

**ANEJO 9:
CÁLCULO ESTRUCTURAL DE LA
ESTACION DE BOMBEO Y OBRA DE TOMA**

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1. INTRODUCCIÓN

En el presente anejo se calculan de los distintos elementos estructurales de la estación de bombeo, tanto la edificación en sí, como la parte correspondiente a la cántara de las bombas, arqueta de filtros y obra de toma.

Una vez realizado el diseño de la edificación y la cantara, estableciendo los elementos que debe albergar, así como instalaciones y espacios necesarios, se realiza el cálculo. Debemos tener en cuenta la consideración de zona inundable de la parcela donde se ubican estas instalaciones, condicionando esta circunstancia la cota de solera de la estación de bombeo, que deberá ser 630,5 (cota de inundación para T:100 años).

En la estación de bombeo ubicados todos los elementos hidráulicos necesarios y los espacios para la ubicación del centro de transformación interior bajo forjado y sala de cuadros eléctricos y de control sobre forjado, así como las zonas de paso, se ha optado finalmente por una nave de planta rectangular de 23.10x17.10m² y una cubierta a dos aguas. La altura se determinó teniendo en cuenta los condicionantes del puente grúa y las necesidades de altura libre para el manejo de los distintos elementos y armarios eléctricos, esta altura hasta las correas será de 9,00 m en la zona más alta y 7,64 m en la parte baja.

Al diseño se unen los condicionantes derivados del estudio geotécnico, donde se desechan el primer nivel de terreno (tierra vegetal) como posible nivel de apoyo de la cimentación, por su origen variable y su deficiente capacidad portante, al ser un relleno donde carece de una tensión admisible que garantice la cimentación, recomendándose su total eliminación.

En el caso de la parcela de ubicación de la estación de bombeo se realizaron dos sondeos para caracterizar perfectamente el terreno que nos encontramos, detectando que a partir de una profundidad de 0,3-1m nos encontramos el nivel el NIVEL III de gravas silíceas con arenas, terreno válido para la cimentación superficial de la futura estación de bombeo,

El estudio geotécnico recomienda la ejecución de muros pantalla en el caso de excavación de la cántara. Dada la gran envergadura de la excavación a ejecutar en para la cántara de bombeo, con excavaciones máximas de 7,5-8,0 m y ante la imposibilidad técnica para realizar muros pantalla con un nivel de empotramiento de 5-6m por debajo del fondo de excavación (longitud total de 14m), según indica en el geotécnico, se ha realizado la consulta a empresas del sector especializadas en la realización de excavaciones en grandes profundidades con terrenos similares al que nos encontramos y se propone la solución para realizar esta excavación mediante tablestacado, arriostrado, reduciendo el moviendo de tierras y permitiendo el desarrollo de los trabajos con las condiciones de seguridad adecuadas.

La elección de la estructura se toma al igual que la cimentación, teniendo en cuenta una optimización económica y un impacto ambiental menor. La estructura prefabricada de hormigón, nos permite una mayor distancia entre pórticos que la solución metálica, y con una estructura prefabricada la ejecución será más limpia y rápida, evitando la generación de residuos de una estructura de hormigón "in situ" y reduciendo a su vez los tiempos de la construcción.

Determinadas las dimensiones y los condicionantes existentes, se definen en este anejo los procesos de cálculo de la nave que alberga la instalación de bombeo y se realiza el dimensionamiento y comprobación de los distintos elementos estructurales de la obra.

En el cálculo se ha optado por diferenciar la estructura de las losas, cimentación y muros de la cantara y obra de toma y arqueta de filtros, que se ejecutarán mediante hormigón "in situ", a su vez se el cálculo del tablestacado; estos cálculos han sido encargados mediante asistencia externa al Ingeniero de Caminos Canales y Puertos Luis Hernández Blanco (Colegiado nº13.760).

Los cálculos de la edificación que se proyecta en hormigón prefabricado han sido facilitados por un fabricante de estructuras prefabricadas de hormigón.

Se presenta en los apéndices al anejo cada una de las partes dimensionadas, con su justificación de cálculo.

APENDICE 1: CALCULO ESTRUCTURAL DE CIMENTACION, LOSAS Y MUROS DE OBRA DE TOMA, ARQUETAS Y ESTACIÓN DE BOMBEO.



MODERNIZACIÓN DEL REGADÍO DEL SECTOR IDE LA ZONA REGABLE DEL CANAL DE SAN JOSÉ (ZAMORA).

Anejo de Cálculo



INSTITUTO
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1. INTRODUCCIÓN

La zona de estudio se localiza en el término municipal de Villaralbo en la provincia de Zamora.

El proyecto a ejecutar consiste en una obra de toma de agua en el río Duero y una estación de bombeo y está englobada en las obras de modernización del regadío del Sector I de la zona regable del Canal de San José. Y están promovidas por el Instituto Tecnológico Agrario perteneciente a la Consejería de Agricultura Ganadería y Desarrollo Rural de la Junta de Castilla y León.

2. ELEMENTOS ESTRUCTURALES

Se distinguen 4 estructuras en la actuación objeto de este anejo: Obra de toma, arqueta de filtros y cántara, losa de edificio prefabricado y su cimentación. Y una parte más que no es objeto de cálculo estructural de este anejo, pero que se tendrá en consideración para el estudio de flotabilidad, la tubería de entrada.

2.1. OBRA DE TOMA

Se trata de un elemento de hormigón que consta a su vez de tres partes diferenciadas.

La entrada con una longitud de 3,69 m está formada por dos aletas con espesor de 25 cm y altura variable de 0,65 a 2,00 m. Y una solera de 35 cm de canto.

La arqueta de la reja automatizada y la de la compuerta. Se cimentan sobre una losa de planta rectangular de dimensiones 5.36 x 3.50 m. y cuentan con muros de 50 cm de espesor. La arqueta de la reja tiene una altura de 3 m y unas dimensiones interiores de 2.50x 2,26 m. La arqueta de la compuerta tiene una altura de 5,40 m y unas dimensiones internas de 2.50x 2,00 m. El muro que separa ambas arquetas tiene un espesor de 30 cm y no llega hasta la losa, dejando un hueco de paso de 2,15 metros de altura a todo el ancho del elemento.

El muro trasero de la obra de toma presenta un espesor de 50cm y un hueco de 1,93x1,50 m que conecta con la tubería de cajones.

2.2.TUBERÍA DE ENTRADA

Formada por cajones prefabricados de hormigón armado de dimensiones exteriores 2,36 m de altura y 1,90 de anchura e interiores de 2,00 x 1,50 m. Con un espesor de 18 cm en sus losas superior e inferior y 20 cm en sus hastiales.

2.3.ARQUETA DE FILTROS Y CÁNTARA DE BOMBEO

Presenta tres partes diferenciadas. Una arqueta de filtro de cadenas, una parte de la cantara exterior de ancho variable creciente y con losa con pendiente del 5% y una tercera parte con losa con ligera pendiente en sentido contrario y cubierta por otra losa en el interior de la estación de bombeo. Esta última parte tiene además las cunas de las bombas.

La losa de todos los elementos tiene un canto de 90cm. Y todos los muros perimetrales son de 80cm de espesor en su base hasta una altura de 4,5m y continúa con un espesor de 40cm hasta alcanzar una altura de 8,30m en la arqueta y 8,61 en el final de la cantara.

La arqueta de filtro de cadenas tiene unas dimensiones interiores de 3,88 x 4,18 y presenta un hueco en su parte frontal por donde entra la tubería de entrada de dimensiones 2,36 x 1,90. En su pared trasera presenta un hueco a todo el ancho de 4,78 m de altura que comunica con la cántara. Este muro tiene un espesor de 30 cm y una altura de 3m por encima del hueco.

La parte de la cantara exterior al edificio de bombeo tiene una longitud de 10.94 m y está cubierta por un tramex soportado por perfiles metálicos dispuestos en sentido transversal. El ancho de esta parte varía desde los 4,18 m iniciales hasta los 11,08m finales.

La parte interior de la cántara tiene un ancho constante de 11.08m y una longitud de 5.03m. Contiene las cunas de 7 bombas separadas por mamparos de hormigón de 2,8m de longitud, 4.45 m de altura y un espesor de 30cm. Está cubierta por una losa de 30cm de espesor que presenta huecos para el paso de las tuberías de las bombas.

2.4.LOSA ESTACIÓN DE BOMBEO

La estación de bombeo presenta una forma rectangular de 17,35m de ancho y 23,19m de largo. La losa tiene dichas dimensiones, pero presenta un hueco rectangular completado por la cántara y su losa de cubierta. Tiene un espesor de 50cm y también deja 9 huecos para los cálices de los pilares prefabricados que conforman la estación de bombeo de dimensiones 1,10 x 1,10 alineados en 3 ejes horizontales y 3 ejes verticales.

2.5.CIMENTACIÓN EDIFICIO PREFABRICADO

La estación de bombeo cuenta con 9 pilares prefabricados de 40x50 cm que se cimentaran sobre cálices de dimensiones interiores 60x70 con un empotramiento de 1,20m con paredes inclinadas, y con una zapata de 2,35x2,35 y canto 0,70.

Los cálices pasan a través de la losa de la estación de bombeo mediante huecos cuadrados de 1,10x1,10 quedando su parte superior enrasada con la cara superior de la losa.

3.GEOTÉCNIA

De acuerdo con el Anejo 05-Estudio Geológico-Geotécnico en el Sector I del Canal de San José (Zamora) las obras objeto de este anejo se cimentarán sobre el Nivel III: Gravas silíceas con arenas localizado en los sondeos y calicatas.

3.1.PARÁMETROS GEOTÉCNICOS

Los principales parámetros geotécnicos son los siguientes:

Densidad aparente: 2,0 – 2,1 t/m³

Cohesión: 0 t/m²

Ángulo de rozamiento interno: 36 – 38°

Módulo de elasticidad: 3.500 t/m³

Coefficiente de Poisson: 0.3

Se ha determinado la presencia de sulfatos con una concentración de 200 mg/l.

3.2.NIVEL FREÁTICO

Se ha detectado la presencia del nivel freático a la cota 625.50

3.3.CIMENTACIONES: CAPACIDAD PORTANTE Y ASIENTOS

A la vista de lo anterior se determina una capacidad portante para el nivel III:

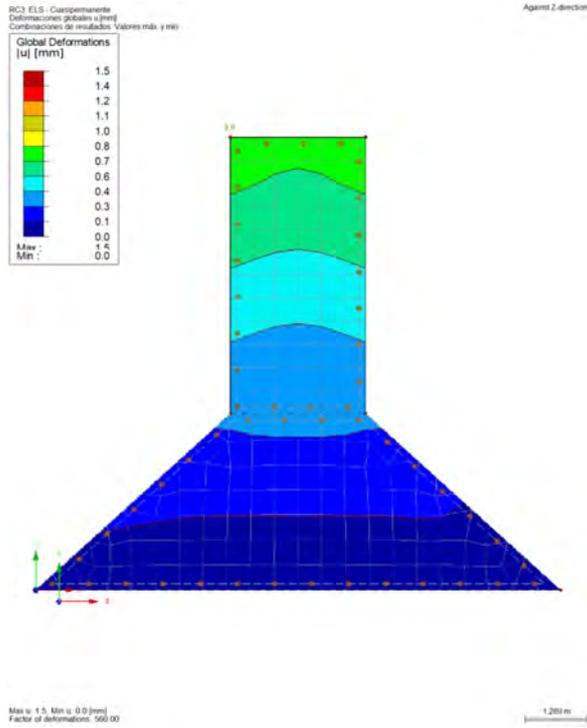
Para el edificio de la estación de bombeo de 2,1 kp/cm² mediante zapatas aisladas.

Para la cántara y arqueta de filtros de 3,0 kp/cm² mediante losa.

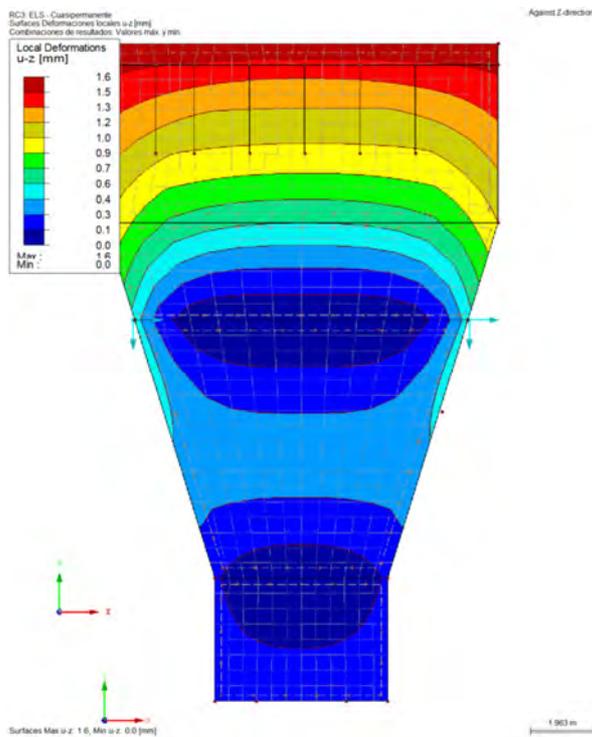
De acuerdo a Jimenez Salas (*Geotecnia y Cimientos: Cimentaciones, Excavaciones y Aplicaciones de la Geotecnia*) se puede estimar un coeficiente de balasto en Gravas gruesas con arenas saturadas en placa de 30cm x 30cm de 9 kg/cm³.

En el Anejo 05 se determina un asiento teórico de 2,0 cm. Los asientos estimados para las diferentes estructuras se muestran en los siguientes gráficos:

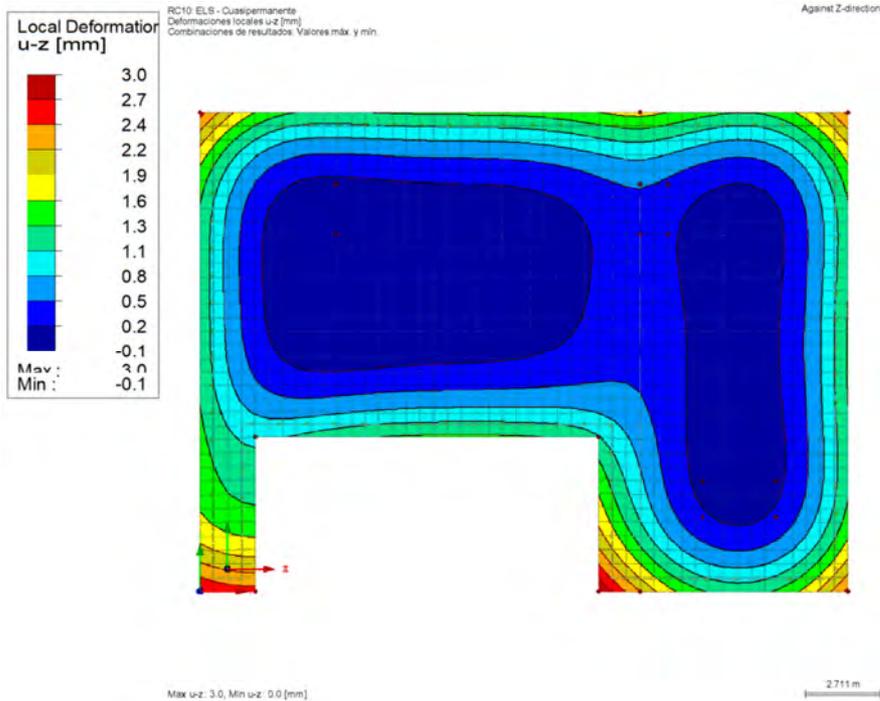
- Obra de toma:



- Arqueta de filtros y cántara:



- Losa edificio estación de bombeo:



Comprobando que los asientos totales máximos se encuentran dentro de lo esperado y dentro de los valores admisibles según la normativa.

4. MATERIALES

4.1. HORMIGÓN

Para todos los elementos estructurales se ha determinado las siguientes características del hormigón:

- clase de exposición IIa+Qa
- Resistencia: HA-30 $f_{ck} \geq 30 \text{ N/mm}^2$
- Ratio a/c: 0.5
- Mínimo contenido de cemento: 325 Kg/cm^3
- Máximo tamaño de árido: 20 mm
- Recubrimiento: 50 mm.
- Máxima apertura de fisura: 0.2 mm

4.2.ARMADURAS PASIVAS

Para las armaduras del hormigón se utilizará acero B 500 S (límite elástico $f_{yk} \geq 500 \text{ N/mm}^2$)

4.3.ACERO ESTRUCTURAL

Se utilizará acero S-275 siendo sus principales características

Grado	Espesor nominal t (mm)	f_y min (N/mm ²)	f_u min (N/mm ²)
S275	≤ 40	275	$430 < f_u < 580$
	$40 < t \leq 80$	255	$410 < f_u < 560$

5.ACCIONES

5.1.CARGAS PERMANENTES

- PESO PROPIO DE LA ESTRUCTURA:

Hormigón armado C30/37 con una densidad de 2.500 Kg/m^3 .

Acero estructural B-500S con una densidad de 7.850 Kg/m^3

5.2.CARGAS VARIABLES

- EQUIPOS MECÁNICOS:

Los equipos se consideran cargas variables ya que o bien tienen esta característica, o bien pueden ser reemplazados durante la vida útil de la estructura.

