM/304/2002, de 8 de febrer, per la que es publiquen les operacions de valorització i eliminació de residus i la llista europea de residus.

Real Decret 108/1991, d'1 de febrer, sobre la prevenció i reducció de la contaminació del medi ambient produïda per l'amiant.

Llei 8/2008, del 10 de juliol, de finançament de les infraestructures de gestió dels residus i dels cànon sobre la disposició del rebuig dels residus.

Llei 7/2011, del 27 de juliol, de mesures fiscals i financeres.

Decret 89/2010, de 29 de juny, pel qual s'aprova el Programa de gestió de residus de la construcció de Catalunya (PROGROC), es regula la producció i gestió dels residus de la construcció i demolició, i el cànon sobre la deposició controlada dels residus de la construcció.

### **APÈNDIX 3. Pressupost**



**PRESSUPOST**

Pàg.: 1

Obra 01 Pressupost GIP-5129\_EGR  
 Capítol 01 CLASSIFICACIÓ DE RESIDUS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	I2R24200	m3	Classificació a peu d'obra de residus de construcció o demolició en fraccions segons REAL DECRETO 105/2008, amb mitjans manuals (P - 1)	19.33	1,167.290	22,563.72
<b>TOTAL</b>	<b>Capítol</b>	<b>01.01</b>			<b>22,563.72</b>	

Obra 01 Pressupost GIP-5129\_EGR  
 Capítol 02 CÀRREGA I TRANSPORT DE RESIDUS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	I2R642J0	m3	Càrrega amb mitjans mecànics i transport de residus inerts o no especials a instal·lació autoritzada de gestió de residus, amb contenidor de 9 m3 de capacitat (P - 3)	19.15	106.880	2,046.75
2	I2R642M0	m3	Càrrega amb mitjans mecànics i transport de residus inerts o no especials a instal·lació autoritzada de gestió de residus, amb contenidor de 12 m3 de capacitat (P - 4)	16.63	589.250	9,799.23
3	I2R540S0	m3	Transport de residus especials a instal·lació autoritzada de gestió de residus, amb contenidor d'1 m3 de capacitat (P - 2)	71.04	471.160	33,471.21
<b>TOTAL</b>	<b>Capítol</b>	<b>01.02</b>			<b>45,317.19</b>	

Obra 01 Pressupost GIP-5129\_EGR  
 Capítol 03 DISPOSICIÓ DE RESIDUS

NUM. CODI	UA	DESCRIPCIÓ	PREU	AMIDAMENT	IMPORT	
1	I2RA73G1	m3	Deposició controlada a dipòsit autoritzat inclòs el cànon sobre la deposició controlada dels residus de la construcció, segons la LLEI 8/2008, de residus barrejats inerts amb una densitat 1,0 t/m3, procedents de construcció o demolició, amb codi 170107 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 9)	21.62	515.140	11,137.33
2	I2RA75A0	m3	Deposició controlada a dipòsit autoritzat de residus barrejats no perillosos amb una densitat 0,43 t/m3, procedents de construcció o demolició, amb codi 170904 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 10)	38.52	49.210	1,895.57
3	I2RA6680	m3	Deposició controlada a centre de reciclatge de residus de metalls barrejats no perillosos amb una densitat 0,2 t/m3, procedents de construcció o demolició, amb codi 170407 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 5)	-25.74	12.810	-329.73
4	I2RA6890	m3	Deposició controlada a centre de reciclatge de residus de fusta no perillosos amb una densitat 0,19 t/m3, procedents de construcció o demolició, amb codi 170201 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 7)	8.80	94.160	828.61
5	I2RA6770	m3	Deposició controlada a centre de reciclatge de residus de plàstic no perillosos amb una densitat 0,035 t/m3, procedents de construcció o demolició, amb codi 170203 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 6)	0.00	8.400	0.00
6	I2RA6960	m3	Deposició controlada a centre de reciclatge de residus de paper i cartró no perillosos amb una densitat 0,04 t/m3, procedents de construcció o demolició, amb codi 150101 segons la Llista Europea de Residus (ORDEN MAM/304/2002) (P - 8)	0.00	16.410	0.00
7	I2RA8E00	kg	Deposició controlada a centre de selecció i transferència de residus barrejats perillosos, procedents de construcció o demolició, amb codi 170903* segons la Llista Europea de Residus (ORDEN	0.11	68,530.000	7,538.30

EUR

**PRESSUPOST**

Pàg.: 2

MAM/304/2002) (P - 11)

<b>TOTAL</b>	<b>Capítol</b>	<b>01.03</b>	<b>21,070.08</b>
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EUR

**RESUM DE PRESSUPOST**

Pàg.: 1

<b>NIVELL 2: Capítol</b>			<b>Import</b>
Capítol	01.01	CLASSIFICACIÓ DE RESIDUS	22,563.72
Capítol	01.02	CÀRREGA I TRANSPORT DE RESIDUS	45,317.19
Capítol	01.03	DISPOSICIÓ DE RESIDUS	21,070.08
<b>Obra</b>	<b>01</b>	<b>Pressupost GIP-5129_EGR</b>	<b>88,950.99</b>
			<b>88,950.99</b>
<b>NIVELL 1: Obra</b>			<b>Import</b>
Obra	01	Pressupost GIP-5129_EGR	88,950.99
			<b>88,950.99</b>

## **APÈNDIX 4. Taula simulació residus**

## Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

**Branca:** Obra civil

**Tipologia:** Nova calçada

	Amplada	Alçaria	Secció	Longitud
<b>Plataforma</b>	7,00	0,95	6,65	904,00
	10,25	1,25	12,81	140,00
<b>Viaducte de bigues prefabricades</b>	9,30	2,60	24,18	120,00

Codi	Residu	Volum(m³)	Massa(T)
	<b>Inerts</b>		
170101	Formigó	40,75	55,18
170107	Mescles de formigó, maons, teules i materials ceràmics, diferents de les especificades en el codi 170106)	474,39	593,95
	<b>Total inerts</b>	<b>515,14</b>	<b>649,13</b>
	<b>No Especials</b>		
150101	Envasos de paper i cartró	16,41	1,15
150104	Envasos metàl·lics	0,09	0,01
170201	Fusta	94,16	23,54
170203	Plàstic	8,40	0,58
170302	Mescles bituminoses diferents de les especificades en el codi 170301	44,76	53,71
170405	Ferro i acer	4,24	26,75
170407	Metalls mesclats	8,48	53,39
170904	Residus mesclats de construcció i demolició diferents dels especificats en els codis 170901,0170902 i 170903	4,45	3,56
	<b>Total No Especials</b>	<b>180,98</b>	<b>162,70</b>
	<b>Especials</b>		
80111	Residus de pintura i vernís que contenen dissolvents orgànics o altres substàncies perilloses	0,29	0,47
80317	Residus de tóner per impressió que contenen substàncies perilloses	0,02	0,01
80318	Residus de tóner per impressió diferents dels especificats en el codi 080317	0,04	0,01
130205	Olis minerals no clorats de motor, de transmissió mecànica i lubricants	0,15	0,14
150110	Envasos que contenen substàncies perilloses o estan contaminats per aquestes	12,73	1,09
150111	Envasos metàl·lics, inclosos els recipients a pressió buits, que contenen una matriu sòlida i porosa perillosa	1,60	0,25
150202	Absorbents, materials de filtració (inclosos els filtres d'oli no especificats en cap altra categoria), draps de neteja i roba protectora contaminats per substàncies perilloses	0,38	0,02
160103	Pneumàtics fora d'ús	0,30	0,06
160107	Filtres d'oli	0,02	0,00
160604	Piles alcalines (excepte 160603)	0,09	0,22
160605	Altres piles i acumuladors	0,46	1,07
170503	Terra i pedres que contenen substàncies perilloses	7,06	7,73
200201	Residus biodegradables	272,69	27,27
200301	Mescles de residus municipals	173,72	28,58
200304	Llots de fosses sèptiques	1,61	1,61
	<b>Total Especials</b>	<b>471,16</b>	<b>68,53</b>
	<b>Total</b>	<b>1167,28</b>	<b>880,36</b>



**Annex 21. Pressupost per al coneixement de l'administració**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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Projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol

**1 PRESSUPOST PER A CONEIXEMENT DE L'ADMINISTRACIÓ**

Realitzats els amidaments i aplicats els preus unitaris, tal com es desenvolupa en el document núm. 4 del present projecte constructiu, les quantitats a les que puja el pressupost són:

<b>PRESSUPOST VARIANT GIP-5129</b>		
<b>TRAMIFICAT</b>		<b>1.827.624,33 €</b>
	TREBALLS PREVIS I ENDERROCS	13.905,83 €
	MOVIMENT DE TERRES	78.433,30 €
	DRENATGE	36.286,89 €
	ESTRUCTURES	1.101.019,14 €
	AFERMATS	386.003,63 €
	SEGURETAT VIÀRIA	132.744,25 €
	MESURES CORRECTORES	24.910,70 €
	OBRES COMPLEMENTÀRIES	54.320,59 €
<b>NO TRAMIFICAT</b>		<b>149.326,88 €</b>
	SEGURETAT I SALUT	35.576,79 €
	GESTIÓ DE RESIDUS	88.950,99 €
	ALTRES PARTIDES ALÇADES	24.799,10 €
<b>TOTAL PRESSUPOST D'EXECUCIÓ MATERIAL</b>		<b>1.976.951,21 €</b>
	Despeses generals (13% sobre el P.E.M.)	257.003,66 €
	Benefici industrial (6% sobre el P.E.M.)	118.617,07 €
	<b>Subtotal:</b>	<b>2.352.571,94 €</b>
	IVA (21%)	494.040,11 €
<b>TOTAL PRESSUPOST D'EXECUCIÓ PER CONTRACTE</b>		<b>2.846.612,05 €</b>
	Serveis afectats	97.154,75 €
	Expropiacions	68.792,54 €
	Aixecament topogràfic	3.872,00 €
	Estudi geològic	14.193,30 €
	Redacció del projecte	48.497,94 €
	Direcció facultativa	82.500,00 €
	Despeses d'acció cultural	41.515,98 €
<b>PRESSUPOST PER A CONEIXEMENT DE L'ADMINISTRACIÓ</b>		<b>3.203.138,55 €</b>

El **Pressupost d'execució per contracta, IVA inclòs**, de l'obra ascendeix a la quantitat de **DOS MILIONS VUIT-CENTS QUARANTA-SIS MIL SIS-CENTS DOTZE EUROS AMB CINC CÈNTIMS (2.846.612,05 €)**.

Aquest **Pressupost per a Coneixement de l'Administració** puja a la quantitat de **TRES MILIONS DOS-CENTS TRES MIL CENT TRENTA-VUIT EUROS AMB CINQUANTA-CINC CÈNTIMS (3.203.138,55 €)**.

El **Pressupost d'execució material** de l'obra ascendeix a la quantitat de **UN MILIÓ NOU-CENTS SETANTA-SIS MIL NOU-CENTS CINQUANTA-UN EUROS AMB VINT-I-UN CÈNTIMS (1.976.951,21 €)**.





## **Annex 22. Enllumenat**

**Condicionament d'un tram de la carretera GIP-5129, de Vilafant a Borrassà, amb nou pont sobre el Manol.**

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## Índex

1. INTRODUCCIÓ .....	1
2. DESCRIPCIÓ DEL SISTEMA D'ENLLUMENAT .....	1
3. NIVELL D'IL·LUMINACIÓ I UNIFORMITAT .....	1
4. INSTAL·LACIONS ELÈCTRIQUES I CÀLCULS .....	3
5. MANTENIMENT .....	4
6. NORMATIVA DE REFERENCIA .....	4
APÈNDIX 1. ESTUDI LUMÍNIC	
APÈNDIX 2. FITXA TÈCNICA	
APÈNDIX 3. CÀLCULS ELÈCTRICS	

## 1. INTRODUCCIÓ

El següent annex té com a objecte la definició de les especificacions tècniques per a l'elaboració de la instal·lació d'enllumenat del present projecte de condicionament d'un tram de la carretera GIP-5129 de Vilafant a Borrassà, amb nou pont sobre el Manol. A l'annex s'exposen les obres corresponents a l'enllumenat, justificant els criteris emprats i les solucions adoptades.

## 2. DESCRIPCIÓ DEL SISTEMA D'ENLLUMENAT

És d'especial importància per raons de seguretat vial que l'enllumenat contribueixi a la correcta percepció de les rotondes, complementant la senyalització horitzontal i vertical adient. Per això, s'ha considerat la implantació de bàculs al voltant de la rotonda al perímetre exterior de la calçada, ressaltant la seva forma anular. S'ha tractat d'evitar, doncs, la inclusió de bàculs a l'illot central de la rotonda, on aquests podrien suposar un obstacle als possibles vehicles que l'envaïssin.

A més de la il·luminació de la rotonda, el projecte inclourà l'enllumenat dels vials d'accés a la rotonda d'intersecció entre la N-260 i la GIP-5129. Els bàculs usats per a la il·luminació de la rotonda tindran una alçada de 9 m i els dels vials seran de 8 metres, a més en el cas dels vials es col·locaran tots ells a un sol marge.

Totes les columnes o bàculs, ancorats al terreny i encarregats de suportar les lluminàries, seran de xapa d'acer galvanitzat segons EN 40-5:2002, dimensionament d'acord a EN 40-3-1 i EN 40-3-3, amb marcat CE i resistents a les següents accions:

- Intempèrie, o amb la deguda protecció contra ella, no permetent l'entrada d'aigua de pluja ni l'acumulació d'aigua de condensació.
- Esforços verticals.
- Esforços horitzontals.
- Xoc contra cossos durs.
- Xoc contra cossos tous.
- Corrosió.

La distribució de l'enllumenat i les característiques de les lluminàries es determinaran de tal manera que els resultats obtinguts a l'anàlisi lumínica (Apèndix 1) compleixin amb els requisits mínims establerts al RD 1890/2008.

El tipus de làmpades que s'utilitzaran per a la il·luminació, a més, hauran de complir amb els requisits marcats pel Decret 190/2015 pel que fa al percentatge de radiància per a longituds d'ona per sota dels 440 nm i el valor de FHS (flux lluminós d'hemisferi superior instal·lat). També disposaran d'una protecció IP66 i un índex de resistència a l'impacte IK09.

La zona afectada pel projecte està classificada com de protecció alta (Figura 1) d'acord amb la Llei 6/2001, segons el Mapa de protecció contra la contaminació lumínica del 2018 del Departament de Territori i Sostenibilitat de la Generalitat de Catalunya, amb la qual cosa, les làmpades a utilitzar segons el Decret 190/2015 hauran de tindre menys del 5% de radiància per sota dels 440 nm i menys d'un 1% de FHS.



Figura 1. Zonificació segons el grau de protecció contra la contaminació lumínica

## 3. NIVELL D'IL·LUMINACIÓ I UNIFORMITAT

El nivell d'il·luminació s'ha establert tenint en consideració les Instruccions Tècniques Complementaries EA-01 a EA-07 del "Reglamento de eficiencia energética en instalaciones de alumbrado exterior" RD 1890/2008. Les taules presentades a continuació (Taula 1 i Taula 2), pertanyents a la normativa referida, contenen valors recomanats que haurà de complir la proposta d'enllumenat als trams viaris corresponents als accessos a les gloriets amb la intenció de millorar l'eficiència, l'estalvi energètic i la limitació de la contaminació lumínica.

Situacions de projecte	Tipus de vies	Classe d'enllumenat <sup>(*)</sup>
A1	<ul style="list-style-type: none"> <li>Carreteres de calçades separades amb encreuaments a diferent nivell i accessos controlats (autopistes i autovies). Intensitat de trànsit</li> <li>Alta (IMD) <math>\geq</math> 25.000.....</li> <li>Mitjana (IMD) <math>\geq</math> 15.000 i <math>&lt;</math> 25.000.....</li> <li>Baixa (IMD) <math>&lt;</math> 15.000.....</li> </ul>	ME1 ME2 ME3a
	<ul style="list-style-type: none"> <li>Carreteres de calçada única amb doble sentit de circulació i accessos limitats (vies ràpides). Intensitat de trànsit</li> <li>Alta (IMD) <math>&gt;</math> 15.000.....</li> <li>Mitjana i baixa (IMD) <math>&lt;</math> 15.000.....</li> </ul>	ME1 ME2
A2	<ul style="list-style-type: none"> <li>Carreteres interurbanes sense separació de voreres o carrils bici.</li> <li>Carreteres locals en zones rurals sense via de servei. Intensitat de trànsit</li> <li>IMD <math>\geq</math> 7.000.....</li> <li>IMD <math>&lt;</math> 7.000.....</li> </ul>	ME1 / ME2 ME3a / ME4a
A3	<ul style="list-style-type: none"> <li>Vies col·lectores i rondes de circumval·lació.</li> <li>Carreteres interurbanes amb accessos no restringits.</li> <li>Vies urbanes de trànsit important, ràpides radials i de distribució urbana a districtes.</li> <li>Vies principals de la ciutat i travessia de poblacions. Intensitat de trànsit i complexitat del traçat de la carretera.</li> <li>IMD <math>\geq</math> 25.000.....</li> <li>IMD <math>\geq</math> 15.000 i <math>&lt;</math> 25.000.....</li> <li>IMD <math>\geq</math> 7.000 i <math>&lt;</math> 15.000.....</li> <li>IMD <math>&lt;</math> 7.000.....</li> </ul>	ME1 ME2 ME3b ME4a / ME4b

<sup>(\*)</sup> Per a totes les situacions de projecte (A1, A2 i A3), quan les zones properes siguin clares (fons clars), totes les vies de trànsit han d'incrementar les exigències a les de la classe d'enllumenat immediatament superior.