Equipos de bombeo principales: 5 unidades 2780 kg/ud

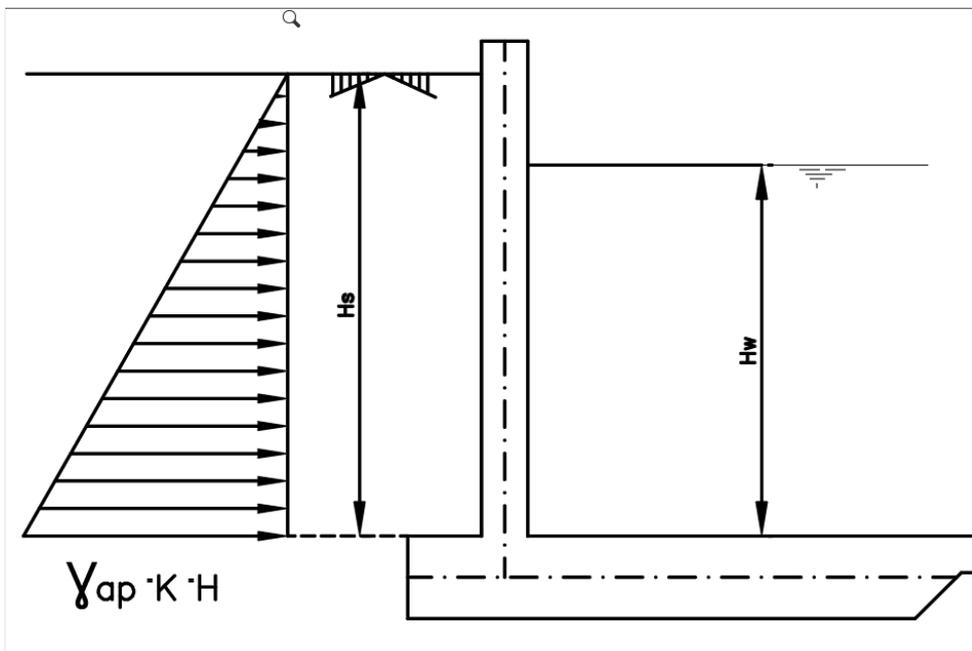
Equipos de bombeo auxiliares: 2 unidades 700 kg/ud

Calderería: 4.500 Kg

Transformador: 7.200 kg

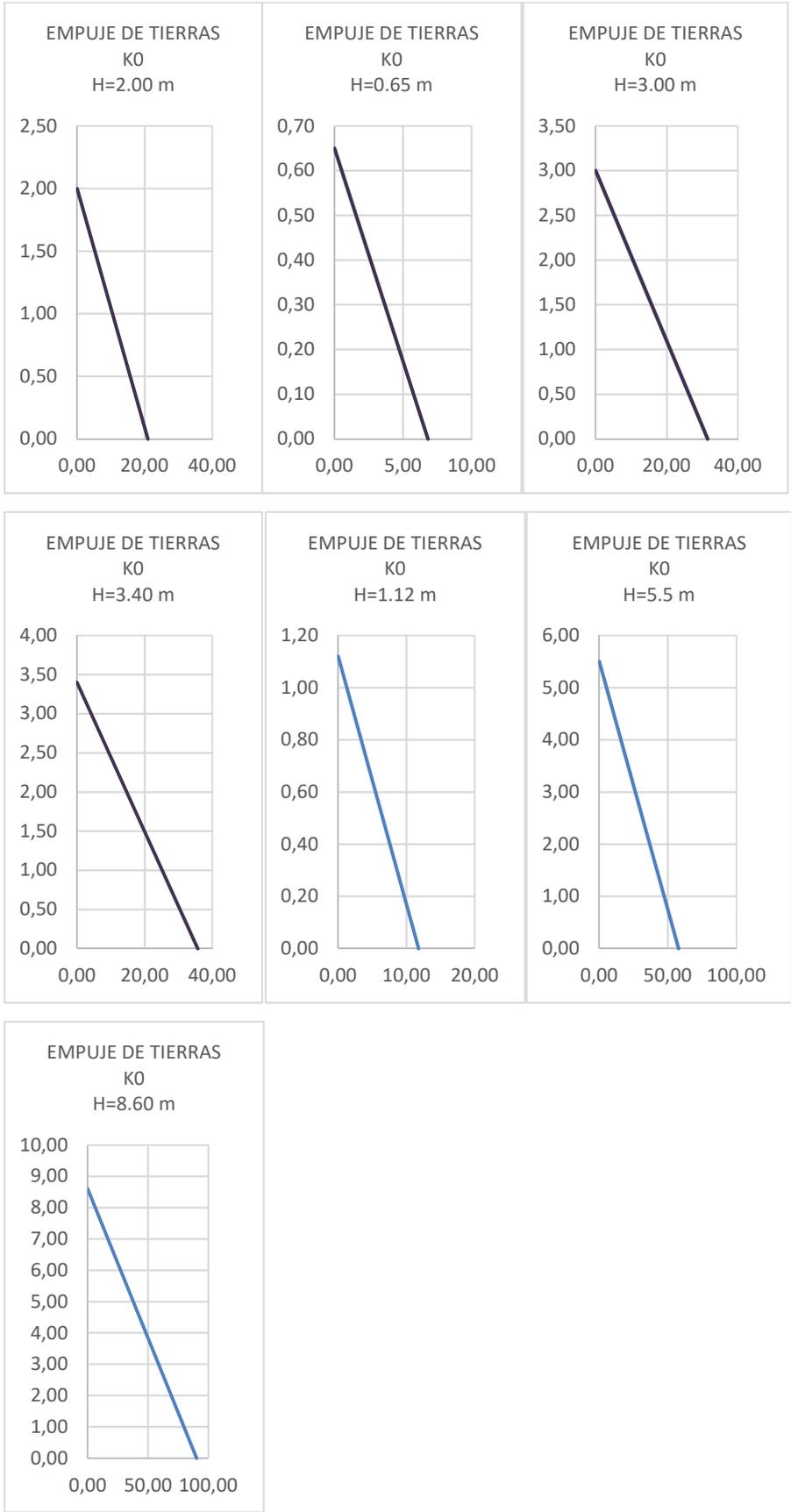
Puente grúa monorraíl: 6.300 kg de capacidad máxima

- **EMPUJE DE TIERRAS:**

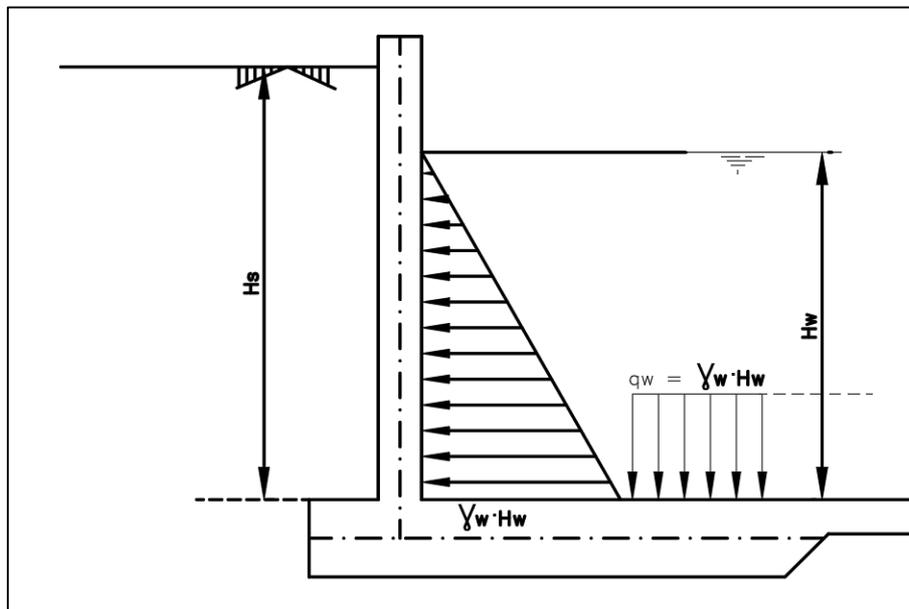


Se considera un peso específico para los rellenos de tierras y rellenos = 21,00 kN/m³

	HS (m)	E ₀ (kN)
Aletas h=2,60	2.00	21.00
Aletas h=0,65	0.65	2.22
Arqueta reja automatizada	3.00	47.25
Arqueta compuerta muro lateral	3.40	60.69
Arqueta compuerta muro salida	1.12	6.59
Arqueta de Filtros	5.50	158.81
Cantara	8.60	388.29



- **EMPUJE DE AGUA:**



- Peso específico del agua y agua = $10,00 \text{ kN/m}^3$

Para la determinación de los esfuerzos transmitidos por el edificio prefabricado de la estación de bombeo se han considerado además de las cargas del puente grúa y el peso propio las siguientes:

- **NIEVE:**

El valor característico de la carga de nieve, para la situación de diseño persistente / transitorio, se determina de la según CTE considerando los parámetros para la zona de Zamora:



La obra se encuentra por tanto en zona climática 3. A una altura de 650 m.

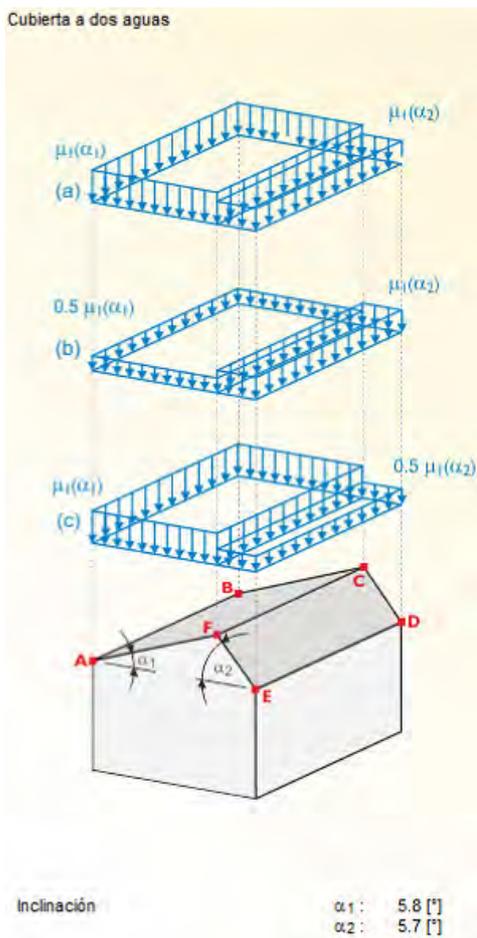
Generar cargas de nieve - Cubierta a dos aguas (1)

Parámetros de carga de nieve		Cargas de nieve adicionales	
Según la norma:	 CTE DB-SE-AE	<input type="checkbox"/>	Carga de nieve redistribuida según 5.3.4(3)
Anejo Nacional:	 CTE	<input type="checkbox"/>	Nieve que sobresale...
Número de zona	Z : 3	<input type="checkbox"/>	Defensa contra la nieve/obstáculo...
Altitud	A : 650,000 [m]	Coefficientes	
Carga de nieve sobre terreno	s _k : 0.35 [kN/m ²]	Exposición	C _e : 1.000
Tipo de topografía:	Normal		

Parámetros

Ac :	<input type="text" value="359.838"/>	[m ²]	AN :	<input type="text" value="España"/>	
α_1 :	<input type="text" value="5.8"/>	[°]	Z :	<input type="text" value="3"/>	
α_2 :	<input type="text" value="5.7"/>	[°]			
Ce :	<input type="text" value="1.00"/>				
			Sk :	<input type="text" value="0.35"/>	[kN/m ²]

Resultando 3 situaciones de carga



Situación 1

Lado con α_1		Lado con α_2	
μ_1 :	1.000 [-]	μ_1 :	1.000 [-]
μ_2 :	- [-]	μ_2 :	- [-]
s_1 :	0.35 [kN/m ²]	s_1 :	0.35 [kN/m ²]
s_2 :	- [kN/m ²]	s_2 :	- [kN/m ²]
S_e :	- [kN/m]	S_e :	- [kN/m]
F_s :	- [kN/m]	F_s :	- [kN/m]
Cargas totales de nieve		Momentos totales a origen	
ΣP_{Area} :	125.307 [kN]		1716.810 [kNm]
ΣP :	125.307 [kN]		1716.810 [kNm]

Situación 2

Lado con α_1		Lado con α_2	
μ_1 :	1.000 [-]	μ_1 :	1.000 [-]
μ_2 :	- [-]	μ_2 :	- [-]
s_1 :	0.17 [kN/m ²]	s_1 :	0.35 [kN/m ²]
s_2 :	- [kN/m ²]	s_2 :	- [kN/m ²]
S_e :	- [kN/m]	S_e :	- [kN/m]
F_s :	- [kN/m]	F_s :	- [kN/m]
Cargas totales de nieve		Momentos totales a origen	
ΣP_{Area} :	84.058 [kN]		1030.190 [kNm]
ΣP :	84.058 [kN]		1030.190 [kNm]

Situación 3

Lado con α_1		Lado con α_2	
μ_1 :	1.000 [-]	μ_1 :	1.000 [-]
μ_2 :	- [-]	μ_2 :	- [-]
s_1 :	0.35 [kN/m ²]	s_1 :	0.17 [kN/m ²]
s_2 :	- [kN/m ²]	s_2 :	- [kN/m ²]
S_e :	- [kN/m]	S_e :	- [kN/m]
F_s :	- [kN/m]	F_s :	- [kN/m]
Cargas totales de nieve		Momentos totales a origen	
ΣP_{Area} :	103.903 [kN]		1551.870 [kNm]
ΣP :	103.903 [kN]		1551.870 [kNm]

- **VIENTO:**

El valor característico de la carga de viento, para la situación de diseño persistente / transitorio, se determina de la según CTE considerando los parámetros para la zona de Zamora y a la categoría del terreno:



Categoría de terreno		Parámetros		
		k	L[m]	Z[m]
I	Mar abierto o zona costera expuesta al mar abierto	0,156	0,003	1
II	Lagos o áreas planas y horizontales con vegetación despreciable y sin obstáculos	0,17	0,01	1
III	Áreas con vegetación baja, como hierba, y obstáculos aislados (árboles, edificaciones) con separaciones de al menos 20 veces la altura de los obstáculos	0,19	0,05	2
IV	Áreas con una cobertura de vegetación uniforme o edificaciones o con obstáculos aislados con una separación máxima de 20 veces la altura de los obstáculos (villas, terreno suburbano, bosques permanentes)	0,22	0,3	5
V	Áreas en las que al menos un 15% de la superficie está cubierta por edificios cuya altura media supera los 15 m	0,24	1,0	10

Resultando una velocidad básica de viento de 26 m/s y una categoría de terreno III.

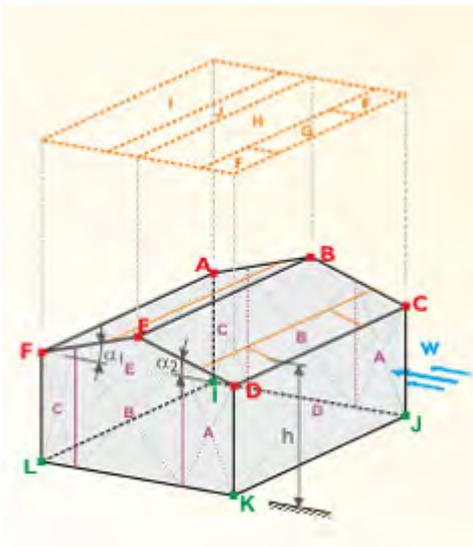
Generar cargas de viento - Muros verticales con cubierta (1)

Presión de velocidad

Según la norma:	🇪🇸 CTE DB-SE-AE	Altura de la estructura	h:	9.110	[m]
Anejo Nacional:	🇪🇸 CTE				
Zona de vientos:	A				
Categoría de terreno:	Categoría III	Velocidad fundamental del viento	v _{b,0} :	26.00	[m/s]

Se han considerado dos situaciones de viento perpendiculares con diferentes estados de presión y succión

Situación 1



Situación 1.A

Coeficiente de presión		Presión externa		
C _{pe,10}		w _e [kN/m ²]		
Zona	A	-1.200	A	-1.17
	B	-0.800	B	-0.78
	C	-0.500	C	-0.49
	D	0.722	D	0.70
	E	-0.343	E	-0.33
	F	0.015	F	0.01
	G	0.015	G	0.01
	H	0.015	H	0.01
	I	0.000	I	0.00
	J	0.185	J	0.18

Cargas de viento totales generadas: Momentos totales al origen

Σ P _{Area} :	151.385 [kN]	1425.500 [kNm]
Σ P :	151.362 [kN]	1425.050 [kNm]

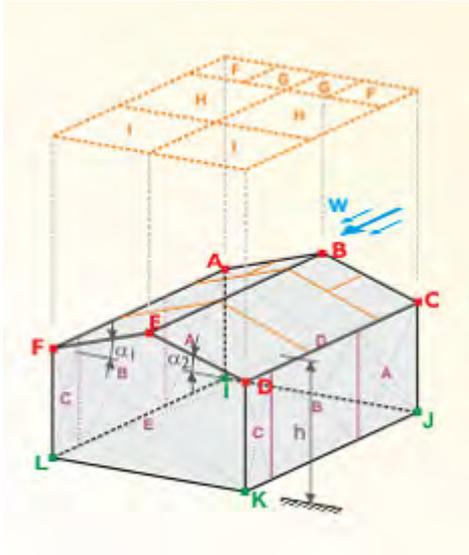
Situación 1.B

Coeficiente de presión		Presión externa		
C _{pe,10}		w _e [kN/m ²]		
Zona	A	-1.200	A	-1.17
	B	-0.800	B	-0.78
	C	-0.500	C	-0.49
	D	0.722	D	0.70
	E	-0.343	E	-0.33
	F	-1.640	F	-1.60
	G	-1.170	G	-1.14
	H	-0.578	H	-0.56
	I	-0.585	I	-0.57
	J	-0.631	J	-0.61

Cargas de viento totales generadas: Momentos totales al origen

Σ P _{Area} :	274.340 [kN]	2711.850 [kNm]
Σ P :	274.299 [kN]	2711.950 [kNm]

Situación 2



Situación 2.A

	Coeficiente de presión		Presión externa	
	C _{pe,10}		w _e [kN/m ²]	
Zona	A	-1.200	A	-1.17
	B	-0.800	B	-0.78
	C	-0.500	C	-0.49
	D	0.742	D	0.72
	E	-0.383	E	-0.37
	F	0.000	F	0.00
	G	0.000	G	0.00
	H	0.000	H	0.00
	I	0.000	I	0.00
	J	-	J	-

	Cargas de viento totales generadas		Momentos totales al origen	
Σ P _{Area} :	227.703	[kN]	2611.420	[kNm]
Σ P :	227.692	[kN]	2611.280	[kNm]

Situación 2.B

Coeficiente de presión		Presión externa		
C _{pe,10}		w _e [kN/m ²]		
Zona	A	-1.200	A	-1.17
	B	-0.800	B	-0.78
	C	-0.500	C	-0.49
	D	0.742	D	0.72
	E	-0.383	E	-0.37
	F	-1.577 / -1.5	F	-1.54 / -1.54
	G	-1.300	G	-1.27
	H	-0.692 / -0.6	H	-0.67 / -0.68
	I	-0.592 / -0.5	I	-0.58 / -0.58
	J	-	J	-
Cargas de viento totales generadas Momentos totales al origen				
Σ P _{Area} :	341.514	[kN]	5063.610	[kNm]
Σ P :	341.506	[kN]	5063.490	[kNm]

6. ANALISIS DE LA FLOTABILIDAD DE LA TUBERÍA DE ENTRADA

De acuerdo con lo comentado en el apartado 3.2 NIVEL FREÁTICO de este anejo, el nivel freático se encuentra a la cota 625.50 lo que implica que la totalidad de los cajones que conforman la tubería de entrada se encuentran por debajo de dicha cota.

Para la determinación de la flotabilidad se tendrán en cuenta las siguientes densidades:

$$\rho_{HA30} = 25 \text{ KN/m}^3$$

$$\rho_{\text{agua}} = 10 \text{ KN/m}^3$$

$$\gamma_{\text{rellenos}} = 21 \text{ KN/m}^3$$

$$\gamma_{\text{rellenos sumergidos}} = 11 \text{ KN/m}^3$$

se considera el factor de seguridad de flotación

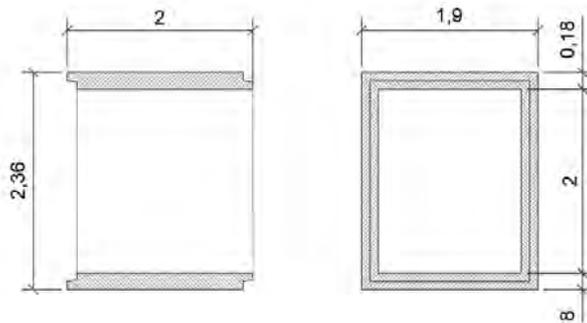
$$F.S.F = \frac{P_c + P_r}{E} \geq 1.05$$

P_c = peso del cajón

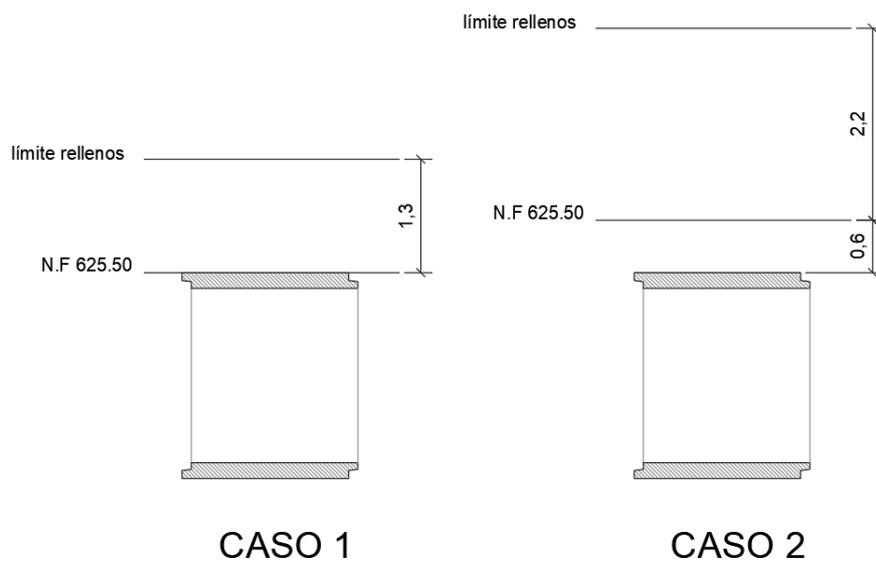
P_r = peso del relleno de tierras

E = empuje del agua

A continuación se presentan las dimensiones del cajón que conforma la tubería de entrada:



Se van a analizar dos situaciones en función de la altura del relleno de tierras por encima de la tubería y de la presencia de nivel freático en ellas.



- CASO 1

Peso del cajón:

$$P_c = (2.36 + 1.9 - 2 \times 0.18) \times 2 \times 0.18 \text{ [m}^3/\text{m]} \times 25 \text{ KN/m}^3 = 35.1 \text{ KN/m}$$

Peso del relleno:

$$P_r = 1.3 \times 1.9 \text{ [m}^3/\text{m]} \times 21 \text{ KN/m}^3 = 51.87 \text{ KN/m}$$

Empuje del agua:

$$E = (2.36 \times 1.9) \text{ [m}^3/\text{m]} \times 10 \text{ KN/m}^3 = 44.84 \text{ KN/m}$$

Para el caso 1 se comprueba:

$$F.S.F = \frac{35.1 + 51.87}{44.84} = 1.9 \geq 1.05$$

- CASO 2

Peso del cajón:

$$P_c = (2.36 + 1.9 - 2 \times 0.18) \times 2 \times 0.18 \text{ [m}^3/\text{m]} \times 25 \text{ KN/m}^3 = 35.1 \text{ KN/m}$$

Peso del relleno:

$$P_r = 2.2 \times 1.9 \text{ [m}^3/\text{m]} \times 21 \text{ KN/m}^3 + 0.6 \times 1.9 \text{ [m}^3/\text{m]} \times 11 \text{ KN/m}^3 = 100.32 \text{ KN/m}$$

Empuje del agua:

$$E = (2.36 \times 1.9) \text{ [m}^3/\text{m]} \times 10 \text{ KN/m}^3 = 44.84 \text{ KN/m}$$

Para el caso 1 se comprueba:

$$F.S.F = \frac{35.1 + 100.32}{44.84} = 3 \geq 1.05$$

Se comprueba por tanto que la tubería de entrada no presentará problemas de flotación.

7.PROCEDIMIENTO DE HINCA DE TABLESTACAS

Debido a la presencia del nivel freático durante la ejecución de los trabajos, se propone la ejecución de un tablestacado. Para el procedimiento de ejecución de este tablestacado se debe tener en cuenta la dureza del terreno.

De acuerdo con el *Anejo 05-Estudio Geológico-Geotécnico en el Sector I del Canal de San José (Zamora)* la dureza del terreno establecida mediante ensayo Penetración Dinámica Standard (S.P.T) se considera que permite la hinca si bien será necesaria una *perforación de alivio*

Por otro lado debido a las características del terreno es casi descartable un hincado de tablestacas de gran longitud para que pudieran trabajar en voladizo en aquellas zonas dónde se precise una excavación de mayor profundidad, (con voladizos de tablestaca superiores a 4m), por lo que se prevé un empotramiento corto en la base con un arriostrado en cabeza.

A continuación se detallan ambos procedimientos¹

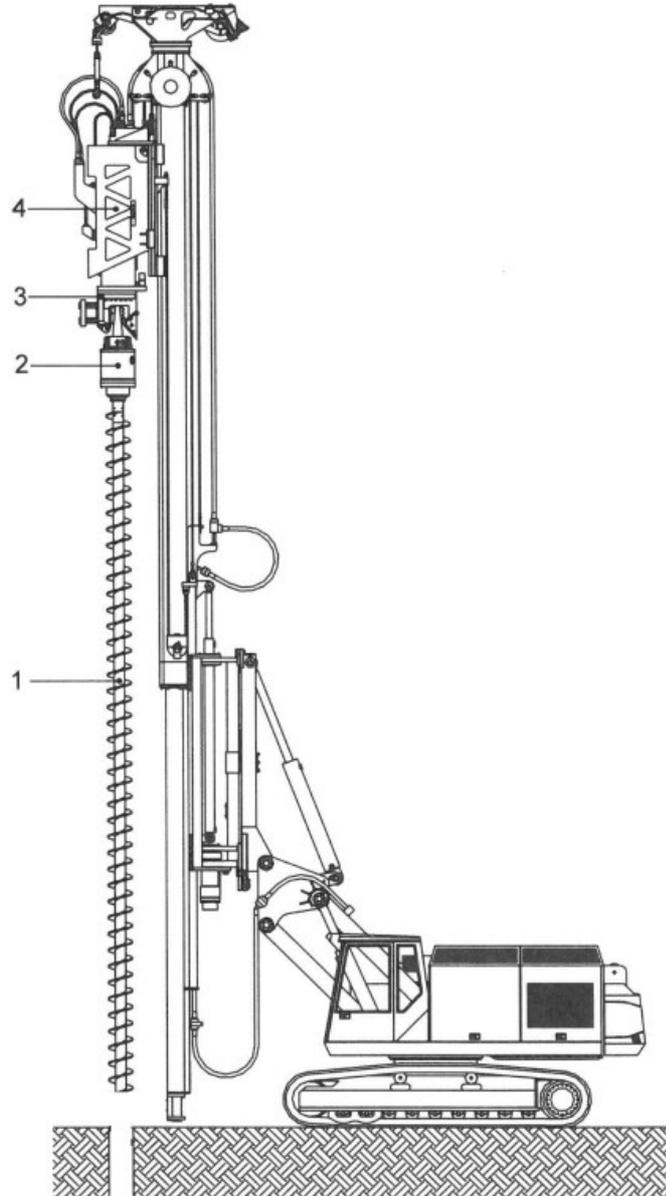
7.1.PERFORACIÓN DE ALIVIO

El procedimiento consiste en realizar una perforación por tablestaca hasta la cota a la que se pretende llegar mediante el hincado. Las perforaciones permiten aliviar las tensiones del terreno o disgregar los estratos más duros con el objeto de facilitar la hinca.

Para ello se emplea una perforadora rotativa acoplada la máquina de hinca.

¹ La información de ambos procedimientos ha sido facilitada por TABLESTACAS VIROSQUE

- 1 Tornillo sinfín
- 2 Accionamiento de perforación
- 3 Pinza de sujeción
- 4 Vibrador

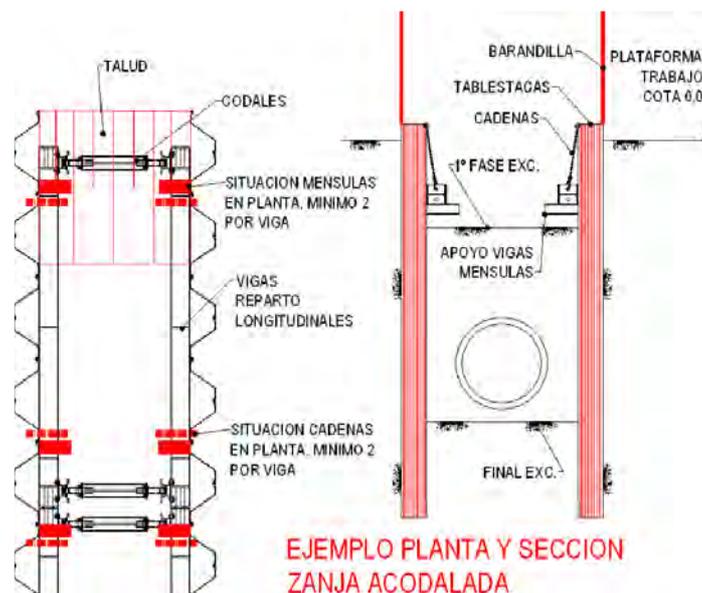


Componente	Descripción/función
Tornillo sinfín	Penetra en el terreno y extrae material de la perforación.
Accionamiento de perforación	<p>Genera el par y el movimiento de giro para el tornillo sinfín.</p> <p>El accionamiento de perforación se sujeta con la pinza de sujeción o se fija directamente al carro del mástil.</p>

Pinza de sujeción	Unión resistente a las vibraciones entre la celda de mecanismo y el pilote o el accionamiento de perforación.
Vibrador	Genera vibraciones de alta frecuencia y las transmite al pilote a través de la pinza de sujeción.

7.2.SISTEMA DE ARRIOSTRADO

Como descripción general, se entiende la ejecución de un arriostrado como un entramado compuesto por perfilería metálica dispuesta perimetralmente y arriostrada con codales, perpendiculares u oblicuos, que confiere al conjunto una mayor rigidez para soportar las fuerzas laterales. La diferencia fundamental con la excavación al abrigo de pantallas calculadas en ménsula o voladizo, es que para poder llegar a la excavación máxima necesaria, será necesario realizar una serie de fases de excavación a fin de poder colocar el arriostrado a la cota solicitada.



El sistema de arriostrado está constituido por:

- Vigas

- Codales
- Cadenas
- Elementos de unión
- Ménsulas de apoyo suministradas y soldadas

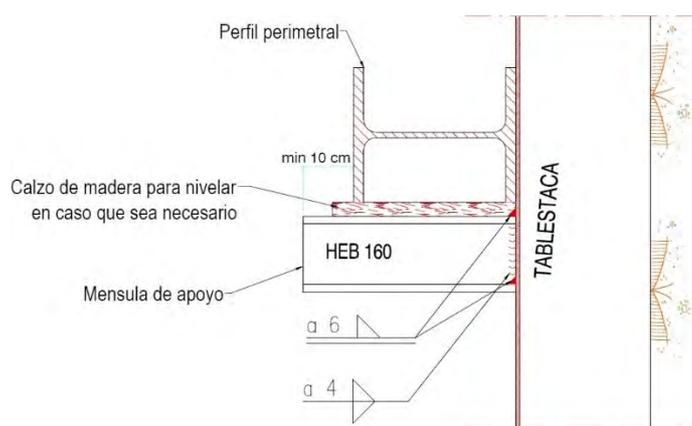
Se establecen las siguientes fases de ejecución

1. Excavación

Se procederá a excavar en el terreno hasta un máximo de 0,5 m por debajo de la cota de apuntalamiento, no pudiendo continuar excavando hasta la completa colocación del apuntalamiento

2. Colocación de ménsulas de apoyo

Previo a la ejecución o montaje del arriostrado, deberán colocarse en las tablestacas, como elemento de principal de seguridad, ménsulas de apoyo soldadas en posición tal, que permitan posteriormente un correcto posicionado de la viga de reparto.



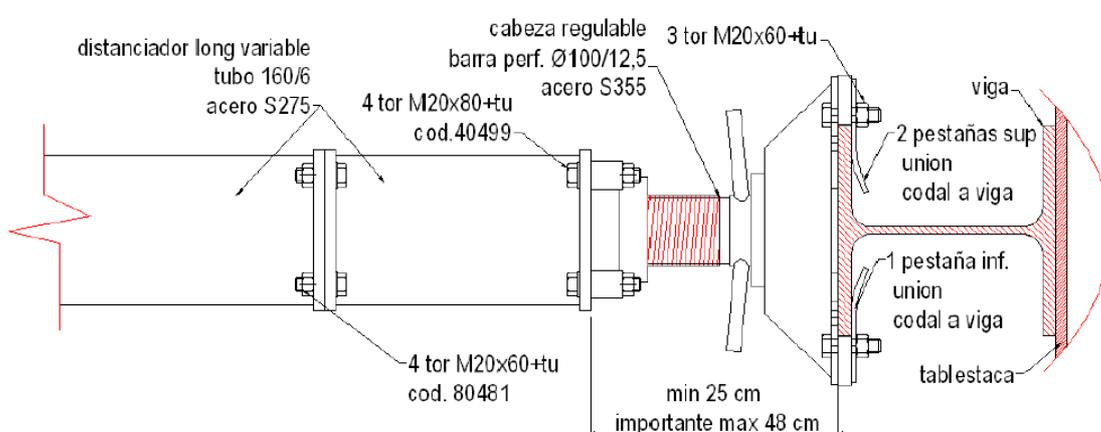
3. Colocación de vigas de reparto y cadenas

Una vez soldadas las ménsulas a las tablestacas, y sin haber excavado más zanja, se colocarán las vigas de reparto sobre las mismas con la ayuda de un

medio de elevación adecuado, nivelándolas a la cota indicada.

4. Colocación de los codales

Los codales están formados por distanciadores centrales y cabezas fijas o regulables en sus extremos. Se procede a unirlos a las vigas perimetrales mediante las pestañas que disponen los cabezales



Una vez ejecutado todo el recinto según indicaciones, puede continuarse con la excavación hasta cota final o, si la hubiera, la siguiente cota de arriostrado

8. METODOLOGÍA DE CÁLCULO

Para el cálculo general de las estructuras se han modelizado los diferentes elementos metálicos y de hormigón mediante el programa Dlubal de elementos finitos bien como elementos superficiales o elementos barras realizando un cálculo tridimensional de los mismos.

Para el cálculo local de diferentes elementos como vigas de gran canto, uniones metálicas o cálices de cimentación se han empleado otros programas o módulos partiendo de los resultados obtenidos en el cálculo general.

La estrategia de cálculo ha sido comprobar cada estructura que conforma la estructura completa objeto de este anejo de manera aislada.

Así se ha realizado un modelo para la obra de toma con aletas incluidas. Otro para la arqueta del filtro de cadenas y la cántara, incluyendo la cubierta. Otro para la losa de la estación de bombeo. Y otro para el cálculo de las cimentaciones. De esta manera se ha considerado que la cántara, la losa de la estación de bombeo y sus cimentaciones forman elementos no conectados entre sí.

Para el cálculo de las cimentaciones se ha modelado de manera simplificada el edificio prefabricado de manera que se obtuvieran esfuerzos equivalentes en la cimentación para las cargas de peso propio, nieve, viento, equipos mecánicos y sobrecargas.

Para el cálculo de los muros con huecos de paso a todo ancho en su base y por tanto desconectados de las losas de cimentación, cuyas relación entre la luz (longitud) y el canto (altura) sea inferior a 2, se han modelizado como vigas de gran canto.

Todos los listados de cálculo se muestran en el capítulo 12 del presente anejo.

Por último para el cálculo de la flotabilidad de la tubería de entrada se han realizado cálculos a mano que se presentan en este anejo en el capítulo 6.

9.SOFTWARE DE CÁLCULO EMPLEADO

- RFEM 5 (Dlubal) ver.5.23: programa de análisis estructural por elementos finitos RFEM permite el modelado, así como también el cálculo y dimensionamiento de estructuras 2D y 3D compuestas de elementos de barras, placas, muros, láminas y sólidos. Número de licencia 127506

- Módulo vigas de gran canto, de CYPE Ingenieros ver.2020.e,: Dimensionado y comprobación de vigas de gran canto de hormigón armado y de sección rectangular. Número de licencia 143562
- IDEA STÁTICA ver.20.1: Software para el análisis estructural y diseño de uniones metálicas. Licencia STANDALONE Single-Lifetime

10. NORMATIVA DE APLICACIÓN

- Código Técnico de la Edificación.
- EHE-08.
- Eurocódigo 3 de Estructuras Metálicas.

11.COMBINACIONES

11.1.COEFICIENTES ψ

Las acciones se definen, en su magnitud, por sus valores representativos. Este valor se utiliza para verificar los estados límite.

A) Para acciones permanentes, se considerará un único valor representativo, que coincide con el valor característico G_k .

B) Para acciones permanentes de valor no constante G_k *

- Para las acciones de origen reológico, se considerará un único valor representativo, coincidiendo con el valor característico R_k , t , correspondiente al instante "t" en el que se realiza la verificación.

- El valor representativo del empuje de la tierra se considerará de acuerdo con las disposiciones de 2.6.3.

C) Para acciones variables, se consideran los siguientes valores representativos:

- Valor característico Q_k : Valor de la acción cuando se actúa solo.
- Valor de combinación $\Psi_0 \cdot Q_k$: Valor de la acción cuando se actúa en compañía de alguna otra acción variable.
- Valor frecuente $\Psi_1 \cdot Q_k$: Valor de la acción que se excede durante un período de corta duración con respecto a la vida útil de la estructura.
- Valor casi permanente $\Psi_2 \cdot Q_k$: Valor de la acción que se supera durante gran parte de la vida útil de la estructura.