Taula 1. Tipus de vies i classe d'enllumenat segons RD 1890/2008

Classe d'enllumenat	Luminància de la superfície de la calçada en condicions seques			Enlluernament pertorbador	Il·luminació dels voltants
	Luminància (4) mitjana $L_m$ (cd/m <sup>2</sup> ) <sup>(1)</sup>	Uniformitat global $U_0$ [mínima]	Uniformitat longitudinal $U_{\square}$ [mínima]	Increment lllindar $TI$ (%) <sup>(2)</sup> [màxim]	Relació entorn SR <sup>(3)</sup> [mínima]
ME1	2,00	0,40	0,70	10	0,50
ME2	1,50	0,40	0,70	10	0,50
ME3a	1,00	0,40	0,70	15	0,50
ME3b	1,00	0,40	0,60	15	0,50
ME3c	1,00	0,40	0,50	15	0,50
ME4a	0,75	0,40	0,60	15	0,50
ME4b	0,75	0,40	0,50	15	0,50
ME5	0,50	0,35	0,40	15	0,50
ME6	0,30	0,35	0,40	15	Sense requisits

<sup>(1)</sup> Els nivells de la taula són valors mínims en servei amb manteniment de la instal·lació d'enllumenat, excepte (TI), que són valors màxims inicials. A fi de mantenir aquests nivells de servei, s'ha de considerar un factor de manteniment ( $f_m$ ) elevat que depèn de la làmpada adoptada, tipus de llum, grau de contaminació de l'aire i modalitat de manteniment preventiu.

<sup>(2)</sup> Quan s'utilitzin fonts de llum de baixa luminància (làmpades fluorescents i de vapor de sodi a baixa pressió), es pot permetre un augment del 5% de l'increment lllindar (TI).

<sup>(3)</sup> La relació entorn SR s'ha d'aplicar en les vies de trànsit rodats on no hi hagi altres àrees contigües a la calçada que tinguin els seus propis requisits. L'amplada de les bandes adjacents per a la relació entorn SR ha de ser igual com a mínim a la d'un carril de trànsit, i es recomana, si és possible, 5 m d'amplada.

<sup>(4)</sup> Els valors de luminància donats es poden convertir en valors d'il·luminació, multiplicant els primers pel coeficient R (segons CIE) del paviment utilitzat, i prenent un valor de 15 quan aquest no es conegui.

Taula 2. Valors mínims i màxims per a cada classe d'enllumenat segons RD 1890/2008

La tipologia de la via, interurbana sense accessos restringits, fa possible definir la situació de projecte com a ME3b i per tant la il·luminació vial haurà de complir amb els valors corresponents de la Taula 2.

La glorieta per la seva banda no es pot considerar com un vial funcional i haurà de complir amb els valors de referència marcats al RD 1890/2008 per a enllumenats específics d'aquesta tipologia: una uniformitat mitjana mínima de 0,5, una il·luminació mitjana horitzontal mínima de 40 lux i un enlluernament màxim  $GR \leq 45$ . A més, es complirà amb la directriu de que les glorietes tinguin nivells un 50% superiors als nivells dels accessos.

Als accessos s'il·luminaran almenys els primers 100 metres des de la glorieta, complint amb el que marca l'Ordre Circular 36/2015 del Ministeri de Foment.

Tenint cura del compliment dels criteris esmentats anteriorment s'ha realitzat un estudi lumínic sobre un pla de treball de les calçades amb les lluminàries proposades. Aquest estudi s'adjunta a l'Apèndix 01. Les fitxes tècniques i certificats de les lluminàries es poden trobar a l'Apèndix 2.

#### **4. INSTAL·LACIONS ELÈCTRIQUES I CÀLCULS**

En aquest apartat s'inclou la definició de tota la instal·lació elèctrica (cables dels circuits de la xarxa subterrània, xarxa de terra, connexions a la xarxa existent, etc) així com el detall dels càlculs realitzats per al dimensionat dels conductors elèctrics.

És important evidenciar que la instal·lació elèctrica es connectarà a la xarxa ja existent, més concretament a una columna existent segons queda reflectit al Document de plànols. La instal·lació de la nova línia d'enllumenat suposarà l'ampliació de la potència actual instal·lada en 1,9 kW. Tanmateix, i d'acord amb la informació proporcionada per l'Ajuntament de Vilafant, aquest augment no implica un augment de la potència contractada que es considera suficient per a cobrir els nous consums.

La línia d'alimentació als punts de llum estarà protegida a l'armari existent amb tall omnipolar, contra sobrecàrregues i curt circuits amb interruptor magnetotèrmic i contra corrents de defecte a terra amb diferencial de la sensibilitat adient segons ITC-BT-09.

El pressupost del projecte contempla les corresponents partides per a possibles modificacions necessàries al quadre d'enllumenat per a complir amb els requisits del paràgraf anterior i per a la legalització de la instal·lació d'enllumenat públic al Departament de Indústria de la Generalitat de Catalunya.

En relació a l'execució de les diferents canalitzacions, s'utilitzaran 2 tubs de PE de diàmetre 90 mm per a la distribució sota vorera i calçada i als creuaments de calçada, deixant sempre almenys un tub lliure, i 1 tub de PE de 90 mm de diàmetre fins als elements receptors. L'ample de la canalització serà de 0,4 m i s'hi instal·laran els tubs com a mínim a 0,4m de profunditat, amb cable nu de coure, amb un recobriments mínim inferior de 0,03m i un recobriments mínim superior de 0,06m, segons ITC-BT-21.

Se situaran pericons de registre quadrats a peu de columna i als canvis de direcció, complint sempre amb una distància màxima entre pericons de 40 metres.

Les derivacions necessàries es realitzaran a caixes de bornes adequades situades a l'interior dels suports de les lluminàries a una altura mínima de 0,3 m sobre el nivell del sòl.

L'alimentació elèctrica a la xarxa de circuits de tota la instal·lació d'enllumenat serà trifàsica amb tensió (400/230V). Els cables elèctrics estaran formats per conductors de coure, i estaran protegits per un aïllant plàstic, elastomèric o qualsevol altre material de propietats aïllants. El tipus a emprar en el present projecte serà de designació R Z1 0,6/1 kV, de secció segons càlculs presentats a l'Apèndix 3.

La xarxa de posta a terra estarà constituïda per piques de terra d'acer couritzat, que s'instal·laran com a mínim cada 5 columnes i a la primera i darrera columna, i la xarxa de cable soterrat de coure nu de secció 35 mm<sup>2</sup> que les connecta. S'utilitzarà cable H07V-K de secció mínima 16 mm<sup>2</sup> per a les connexions a terra per l'interior de les columnes.

La resistència de posada a terra, mesurada durant la posada en servei de la instal·lació serà com a màxim de 30 Ohm. En qualsevol cas es complirà amb la condició següent establerta a la ITC-BT-24 que relaciona tensió de contacte admissible U (que es considerarà de 24V), sensibilitat de l'interruptor diferencial Ia i resistència de terra RA:

$$RA \times I_a \leq U$$

El dimensionament de les seccions dels conductors elèctrics s'ha realitzat seguint els següents criteris:

- Caiguda de tensió: S'ha dimensionat la secció de tal manera que la caiguda percentual des del punt de connexió amb la xarxa fins als receptors més allunyats sigui menor al 3%, tal i com es pot observar a l'Apèndix de càlculs elèctrics. S'ha pres com a origen de la instal·lació el quadre d'alimentació de l'enllumenat existent i s'ha considerat la potència existent ja instal·lada, amb sis punts de llum de tecnologia VSAP de 250 W.
- Densitat de corrent: Determinades les seccions amb el criteri anterior, la intensitat de corrent que correspon a cada secció està molt per sota de la màxima permesa per la Instrucció ITC-MI-BT (001 a 007).
- A efectes de càlcul de seccions i en quant a la potència dels nous receptors que en aquest cas son LED es considera un factor d'arrancada de seguretat d'1,25. Per als càlculs relatius als receptors existents, de tecnologia VSAP, es considera un factor d'arrancada d'1,8, d'acord amb el que estableix el REBT.
- Correcció del factor de potència: El factor de potència serà com a mínim de 0,90.

A continuació es detallaran les expressions utilitzades per al càlcul de les intensitats, caigudes de tensió i les intensitats de curt-circuit.

Per al càlcul de les intensitats en circuits trifàsics s'ha emprat la següent expressió:

$$I = \frac{P}{\sqrt{3} \cdot V \cdot \cos\varphi}$$

Per al càlcul de les caigudes de tensió, l'expressió utilitzada ha estat:

$$\Delta V = \frac{P \cdot L}{56 \cdot S \cdot V}$$

La resistència del conductor, el valor de la qual cal conèixer a l'hora de calcular les intensitats de curt-circuit, es defineix seguint la següent expressió:

$$R_C = \rho \cdot \frac{l}{S}$$

On  $\rho$  és la resistivitat del conductor calculada amb l'equació:

$$\rho = \rho_{20} \cdot [1 + \alpha \cdot (\theta - 20)]$$

Es considera una temperatura ambient de 25°C per a línies soterrades. I es prenen els valors de  $\rho_{20}$  i  $\alpha$  tenint en compte el material del conductor. Els valors d'aquests paràmetres per als materials més comuns són:

Coure:

- $\rho_{20} = 0,018 \Omega \cdot \text{mm}^2/\text{m}$
- $\alpha = 0,00392^\circ\text{C}^{-1}$

Alumini:

- $\rho_{20} = 0,029 \Omega \cdot \text{mm}^2/\text{m}$
- $\alpha = 0,00403^\circ\text{C}^{-1}$

Finalment, la intensitat de curt-circuit s'ha calculat amb la següent expressió:

$$I_{cc} = \frac{0,8 \cdot U}{R_C}$$

Els valors d'intensitat de curt-circuit calculats són inferiors als valors d'intensitat de curt-circuit màxims admissibles segons ITC-BT-07 per a la tipologia de cable seleccionada.

Els valors de caiguda de tensió, d'intensitat i d'intensitat de curt-circuit així com altres resultats intermedis i informació addicional es poden trobar a l'Apèndix 3. Càlculs de les línies.

## 5. MANTENIMENT

Una vegada realitzada l'obra objecte d'aquest projecte, el manteniment de la xarxa d'enllumenat així com les despeses derivades dels consums d'electricitat hauran d'anar a càrrec de l'Ajuntament de Vilafant.

## 6. NORMATIVA DE REFERENCIA

- Reial Decret 1890/2008, de 14 de novembre, pel qual s'aprova el Reglament d'eficiència energètica en instal·lacions d'enllumenat exterior i les seves instruccions tècniques complementaries EA-01 a EA-07. Serà d'obligat compliment durant la execució de les obres.
- Llei 6/2001, de 31 de maig, d'ordenació ambiental de l'enllumenament per a la protecció del medi nocturn.
- Decret 190/2015, de 25 d'agost, de desplegament de la Llei 6/2001, d'ordenació ambiental de l'enllumenament per a la protecció del medi nocturn.
- Ordre circular 36/2015 sobre criteris a aplicar en la il·luminació de carreteres a cel obert i túnels. Tom I.
- Reial Decret 842/2002, de 2 d'agost, pel qual s'aprova el Reglament electrotècnic per a baixa tensió.





## **APÈNDIX 1. Estudi lumínic**

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**PRO-0344 CONDICIONAMENT TRAM CARRETERA GIP-5129**

**Índice**

El flujo de salida de la luminaria puede sufrir variaciones en torno al +/- 6% respecto a los publicados atendiendo a la condición ambiental y/o a la evolución constante que experimenta la tecnología.

**PRO-0344 CONDICIONAMENT TRAM CARRETERA GIP-5129**

Portada del proyecto	1
Índice	2
<b>SIMON - Nath L Óptica RJ_ 3000 K 193W a 530 mA</b>	
Hoja de datos de luminarias	3
<b>SIMON - Nath S Óptica RJ_ 3000 K 94W a 800 mA</b>	
Hoja de datos de luminarias	4
<b>Glorieta</b>	
Datos de planificación	5
Lista de luminarias	6
Planta	7
Luminarias (ubicación)	8
Observador GR (sumario de resultados)	9
Rendering (procesado) en 3D	12
Rendering (procesado) de colores falsos	13
<b>Superficies exteriores</b>	
<b>Glorieta</b>	
Resumen	14
Gráfico de valores (E, perpendicular)	15
<b>Accessos Glorieta</b>	
Datos de planificación	16
Lista de luminarias	17
Planta	18
Luminarias (ubicación)	19
Superficie de cálculo (sumario de resultados)	20
Rendering (procesado) en 3D	21
Rendering (procesado) de colores falsos	22
<b>Superficies exteriores</b>	
<b>Accés Esquerra</b>	
Gráfico de valores (E, perpendicular)	23
<b>Accés Dreta</b>	
Gráfico de valores (E, perpendicular)	24
<b>Accés Inferior</b>	
Gráfico de valores (E, perpendicular)	25
<b>Glorieta</b>	
Gráfico de valores (E, perpendicular)	26
<b>Accessos Glorieta</b>	
Datos de planificación	27
Lista de luminarias	28
Resultados luminotécnicos	29
Rendering (procesado) en 3D	30
Rendering (procesado) de colores falsos	31
<b>Recuadros de evaluación</b>	
<b>Recuadro de evaluación Calzada 1</b>	
Gráfico de valores (E)	32
<b>Observador</b>	
<b>Observador 1</b>	
Isolíneas (L)	33
<b>Observador 2</b>	
Isolíneas (L)	34

AGENTE COMERCIAL: Úrsula Sanjuan  
 Nº de PROYECTO: PRO-0344  
 Nº de Obra: C-066035

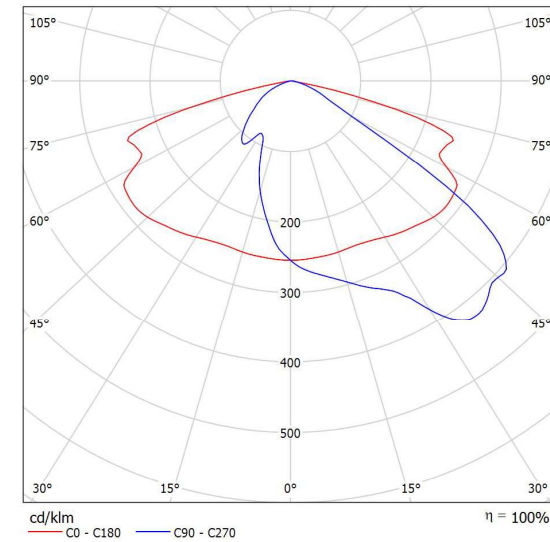
Fecha: 15.12.2020  
 Proyecto elaborado por: Simon Lighting, S.A.U.

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**SIMON - Nath L Óptica RJ\_ 3000 K 193W a 530 mA / Hoja de datos de luminarias**

Emisión de luz 1:



Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100

SIMON Nath L . Luminaria exterior Vial con instalación Post-Top y lateral Ø 60, ajustable de -5° a +10° para compensación negativa en báculos y brazos murales. Cubierta plana con aletas de refrigeración no visibles en posición instalada. Difusor de vidrio templado transparente plano para facilitar su limpieza y atenúa la radiación UV en las ópticas. Reflector troncopiramidal antideslumbramiento, matizado con recuperación de flujo. .

Características técnicas:  
- Óptica RJ\_  
- CCT LED 3000 K.  
- CRI > 70.  
- IP66, IK08.

Nota: La fotometría puede sufrir variaciones del ± 6 % del flujo.