D) Para acciones accidentales, se considera un único valor representativo que coincide con el valor característico. Solo se considera la acción del terremoto AE, k

Para acciones accidentales, se considera un único valor representativo que coincide con el valor característico.

Siendo los coeficientes de simultaneidad a aplicar en cada caso

ACCION	Ψ_0	Ψ_1	Ψ_2
Operativas	0,70	0,70	0,60
Viento	0,60	0,20	0,00
Nieve	0,70	0,50	0,40
Temperatura	0,60	0,50	0,00

11.2. COEFICIENTES PARCIALES DE SEGURIDAD PARA ACCIONES PERSISTENTES

Los siguientes factores parciales de seguridad de las acciones se definen para la verificación de los estados límite últimos, tanto en situaciones persistentes o transitorias.

SITUACIONES PERSISTENTES O TRANSITORIAS E.L.U.		Tipo de Acción	
		Permanente	Variable
Efecto	favorable	$\gamma_G = 1,00$	$\gamma_Q = 0,00$ $\gamma_w = 0,00$
	desfavorable	$\gamma_G = 1,35$	$\gamma_Q = 1,5$ $\gamma_w = 1,2$

Los coeficientes $\gamma_G = 1.0$ y $\gamma_Q = 1.35$, se aplicarán a la totalidad de la acción, según su efecto sea favorable o desfavorable.

Cuando el comportamiento de la estructura puede ser muy sensible a las variaciones de las acciones permanentes de una parte de la estructura a otra, las partes favorables y desfavorables de la misma acción se considerarán acciones separadas, aplicando coeficientes γ_G específicos y diferentes para cada una. . de ellos. Los valores de estos coeficientes serán:

- Para la parte favorable de la acción $\gamma_{G1} = 0.9$
- Para la parte desfavorable de la acción $\gamma_{G2} = 1,1$

Los siguientes factores parciales de seguridad de las acciones se definen para la verificación de los estados límite de servicio.

E.L.S		Tipo de Acción	
		Permanente	Variable
Efecto	favorable	$\gamma_G = 1,00$	$\gamma_Q = 0$ $\gamma_w = 0$
	desfavorable	$\gamma_G = 1,00$	$\gamma_Q = 1,00$ $\gamma_w = 1,00$

11.3. ESTADOS LÍMITE

Para cada una de las situaciones descritas, en los diferentes estados límite, se establecerán las posibles combinaciones de acciones utilizadas en el dimensionamiento de las diferentes secciones

11.3.1. ESTADO LÍMITE ÚLTIMO

Las combinaciones de las diferentes acciones consideradas en estas situaciones se llevarán a cabo de acuerdo con los siguientes criterios:

A) Situaciones persistentes y transitorias.

$$\sum_{j \geq 1} \gamma_{G,j} \cdot G_{k,j} + \sum_{j \geq 1} \gamma_{G^*,j} \cdot G_{k,j}^* + \gamma_{Q,1} \cdot \Psi_{1,1} \cdot Q_{k,1} + \sum_{l > 1} \gamma_{Q,l} \cdot \Psi_{0,l} \cdot Q_{k,l}$$

$G_{k,j}$ Valor característico de cada acción permanente

$G_{k,j}^*$ Valor característico de cada acción permanente de valor no constante

$Q_{k,1}$ Valor característico de la acción variable determinante

$\Psi_{1,1} \cdot Q_{k,1}$ Valor frecuente de la acción variable determinante

$\Psi_{0,i} \cdot Q_{k,i}$ Valores de combinación de las acciones variables concomitantes con la acción variable determinante

- $\Psi_{2,i} \cdot Q_{k,i}$ Valores cuasi-permanentes de las acciones variables concomitantes con la acción determinante o con la acción accidental
- $A_{E,k}$ Valor característico de la acción sísmica

11.3.2. ESTADO LÍMITE DE SERVICIO

Para estos estados solo se considerarán situaciones persistentes y transitorias,

Las combinaciones de las diferentes acciones consideradas en estas situaciones se llevarán a cabo de acuerdo con los siguientes criterios:

A) Combinación características:

$$\sum_{j \leq 1} \gamma_{G,j} \cdot G_{k,j} + \sum_{j \geq 1} \gamma_{G^*,j} \cdot G_{k,j}^* + \gamma_{Q,1} + \sum_{i > 1} \gamma_{Q,i} \cdot \Psi_{0,i} \cdot Q_{k,i}$$

B) Combinación Frecuente:

$$\sum_{j \leq 1} \gamma_{G,j} \cdot G_{k,j} + \sum_{j \geq 1} \gamma_{G^*,j} \cdot G_{k,j}^* + \gamma_{Q,1} \cdot \Psi_{1,1} \cdot Q_{k,1} + \sum_{i > 1} \gamma_{Q,i} \cdot \Psi_{2,i} \cdot Q_{k,i}$$

C) Combinación Cuasi-permanente:

$$\sum_{j \leq 1} \gamma_{G,j} \cdot G_{k,j} + \sum_{j \geq 1} \gamma_{G^*,j} \cdot G_{k,j}^* + \sum_{i > 1} \gamma_{Q,i} \cdot \Psi_{2,i} \cdot Q_{k,i}$$

- $G_{k,j}$ Valor característico de cada acción permanente
- $G_{k,j}^*$ Valor característico de cada acción permanente de valor no constante

$Q_{k,1}$	Valor característico de la acción variable determinante
$\Psi_{1,1} \cdot Q_{k,1}$	Valor frecuente de la acción variable determinante
$\Psi_{0,i} \cdot Q_{k,1}$	Valores de combinación de las acciones variables concomitantes con la acción variable determinante
$\Psi_{2,i} \cdot Q_{k,1}$	Valores cuasi-permanentes de las acciones variables concomitantes con la acción determinante o con la acción accidental

12. CÁLCULO

12.1. OBRA DE TOMA

Model - General Data

General	Model name	: OBRA DE TOMA
	Project name	: CANAL SAN JOSE
	Type of model	: 3D
	Positive direction of global axis Z	: Upward
	Classification of load cases and combinations	: According to Standard: EN 1990 National Annex: UNE - España
	x Automatically create combinations	: x Load Combinations
	<hr/>	
Options	- RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures	
	- RF-CUTTING-PATTERN	
	- Piping analysis	
	- Use CQC Rule	
	- Enable CAD/BIM model	
	Standard Gravity	g

FE Mesh Settings

General	Target length of finite elements	l_{FE}	: 0.500 m
	Maximum distance between a node and a line to integrate it into the line	ϵ	: 0.001 m
	Maximum number of mesh nodes (in thousands)		: 500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		: 10
	x Activate member divisions for large deformation or post-critical analysis		
	x Use division for members with node lying on them		
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	: 1.800
	Maximum out-of-plane inclination of two finite elements	α	: 0.50 °
	Shape direction of finite elements		: Triangles and quadrangles x Same squares where possible

1.3 Materials

Matl. No.	Modulus E [kN/cm ²]	Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m ³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Concrete C30/37 EN 1992-1-1:2004/A1:2014 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
2	Steel S 275 EN 10025-2:2004-11 21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
3	Concrete C30/37 EN 1992-1-1:2004/A1:2014 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 Surfaces

Surface No.	Surface Type		Boundary Lines No.	Matl. No.	Thickness		Area A [m ²]	Weight W [kg]
	Geometry	Stiffness			Type	d [mm]		
1	Plane	Standard	7,13,10,17,21,30,25,28	3	Constant	500.0	24.528	30659.50
2	Plane	Standard	6,12,9,15,20,24,23,27	3	Constant	500.0	24.528	30659.50
3	Plane	Standard	19,24,22,30	3	Constant	500.0	9.498	11872.30
4	Plane	Standard	8,15,18,17	3	Constant	300.0	6.688	5015.85
5	Plane	Standard	2,28,26,27	3	Constant	600.0	16.242	24362.70
6	Plane	Standard	5,13,11,12	3	Constant	250.0	2.810	1756.25
7	Plane	Standard	3,6,14,29	3	Constant	250.0	7.250	4531.12
8	Plane	Standard	4,7,16,31	3	Constant	250.0	7.250	4531.12
9	Plane	Standard	1,4,2,3	3	Constant	350.0	25.277	22116.90

1.4.1 Surfaces - Eccentricities

Surface No.	Eccentricity e _z [mm]	Comment
1	250.0	
2	250.0	
3	250.0	
4	150.0	
6	150.0	
9	-130.0	

1.9 Surface Supports

Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m ³]			Shear Spring [kN/m]	
			u _x	u _y	u _z	V _{xz}	V _{yz}
1	5,9	-	x	x	90000.000	-	-

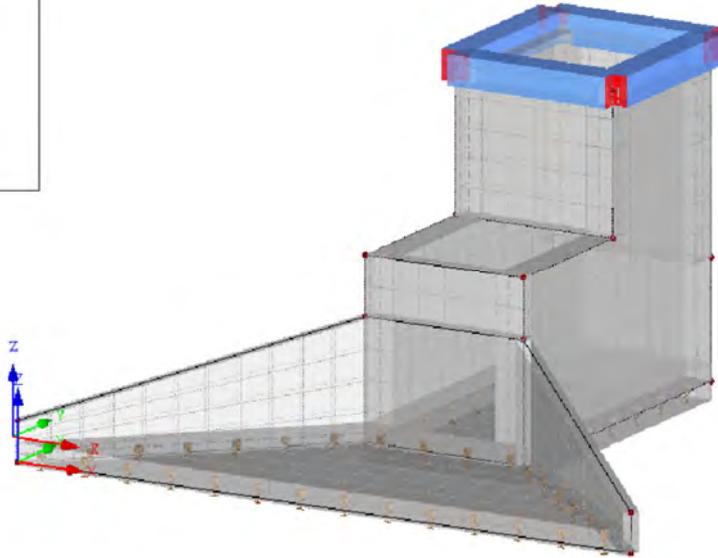
1.13 Cross-Sections

Section No.	Matl. No.	J [cm ⁴] A [cm ²]	I _y [cm ⁴] A _y [cm ²]	I _z [cm ⁴] A _z [cm ²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm]	
							Width b	Height h
1	Rectángulo 500/500							
	1	879166.69 2500.00	520833.34 2083.33	520833.33 2083.33	0.00	0.00	500.0	500.0

Model



Isometric



Máx. a-s,1,+z (inferior): 36.35, Min. a-s,1,+z (inferior): 0.00 cm²/m

LC2

EMPUJE DE TIERRAS

3.4 Surface Loads

LC2: EMPUJE DE TIERRAS

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters		On Node No.
						Value	Unit	
1	7,8	Force	Linear in Z	z	p ₁	21.00	kN/m ²	2
					p ₂	0.00	kN/m ²	12

LC2

EMPUJE DE TIERRAS

3.8 Free Rectangular Loads

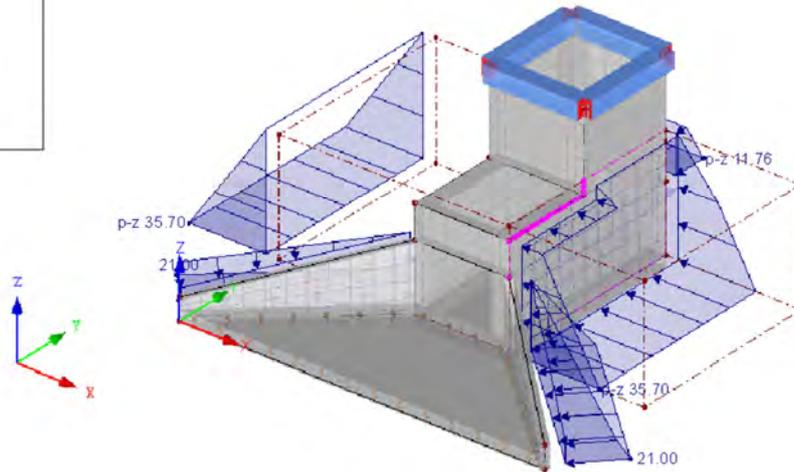
LC2: EMPUJE DE TIERRAS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Symbol	Magnitude		Load Position		
						Value	Unit	X [m]	Y [m]	Z [m]
1	1	YZ	Linear Z	z	p ₁	35.70	kN/m ²		3.690	0.000
					p ₂	0.00	kN/m ²			9.470
2		YZ	Linear Z	z	p ₁	35.70	kN/m ²		3.690	0.000
					p ₂	0.00	kN/m ²			9.470
3	3	XZ	Linear Z	z	p ₁	11.76	kN/m ²	6.850		2.000
					p ₂	0.00	kN/m ²			4.040

LC2: SOBRE CARGA

LC2: EMPUJE DE TIERRAS
 Cargas [kN/m²]

Isometric



Máx u-z: 1.5, Mín. u-z: -0.9 mm

LC3

EMPUJE DE AGUAS

3.4 Surface Loads

LC3: EMPUJE DE AGUAS

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters		On Node No.
						Value	Unit	
1	7,8	Force	Linear in Z	z	p ₁	-20.00	kN/m ²	1
						0.00	kN/m ²	11
2	9	Force	Uniform	z	p	20.00	kN/m ²	

LC3

EMPUJE DE AGUAS

3.8 Free Rectangular Loads

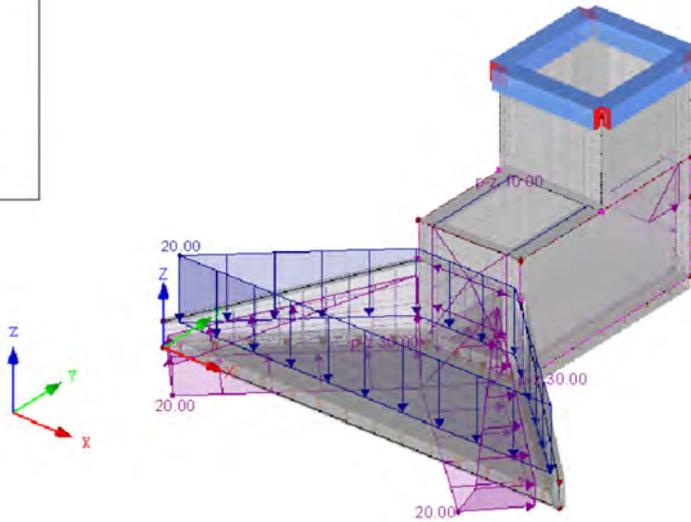
LC3: EMPUJE DE AGUAS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Symbol	Magnitude		Load Position		
						Value	Unit	X [m]	Y [m]	Z [m]
1	1,2	YZ	Linear Z	z	p ₁	-30.00	kN/m ²		3.690	0.000
						0.00	kN/m ²		9.470	3.000
2	3	XZ	Linear Z	z	p ₁	-10.00	kN/m ²	4.040		2.000
						0.00	kN/m ²	6.850		3.000

LC3: EMPUJE DE TIERRAS

LC3: EMPUJE DE AGUAS
Cargas [kN/m²]

Isometric



Máx u-z: 1.5, Mín. u-z: -0.9 mm

LC4

FREÁTICO

3.4 Surface Loads

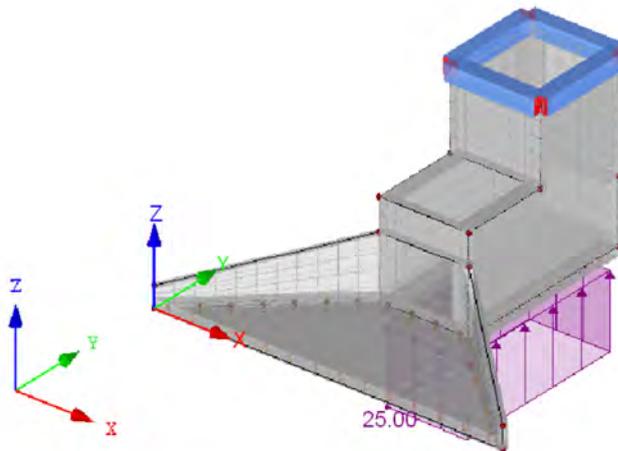
LC4: FREÁTICO

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters	
						Value	Unit
1	5	Force	Uniform	z	p	-25.00	kN/m ²

LC4: EMPUJE DE AGUAS

LC4: FREÁTICO
Cargas [kN/m²]

Isometric



Máx u-z: 1.5, Mín. u-z: -0.9 mm

LC5

SOBRECARGA

3.15 Generated Loads

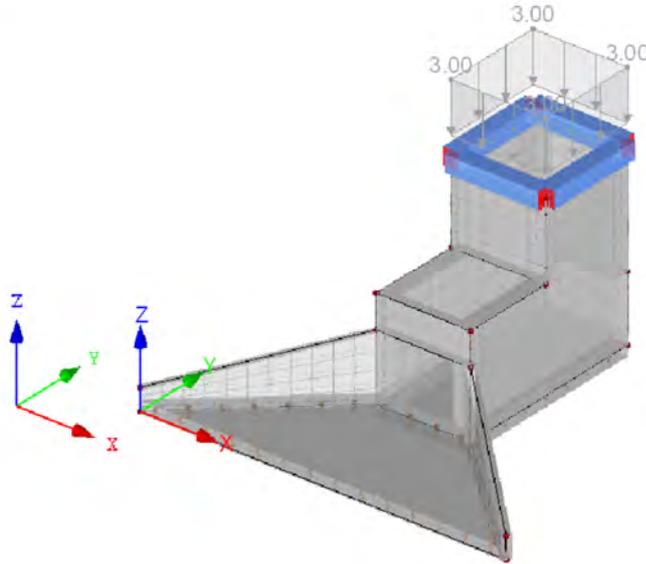
LC5: SOBRECARGA

No.	Load Description			
1	From Area Loads via Plane			
	Area load direction	Perpendicular to the plane	:	x z
	Member load direction	Direction of generated member loads:	:	x Global in X, Y, Z
	Area of load application	x Fully closed plane		
	Load distribution type:	x Combined		
	Area load magnitude	x Constant	:	3.00 kN/m ²
	Boundary of the area load plane	Corner nodes	:	15,17,18,16
		Note	:	Each row in the drop down list box denotes one plane
	Generating total loads in direction	ΣP_{Areas}	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -25.459 kN
		$\Sigma P_{Members}$	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -25.459 kN
	Total moment to the origin	ΣM_{Areas}	X	: -202.650 kNm
			Y	: 138.622 kNm
			Z	: 0.000 kNm
		$\Sigma M_{Members}$	X	: -202.650 kNm
			Y	: 138.622 kNm
			Z	: 0.000 kNm
	Cells selected for generating	Σ number of cells	:	1
		Σ cell area	:	8.486 m ²
	Convert loads to members No.		:	1-4

LC5: EQUIPOS MECÁNICOS

LC5: SOBRECARGA
Cargas [kN/m²]

Isometric



Máx u-z: 1.5, Mín. u-z: -0.9 mm

LC6
NIEVE

LC6: NIEVE

3.15 Generated Loads

No.	Load Description	
1	From Snow Loads (Flat/Monopitch Roof)	
	Snow load parameters	According to Standard : CTE DB-SE-AE National Annex : Spain Snow load zone Z : 3 Altitude A : 650.000 m Ground snow load s_k : 0.35 kN/m ² Topography type : Normal
	Coefficients	Exposure C_e : 1.00
	Roof geometry	Node A : 15 B : 17 C : 18 D : 16
	Generate LC	x LC s1 : LC6
	Create load type	x Member loads
	Load distribution type	x Combined
	Generate snow loads on members No.	: 1-4
	Parameters	A_R : 8.486 m ² α : 0.0 ° S_k : 0.35 kN/m ²

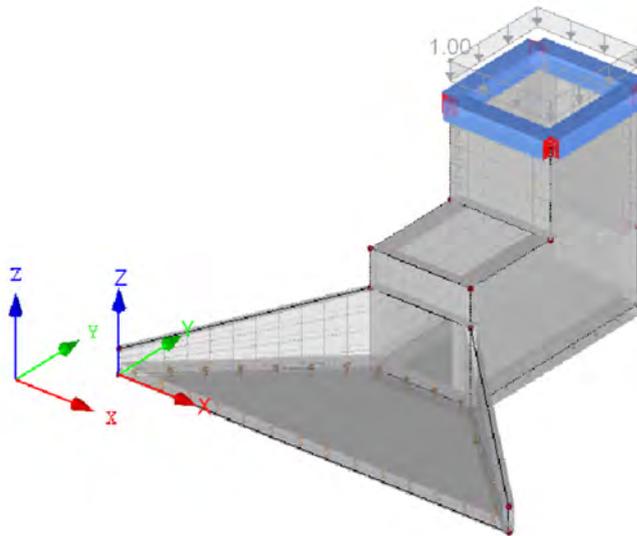
3.15 Generated Loads

No.	Load Description		
		μ_1	: 1.000
		s_1	: 1.00 kN/m ²
Generated total loads	ΣP_{Areas}	: 8.486	kN
	ΣP	: 8.486	kN
Total moment to the origin	ΣM_{Areas}	: 81.842	kNm
	ΣM	: 81.842	kNm
Cells selected for generating	Σ number of cells	: 1	
	Σ cell area	: 8.486	m ²

LC6: NIEVE

LC6: NIEVE
 Cargas [kN/m²]

Isometric



Máx u-z: 1.5, Mín u-z: -0.9 mm

4.12 Cross-Sections - Internal Forces

Result Combinations

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
Section No. 1: Rectángulo 500/500											
1	RC1	15	0.000	Max N	> 4.11	0.65	6.25	0.52	-2.80	0.75	CO 47
			Left	Min N	> -1.81	5.35	7.29	0.25	-3.51	9.81	CO 4
				Max V _y	0.78	> 6.18	7.57	0.53	-3.86	10.07	CO 40
				Min V _y	1.53	> -0.19	5.96	0.24	-2.45	0.49	CO 11
				Max V _z	-0.72	5.79	> 8.06	0.54	-4.12	10.09	CO 36
				Min V _z	3.02	0.21	> 5.47	0.23	-2.18	0.47	CO 1
				Max M _T	-0.71	5.79	8.05	> 0.54	-4.12	10.09	CO 37
				Min M _T	3.02	0.20	5.48	> 0.23	-2.19	0.47	CO 14
				Max M _y	3.02	0.21	5.47	0.23	> -2.18	0.47	CO 1
				Min M _y	-0.72	5.79	8.06	0.54	> -4.12	10.09	CO 36

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
		16	0.000 Right	Max M _z	-0.71	5.79	8.05	0.54	-4.12	> 10.09	CO 37
				Min M _z	3.02	0.21	5.47	0.23	-2.18	> 0.47	CO 1
				Max N	> 4.11	0.65	6.25	0.52	-2.80	0.75	CO 47
				Min N	> -1.81	5.35	7.29	0.25	-3.51	9.81	CO 4
				Max V _y	0.78	> 6.18	7.57	0.53	-3.86	10.07	CO 40
				Min V _y	1.53	> -0.19	5.96	0.24	-2.45	0.49	CO 11
				Max V _z	-0.72	5.79	> 8.06	0.54	-4.12	10.09	CO 36
				Min V _z	3.02	0.21	> 5.47	0.23	-2.18	0.47	CO 1
				Max M _T	-0.71	5.79	8.05	> 0.54	-4.12	10.09	CO 37
				Min M _T	3.02	0.20	5.48	> 0.23	-2.19	0.47	CO 14
				Max M _y	3.02	0.21	5.47	0.23	> -2.18	0.47	CO 1
				Min M _y	-0.72	5.79	8.06	0.54	> -4.12	10.09	CO 36
			1.405 Left	Max M _z	-0.71	5.79	8.05	0.54	-4.12	> 10.09	CO 37
				Min M _z	3.02	0.21	5.47	0.23	-2.18	> 0.47	CO 1
				Max N	> 8.69	7.42	0.73	0.34	-0.36	-0.23	CO 2
				Min N	> -9.96	-0.00	0.00	-0.00	1.22	-0.81	CO 43
				Max V _y	8.47	> 7.42	0.73	0.34	-0.16	-0.38	CO 40
				Min V _y	-9.91	> -0.00	0.00	-0.00	1.17	-0.78	CO 12
				Max V _z	8.47	7.42	> 0.73	0.34	-0.16	-0.38	CO 40
				Min V _z	-4.08	0.00	> 0.00	0.00	0.60	-0.53	CO 1
				Max M _T	2.80	7.42	0.73	> 0.34	0.26	-0.52	CO 36
				Min M _T	-9.93	-0.00	0.00	> -0.00	1.20	-0.79	CO 27
				Max M _y	-9.96	-0.00	0.00	-0.00	> 1.22	-0.81	CO 43
				Min M _y	8.69	7.42	0.73	0.34	> -0.36	-0.23	CO 2
			1.405 Right	Max M _z	8.69	7.42	0.73	0.34	-0.36	> -0.23	CO 2
				Min M _z	-9.96	-0.00	0.00	-0.00	1.22	> -0.81	CO 43
				Max N	> 8.69	7.42	0.73	0.34	-0.36	-0.23	CO 2
				Min N	> -9.96	-0.00	0.00	-0.00	1.22	-0.81	CO 43
				Max V _y	8.47	> 7.42	0.73	0.34	-0.16	-0.38	CO 40
				Min V _y	-9.91	> -0.00	0.00	-0.00	1.17	-0.78	CO 12
				Max V _z	8.47	7.42	> 0.73	0.34	-0.16	-0.38	CO 40
				Min V _z	-4.08	0.00	> 0.00	0.00	0.60	-0.53	CO 1
				Max M _T	2.80	7.42	0.73	> 0.34	0.26	-0.52	CO 36
				Min M _T	-9.93	-0.00	0.00	> -0.00	1.20	-0.79	CO 27
				Max M _y	-9.96	-0.00	0.00	-0.00	> 1.22	-0.81	CO 43
				Min M _y	8.69	7.42	0.73	0.34	> -0.36	-0.23	CO 2
2.810	Max M _z	8.69	7.42	0.73	0.34	-0.36	> -0.23	CO 2			
	Min M _z	-9.96	-0.00	0.00	-0.00	1.22	> -0.81	CO 43			
	Max N	> 14.23	3.02	-2.69	-0.54	-0.60	-8.71	CO 40			
	Min N	> 1.53	0.19	-5.96	-0.24	-2.45	0.49	CO 11			
	Max V _y	11.64	> 3.85	-2.40	-0.26	-0.25	-8.97	CO 4			
	Min V _y	4.11	> -0.65	-6.25	-0.52	-2.80	0.75	CO 47			
	Max V _z	13.14	3.46	> -1.92	-0.25	0.01	-8.99	CO 2			
	Min V _z	2.61	-0.26	> -6.73	-0.53	-3.06	0.77	CO 43			
	Max M _T	3.02	-0.20	-5.48	> -0.23	-2.19	0.47	CO 14			
	Min M _T	12.73	3.41	-3.17	> -0.55	-0.86	-8.69	CO 37			
	Max M _y	13.14	3.46	-1.92	-0.25	> 0.01	-8.99	CO 2			
	Min M _y	2.61	-0.26	-6.73	-0.53	> -3.06	0.77	CO 43			
RC3 15 0.000 Left	Max M _z	2.61	-0.26	-6.73	-0.53	-3.06	> 0.77	CO 43			
	Min M _z	13.14	3.46	-1.92	-0.25	0.01	> -8.99	CO 2			
	Max N	> 2.68	0.33	4.36	0.29	-1.86	0.46	CO 110			
	Min N	> -0.34	2.89	5.02	0.18	-2.32	5.33	CO 98			
	Max V _y	0.90	> 3.28	5.07	0.29	-2.43	5.43	CO 103			
	Min V _y	1.44	> -0.06	4.31	0.18	-1.76	0.36	CO 105			
	Max V _z	0.10	3.07	> 5.33	0.30	-2.57	5.44	CO 99			
	Min V _z	2.24	0.15	> 4.05	0.17	-1.62	0.35	CO 95			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
2	RC1	17	0.000	Right	Max M _T	0.10	3.07	5.33	> 0.30	-2.57	5.44	CO 100
					Min M _T	2.24	0.15	4.06	> 0.17	-1.62	0.35	CO 108
					Max M _y	2.24	0.15	4.05	0.17	> -1.62	0.35	CO 95
					Min M _y	0.10	3.07	5.33	0.30	> -2.57	5.44	CO 99
					Max M _z	0.10	3.07	5.33	0.30	-2.57	> 5.44	CO 100
					Min M _z	2.24	0.15	4.05	0.17	-1.62	> 0.35	CO 95
					Max N	> 2.68	0.33	4.36	0.29	-1.86	0.46	CO 110
					Min N	> -0.34	2.89	5.02	0.18	-2.32	5.33	CO 98
					Max V _y	0.90	> 3.28	5.07	0.29	-2.43	5.43	CO 103
				Min V _y	1.44	> -0.06	4.31	0.18	-1.76	0.36	CO 105	
				Max V _z	0.10	3.07	> 5.33	0.30	-2.57	5.44	CO 99	
				Min V _z	2.24	0.15	> 4.05	0.17	-1.62	0.35	CO 95	
				Max M _T	0.10	3.07	5.33	> 0.30	-2.57	5.44	CO 100	
				Min M _T	2.24	0.15	4.06	> 0.17	-1.62	0.35	CO 108	
				Max M _y	2.24	0.15	4.05	0.17	> -1.62	0.35	CO 95	
				Min M _y	0.10	3.07	5.33	0.30	> -2.57	5.44	CO 99	
				Max M _z	0.10	3.07	5.33	0.30	-2.57	> 5.44	CO 100	
				Min M _z	2.24	0.15	4.05	0.17	-1.62	> 0.35	CO 95	
			Max N	> 3.79	3.96	0.39	0.18	-0.07	-0.23	CO 96		
			Min N	> -6.13	-0.00	0.00	-0.00	0.75	-0.52	CO 106		
			Max V _y	3.70	> 3.96	0.39	0.18	0.01	-0.29	CO 103		
			Min V _y	-6.13	> -0.00	0.00	-0.00	0.75	-0.52	CO 106		
			Max V _z	3.70	3.96	> 0.39	0.18	0.01	-0.29	CO 103		
			Min V _z	-3.02	0.00	> 0.00	0.00	0.45	-0.39	CO 95		
			Max M _T	0.68	3.95	0.39	> 0.18	0.24	-0.36	CO 99		
			Min M _T	-6.13	-0.00	0.00	> -0.00	0.75	-0.52	CO 106		
			Max M _y	-6.13	-0.00	0.00	-0.00	> 0.75	-0.52	CO 106		
			Min M _y	3.79	3.96	0.39	0.18	> -0.07	-0.23	CO 96		
			Max M _z	3.79	3.96	0.39	0.18	-0.07	> -0.23	CO 96		
			Min M _z	-6.13	-0.00	0.00	-0.00	0.75	> -0.52	CO 106		
			Max N	> 3.79	3.96	0.39	0.18	-0.07	-0.23	CO 96		
			Min N	> -6.13	-0.00	0.00	-0.00	0.75	-0.52	CO 106		
			Max V _y	3.70	> 3.96	0.39	0.18	0.01	-0.29	CO 103		
			Min V _y	-6.13	> -0.00	0.00	-0.00	0.75	-0.52	CO 106		
			Max V _z	3.70	3.96	> 0.39	0.18	0.01	-0.29	CO 103		
			Min V _z	-3.02	0.00	> 0.00	0.00	0.45	-0.39	CO 95		
			Max M _T	0.68	3.95	0.39	> 0.18	0.24	-0.36	CO 99		
			Min M _T	-6.13	-0.00	0.00	> -0.00	0.75	-0.52	CO 106		
			Max M _y	-6.13	-0.00	0.00	-0.00	> 0.75	-0.52	CO 106		
			Min M _y	3.79	3.96	0.39	0.18	> -0.07	-0.23	CO 96		
			Max M _z	3.79	3.96	0.39	0.18	-0.07	> -0.23	CO 96		
			Min M _z	-6.13	-0.00	0.00	-0.00	0.75	> -0.52	CO 106		
Max N	> 8.07	1.62	-2.47	-0.30	-0.69	-4.58	CO 103					
Min N	> 1.44	0.06	-4.31	-0.18	-1.76	0.36	CO 105					
Max V _y	6.83	> 2.01	-2.42	-0.19	-0.59	-4.68	CO 98					
Min V _y	2.68	> -0.33	-4.36	-0.29	-1.86	0.46	CO 110					
Max V _z	7.63	1.80	> -2.16	-0.18	-0.45	-4.69	CO 96					
Min V _z	1.88	-0.12	> -4.62	-0.29	-2.00	0.47	CO 106					
Max M _T	2.24	-0.15	-4.06	> -0.17	-1.62	0.35	CO 108					
Min M _T	7.27	1.83	-2.72	> -0.30	-0.83	-4.57	CO 100					
Max M _y	7.63	1.80	-2.16	-0.18	> -0.45	-4.69	CO 96					
Min M _y	1.88	-0.12	-4.62	-0.29	> -2.00	0.47	CO 106					
Max M _z	1.88	-0.12	-4.62	-0.29	-2.00	> 0.47	CO 106					
Min M _z	7.63	1.80	-2.16	-0.18	-0.45	> -4.69	CO 96					
Max N	> 21.07	2.60	6.87	-0.12	-1.42	4.63	CO 40					
Min N	> 2.53	0.87	5.49	-0.08	-1.94	0.03	CO 10					

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
					Max V _y	19.67	> 3.80	6.68	0.08	-0.97	5.05	CO 4
					Min V _y	3.92	> -0.32	5.69	-0.28	-2.40	-0.39	CO 47
					Max V _z	20.40	3.16	> 7.11	-0.12	-1.45	4.83	CO 36
					Min V _z	3.19	0.32	> 5.26	-0.08	-1.92	-0.17	CO 1
					Max M _T	19.67	3.80	6.68	> 0.08	-0.97	5.05	CO 4
					Min M _T	3.92	-0.32	5.69	> -0.28	-2.40	-0.39	CO 47
					Max M _y	20.34	3.24	6.44	0.08	> -0.94	4.85	CO 2
					Min M _y	3.25	0.23	5.93	-0.28	> -2.42	-0.19	CO 43
					Max M _z	19.67	3.80	6.68	0.08	-0.97	> 5.05	CO 4
					Min M _z	3.92	-0.32	5.69	-0.28	-2.40	> -0.39	CO 47
			0.000		Max N	> 21.07	2.60	6.87	-0.12	-1.42	4.63	CO 40
			Right		Min N	> 2.53	0.87	5.49	-0.08	-1.94	0.03	CO 10
					Max V _y	19.67	> 3.80	6.68	0.08	-0.97	5.05	CO 4
					Min V _y	3.92	> -0.32	5.69	-0.28	-2.40	-0.39	CO 47
					Max V _z	20.40	3.16	> 7.11	-0.12	-1.45	4.83	CO 36
					Min V _z	3.19	0.32	> 5.26	-0.08	-1.92	-0.17	CO 1
					Max M _T	19.67	3.80	6.68	> 0.08	-0.97	5.05	CO 4
					Min M _T	3.92	-0.32	5.69	> -0.28	-2.40	-0.39	CO 47
					Max M _y	20.34	3.24	6.44	0.08	> -0.94	4.85	CO 2
					Min M _y	3.25	0.23	5.93	-0.28	> -2.42	-0.19	CO 43
					Max M _z	19.67	3.80	6.68	0.08	-0.97	> 5.05	CO 4
					Min M _z	3.92	-0.32	5.69	-0.28	-2.40	> -0.39	CO 47
			1.405		Max N	> 4.56	6.41	-0.79	0.39	0.26	0.74	CO 40
			Left		Min N	> -4.73	0.00	0.00	0.00	0.44	0.21	CO 11
					Max V _y	4.56	> 6.41	-0.79	0.39	0.26	0.74	CO 40
					Min V _y	-1.98	> 0.00	0.00	0.00	0.35	0.34	CO 1
					Max V _z	-4.33	0.00	> 0.00	0.00	0.54	0.34	CO 27
					Min V _z	1.34	6.40	> -0.79	0.39	0.24	0.47	CO 4
					Max M _T	4.56	6.41	-0.79	> 0.39	0.26	0.74	CO 40
					Min M _T	-1.98	0.00	0.00	> 0.00	0.35	0.34	CO 1
					Max M _y	-4.27	0.00	0.00	0.00	> 0.56	0.35	CO 43
					Min M _y	4.10	6.41	-0.79	0.39	> 0.15	0.60	CO 2
					Max M _z	4.56	6.41	-0.79	0.39	0.26	> 0.74	CO 40
					Min M _z	-4.73	0.00	0.00	0.00	0.44	> 0.21	CO 11
			1.405		Max N	> 4.56	6.41	-0.79	0.39	0.26	0.74	CO 40
			Right		Min N	> -4.73	0.00	0.00	0.00	0.44	0.21	CO 11
					Max V _y	4.56	> 6.41	-0.79	0.39	0.26	0.74	CO 40
					Min V _y	-1.98	> 0.00	0.00	0.00	0.35	0.34	CO 1
					Max V _z	-4.33	0.00	> 0.00	0.00	0.54	0.34	CO 27
					Min V _z	1.34	6.40	> -0.79	0.39	0.24	0.47	CO 4
					Max M _T	4.56	6.41	-0.79	> 0.39	0.26	0.74	CO 40
					Min M _T	-1.98	0.00	0.00	> 0.00	0.35	0.34	CO 1
					Max M _y	-4.27	0.00	0.00	0.00	> 0.56	0.35	CO 43
					Min M _y	4.10	6.41	-0.79	0.39	> 0.15	0.60	CO 2
					Max M _z	4.56	6.41	-0.79	0.39	0.26	> 0.74	CO 40
					Min M _z	-4.73	0.00	0.00	0.00	0.44	> 0.21	CO 11
		18	2.810		Max N	> 3.92	0.32	-5.69	0.28	-2.40	-0.39	CO 46
					Min N	> -11.32	4.73	-3.47	0.32	-2.92	-5.83	CO 3
					Max V _y	-9.94	> 5.92	-3.67	0.52	-3.38	-6.25	CO 40
					Min V _y	2.53	> -0.87	-5.49	0.08	-1.94	0.03	CO 11
					Max V _z	-10.66	5.28	> -3.23	0.33	-2.90	-6.03	CO 2
					Min V _z	3.25	-0.23	> -5.93	0.28	-2.42	-0.19	CO 43
					Max M _T	-9.94	5.92	-3.67	> 0.52	-3.38	-6.25	CO 40
					Min M _T	2.53	-0.87	-5.49	> 0.08	-1.94	0.03	CO 11
					Max M _y	3.19	-0.32	-5.26	0.08	> -1.92	-0.17	CO 1
					Min M _y	-10.60	5.36	-3.91	0.52	> -3.41	-6.05	CO 36