Certificaciones:

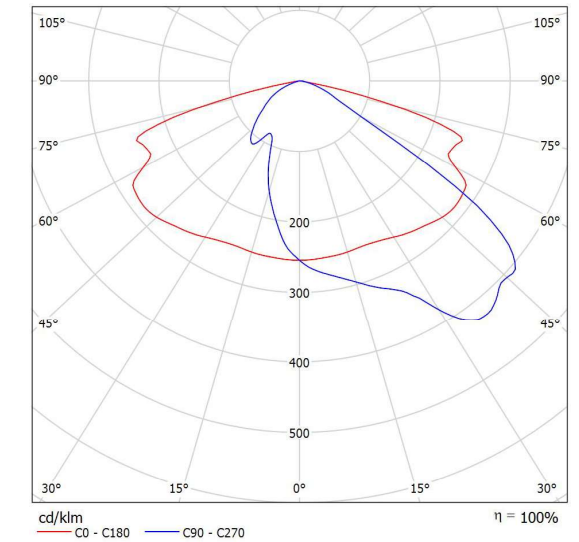
UNE-EN 60598-1 / UNE-EN 60598-2-3 / UNE-EN 62493 / UNE-EN 55015 / UNE-EN 61547 / UNE-EN 61000-3-2 / UNE-EN 61000-3-3 / UNE-EN 50581 / UNE-EN 62471:2009 / UNE-EN 62031 / UNE-EN 61347-2-13 / UNE-EN 62384.

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**SIMON - Nath S Óptica RJ\_ 3000 K 94W a 800 mA / Hoja de datos de luminarias**

Emisión de luz 1:



Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100

SIMON Nath S . Luminaria exterior Vial con instalación Post-Top y lateral Ø 60, ajustable de -5° a +10° para compensación negativa en báculos y brazos murales. Cubierta plana con aletas de refrigeración no visibles en posición instalada. Difusor de vidrio templado transparente plano para facilitar su limpieza y atenúa la radiación UV en las ópticas. Reflector troncopiramidal antideslumbramiento, matizado con recuperación de flujo. .

Características técnicas:  
- Óptica RJ\_  
- CCT LED 3000 K.  
- CRI > 70.  
- IP66, IK09.

Nota: La fotometría puede sufrir variaciones del ± 6 % del flujo.

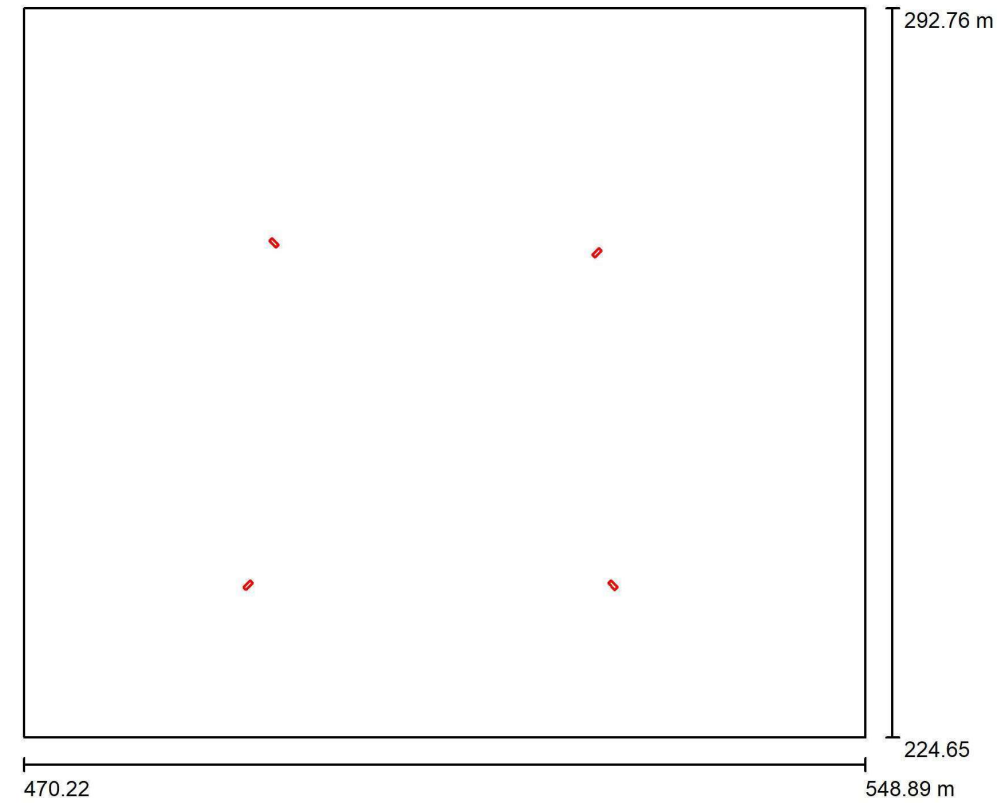
Certificaciones:

UNE-EN 60598-1 / UNE-EN 60598-2-3 / UNE-EN 62493 / UNE-EN 55015 / UNE-EN 61547 / UNE-EN 61000-3-2 / UNE-EN 61000-3-3 / UNE-EN 50581 / UNE-EN 62471:2009 / UNE-EN 62031 / UNE-EN 61347-2-13 / UNE-EN 62384.

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**Glorieta / Datos de planificación**



Factor mantenimiento: 0.80, ULR (Upward Light Ratio): 0.0%

Escala 1:632

**Lista de piezas - Luminarias**

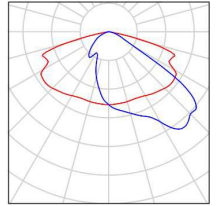
Nº	Pieza	Designación (Factor de corrección)	Φ (Luminaria) [lm]	Φ (Lámparas) [lm]	P [W]
1	4	SIMON - Nath L Óptica RJ_ 3000 K 193W a 530 mA (1.000)	26279	26280	193.0
Total:			105118	105120	772.0

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**Glorieta / Lista de luminarias**

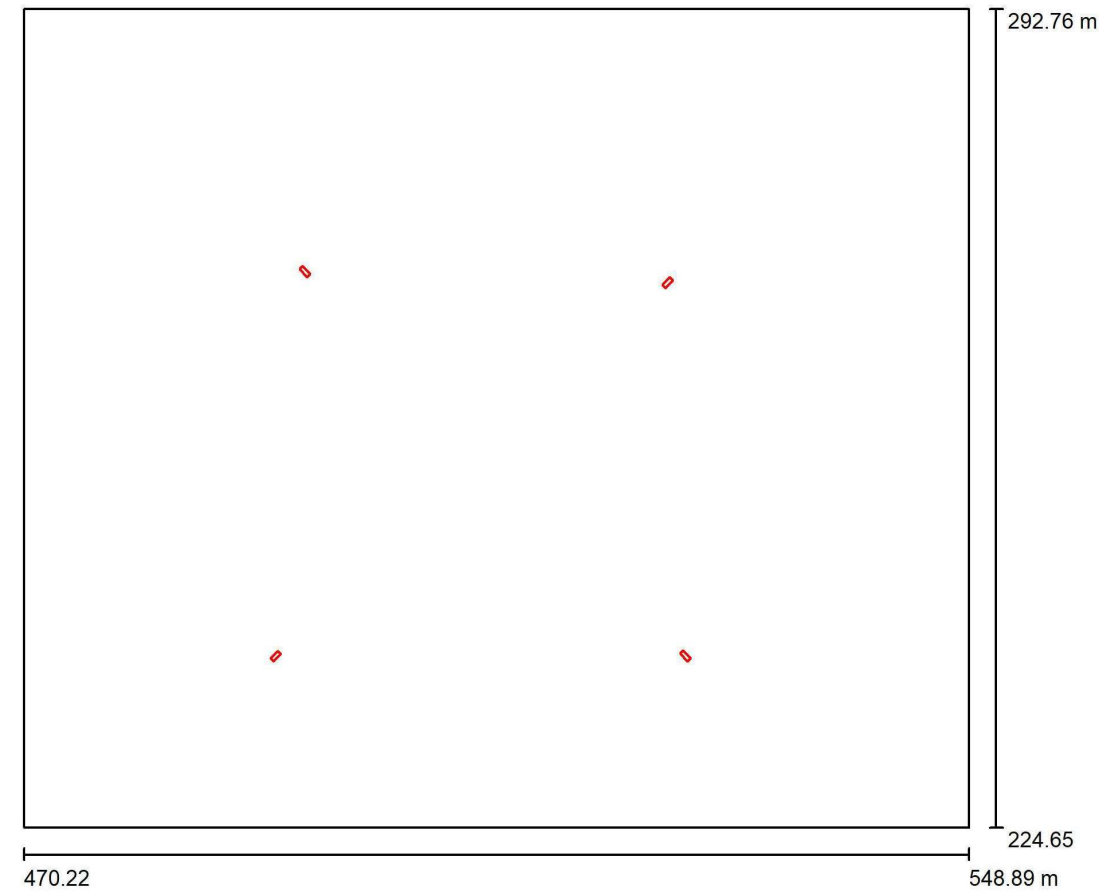
4 Pieza SIMON - Nath L Óptica RJ\_ 3000 K 193W a 530 mA  
Nº de artículo: -  
Flujo luminoso (Luminaria): 26279 lm  
Flujo luminoso (Lámparas): 26280 lm  
Potencia de las luminarias: 193.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100  
Lámpara: 1 x Nath L Óptica RJ\_ 3000 K 193W a 530 mA (Factor de corrección 1.000).



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**Glorieta / Planta**

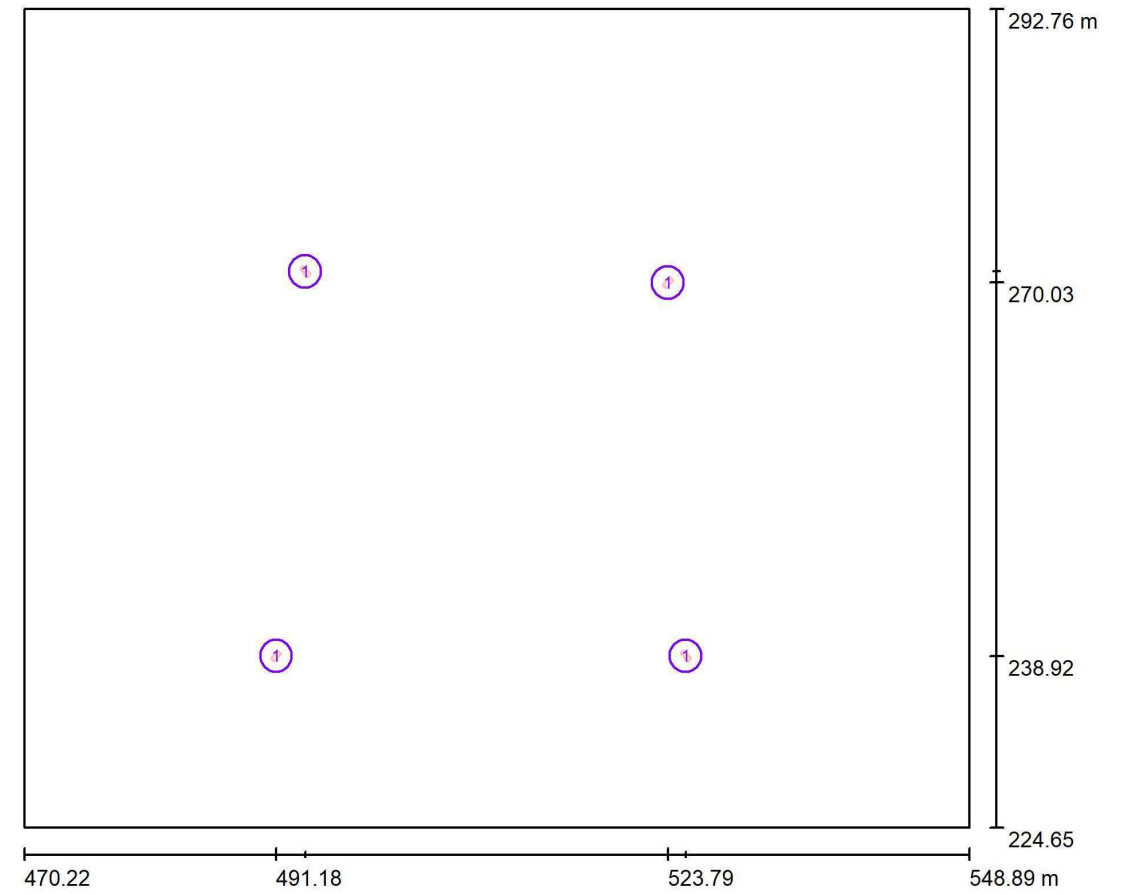


Escala 1 : 563

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**Glorieta / Luminarias (ubicación)**

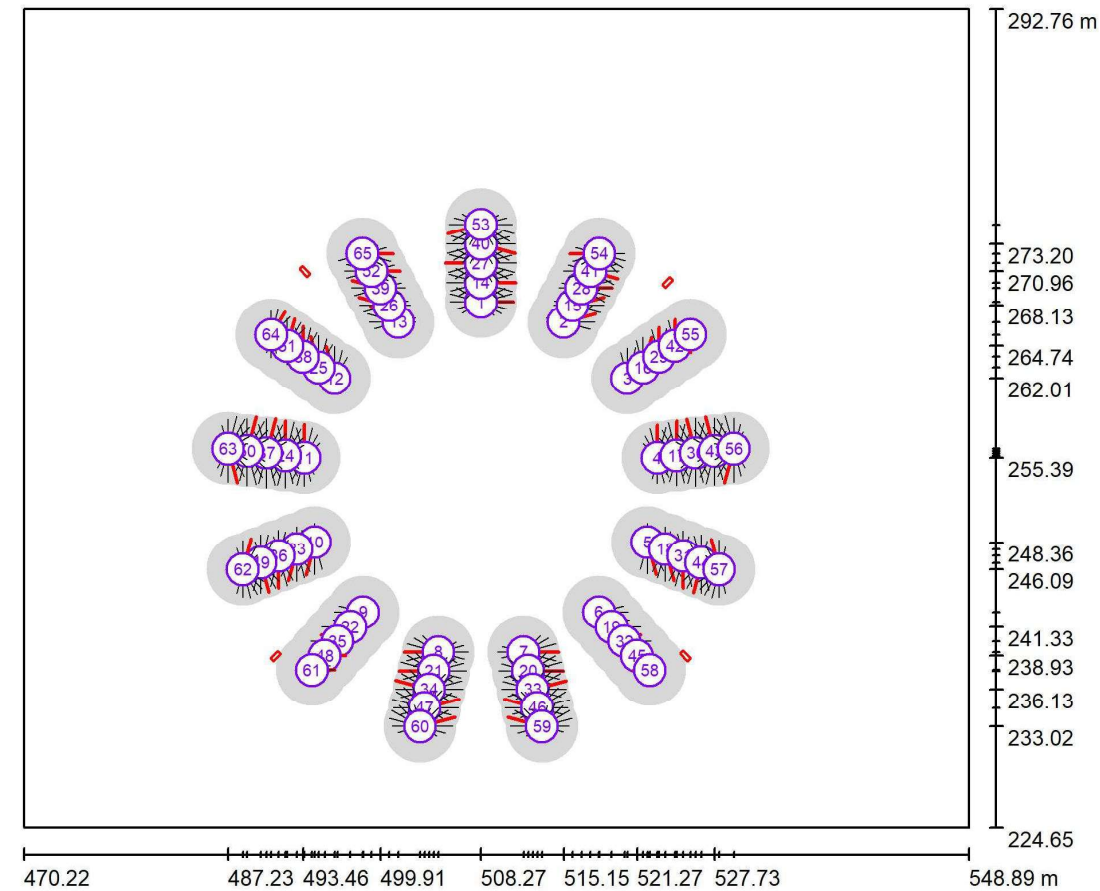


Escala 1 : 563

**Lista de piezas - Luminarias**

Nº	Pieza	Designación
1	4	SIMON - Nath L Óptica RJ_ 3000 K 193W a 530 mA

Glorieta / Observador GR (sumario de resultados)



Escala 1 : 563

Lista de puntos de cálculo GR

Nº	Designación	Posición [m]			Área del ángulo visual [°]			Inclination	Max
		X	Y	Z	Inicio	Fin	Amplitud de paso		
1	Observador GR 1	508.273	268.404	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
2	Observador GR 2	515.151	266.708	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
3	Observador GR 3	520.453	262.011	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
4	Observador GR 4	522.965	255.387	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>

Glorieta / Observador GR (sumario de resultados)