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
	RC3	17	0.000	Left	Max M _z	2.53	-0.87	-5.49	0.08	-1.94	> 0.03	CO 11
					Min M _z	-9.94	5.92	-3.67	0.52	-3.38	> -6.25	CO 40
					Max N	> 11.80	1.54	4.70	-0.06	-1.09	2.46	CO 103
					Min N	> 2.01	0.53	4.02	-0.06	-1.43	-0.02	CO 104
					Max V _y	11.15	> 2.09	4.65	0.03	-0.91	2.65	CO 98
					Min V _y	2.66	> -0.02	4.07	-0.14	-1.61	-0.21	CO 110
				Right	Max V _z	11.44	1.84	> 4.82	-0.05	-1.11	2.57	CO 99
					Min V _z	2.37	0.23	> 3.89	-0.06	-1.42	-0.13	CO 95
					Max M _T	11.15	2.09	4.65	> 0.03	-0.91	2.65	CO 98
					Min M _T	2.66	-0.02	4.07	> -0.14	-1.61	-0.21	CO 110
					Max M _y	11.51	1.80	4.52	0.02	> -0.90	2.55	CO 96
					Min M _y	2.30	0.27	4.19	-0.14	> -1.63	-0.11	CO 106
			0.000	Left	Max M _z	11.15	2.09	4.65	0.03	-0.91	> 2.65	CO 98
					Min M _z	2.66	-0.02	4.07	-0.14	-1.61	> -0.21	CO 110
					Max N	> 11.80	1.54	4.70	-0.06	-1.09	2.46	CO 103
					Min N	> 2.01	0.53	4.02	-0.06	-1.43	-0.02	CO 104
					Max V _y	11.15	> 2.09	4.65	0.03	-0.91	2.65	CO 98
					Min V _y	2.66	> -0.02	4.07	-0.14	-1.61	-0.21	CO 110
				Right	Max V _z	11.44	1.84	> 4.82	-0.05	-1.11	2.57	CO 99
					Min V _z	2.37	0.23	> 3.89	-0.06	-1.42	-0.13	CO 95
					Max M _T	11.15	2.09	4.65	> 0.03	-0.91	2.65	CO 98
					Min M _T	2.66	-0.02	4.07	> -0.14	-1.61	-0.21	CO 110
					Max M _y	11.51	1.80	4.52	0.02	> -0.90	2.55	CO 96
					Min M _y	2.30	0.27	4.19	-0.14	> -1.63	-0.11	CO 106
		18	1.405	Left	Max M _z	11.15	2.09	4.65	0.03	-0.91	> 2.65	CO 98
					Min M _z	2.66	-0.02	4.07	-0.14	-1.61	> -0.21	CO 110
					Max N	> 1.96	3.42	-0.42	0.21	0.20	0.44	CO 103
					Min N	> -2.93	0.00	0.00	0.00	0.31	0.18	CO 105
					Max V _y	1.96	> 3.42	-0.42	0.21	0.20	0.44	CO 103
					Min V _y	-1.46	> 0.00	0.00	0.00	0.26	0.25	CO 95
				Right	Max V _z	-1.28	0.00	> 0.00	0.00	0.30	0.31	CO 109
					Min V _z	0.31	3.41	> -0.42	0.21	0.20	0.32	CO 98
					Max M _T	1.96	3.42	-0.42	> 0.21	0.20	0.44	CO 103
					Min M _T	-1.46	0.00	0.00	> 0.00	0.26	0.25	CO 95
					Max M _y	-2.75	0.00	0.00	0.00	> 0.35	0.24	CO 106
					Min M _y	1.78	3.42	-0.42	0.21	> 0.15	0.39	CO 96
			2.810	Left	Max M _z	1.96	3.42	-0.42	0.21	0.20	> 0.44	CO 103
					Min M _z	-2.93	0.00	0.00	0.00	0.31	> 0.18	CO 105
					Max N	> 1.96	3.42	-0.42	0.21	0.20	0.44	CO 103
					Min N	> -2.93	0.00	0.00	0.00	0.31	0.18	CO 105
					Max V _y	1.96	> 3.42	-0.42	0.21	0.20	0.44	CO 103
					Min V _y	-1.46	> 0.00	0.00	0.00	0.26	0.25	CO 95
				Right	Max V _z	-1.28	0.00	> 0.00	0.00	0.30	0.31	CO 109
					Min V _z	0.31	3.41	> -0.42	0.21	0.20	0.32	CO 98
					Max M _T	1.96	3.42	-0.42	> 0.21	0.20	0.44	CO 103
					Min M _T	-1.46	0.00	0.00	> 0.00	0.26	0.25	CO 95
					Max M _y	-2.75	0.00	0.00	0.00	> 0.35	0.24	CO 106
					Min M _y	1.78	3.42	-0.42	0.21	> 0.15	0.39	CO 96

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
3	RC1	15	0.000	Max M _T	-4.73	3.00	-2.99	> 0.27	-2.14	-3.34	CO 103
				Min M _T	2.01	-0.53	-4.02	> 0.06	-1.43	-0.02	CO 105
				Max M _y	2.37	-0.23	-3.89	0.06	> -1.42	-0.13	CO 95
				Min M _y	-5.08	2.71	-3.12	0.27	> -2.15	-3.23	CO 99
				Max M _z	2.01	-0.53	-4.02	0.06	-1.43	> -0.02	CO 105
				Min M _z	-4.73	3.00	-2.99	0.27	-2.14	> -3.34	CO 103
				Max N	> 1.58	-3.30	-1.74	-0.79	-0.90	-0.73	CO 47
				Min N	> -9.69	-11.18	-4.45	-0.93	-1.43	-6.15	CO 4
				Max V _y	0.90	> -1.49	-1.98	-0.49	-0.49	-0.56	CO 11
				Min V _y	-9.01	> -13.00	-4.21	-1.23	-1.84	-6.32	CO 40
				Max V _z	1.16	-2.35	> -1.44	-0.53	-0.54	-0.51	CO 1
				Min V _z	-9.27	-12.14	> -4.75	-1.20	-1.79	-6.37	CO 36
				Max M _T	0.90	-1.50	-1.98	> -0.49	-0.49	-0.56	CO 10
				Min M _T	-9.02	-12.99	-4.21	> -1.23	-1.84	-6.32	CO 39
				Max M _y	0.90	-1.50	-1.98	-0.49	> -0.49	-0.56	CO 10
				Min M _y	-9.02	-12.99	-4.21	-1.23	> -1.84	-6.32	CO 39
				Max M _z	1.16	-2.35	-1.44	-0.53	-0.54	> -0.51	CO 1
				Min M _z	-9.27	-12.14	-4.75	-1.20	-1.79	> -6.37	CO 36
	Max N	> 14.12	2.50	1.59	0.72	0.85	4.50	CO 36			
	Min N	> 0.48	2.60	2.33	0.51	-0.02	-0.39	CO 1			
	Max V _y	0.93	> 3.49	2.46	0.75	-0.36	-0.62	CO 47			
	Min V _y	13.67	> 1.61	1.45	0.48	1.20	4.73	CO 4			
	Max V _z	1.17	2.68	> 2.91	0.68	-0.21	-0.45	CO 44			
	Min V _z	13.43	2.42	> 1.01	0.55	1.05	4.56	CO 7			
	Max M _T	13.88	3.32	1.14	> 0.79	0.70	4.33	CO 40			
	Min M _T	0.72	1.78	2.77	> 0.44	0.14	-0.22	CO 11			
	Max M _y	13.66	1.61	1.46	0.48	> 1.20	4.73	CO 3			
	Min M _y	0.93	3.49	2.46	0.75	> -0.36	-0.62	CO 47			
	Max M _z	13.67	1.61	1.45	0.48	1.20	> 4.73	CO 4			
	Min M _z	0.93	3.49	2.46	0.75	-0.36	> -0.62	CO 47			
	Max N	> 1.03	-2.12	-1.19	-0.50	-0.54	-0.46	CO 110			
	Min N	> -4.93	-6.45	-2.67	-0.61	-0.87	-3.38	CO 98			
	Max V _y	0.72	> -1.28	-1.36	-0.37	-0.37	-0.40	CO 105			
	Min V _y	-4.62	> -7.29	-2.50	-0.73	-1.05	-3.44	CO 103			
	Max V _z	0.86	-1.74	> -1.07	-0.39	-0.40	-0.38	CO 95			
	Min V _z	-4.76	-6.83	> -2.79	-0.71	-1.02	-3.47	CO 99			
Max M _T	0.72	-1.29	-1.35	> -0.37	-0.37	-0.40	CO 104				
Min M _T	-4.62	-7.29	-2.50	> -0.73	-1.05	-3.44	CO 102				
Max M _y	0.72	-1.29	-1.35	-0.37	> -0.37	-0.40	CO 104				
Min M _y	-4.62	-7.29	-2.50	-0.73	> -1.05	-3.44	CO 102				
Max M _z	0.86	-1.74	-1.07	-0.39	-0.40	> -0.38	CO 95				
Min M _z	-4.76	-6.83	-2.79	-0.71	-1.02	> -3.47	CO 99				
Max N	> 7.57	1.75	1.31	0.46	0.50	2.35	CO 99				
Min N	> 0.35	1.92	1.73	0.38	-0.01	-0.29	CO 95				
Max V _y	0.54	> 2.28	1.78	0.48	-0.15	-0.38	CO 110				
Min V _y	7.39	> 1.40	1.26	0.36	0.63	2.44	CO 98				
Max V _z	0.66	1.85	> 2.02	0.44	-0.07	-0.29	CO 107				
Min V _z	7.26	1.83	> 1.02	0.40	0.55	2.35	CO 101				
Max M _T	7.44	2.19	1.08	> 0.49	0.41	2.26	CO 103				
Min M _T	0.48	1.49	1.96	> 0.34	0.07	-0.20	CO 105				
Max M _y	7.38	1.40	1.26	0.36	> 0.63	2.44	CO 97				
Min M _y	0.54	2.28	1.78	0.48	> -0.15	-0.38	CO 109				
Max M _z	7.39	1.40	1.26	0.36	0.63	> 2.44	CO 98				
Min M _z	0.54	2.28	1.78	0.48	-0.15	> -0.38	CO 110				
Max N	> 13.52	-2.67	3.33	0.54	-0.25	-5.14	CO 40				
Min N	> 0.90	1.49	-1.98	0.49	-0.49	0.56	CO 11				
4	RC1	16	0.000								

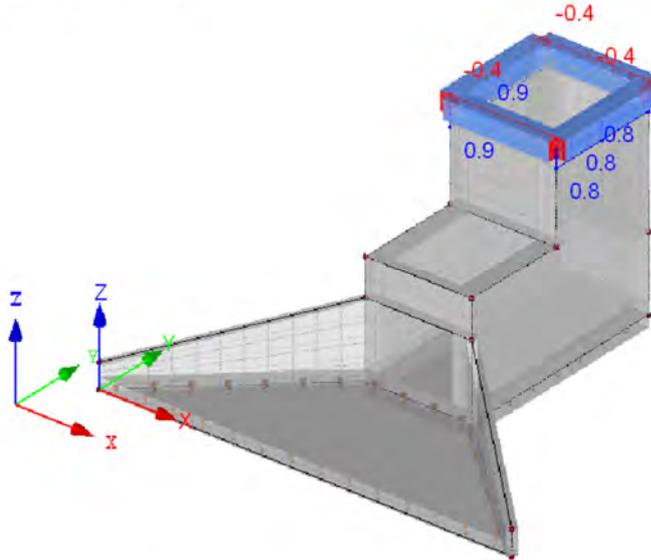
4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
		18	3.020	Max V _y	1.58	> 3.30	-1.74	0.79	-0.90	0.73	CO 47
				Min V _y	12.84	> -4.48	3.08	0.24	0.17	-5.31	CO 4
				Max V _z	13.09	-3.62	> 3.63	0.28	0.11	-5.36	CO 2
				Min V _z	1.33	2.44	> -2.28	0.76	-0.85	0.78	CO 43
				Max M _T	1.58	3.29	-1.75	> 0.79	-0.90	0.73	CO 46
				Min M _T	12.84	-4.47	3.09	> 0.24	0.17	-5.31	CO 3
				Max M _y	12.84	-4.47	3.09	0.24	> 0.17	-5.31	CO 3
				Min M _y	1.58	3.29	-1.75	0.79	> -0.90	0.73	CO 46
				Max M _z	1.33	2.44	-2.28	0.76	-0.85	> 0.78	CO 43
				Min M _z	13.09	-3.62	3.63	0.28	0.11	> -5.36	CO 2
				Max N	> 1.17	-2.68	2.91	-0.68	-0.21	0.45	CO 43
				Min N	> -12.88	-6.45	1.52	-0.84	-1.83	6.04	CO 2
				Max V _y	0.72	> -1.78	2.77	-0.44	0.14	0.22	CO 11
				Min V _y	-12.43	> -7.35	1.65	-1.08	-2.18	6.28	CO 40
				Max V _z	1.17	-2.68	> 2.91	-0.68	-0.21	0.45	CO 44
				Min V _z	-12.88	-6.45	> 1.52	-0.85	-1.83	6.04	CO 7
				Max M _T	0.72	-1.78	2.77	> -0.44	0.14	0.22	CO 11
				Min M _T	-12.43	-7.34	1.65	> -1.08	-2.18	6.27	CO 39
				Max M _y	0.72	-1.79	2.78	-0.44	> 0.14	0.22	CO 10
				Min M _y	-12.43	-7.35	1.65	-1.08	> -2.18	6.28	CO 40
				Max M _z	-12.43	-7.35	1.65	-1.08	-2.18	> 6.28	CO 40
				Min M _z	0.72	-1.78	2.77	-0.44	0.14	> 0.22	CO 11
				Max N	> 7.39	-1.06	1.51	0.36	-0.20	-2.67	CO 103
				Min N	> 0.72	1.28	-1.36	0.37	-0.37	0.40	CO 105
				Max V _y	1.03	> 2.12	-1.19	0.50	-0.54	0.46	CO 110
				Min V _y	7.08	> -1.90	1.35	0.24	-0.02	-2.72	CO 98
				Max V _z	7.22	-1.44	> 1.63	0.26	-0.05	-2.75	CO 96
				Min V _z	0.89	1.66	> -1.48	0.48	-0.52	0.49	CO 106
				Max M _T	1.03	2.12	-1.19	> 0.50	-0.54	0.46	CO 109
				Min M _T	7.09	-1.89	1.35	> 0.24	-0.02	-2.72	CO 97
				Max M _y	7.09	-1.89	1.35	0.24	> -0.02	-2.72	CO 97
				Min M _y	1.03	2.12	-1.19	0.50	> -0.54	0.46	CO 109
				Max M _z	0.89	1.66	-1.48	0.48	-0.52	> 0.49	CO 106
				Min M _z	7.22	-1.44	1.63	0.26	-0.05	> -2.75	CO 96
				Max N	> 0.66	-1.85	2.02	-0.44	-0.07	0.29	CO 106
				Min N	> -6.77	-3.98	1.30	-0.56	-0.98	3.30	CO 96
				Max V _y	0.48	> -1.49	1.96	-0.34	0.07	0.20	CO 105
				Min V _y	-6.59	> -4.34	1.35	-0.65	-1.12	3.40	CO 103
				Max V _z	0.66	-1.85	> 2.02	-0.44	-0.07	0.29	CO 107
				Min V _z	-6.77	-3.98	> 1.29	-0.56	-0.98	3.30	CO 101
				Max M _T	0.48	-1.49	1.96	> -0.34	0.07	0.20	CO 105
				Min M _T	-6.59	-4.34	1.35	> -0.65	-1.12	3.39	CO 102
				Max M _y	0.48	-1.49	1.96	-0.34	> 0.07	0.20	CO 104
				Min M _y	-6.59	-4.34	1.35	-0.65	> -1.12	3.39	CO 102
				Max M _z	-6.59	-4.34	1.35	-0.65	-1.12	> 3.40	CO 103
				Min M _z	0.48	-1.49	1.96	-0.34	0.07	> 0.20	CO 105

Local Deformations u_x

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-x
 Combinaciones de resultados: Valores máx. y mín.

Isometric

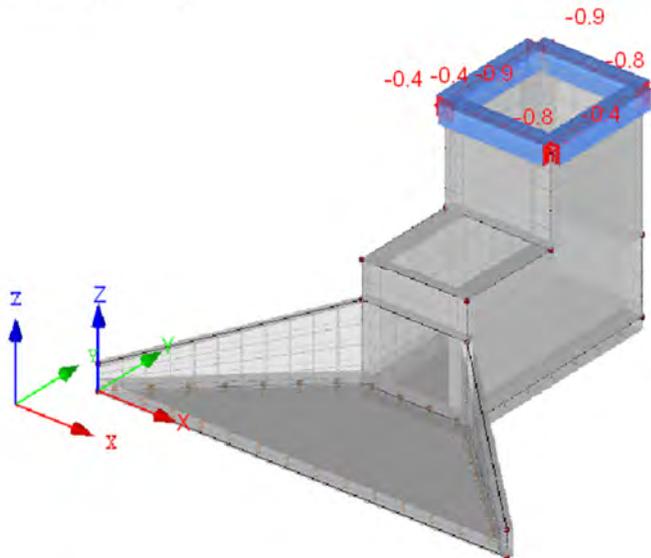


Members Max u-x: 0.9, Min u-x: -0.4 [mm]

Local Deformations u_y

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-y
 Combinaciones de resultados: Valores máx. y mín.