Lista de puntos de cálculo GR

Nº	Designación	Posición [m]			Área del ángulo visual [°]			Inclination	Max
		X	Y	Z	Inicio	Fin	Amplitud de paso		
5	Observador GR 5	522.111	248.355	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
6	Observador GR 6	518.087	242.526	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
7	Observador GR 7	511.815	239.234	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
8	Observador GR 8	504.731	239.234	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
9	Observador GR 9	498.459	242.526	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
10	Observador GR 10	494.435	248.355	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
11	Observador GR 11	493.581	255.387	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
12	Observador GR 12	496.093	262.011	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
13	Observador GR 13	501.395	266.708	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
14	Observador GR 14	508.273	270.004	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
15	Observador GR 15	515.894	268.125	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
16	Observador GR 16	521.770	262.920	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
17	Observador GR 17	524.553	255.580	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
18	Observador GR 18	523.607	247.788	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
19	Observador GR 19	519.148	241.328	1.000	0.0	360.0	15.0	-2.0	38 <sup>2)</sup>
20	Observador GR 20	512.198	237.680	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
21	Observador GR 21	504.348	237.680	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
22	Observador GR 22	497.398	241.328	1.000	0.0	360.0	15.0	-2.0	38 <sup>2)</sup>
23	Observador GR 23	492.939	247.788	1.000	0.0	360.0	15.0	-2.0	42 <sup>2)</sup>
24	Observador GR 24	491.993	255.580	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
25	Observador GR 25	494.776	262.920	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
26	Observador GR 26	500.652	268.125	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
27	Observador GR 27	508.273	271.604	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
28	Observador GR 28	516.638	269.542	1.000	0.0	360.0	15.0	-2.0	39 <sup>2)</sup>
29	Observador GR 29	523.087	263.829	1.000	0.0	360.0	15.0	-2.0	37 <sup>2)</sup>
30	Observador GR 30	526.142	255.773	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
31	Observador GR 31	525.103	247.221	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
32	Observador GR 32	520.209	240.130	1.000	0.0	360.0	15.0	-2.0	34 <sup>2)</sup>
33	Observador GR 33	512.581	236.127	1.000	0.0	360.0	15.0	-2.0	43 <sup>2)</sup>
34	Observador GR 34	503.965	236.127	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
35	Observador GR 35	496.337	240.130	1.000	0.0	360.0	15.0	-2.0	34 <sup>2)</sup>
36	Observador GR 36	491.443	247.221	1.000	0.0	360.0	15.0	-2.0	41 <sup>2)</sup>
37	Observador GR 37	490.404	255.773	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
38	Observador GR 38	493.459	263.829	1.000	0.0	360.0	15.0	-2.0	39 <sup>2)</sup>
39	Observador GR 39	499.908	269.542	1.000	0.0	360.0	15.0	-2.0	38 <sup>2)</sup>
40	Observador GR 40	508.273	273.204	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>



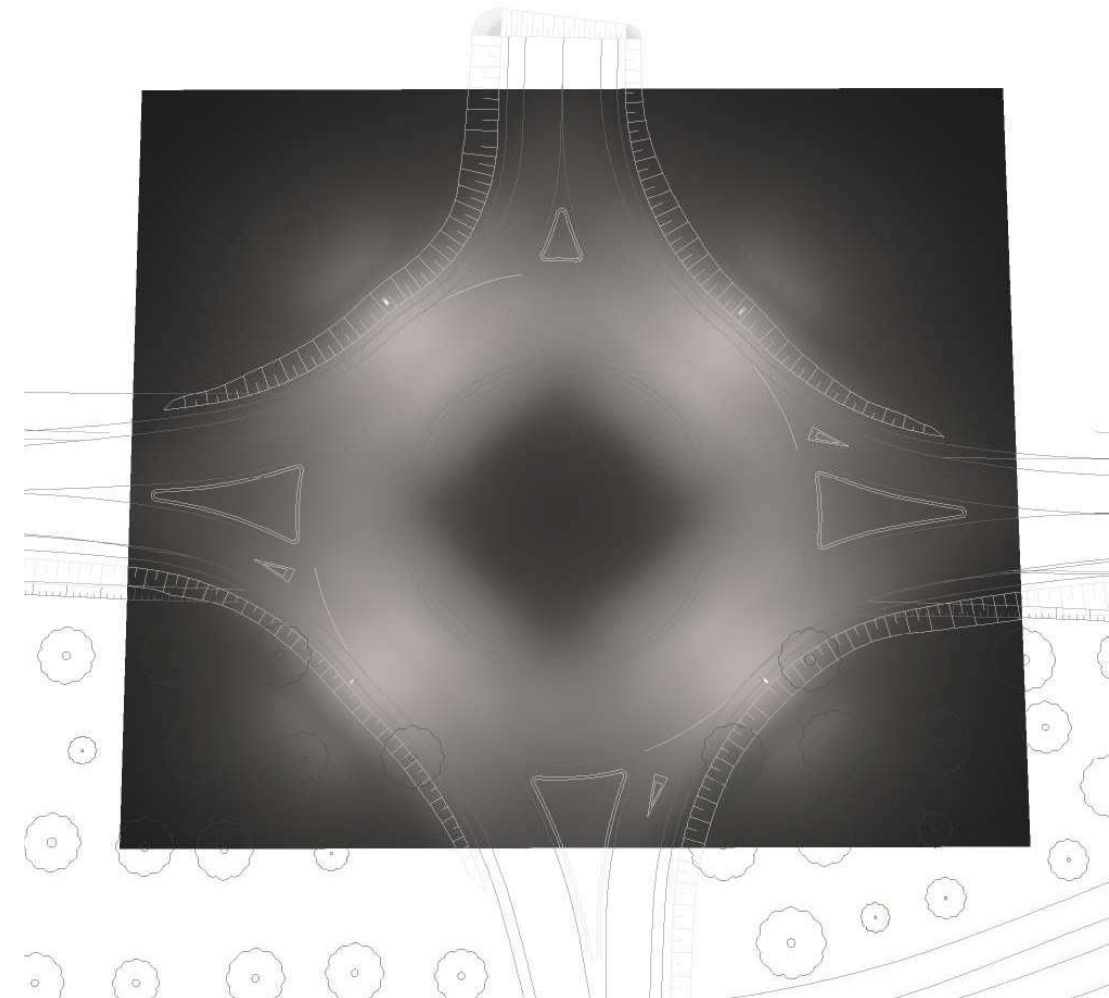
**Glorieta / Observador GR (sumario de resultados)**

**Lista de puntos de cálculo GR**

N°	Designación	Posición [m]			Área del ángulo visual [°]				Max
		X	Y	Z	Inicio	Fin	Amplitud de paso	Inclination	
41	Observador GR 41	517.382	270.958	1.000	0.0	360.0	15.0	-2.0	36 <sup>2)</sup>
42	Observador GR 42	524.403	264.738	1.000	0.0	360.0	15.0	-2.0	33 <sup>2)</sup>
43	Observador GR 43	527.730	255.966	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
44	Observador GR 44	526.599	246.653	1.000	0.0	360.0	15.0	-2.0	39 <sup>2)</sup>
45	Observador GR 45	521.270	238.933	1.000	0.0	360.0	15.0	-2.0	18 <sup>2)</sup>
46	Observador GR 46	512.964	234.573	1.000	0.0	360.0	15.0	-2.0	43 <sup>2)</sup>
47	Observador GR 47	503.582	234.573	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
48	Observador GR 48	495.276	238.933	1.000	0.0	360.0	15.0	-2.0	26 <sup>2)</sup>
49	Observador GR 49	489.947	246.653	1.000	0.0	360.0	15.0	-2.0	39 <sup>2)</sup>
50	Observador GR 50	488.816	255.966	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
51	Observador GR 51	492.142	264.738	1.000	0.0	360.0	15.0	-2.0	36 <sup>2)</sup>
52	Observador GR 52	499.164	270.958	1.000	0.0	360.0	15.0	-2.0	36 <sup>2)</sup>
53	Observador GR 53	508.273	274.804	1.000	0.0	360.0	15.0	-2.0	44 <sup>2)</sup>
54	Observador GR 54	518.125	272.375	1.000	0.0	360.0	15.0	-2.0	38 <sup>2)</sup>
55	Observador GR 55	525.720	265.647	1.000	0.0	360.0	15.0	-2.0	22 <sup>2)</sup>
56	Observador GR 56	529.318	256.159	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
57	Observador GR 57	528.095	246.086	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
58	Observador GR 58	522.331	237.735	1.000	0.0	360.0	15.0	-2.0	21 <sup>2)</sup>
59	Observador GR 59	513.346	233.020	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
60	Observador GR 60	503.199	233.020	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
61	Observador GR 61	494.215	237.735	1.000	0.0	360.0	15.0	-2.0	28 <sup>2)</sup>
62	Observador GR 62	488.451	246.086	1.000	0.0	360.0	15.0	-2.0	40 <sup>2)</sup>
63	Observador GR 63	487.228	256.159	1.000	0.0	360.0	15.0	-2.0	45 <sup>2)</sup>
64	Observador GR 64	490.826	265.647	1.000	0.0	360.0	15.0	-2.0	34 <sup>2)</sup>
65	Observador GR 65	498.421	272.375	1.000	0.0	360.0	15.0	-2.0	38 <sup>2)</sup>

2) La luminancia difusa equivalente del entorno que ha sido calculada presupone que el entorno presenta una reflexión completamente difusa (conforme a la norma EN 12464-2).

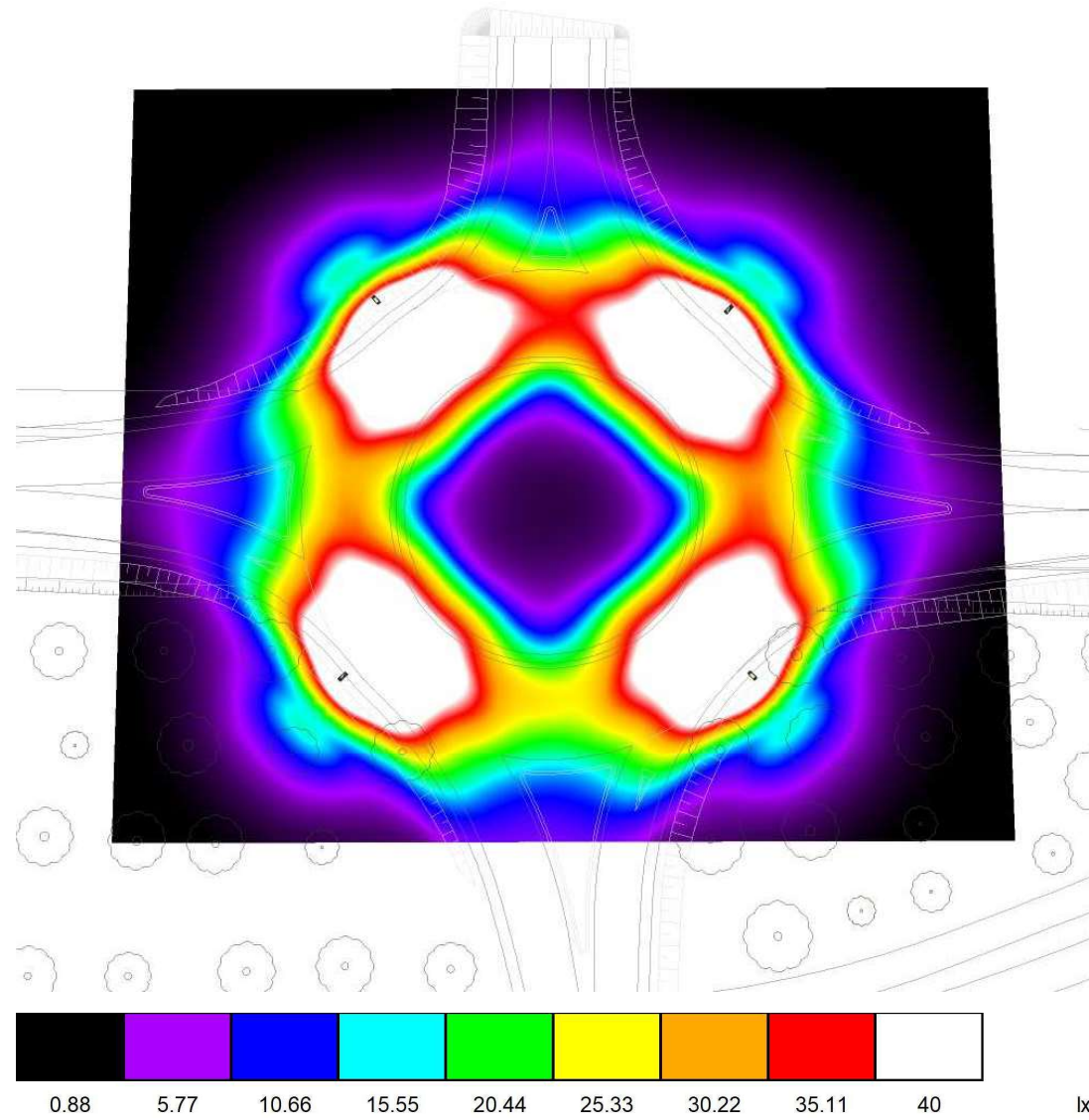
**Glorieta / Rendering (procesado) en 3D**



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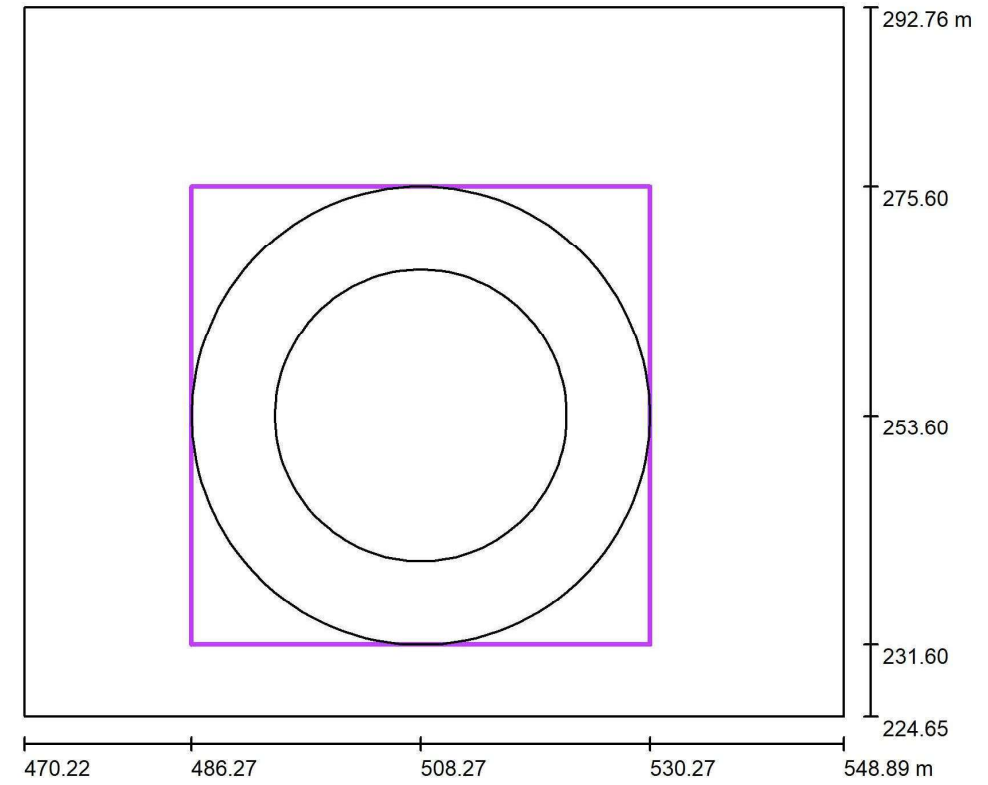
Glorieta / Rendering (procesado) de colores falsos



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Glorieta / Glorieta / Resumen



Posición: (508.273 m, 253.604 m, 0.000 m)  
Tamaño: (44.000 m, 44.000 m)  
Rotación: (0.0°, 0.0°, 0.0°)  
Tipo: Radial, Trama: 13 x 5 Puntos