Isometric

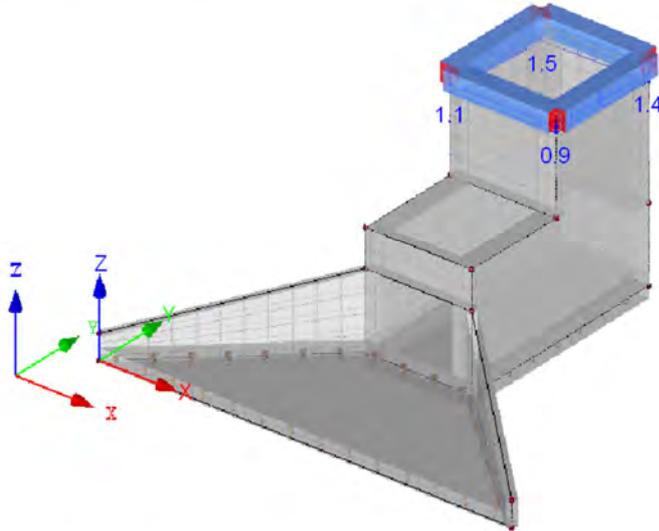


Members Max u-y: 0.0, Min u-y: -0.9 [mm]

Local Deformations u_z

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-z
 Combinaciones de resultados: Valores máx. y mín.

Isometric

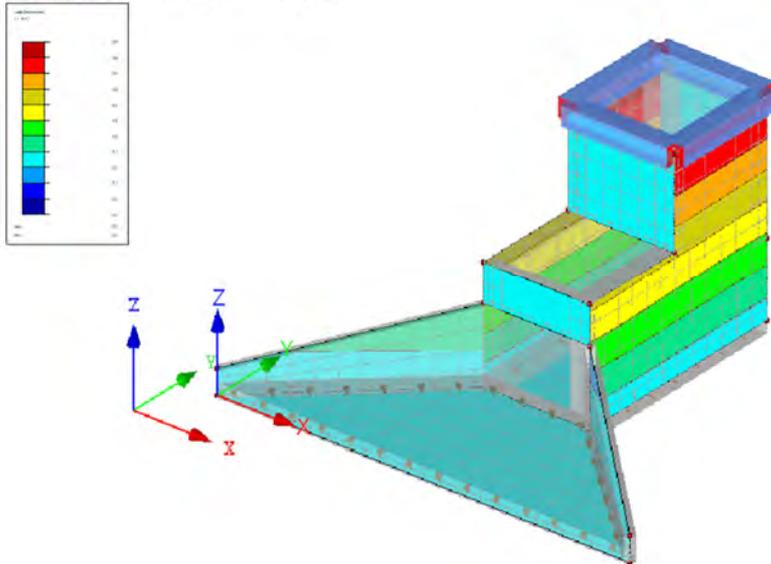


Members Max u-z: 1.5, Min u-z: 0.5 [mm]

Local Deformations u_x

RC3: ELS - Cuasipermanente
 Surfaces Deformaciones locales u-x [mm]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

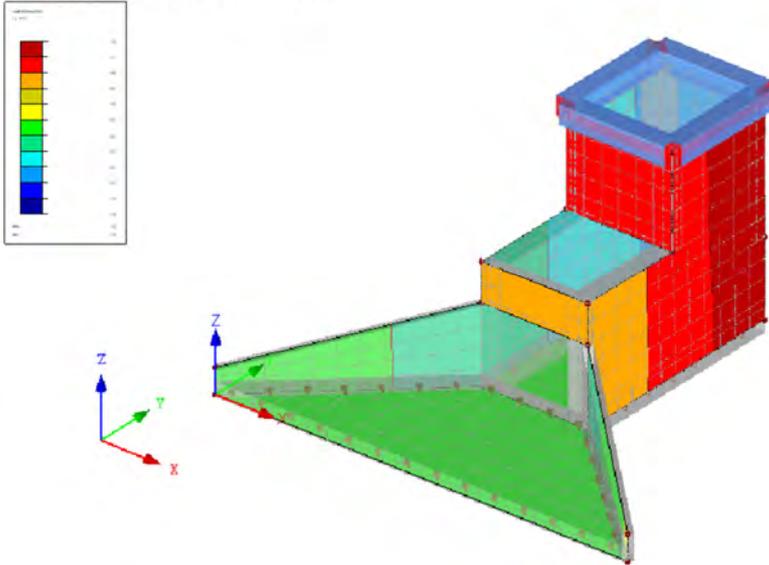


Surfaces Max u-x: 0.9, Min u-x: 0.0 [mm]

Local Deformations u_y

RC3: ELS - Cuasipermanente
 Superficies Deformaciones locales u-y [mm]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

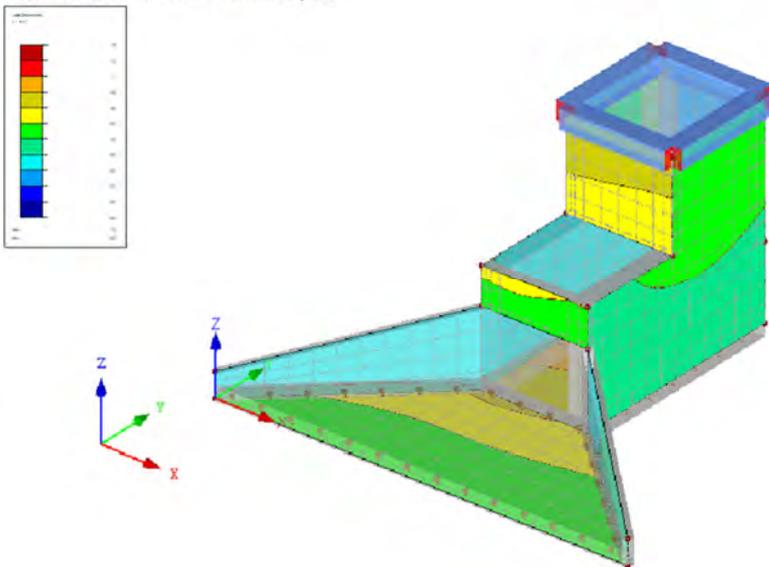


Surfaces Max u-y: 1.4, Min u-y: 0.0 [mm]

Local Deformations u_z

RC3: ELS - Cuasipermanente
 Superficies Deformaciones locales u-z [mm]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

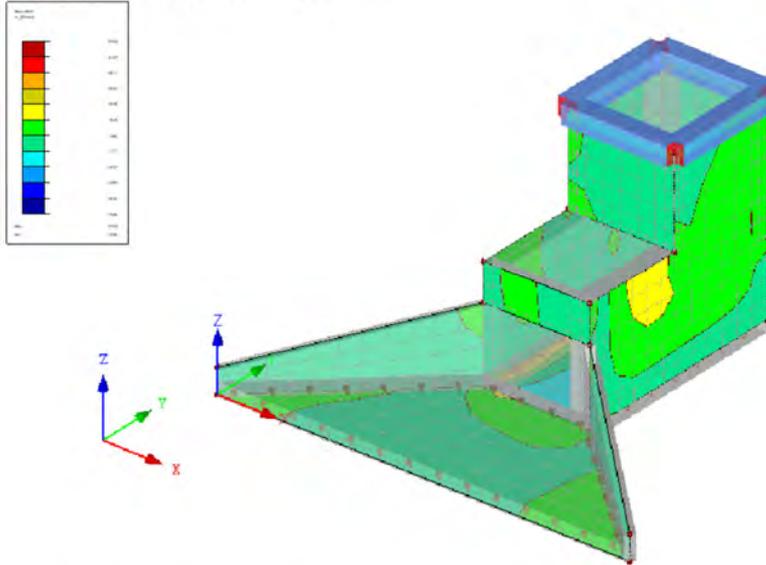


Surfaces Max u-z: 1.5, Min u-z: 0.0 [mm]

Base values m_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-x [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

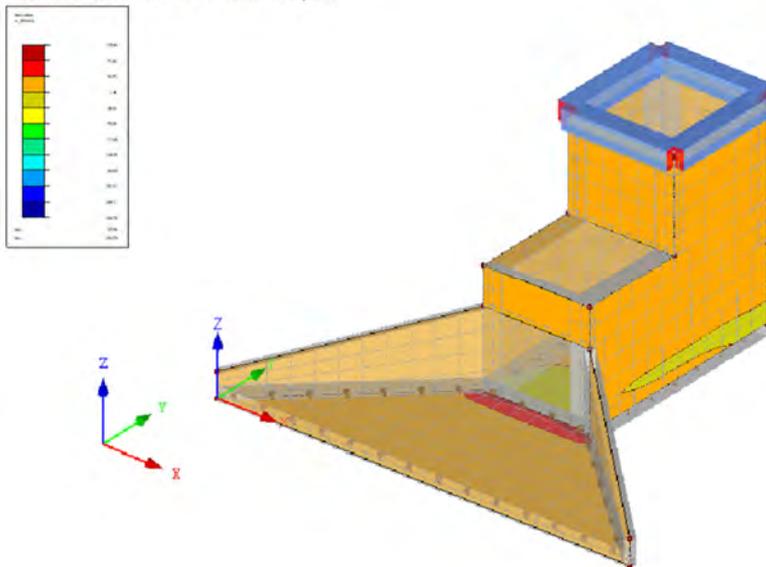


Surfaces Max m-x: 97.23, Min m-x: 0.00 [kNm/m]

Base values m_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-y [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

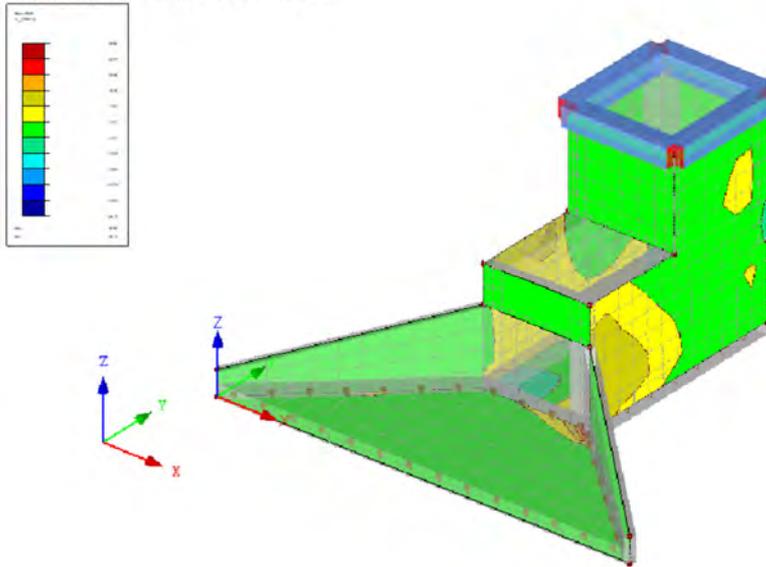


Surfaces Max m-y: 107.96, Min m-y: 0.00 [kNm/m]

Base values m_{xy}

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-xy [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

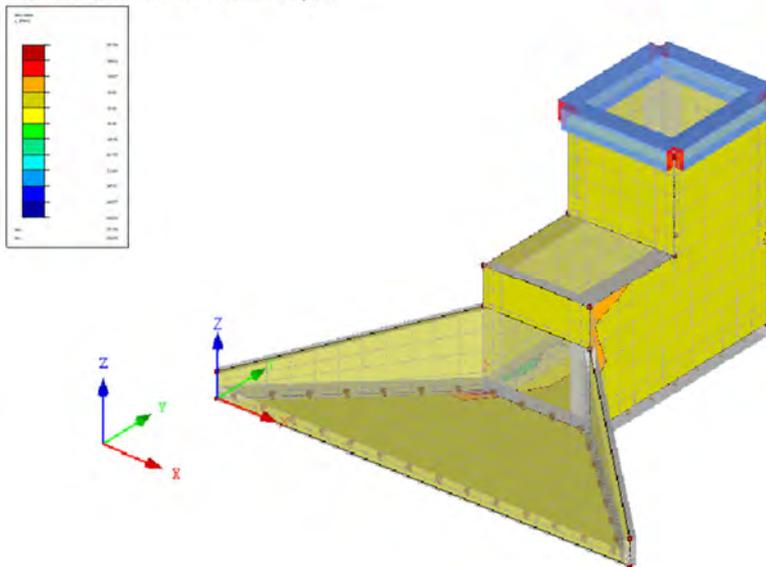


Surfaces Max m-xy: 39.96, Min m-xy: 0.00 [kNm/m]

Base values v_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos v-x [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

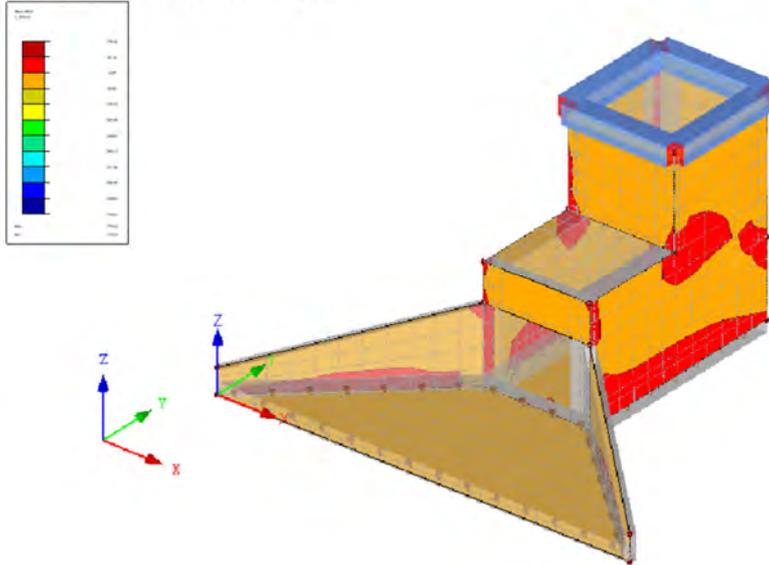


Surfaces Max v-x: 271.78, Min v-x: 0.00 [kN/m]

Base values v_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos v-y [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

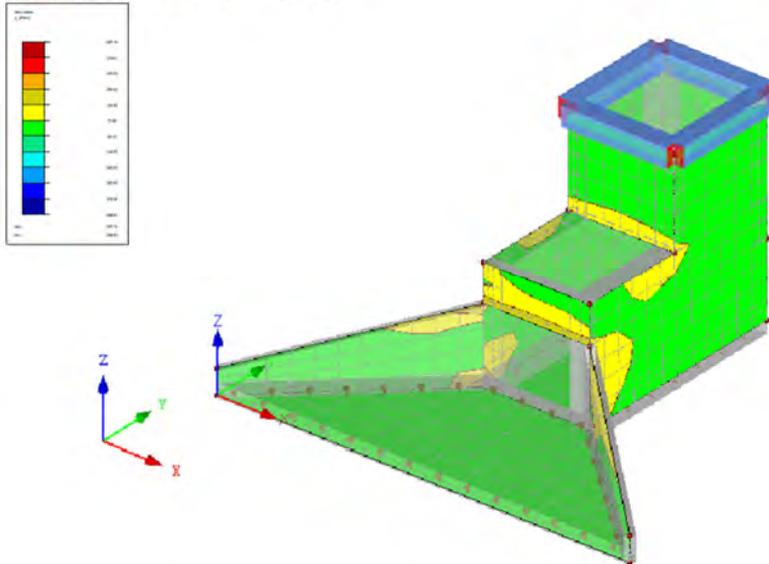


Superficies Max v-y: 178.42, Min v-y: 0.00 [kN/m]

Base values n_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-x [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

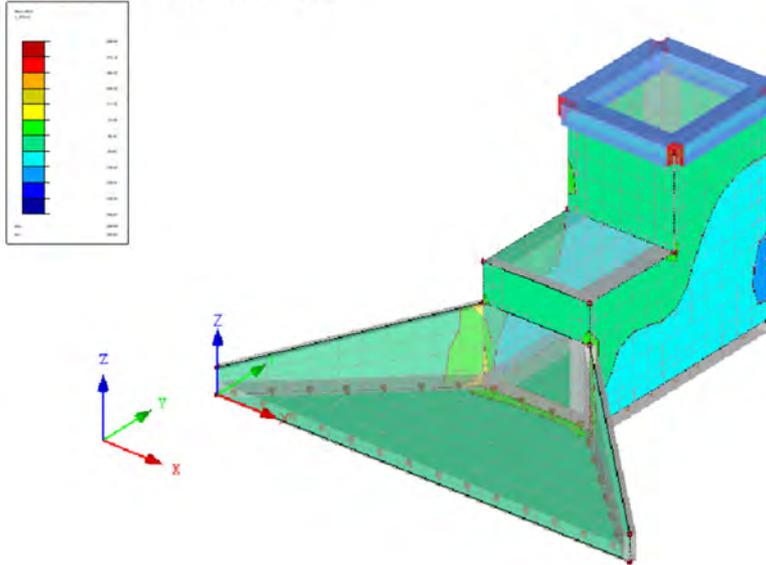


Superficies Max n-x: 627.16, Min n-x: 0.00 [kN/m]

Base values n_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-y [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

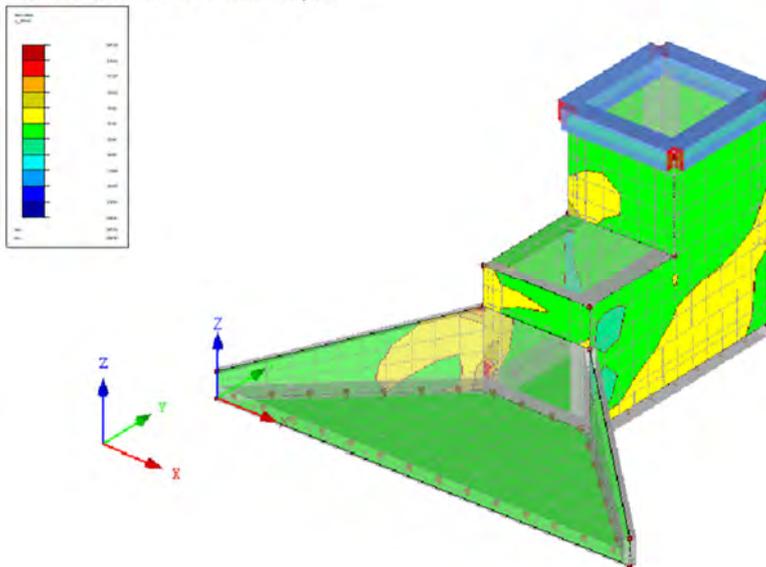


Surfaces Max n-y: 558.98, Min n-y: 0.00 [kN/m]