Escala 1 : 650

Sumario de los resultados

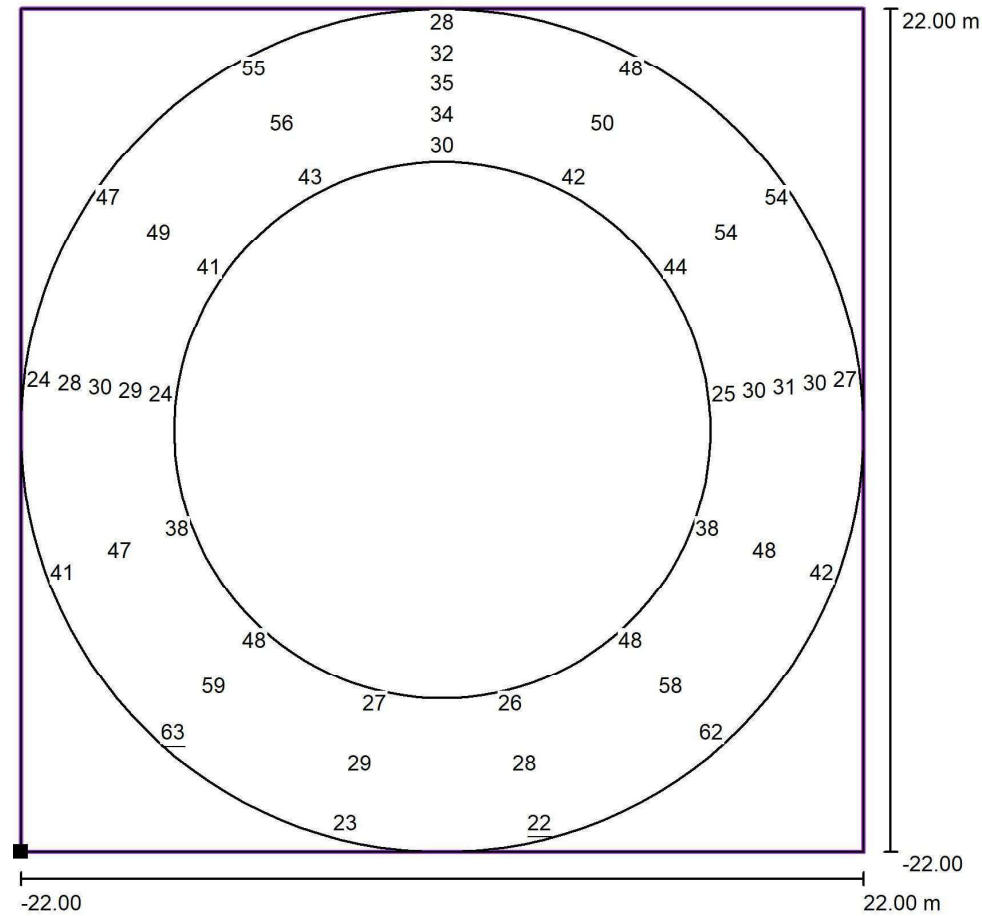
Nº	Tipo	$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$	$E_{h m} / E_m$	H [m]	Cámara
1	perpendicular	42	22	63	0.52	0.35	/	0.000	/

$E_{h m} / E_m$  = Relación entre la intensidad luminica central horizontal y vertical, H = Medición altura

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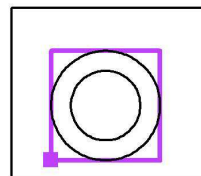
**Glorieta / Glorieta / Gráfico de valores (E, perpendicular)**



Valores en Lux, Escala 1 : 353

No pudieron representarse todos los valores calculados.

Situación de la superficie en la escena exterior:  
Punto marcado: (486.273 m, 231.604 m, 0.000 m)



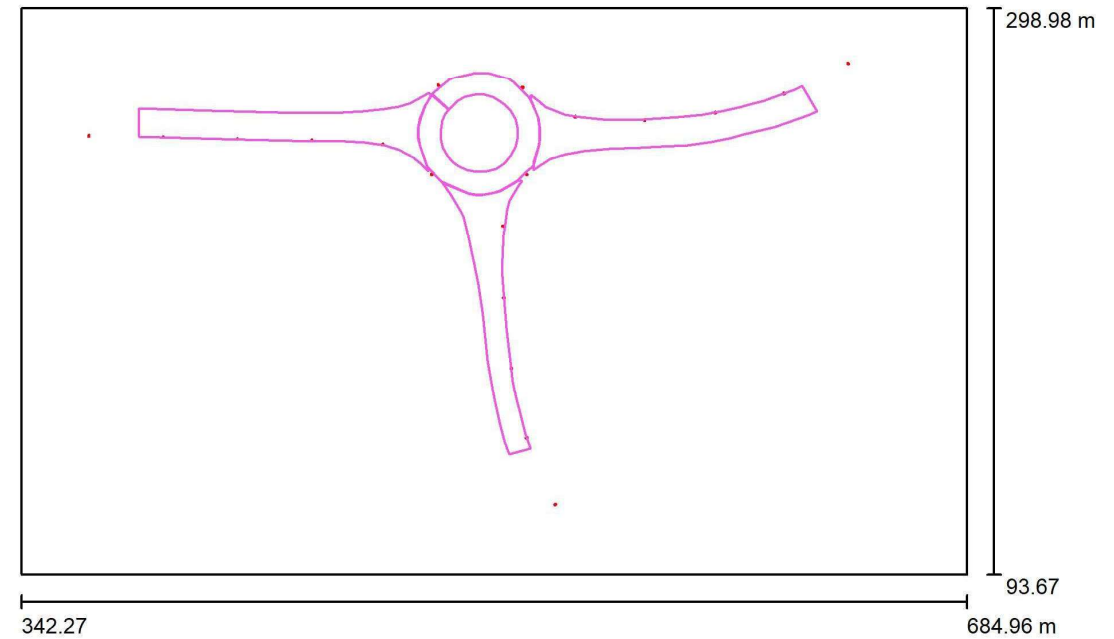
Trama: 13 x 5 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
42	22	63	0.52	0.35

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**Accesos Glorieta / Datos de planificación**



Factor mantenimiento: 0.80, ULR (Upward Light Ratio): 0.0%

Escala 1:2450

**Lista de piezas - Luminarias**

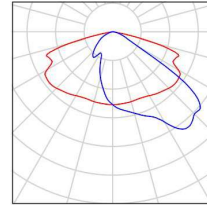
Nº	Pieza	Designación (Factor de corrección)	$\Phi$ (Luminaria) [lm]	$\Phi$ (Lámparas) [lm]	P [W]
1	4	SIMON - Nath L Óptica RJ_ 3000 K 193W a 530 mA (1.000)	26279	26280	193.0
2	15	SIMON - Nath S Óptica RJ_ 3000 K 94W a 800 mA (1.000)	11360	11360	94.0
Total:			275514	Total: 275520	2182.0

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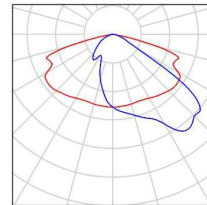
Proyecto elaborado por Simon Lighting, S.A.U.  
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e-Mail ursula.sanjuan@simon.es

Accesos Glorieta / Lista de luminarias

4 Pieza SIMON - Nath L Óptica RJ\_ 3000 K 193W a 530 mA  
N° de artículo: -  
Flujo luminoso (Luminaria): 26279 lm  
Flujo luminoso (Lámparas): 26280 lm  
Potencia de las luminarias: 193.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100  
Lámpara: 1 x Nath L Óptica RJ\_ 3000 K 193W a 530 mA (Factor de corrección 1.000).



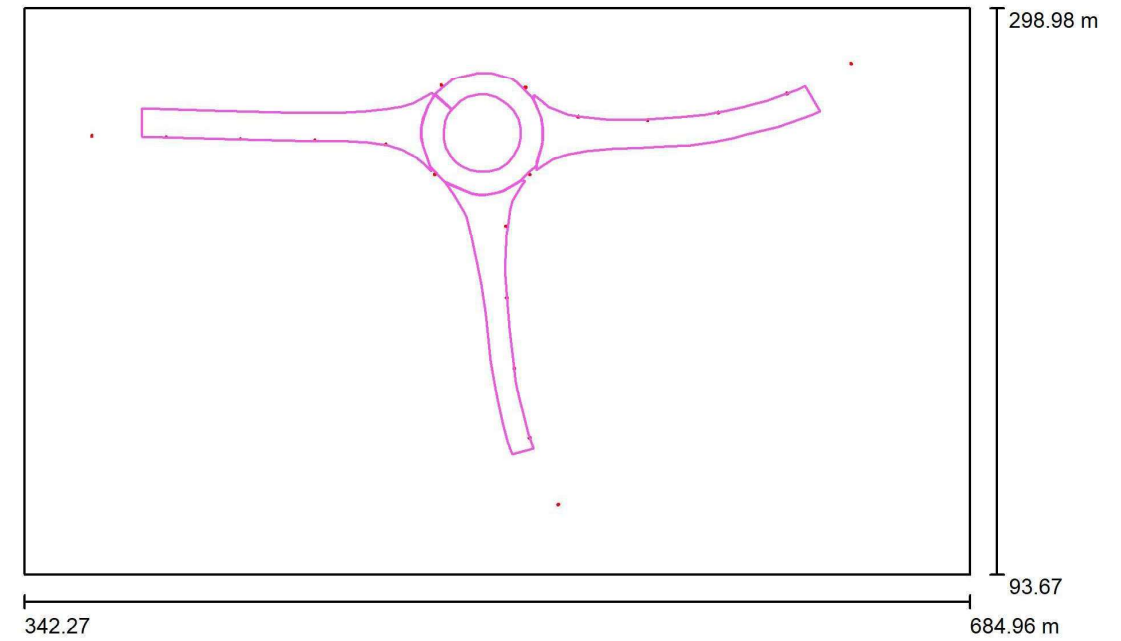
15 Pieza SIMON - Nath S Óptica RJ\_ 3000 K 94W a 800 mA  
N° de artículo: -  
Flujo luminoso (Luminaria): 11360 lm  
Flujo luminoso (Lámparas): 11360 lm  
Potencia de las luminarias: 94.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100  
Lámpara: 1 x Nath S Óptica RJ\_ 3000 K 94W a 800 mA (Factor de corrección 1.000).



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Accesos Glorieta / Planta

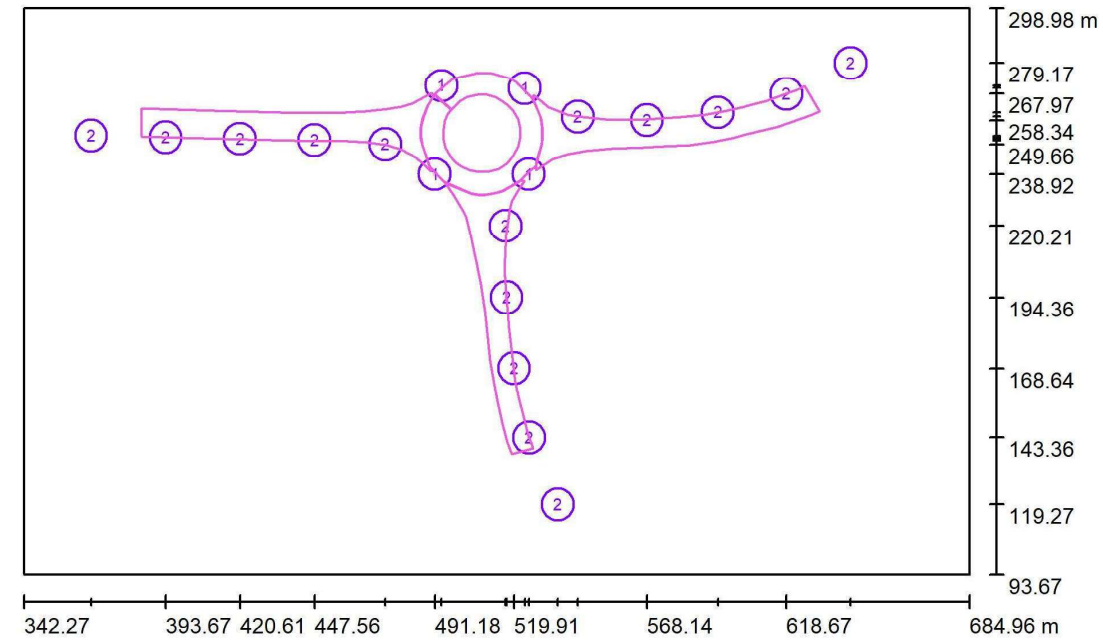


Escala 1 : 2450

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**Accessos Glorieta / Luminarias (ubicación)**



Escala 1 : 2450

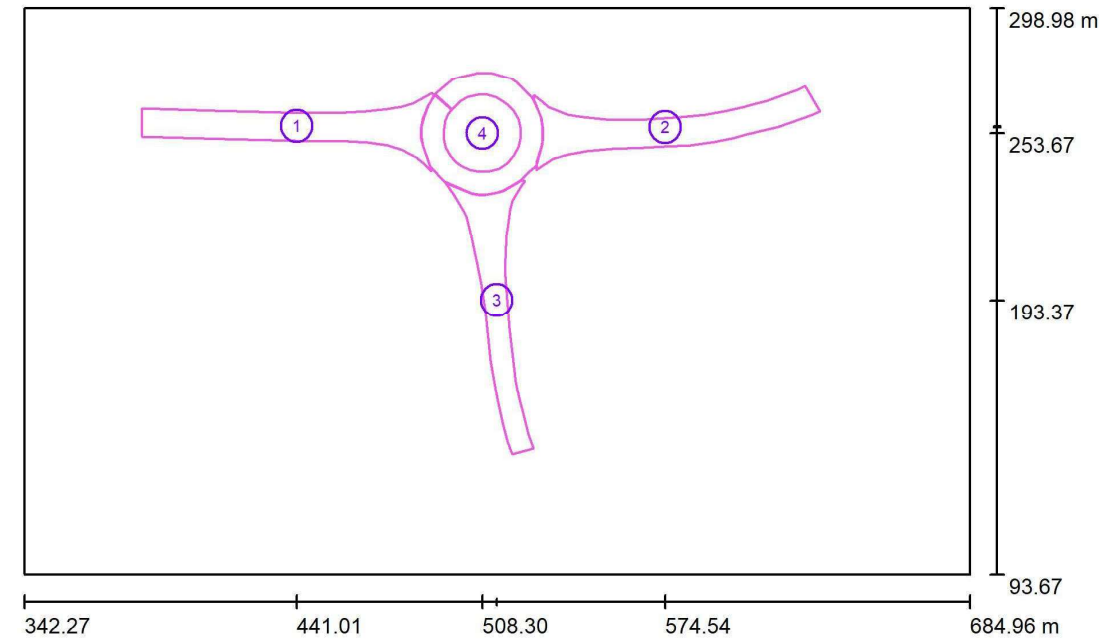
**Lista de piezas - Luminarias**

Nº	Pieza	Designación
1	4	SIMON - Nath L Óptica RJ_ 3000 K 193W a 530 mA
2	15	SIMON - Nath S Óptica RJ_ 3000 K 94W a 800 mA

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**Accessos Glorieta / Superficie de cálculo (sumario de resultados)**



Escala 1 : 2450

**Lista de superficies de cálculo**

Nº	Designación	Tipo	Trama	$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
1	Accés Esquerra	perpendicular	128 x 128	22	9.44	61	0.427	0.155
2	Accés Dreta	perpendicular	128 x 128	23	9.51	54	0.420	0.178
3	Accés Inferior	perpendicular	128 x 128	22	9.26	53	0.413	0.174
4	Glorieta	perpendicular	128 x 128	44	23	74	0.518	0.313

**Resumen de los resultados**

Tipo	Cantidad	Media [lx]	Min [lx]	Max [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
perpendicular	4	27	9.26	74	0.34	0.13



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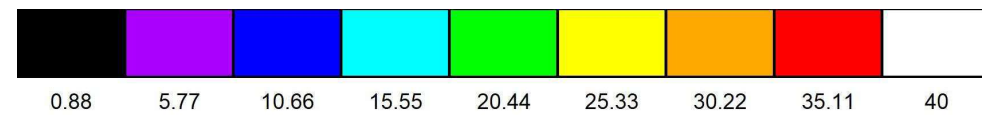
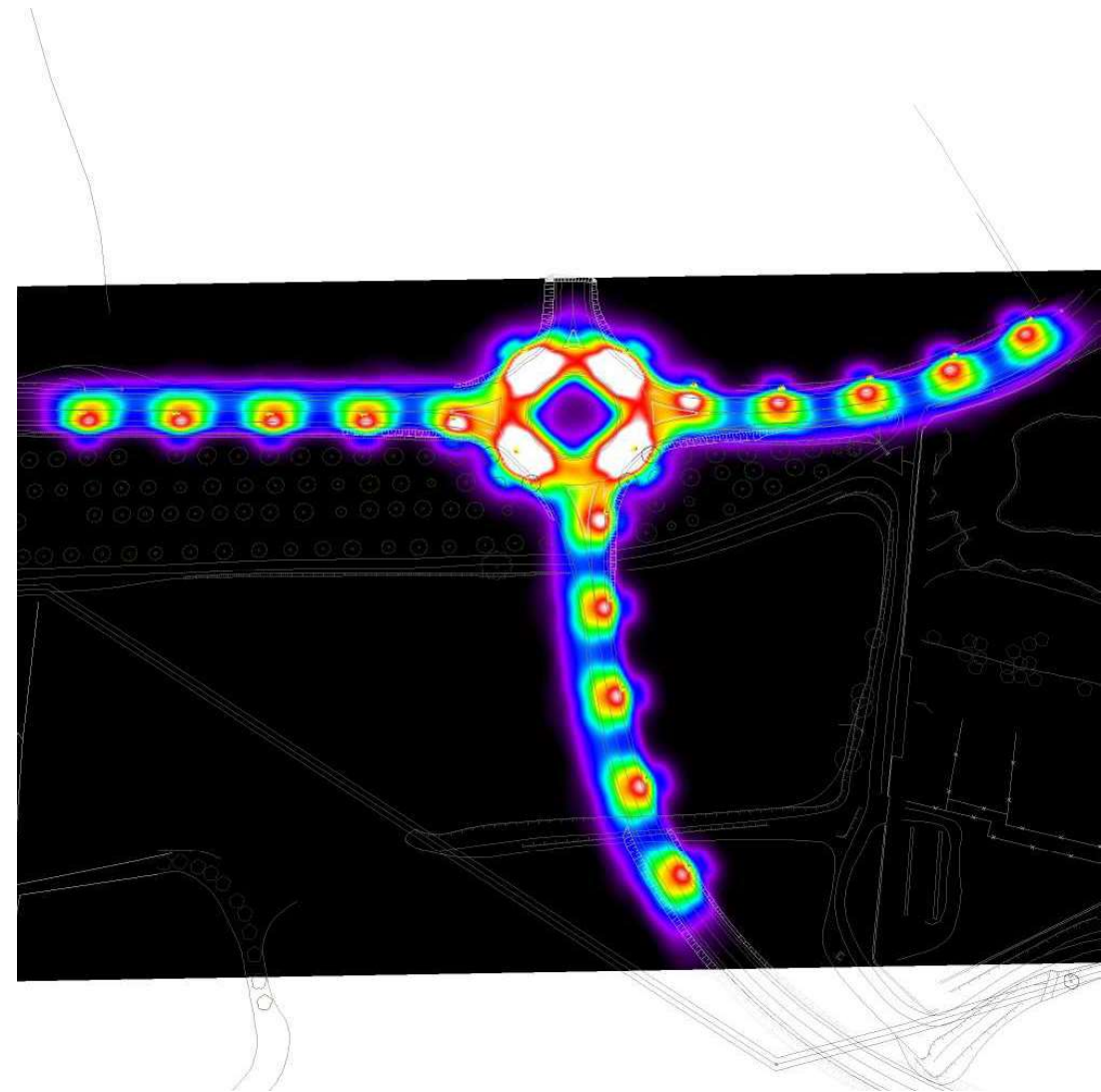
Accessos Glorieta / Rendering (procesado) en 3D



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Accessos Glorieta / Rendering (procesado) de colores falsos



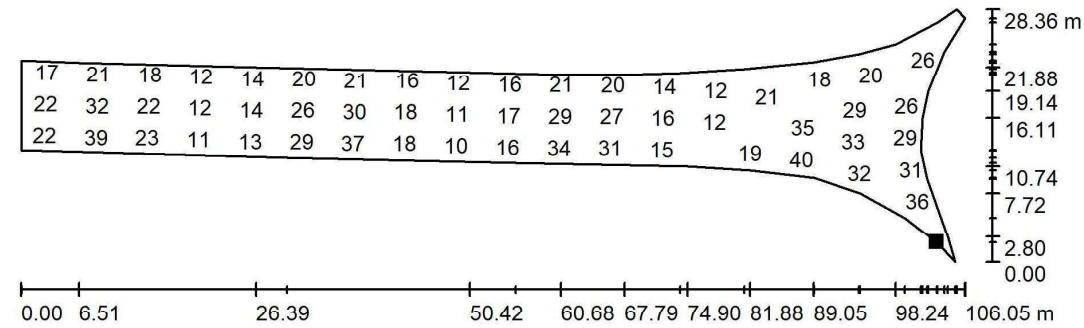
lx



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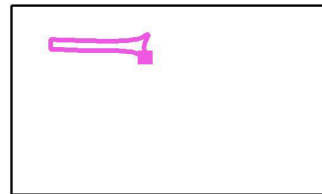
Accessos Glorieta / Accés Esquerra / Gráfico de valores (E, perpendicular)



Valores en Lux, Escala 1 : 759

No pudieron representarse todos los valores calculados.

Situación de la superficie en la escena exterior:  
Punto marcado:  
(487.730 m, 242.170 m, 0.000 m)



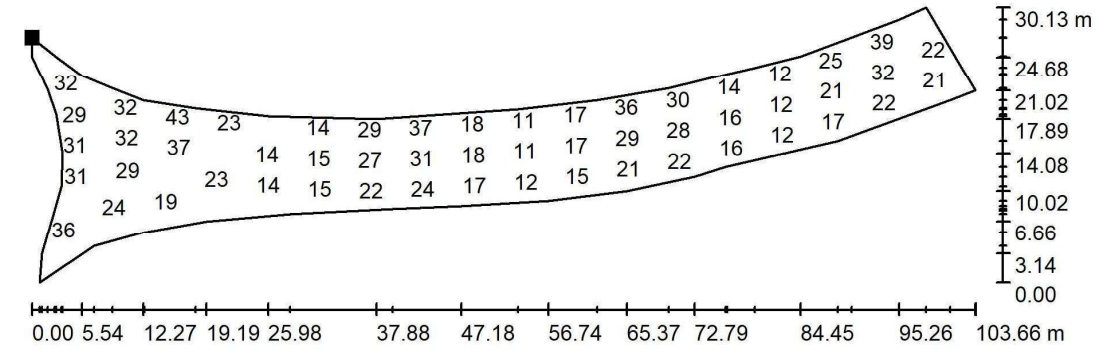
Trama: 128 x 128 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
22	9.44	61	0.427	0.155

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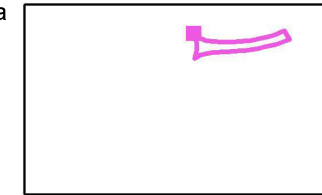
Accessos Glorieta / Accés Dreta / Gráfico de valores (E, perpendicular)



Valores en Lux, Escala 1 : 742

No pudieron representarse todos los valores calculados.

Situación de la superficie en la escena exterior:  
Punto marcado:  
(526.984 m, 267.312 m, 0.000 m)



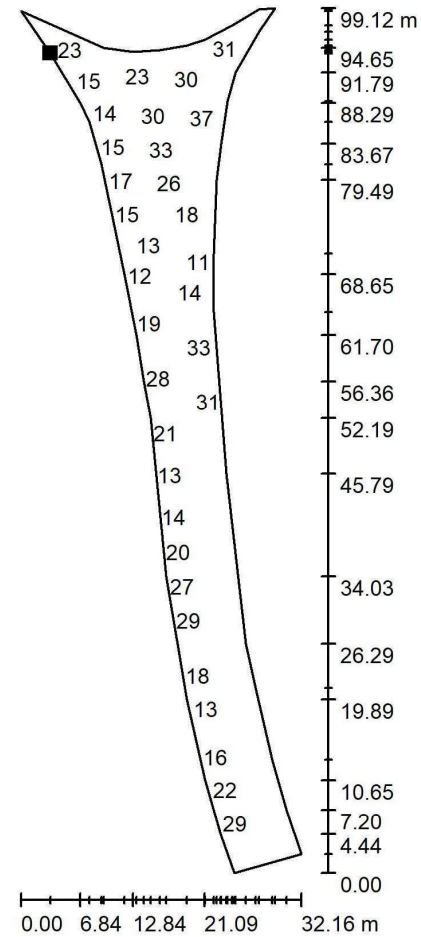
Trama: 128 x 128 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
23	9.51	54	0.420	0.178

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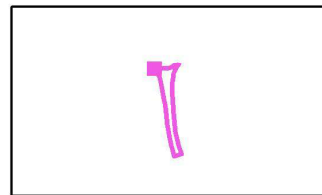
Accesos Glorieta / Accés Inferior / Gráfico de valores (E, perpendicular)



Valores en Lux, Escala 1 : 776

No pudieron representarse todos los valores calculados.

Situación de la superficie en la escena exterior:  
Punto marcado:  
(497.942 m, 231.379 m, 0.000 m)



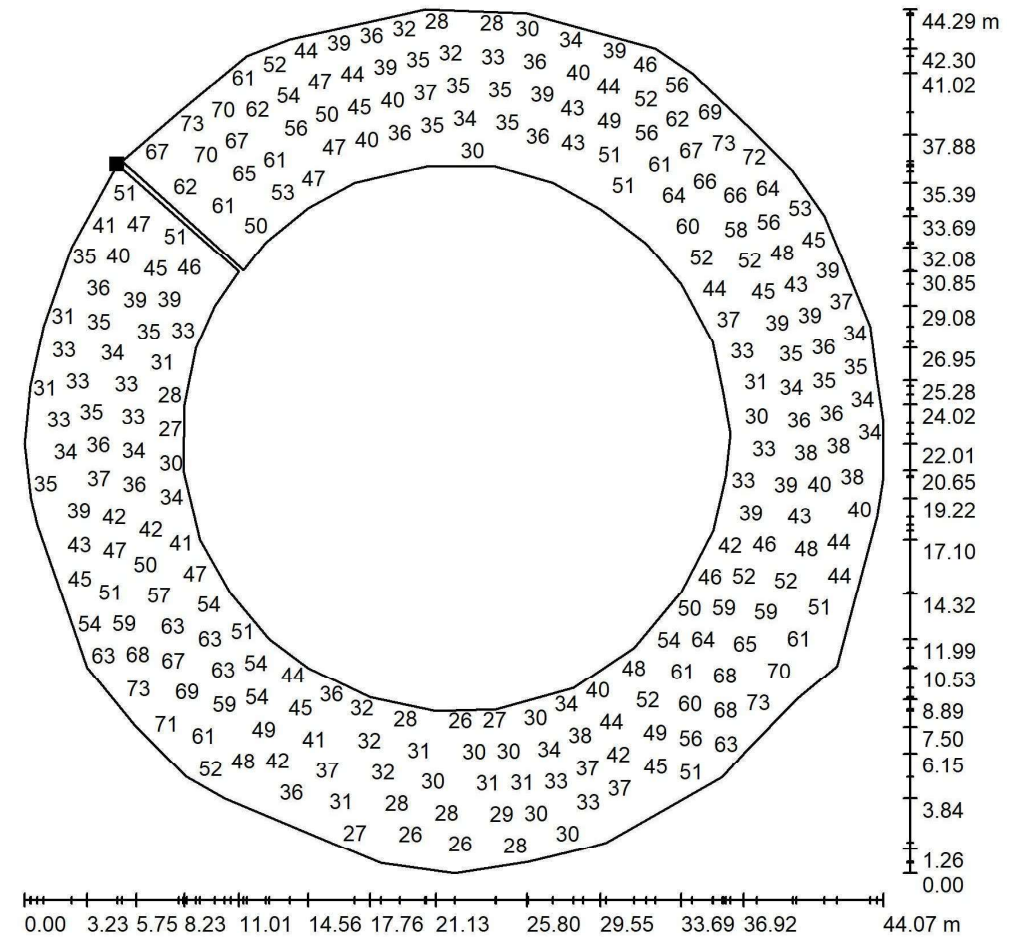
Trama: 128 x 128 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
22	9.26	53	0.413	0.174

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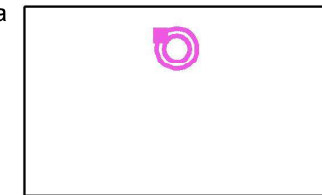
Accesos Glorieta / Glorieta / Gráfico de valores (E, perpendicular)



Valores en Lux, Escala 1 : 347

No pudieron representarse todos los valores calculados.

Situación de la superficie en la escena exterior:  
Punto marcado:  
(490.822 m, 267.724 m, 0.000 m)



Trama: 128 x 128 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
44	23	74	0.518	0.313

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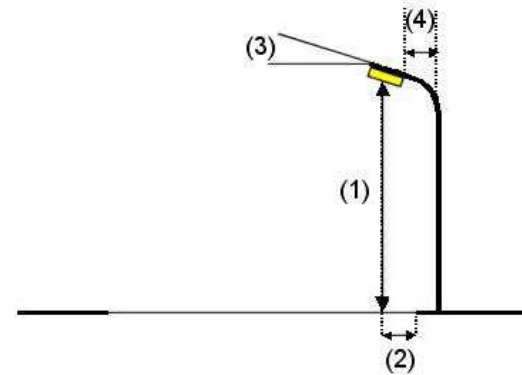
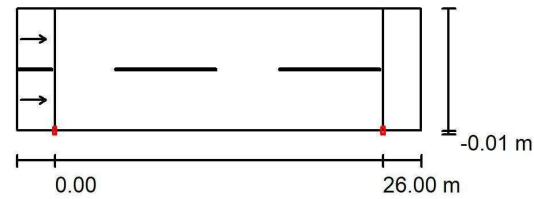
**Accesos Glorieta / Datos de planificación**

**Perfil de la vía pública**

Calzada 1 (Anchura: 9.600 m, Cantidad de carriles de tránsito: 2, Revestimiento de la calzada: R3, q0: 0.070)

Factor mantenimiento: 0.80

**Disposiciones de las luminarias**



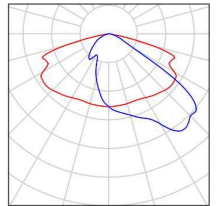
Luminaria:	SIMON - Nath S Óptica RJ_ 3000 K 94W a 800 mA	
Flujo luminoso (Luminaria):	11360 lm	Valores máximos de la intensidad lumínica
Flujo luminoso (Lámparas):	11360 lm	con 70°: 489 cd/klm
Potencia de las luminarias:	94.0 W	con 80°: 192 cd/klm
Organización:	unilateral abajo	con 90°: 6.51 cd/klm
Distancia entre mástiles:	26.000 m	Respectivamente en todas las direcciones que forman los ángulos especificados con las
Altura de montaje (1):	8.000 m	verticales inferiores (con luminarias instaladas aptas para el funcionamiento).
Altura del punto de luz:	7.846 m	La disposición cumple con la clase de intensidad lumínica G1.
Saliente sobre la calzada (2):	0.000 m	La disposición cumple con la clase del índice de
Inclinación del brazo (3):	5.0 °	deslumbramiento D.3.
Longitud del brazo (4):	0.000 m	

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**Accesos Glorieta / Lista de luminarias**

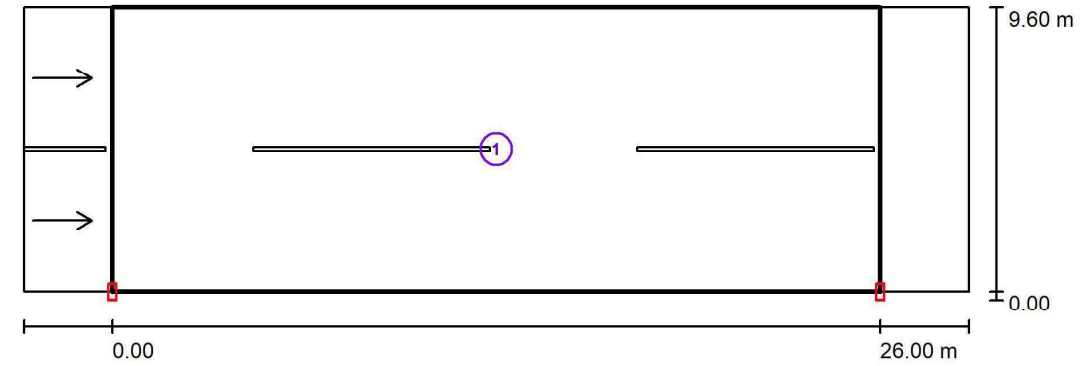
SIMON - Nath S Óptica RJ\_ 3000 K 94W a 800 mA  
N° de artículo: -  
Flujo luminoso (Luminaria): 11360 lm  
Flujo luminoso (Lámparas): 11360 lm  
Potencia de las luminarias: 94.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 37 75 97 100 100  
Lámpara: 1 x Nath S Óptica RJ\_ 3000 K 94W a 800 mA (Factor de corrección 1.000).



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Accessos Glorieta / Resultados luminotécnicos



Factor mantenimiento: 0.80

Escala 1:229

Lista del recuadro de evaluación

- 1 Recuadro de evaluación Calzada 1  
Longitud: 26.000 m, Anchura: 9.600 m  
Trama: 10 x 6 Puntos  
Elemento de la vía pública respectivo: Calzada 1.  
Revestimiento de la calzada: R3, q0: 0.070  
Clase de iluminación seleccionada: ME3b

(Se cumplen todos los requerimientos fotométricos.)

	$L_m$ [cd/m <sup>2</sup> ]	U0	UI	TI [%]	SR
Valores reales según cálculo:	1.11	0.58	0.73	9	0.52
Valores de consigna según clase:	≥ 1.00	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Cumplido/No cumplido:	✓	✓	✓	✓	✓

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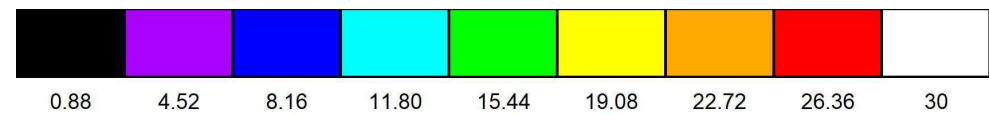
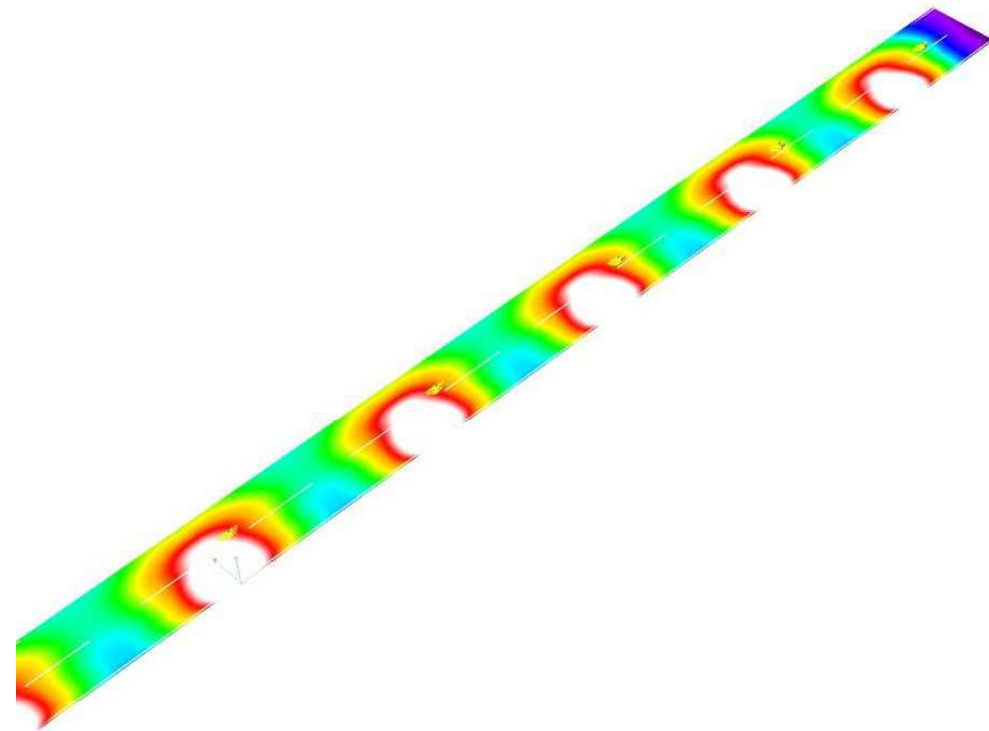
Accessos Glorieta / Rendering (procesado) en 3D



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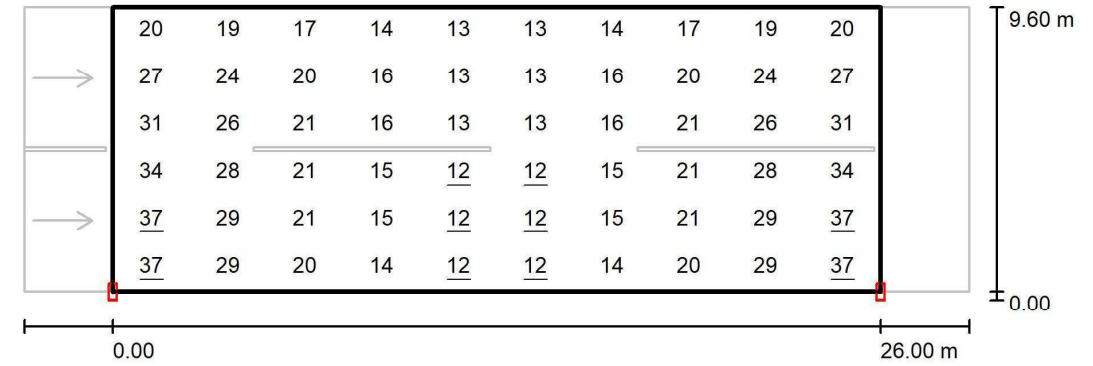
Accessos Glorieta / Rendering (procesado) de colores falsos



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Accessos Glorieta / Recuadro de evaluación Calzada 1 / Gráfico de valores (E)



Valores en Lux, Escala 1 : 229

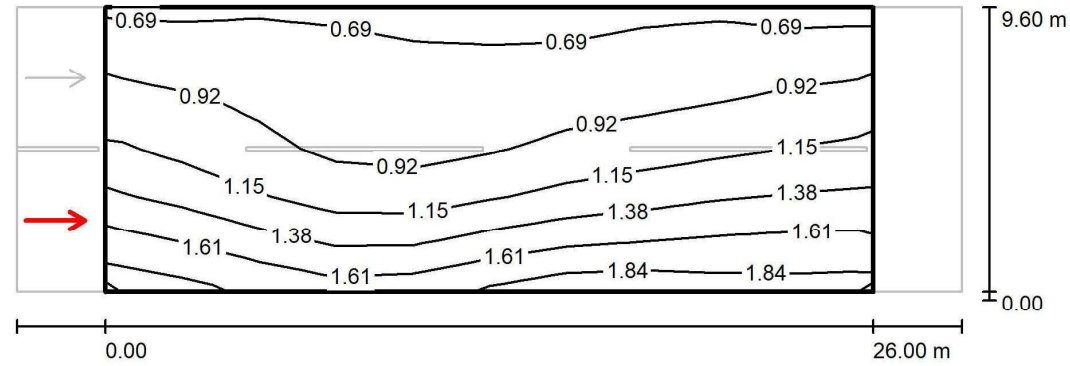
Trama: 10 x 6 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
21	12	37	0.551	0.308

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Accesos Glorieta / Recuadro de evaluación Calzada 1 / Observador 1 / Isolíneas (L)



Valores en Candela/m<sup>2</sup>, Escala 1 : 229

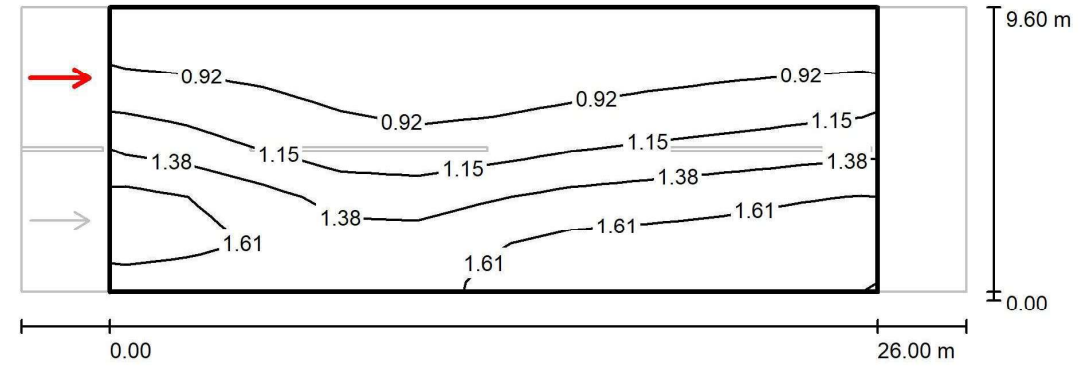
Trama: 10 x 6 Puntos  
Posición del observador: (-60.000 m, 2.400 m, 1.500 m)  
Revestimiento de la calzada: R3, q0: 0.070

	$L_m$ [cd/m <sup>2</sup> ]	U0	UI	TI [%]
Valores reales según cálculo:	1.11	0.60	0.73	9
Valores de consigna según clase ME3b:	≥ 1.00	≥ 0.40	≥ 0.60	≤ 15
Cumplido/No cumplido:	✓	✓	✓	✓

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Accesos Glorieta / Recuadro de evaluación Calzada 1 / Observador 2 / Isolíneas (L)



Valores en Candela/m<sup>2</sup>, Escala 1 : 229

Trama: 10 x 6 Puntos  
Posición del observador: (-60.000 m, 7.200 m, 1.500 m)  
Revestimiento de la calzada: R3, q0: 0.070

	$L_m$ [cd/m <sup>2</sup> ]	U0	UI	TI [%]
Valores reales según cálculo:	1.20	0.58	0.81	6
Valores de consigna según clase ME3b:	≥ 1.00	≥ 0.40	≥ 0.60	≤ 15
Cumplido/No cumplido:	✓	✓	✓	✓





## **APÈNDIX 2. Fitxa tècnica**



# NATH

S / M / L

## ISTANIUM<sup>LED</sup>®

Luminaria vial funcional ideal para la introducción intensiva de la tecnología LED

Proporcionar la iluminación necesaria en el alumbrado público con la máxima eficiencia energética es el objetivo de la colección NATH Istanium<sup>LED</sup> de Simon.

Flujo lumínico superior a 34.200 lm  
 Ahorro hasta 65 %  
 Eficiencia hasta 152 lm/ W  
 Gestión térmica avanzada



Autopista / autovía  
S / M / L



Carretera  
S / M



Espacio industrial  
S / M / L



Zona aparcamiento  
S / M / L



Via verde  
S



Avenida  
S / M / L



Calle  
S / M



Calle peatonal  
S



Zona comercial  
S / M



Via ciclista urbana  
S / M



Glorietas / intersecciones  
S / M / L



Gran área  
L

# NATH

## CARACTERÍSTICAS

### COLECCIÓN



Tamaño S

Tamaño M

Tamaño L

### ATRIBUTOS (SÓLO MODELOS NATH S / L)



Apertura sin herramientas

Desconector automático opcional

Sistema de refrigeración sin aletas de disipación a la vista



Nivelador incorporado

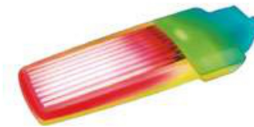
Equipo y grupo lumínico LED en un único cuerpo con dos volúmenes independientes



Equipo

Grupo Óptico

### DISEÑO AVANZADO



Nuevo sistema de refrigeración por aletas no visibles desde el plano inferior, aumenta el rendimiento de los LEDs a altas corrientes de alimentación.

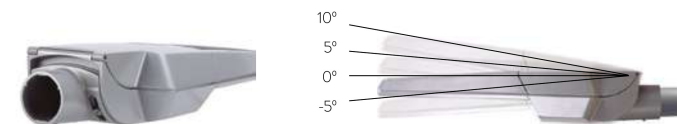


Sustitución y actualización de los grupos lumínicos Istanium® LED con la luminaria instalada, permitiendo alargar su vida útil. Gracias a su sistema modular de LEDs, ofrece una gran cantidad de paquetes lumínicos diferentes.



Sistema de autolimpieza mediante el agua de lluvia, el agua se evacua sin ensuciar la luminaria y las prestaciones lumínicas no se ven afectadas por el paso del tiempo.

### SISTEMA DE FIJACIÓN LATERAL

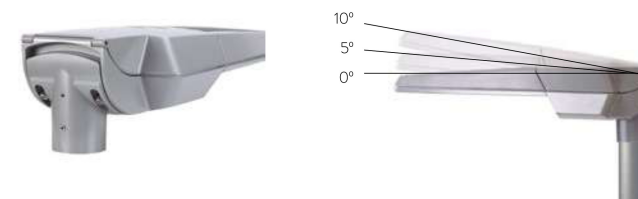


10°  
5°  
0°  
-5°



Accesorio para la fijación lateral de brazos de 48 mm a 60 mm.

### SISTEMA DE FIJACIÓN POST-TOP



10°  
5°  
0°

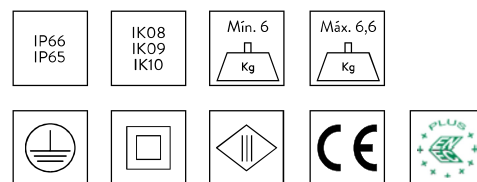




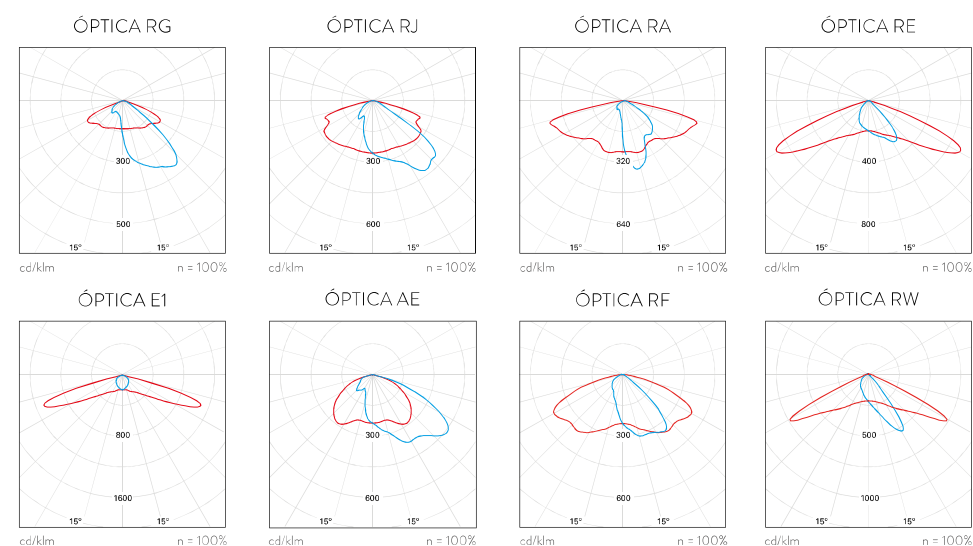
# NATH S

## ISTANIUM<sup>LED</sup>

### LUMINARIA LED VIAL



T° COLOR: NDL 4000 K | WDL 3000 K | SDL 2700 K | XDL 2200 K\* | APC\*  
 ÍNDICE DE REPRODUCCIÓN CROMÁTICA: >70  
 FLUJO AL HEMISFERIO SUPERIOR (FHS INST.): <1% (zonas E1)  
 DURACIÓN DE LOS LED (L90 B10 A T<sub>a</sub>=25 °C Y T<sub>j</sub>=95 °C): 100.000 h



— C0 - C180 — C90 - C270

Consultar otras distribuciones fotométricas

\* Bajo demanda

Luminaria Simon **NATH LED**, tamaño **S**, de fundición inyectada de aluminio. Fijación lateral ajustable de -5° a +10° y fijación post-top ajustable de 0° a +10° mediante cambio de posición de la misma pieza.

Adaptación a fijaciones de Ø34 mm a Ø76 mm en función del adaptador, con compensación negativa en báculos y brazos murales.

Cubierta plana con aletas de refrigeración no visibles en posición instalada. Sistema de autolimpieza por medio del agua de lluvia, que permite su correcta evacuación sin ensuciar la luminaria, evitando que las prestaciones luminarias se vean afectadas con el paso del tiempo. Luminaria de cuerpo único con dos volúmenes independientes de separación térmica para grupo óptico y para grupo eléctrico, con dispositivo autonivelador. Acceso al equipo y mantenimiento por la parte superior con apertura por palanca, sin herramientas.

Difusor de vidrio templado transparente plano para facilitar su limpieza y evitar la radiación UV en las ópticas. Índice de protección **IP66** para el grupo óptico Istanium LED, con válvula depresora para mantener constante la presión y evitar la entrada de humedad, e índice de resistencia al impacto desde **IK08** hasta IK10. Posibilidad de montaje de hasta once ópticas tipo multi-array, para garantizar la homogeneidad de la fotometría. Reflector troncopiramidal antideslumbramiento, matizado con recuperación de flujo.

Posibilidad de cuatro temperaturas de color en luz blanca, así como APC (Amber Phosphor Converted) para zonas especialmente protegidas.

Vida útil de los LED L90 B10 100.000 horas. Los grupos lumínicos Istanium LED pueden ser sustituidos y actualizados aunque la luminaria esté instalada, permitiendo extender su vida útil. Además, gracias a su sistema modular de LEDs, hay disponibles una gran cantidad de paquetes lumínicos diferentes. Porcentaje de Flujo luminoso hacia el Hemisferio Superior (FHS inst.) inferior al 1%.

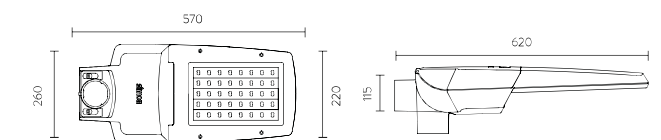
Con equipo electrónico de **Clase I** y **Clase II** con tensión de alimentación 230 V<sub>ac</sub> / 50 Hz y **Clase III** con tensión de alimentación a 12 / 24 V<sub>dc</sub>. Posibilidad de incluir protección adicional contra sobre tensiones de 10 kV / 10 kA y desconector automático al abrir el compartimento porta equipos.

Regulación opcional con línea de mando 2N+, sin línea de mando (Autorregulación) 2N-, mediante regulador de flujo desde cabecera CAD, mediante telegestión con entrada 1.10V o DALI. Programación a medida y mantenimiento de flujo de salida constante opcional (CLO).

Acabado estándar en color Simon GY9007. Posibilidad de acabados carta Simon y carta RAL. Dimensiones 570x260x160 mm.

Luminaria certificada ENEC +.

### DIMENSIONES Y SISTEMAS DE FIJACIÓN



<b>Fijación lateral</b>	Ø60 mm, 100 mm longitud, inclinación -5°, 0°, +5°, +10° Opcional con accesorio 50-73277, Ø48 mm, 100 mm longitud, inclinación -5°, 0°, +5°, +10°
<b>Fijación post-top</b>	Ø60 mm, 100 mm de longitud, inclinación 0°, +5°, +10°
<b>Superficie al viento</b>	0,047 m <sup>2</sup>
<b>Peso</b>	Máx. 6,6 kg / Min. 6 kg

### CARACTERÍSTICAS FÍSICAS Y MATERIALES

<b>IP</b>	IP66 / IP65
<b>IK</b>	Desde IK08 hasta IK10
<b>Cuerpo</b>	Fundición inyectada de aluminio
<b>Sistema de cierre</b>	Palanca de acero inoxidable, apertura sin herramientas
<b>Sistema de fijación</b>	Fundición inyectada de aluminio
<b>Difusor</b>	Vidrio templado transparente plano inastillable

### ACABADOS

<b>Cuerpo</b>	Colores Simon Colores carta RAL
<b>Cierre</b>	Acero inoxidable

### NORMAS Y CERTIFICADOS



Luminaria según: EN 60598-2-3 / EN 62493 / EN 55015 / EN 61547 / EN 61000-3-2 / EN 50581

<b>Garantía</b>	5 años.
<b>Suministro y embalaje</b>	Embalado en caja de cartón reciclable con etiqueta identificativa para proteger el producto durante el transporte y almacenamiento.
<b>Mantenimiento</b>	Mantener limpia la superficie del difusor para conseguir el máximo flujo lumínico. Utilizar un trapo húmedo sin ningún tipo de producto agresivo ni detergente. Lubricar las juntas de estanqueidad y reemplazarlas cuando estén cuarteadas. Lubricar los cierres y/o las charnelas de las partes móviles. Mantener limpia la superficie de radiación térmica para no perder flujo lumínico ni acortar la vida de los LEDs.

\* Valores correspondientes al estado actual de la tecnología. \*\* Consultar otras regulaciones. \*\*\* Los valores de potencia tienen una tolerancia de ±7%. \*\*\*\* 800 mA



## CONFIGURA TU LUMINARIA NATH S

Modelo	Difusor	Cable	Óptica	Tº de color	Potencia	Equipo	Regulación	Protección	Acabado	Descripción
<b>NATSXF</b>										Simon NATH Istanium® LED, tamaño S, fijación lateral y post-top Ø60 mm, cubierta plana
	<b>GTF</b>									Difusor de vidrio templado transparente plano inastillable
		<b>0</b>								Sin cable de instalación (0 m)
			<b>RG_</b>							Óptica Vial Frontal Tipo G
			<b>RJ_</b>							Óptica Vial Frontal Tipo J
			<b>RA_</b>							Óptica Vial Extensiva Tipo A
			<b>RE_</b>							Óptica Vial Extensiva Tipo E
			<b>E1_</b>							Óptica Vial Elíptica Tipo 1
			<b>AE_</b>							Óptica Asimétrica Tipo E
			<b>RF_</b>							Óptica Vial Frontal Tipo F
			<b>RW_</b>							Óptica Vial Amplia
									<input type="radio"/> <b>NDL</b>	Luz de día neutra – 4.000 K
									<input type="radio"/> <b>WDL</b>	Luz de día cálida – 3.000 K
									<input type="radio"/> <b>SDL</b>	Luz de día suave – 2.700 K
					<b>_16W350</b>					16 W 350 mA 2.580 lm @ 4.000K
					<b>_24W530</b>					24 W 530 mA 3.590 lm @ 4.000K
					<b>_32W700</b>					32 W 700 mA 4.620 lm @ 4.000K
					<b>_36W530</b>					36 W 530 mA 5.320 lm @ 4.000K
					<b>_47W530</b>					47 W 530 mA 7.180 lm @ 4.000K
					<b>_49W700</b>					49 W 700 mA 6.820 lm @ 4.000K
					<b>_50W_1K</b>					50 W 1.050 mA 6.290 lm @ 4.000K
					<b>_60W530</b>					60 W 530 mA 8.560 lm @ 4.000K
					<b>_63W700</b>					63 W 700 mA 9.240 lm @ 4.000K
					<b>_75W_1K</b>					75 W 1050 mA 9.130 lm @ 4.000K
					<b>_81W700</b>					81 W 700 mA 10.720 lm @ 4.000K
					<b>_94W_1K</b>					94 W 1.050 mA 12.580 lm @ 4.000K
					<b>IA23_</b>					Equipo electrónico a 230 V <sub>AC</sub> 50 / 60 Hz, protección estándar contra sobretensiones 6 kV
					<b>IA23S</b>					Equipo electrónico a 230 V <sub>AC</sub> 50 / 60 Hz, protección adicional contra sobretensiones 10 kV
					<b>IA12</b>					Equipo electrónico 12 / 24 V <sub>DC</sub> C3 (solares). Sólo admite hasta 36 W y regulación 1N y 2N-
					<b>2N-</b>					Regulación sin línea de mando (autorregulación)
					<b>2N+</b>					Regulación con línea de mando
					<b>1N</b>					Sin regulación (on/off)
					<b>CAD</b>					Regulación Flujo desde Cabecera (Regulador cuadro eléctrico)
					<b>1-10</b>					Regulación mediante entrada protocolo 1.10V
					<b>DALI</b>					Regulación mediante entrada protocolo DALI
					<b>C1</b>					Protección eléctrica de la luminaria Clase 1
					<b>C2</b>					Protección eléctrica de la luminaria Clase 2
					<b>C3</b>					Clase 3 (exclusiva DC)
					<b>GY9007</b>					Acabado estándar RAL GY9007
					<b>*****</b>					Acabado colores Simon (ver pagina 514)
					<b>*****</b>					Acabado colores carta RAL Classic

### REFERENCIAS BASE

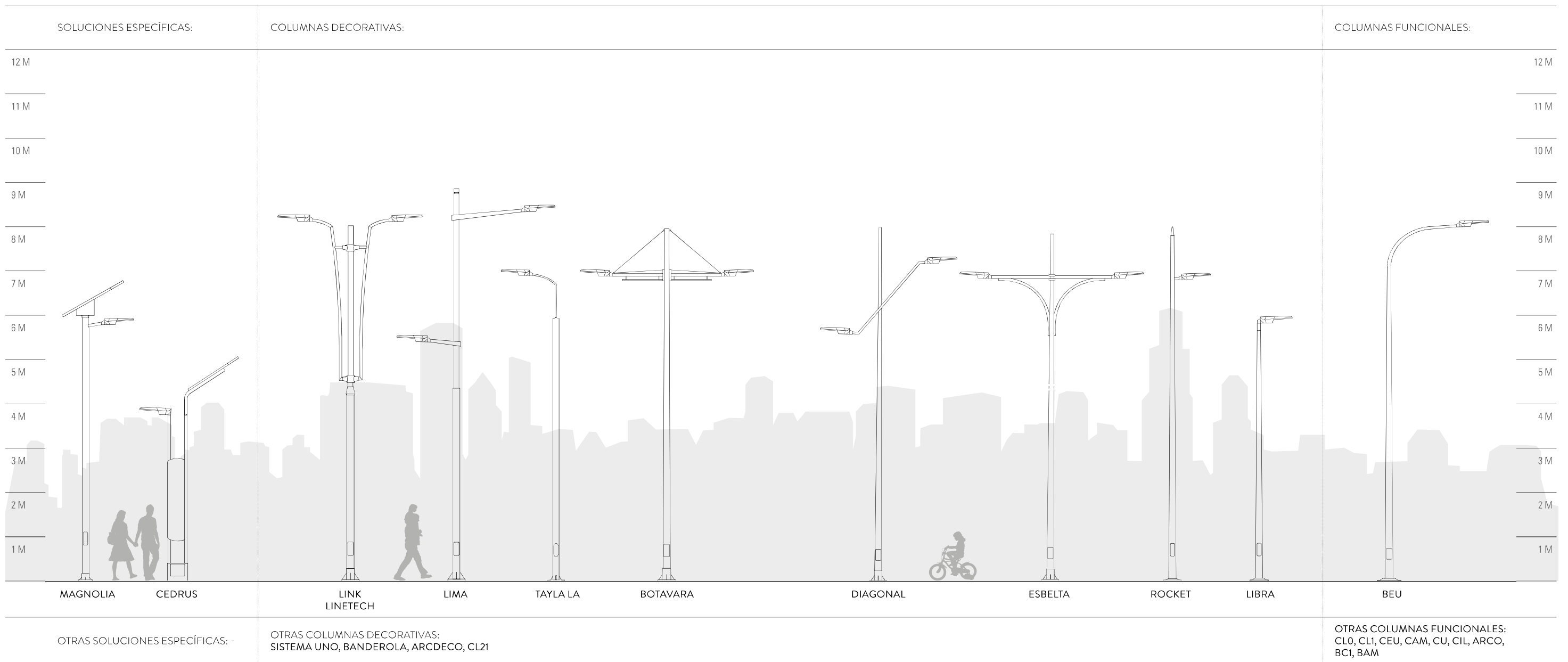
Potencia	Corriente	Configuración	Código de pedido
16 W	350 mA	NATSXFGTFORJ_NDL_16W350IA23_1N_C1GY9007	<b>103-000222016</b>
24 W	530 mA	NATSXFGTFORJ_NDL_24W530IA23_1N_C1GY9007	<b>103-000220016</b>
32 W	700 mA	NATSXFGTFORJ_NDL_32W700IA23_1N_C1GY9007	<b>103-000183016</b>
36 W	530 mA	NATSXFGTFORJ_NDL_36W530IA23_1N_C1GY9007	<b>103-000219016</b>
47 W	530 mA	NATSXFGTFORJ_NDL_47W530IA23_1N_C1GY9007	<b>103-002727016</b>
49 W	700 mA	NATSXFGTFORJ_NDL_49W700IA23_1N_C1GY9007	<b>103-000186016</b>
50 W	1.050 mA	NATSXFGTFORJ_NDL_50W_1KIA23_1N_C1GY9007	<b>103-000439016</b>
60 W	530 mA	NATSXFGTFORJ_NDL_60W530IA23_1N_C1GY9007	<b>103-000218016</b>
63 W	700 mA	NATSXFGTFORJ_NDL_63W700IA23_1N_C1GY9007	<b>103-002729016</b>
75 W	1.050 mA	NATSXFGTFORJ_NDL_75W_1KIA23_1N_C1GY9007	<b>103-000441016</b>
81 W	700 mA	NATSXFGTFORJ_NDL_81W700IA23_1N_C1GY9007	<b>103-000371016</b>
94 W	1.050 mA	NATSXFGTFORJ_NDL_94W_1KIA23_1N_C1GY9007	<b>103-002730016</b>

\* Modelos disponibles sólo con ópticas RJ y RE.

El flujo de salida de la luminaria puede sufrir variaciones en torno al ± 6% respecto a los publicados atendiendo a la condición ambiental y/o a la evolución constante que experimenta la tecnología LED. La potencia de la luminaria puede sufrir variaciones en torno al ± 7% respecto a los publicados atendiendo a la condición ambiental y/o a la evolución constante que experimenta la tecnología.



COMBINA TU LUMINARIA NATH S CON:



ACCESORIOS / RECAMBIOS

Descripción	Código de pedido
 Accesorio reductor para fijación lateral a brazo de Ø48 mm	50-73277
 Accesorio de fijación a soporte de Ø76 mm	50-88540
 Accesorio de fijación a soporte de Ø76 mm, acabado GY9007	50-88540-016
 Accesorio reductor para fijación lateral a brazo de Ø42 mm	5-531785
 Accesorio reductor para fijación lateral a brazo de Ø34 mm	5-531818

OTRAS LUMINARIAS DE LA COLECCIÓN



NATH M



NATH L





### **APÈNDIX 3. Càlculs elèctrics**

DESCRIPCIÓ	Potència al punt	Potència acumulada	Factor d'arrancada	Llargada	Tensió	Cos $\Phi$	Intensitat	Secció	Caiguda de tensió			Icc	Rtram	Rtotal	
	W	W	K	m	Volts	Abs.	Trifa. Amp	mm2	V (tram)	% (tram)	% (total)	A			
<b>CAIGUDA DE TENSÍO MÀXIMA (%)</b>											<b>2,9834</b>				
<b>CIRCUIT L1</b>															
Q1 a L1.1.9	250	3400	1,80	12	400	0,90	9,81	6	0,546	0,14	0,1366	2.556	0,07	0,07	
DE L1.1.9 a L1.1.10	250	3150	1,80	48	400	0,90	9,09	6	2,025	0,51	0,6429	511	0,29	0,36	
DE L1.1.9 a L1.1.11	250	2900	1,80	48	400	0,90	8,37	6	1,864	0,47	1,1089	284	0,29	0,65	
DE L1.1.9 a L1.1.12	250	2650	1,80	48	400	0,90	7,65	6	1,704	0,43	1,5348	197	0,29	0,94	
DE L1.1.9 a L1.1.13	250	2400	1,80	48	400	0,90	6,93	6	1,543	0,39	1,9205	150	0,29	1,22	
DE L1.1.9 a L1.1.14	250	2150	1,80	48	400	0,90	6,21	6	1,382	0,35	2,2661	122	0,29	1,51	
DE L1.1.14 A L1.1	94	1900	1,25	35	400	0,90	3,81	6	0,618	0,15	2,4207	107	0,21	1,72	
L1.1 a L1.2	94	1806	1,25	35	400	0,90	3,62	6	0,588	0,15	2,5677	95	0,21	1,93	
L1.2 a L1.3	193	1326	1,25	48	400	0,90	2,66	6	0,592	0,15	2,7157	83	0,29	2,22	
L1.3 a L1.4	94	1133	1,25	30	400	0,90	2,27	6	0,316	0,08	2,7947	77	0,18	2,40	
L1.4 a L1.5	193	663	1,25	48	400	0,90	1,33	6	0,296	0,07	2,8687	68	0,29	2,69	
L1.5 a L1.6	94	470	1,25	35	400	0,90	0,94	6	0,153	0,04	2,9069	63	0,21	2,90	
L1.6 a L1.7	94	376	1,25	35	400	0,90	0,75	6	0,122	0,03	2,9375	59	0,21	3,11	
L1.7 a L1.8	94	282	1,25	35	400	0,90	0,57	6	0,092	0,02	2,9605	55	0,21	3,32	
L1.8 a L1.9	94	188	1,25	35	400	0,90	0,38	6	0,061	0,02	2,9758	52	0,21	3,53	
L1.9 a L1.10	94	94	1,25	35	400	0,90	0,19	6	0,031	0,01	2,9834	49	0,21	3,74	
L1.2 a L1.11	193	386	1,25	35	400	0,90	0,77	6	0,126	0,03	2,5991	86	0,21	2,14	
L1.11 a L1.12	193	193	1,25	60	400	0,90	0,39	6	0,108	0,03	2,6260	74	0,36	2,50	
L1.4 a L1.13	94	376	1,25	35	400	0,90	0,75	6	0,122	0,03	2,8253	70	0,21	2,61	
L1.13 a L1.14	94	282	1,25	35	400	0,90	0,57	6	0,092	0,02	2,8482	65	0,21	2,82	
L1.14 a L1.15	94	188	1,25	35	400	0,90	0,38	6	0,061	0,02	2,8635	61	0,21	3,03	
L1.15 a L1.16	94	94	1,25	35	400	0,90	0,19	6	0,031	0,01	2,8712	57	0,21	3,24	