Base values n_{xy}

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-xy [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric



Surfaces Max n-xy: 267.33, Min n-xy: 0.00 [kN/m]

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

1.4 Reinforcement Group No. 1 - LOSA DE CIMENTACION

Applied to surfaces:

5,9

REINFORCEMENT RATIO

1.4 Reinforcement Group No. 1 - LOSA DE CIMENTACION

Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	x
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	x
Minimum longitudinal reinforcement for walls acc. to 9.6	-
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4 Reinforcement Group No. 2 - ALETAS

Applied to surfaces:	7,8
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	-
Minimum longitudinal reinforcement for walls acc. to 9.6	x
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4 Reinforcement Group No. 3 - MUROS

Applied to surfaces:	1-4,6
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	-
Minimum longitudinal reinforcement for walls acc. to 9.6	x
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

2.2 Required Reinforcement by Surface

Surface No.	Point No.	Point Coordinates [m]			Symbol	Required Reinforcement			Basic Reinf.	Additional Reinforcement		Unit	Notes
		X	Y	Z		ULS	SLS	ULS/SLS		Required	Provided		
1	M4	6.850	3.690	0.000	a _{s,1,-z} (top)	10.30	6.42	10.30	0.00	10.30	10.30	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,2,-z} (top)	8.00	3.86	8.00	0.00	8.00	8.00	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,1,+z} (bottom)	9.20	4.14	9.20	0.00	9.20	9.20	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,2,+z} (bottom)	8.00	4.61	8.00	0.00	8.00	8.00	cm ² /m	
	M4	6.850	3.690	0.000	a _{sw}	8.76	-	8.76	-	-	-	cm ² /m ²	
2	M5	4.040	3.690	0.000	a _{s,1,-z} (top)	10.21	6.34	10.21	0.00	10.21	10.21	cm ² /m	
	M5	4.040	3.690	0.000	a _{s,2,-z} (top)	8.00	2.83	8.00	0.00	8.00	8.00	cm ² /m	
	M5	4.040	3.690	0.000	a _{s,1,+z} (bottom)	9.49	5.90	9.49	0.00	9.49	9.49	cm ² /m	
	M5	4.040	3.690	0.000	a _{s,2,+z} (bottom)	10.11	6.20	10.11	0.00	10.11	10.11	cm ² /m	
	M5	4.040	3.690	0.000	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
3	M13	4.040	9.470	2.000	a _{s,1,-z} (top)	9.20	0.93	9.20	0.00	9.20	9.20	cm ² /m	
	M13	4.040	9.470	2.000	a _{s,2,-z} (top)	8.00	0.37	8.00	0.00	8.00	8.00	cm ² /m	
	M13	4.040	9.470	2.000	a _{s,1,+z} (bottom)	9.20	1.52	9.20	0.00	9.20	9.20	cm ² /m	
	M13	4.040	9.470	2.000	a _{s,2,+z} (bottom)	8.00	0.23	8.00	0.00	8.00	8.00	cm ² /m	
	M13	4.040	9.470	2.000	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
4	M9	4.040	6.450	3.000	a _{s,1,-z} (top)	5.52	1.32	5.52	0.00	5.52	5.52	cm ² /m	
	M9	4.040	6.450	3.000	a _{s,2,-z} (top)	4.80	0.67	4.80	0.00	4.80	4.80	cm ² /m	
	M9	4.040	6.450	3.000	a _{s,1,+z} (bottom)	5.52	1.36	5.52	0.00	5.52	5.52	cm ² /m	
	M9	4.040	6.450	3.000	a _{s,2,+z} (bottom)	4.80	0.06	4.80	0.00	4.80	4.80	cm ² /m	
	M9	4.040	6.450	3.000	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
5	M4	6.850	3.690	0.000	a _{s,1,-z} (top)	6.75	10.26	10.26	0.00	10.26	10.26	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,2,-z} (top)	15.83	21.91	21.91	0.00	21.91	21.91	cm ² /m	
	M19	4.040	9.470	0.000	a _{s,1,+z} (bottom)	8.22	1.67	8.22	0.00	8.22	8.22	cm ² /m	
	M348	4.508	6.098	0.000	a _{s,2,+z} (bottom)	8.22	0.29	8.22	0.00	8.22	8.22	cm ² /m	
	M5	4.040	3.690	0.000	a _{sw}	16.63	-	16.63	-	-	-	cm ² /m ²	
6	M12	6.850	3.690	2.000	a _{s,1,-z} (top)	5.98	3.55	5.98	0.00	5.98	5.98	cm ² /m	
	M7	4.040	3.690	3.000	a _{s,2,-z} (top)	4.00	0.65	4.00	0.00	4.00	4.00	cm ² /m	
	M7	4.040	3.690	3.000	a _{s,1,+z} (bottom)	4.60	0.97	4.60	0.00	4.60	4.60	cm ² /m	
	M7	4.040	3.690	3.000	a _{s,2,+z} (bottom)	4.00	0.15	4.00	0.00	4.00	4.00	cm ² /m	
	M7	4.040	3.690	3.000	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
7	M5	4.040	3.690	0.000	a _{s,1,-z} (top)	5.29	3.28	5.29	0.00	5.29	5.29	cm ² /m	
	M1	0.000	0.000	0.000	a _{s,2,-z} (top)	4.00	0.67	4.00	0.00	4.00	4.00	cm ² /m	
	M11	4.040	3.690	2.000	a _{s,1,+z} (bottom)	8.79	5.28	8.79	0.00	8.79	8.79	cm ² /m	
	M5	4.040	3.690	0.000	a _{s,2,+z} (bottom)	6.98	4.35	6.98	0.00	6.98	6.98	cm ² /m	
	M5	4.040	3.690	0.000	a _{sw}	9.63	-	9.63	-	-	-	cm ² /m ²	
8	M12	6.850	3.690	2.000	a _{s,1,-z} (top)	6.89	4.17	6.89	0.00	6.89	6.89	cm ² /m	
	M102	6.850	3.690	0.500	a _{s,2,-z} (top)	4.68	2.80	4.68	0.00	4.68	4.68	cm ² /m	
	M12	6.850	3.690	2.000	a _{s,1,+z} (bottom)	8.79	5.28	8.79	0.00	8.79	8.79	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,2,+z} (bottom)	10.05	8.10	10.05	0.00	10.05	10.05	cm ² /m	
	M4	6.850	3.690	0.000	a _{sw}	8.76	-	8.76	-	-	-	cm ² /m ²	
9	M1	0.000	0.000	0.000	a _{s,1,-z} (top)	4.45	0.30	4.45	0.00	4.45	4.45	cm ² /m	
	M1	0.000	0.000	0.000	a _{s,2,-z} (top)	4.45	0.29	4.45	0.00	4.45	4.45	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,1,+z} (bottom)	5.41	8.29	8.29	0.00	8.29	8.29	cm ² /m	
	M4	6.850	3.690	0.000	a _{s,2,+z} (bottom)	12.86	19.34	19.34	0.00	19.34	19.34	cm ² /m	
	M4	6.850	3.690	0.000	a _{sw}	19.83	-	19.83	-	-	-	cm ² /m ²	

RF-CONCRETE Surfaces

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Cálculo de hormigón armado

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Design			Notes	
		X	Y	Z			Exist. Value	Limit Value	Unit		Ratio
1	M4	6.850	3.690	0.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M4	6.850	3.690	0.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M4	6.850	3.690	0.000	Envelope nte ChD	lim s_i	0.098	-	m	0.0	226)
	M4	6.850	3.690	0.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
2	M5	4.040	3.690	0.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M5	4.040	3.690	0.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M5	4.040	3.690	0.000	Envelope nte ChD	lim s_i	0.098	-	m	0.0	226)
	M5	4.040	3.690	0.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
3	M13	4.040	9.470	2.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M13	4.040	9.470	2.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M13	4.040	9.470	2.000	Envelope nte ChD	lim s_i	0.098	-	m	0.0	226)
	M13	4.040	9.470	2.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
4	M9	4.040	6.450	3.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M9	4.040	6.450	3.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M9	4.040	6.450	3.000	Envelope nte ChD	lim s_i	0.164	-	m	0.0	226)
	M9	4.040	6.450	3.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
5	M324	4.508	3.690	0.000	Envelope nte ChD	σ_s	328.29	400.00	N/mm ²	0.9	
	M5	4.040	3.690	0.000	Envelope nte Qp	lim d_s	10.00	16.04	mm	0.7	
	M5	4.040	3.690	0.000	Envelope nte Qp	lim s_i	0.102	0.200	m	0.6	
	M5	4.040	3.690	0.000	Envelope nte Qp	w_k	0.200	0.200	mm	1.0	
6	M7	4.040	3.690	3.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M7	4.040	3.690	3.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M7	4.040	3.690	3.000	Envelope nte ChD	lim s_i	0.196	-	m	0.0	226)
	M7	4.040	3.690	3.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
7	M1	0.000	0.000	0.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte ChD	lim s_i	0.196	-	m	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)
8	M4	6.850	3.690	0.000	Envelope nte ChD	σ_s	322.21	400.00	N/mm ²	0.9	
	M2	10.890	0.000	0.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M2	10.890	0.000	0.000	Envelope nte ChD	lim s_i	0.196	-	m	0.0	226)
	M2	10.890	0.000	0.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Design			Notes
		X	Y	Z			Exist. Value	Limit Value	Unit	
9	M4	6.850	3.690	0.000	Envolve nte Qp	σ_s	219.72	400.00	N/mm ²	0.6
	M4	6.850	3.690	0.000	Envolve nte ChD					
	M324	4.508	3.690	0.000	Envolve nte Qp	lim d_s	10.00	10.03	mm	1.0
	M4	6.850	3.690	0.000	Envolve nte Qp	lim s_l	0.182	0.200	m	1.0
	M4	6.850	3.690	0.000	Envolve nte Qp	w_k	0.198	0.200	mm	1.0

RF-CONCRETE Surfaces

CA1
Cálculo de hormigón armado

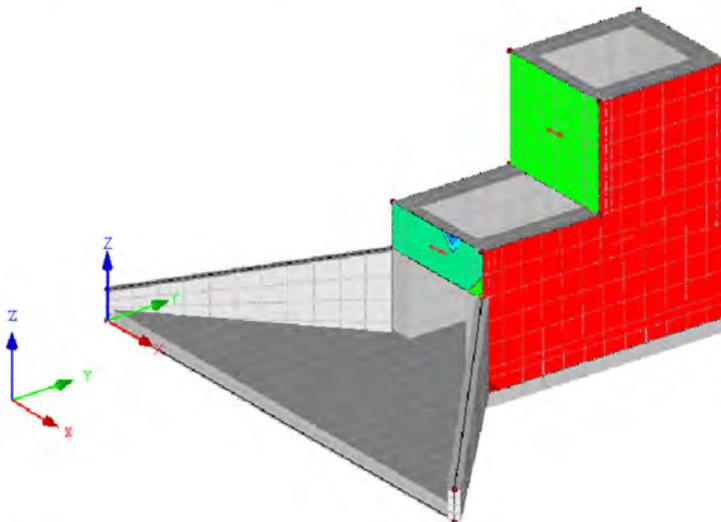
Serviceability Check Notes

No.	Description
226)	Concrete cracks on neither side.

Required Reinforcement $a_{s,1,-z}$ (superior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura necesaria $a-s,1,-z$ (superior) [cm²/m]

Isometric

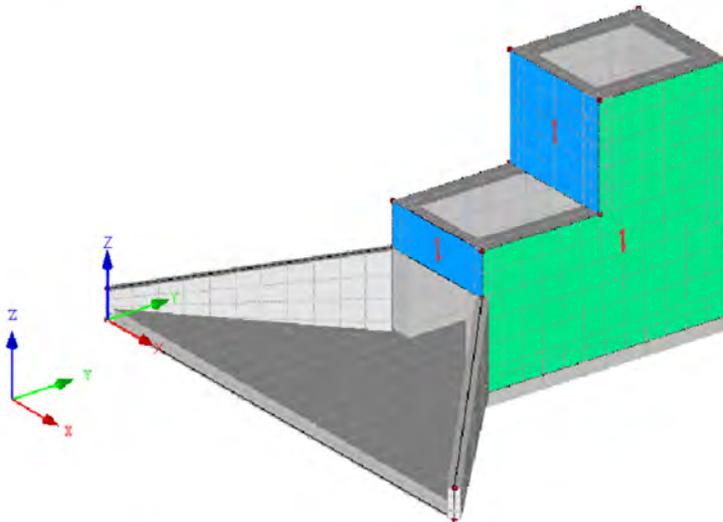


Surfaces Max $a-s,1,-z$ (superior): 10.30, Min $a-s,1,-z$ (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,-z}$ (superior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura necesaria a-s,2,-z (superior) [cm²/m]

Isometric

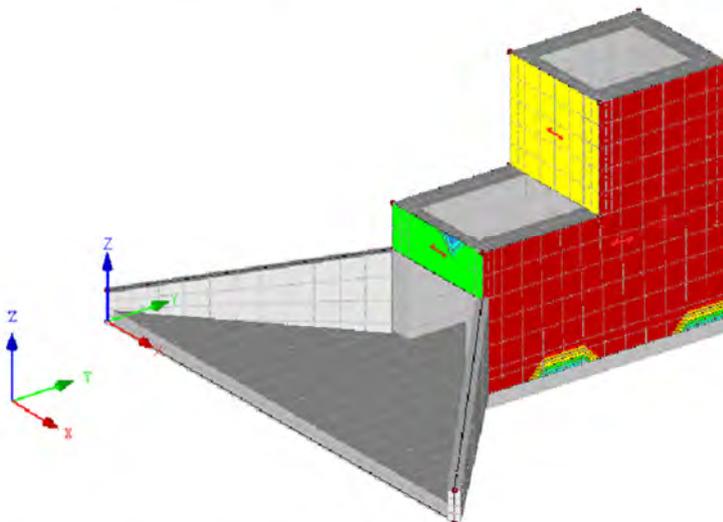


Surfaces Max a-s,2,-z (superior): 21.91, Min a-s,2,-z (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,1,+z}$ (inferior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura necesaria a-s,1,+z (inferior) [cm²/m]

Isometric

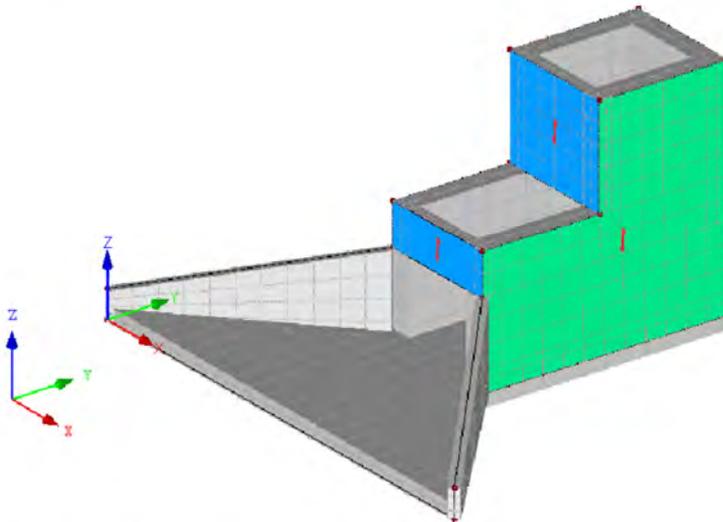


Surfaces Max a-s,1,+z (inferior): 9.49, Min a-s,1,+z (inferior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,+z}$ (inferior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura necesaria a-s,2,+z (inferior) [cm²/m]

Isometric

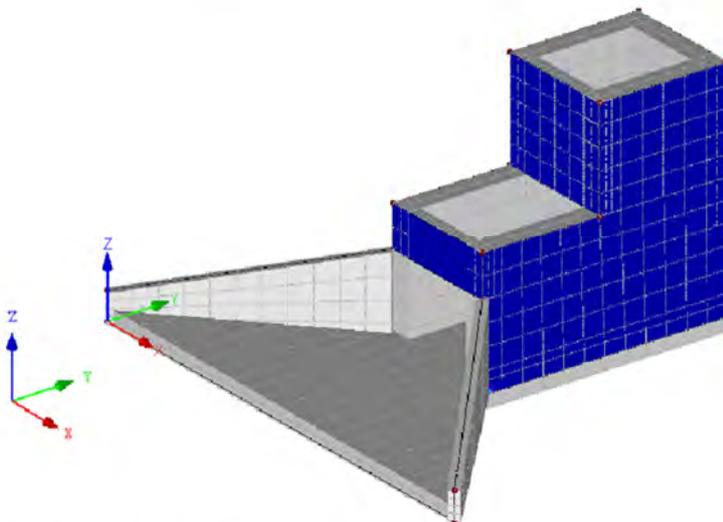


Surfaces Max a-s,2,+z (inferior): 19.34, Min a-s,2,+z (inferior): 0.00 [cm²/m]

Shear Reinforcement a_{sw}

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura de cortante a-sw [cm²/m²]

Isometric



Surfaces Max a-sw: 19.83, Min a-sw: 0.00 [cm²/m²]

1.- DATOS DE OBRA

Hormigón: C25/30

Acero: S-500

Recubrimiento: 4.00 cm

Estados límite

E.L.U. de rotura. Hormigón	EC
	Nieve: Resto de los Estados miembro del CEN, H <= 1000 m

2.- DESCRIPCIÓN DE VIGAS

Geometría de vigas

Ref.	Canto (m)	Ancho apoyo (m)		Luz entre ejes (m)	Ancho (m)	Tipo de apoyo
		Izquierdo	Derecho			
V-1	2.38	0.50	0.50	3.00	0.30	No rigidizados
V-2	3.38	0.50	0.50	3.00	0.50	No rigidizados

Cargas en vigas

Ref.	Hipótesis	Pp	Qs (kN/m)
V-1	Peso propio	Sí	
	Q 1	No	4.20
V-2	Peso propio	Sí	
	Q 1	No	4.20

Abreviaturas utilizadas

- Pp: Se genera el peso propio en esta hipótesis
- Qs: Carga superior

Armado de vigas

Ref.	A. Longitudinal	A. Base del alma		A. Refuerzo del alma
		Vertical	Horizontal	
V-1	3Ø12 Ancho: 0.40 m	Ø12c/20	Ø12c/20	Longit. horiz.: 0.80 m Longit. vert.: 1.25 m Ancho: 0.60 m
V-2	4Ø12 Ancho: 0.40 m	Ø16c/20	Ø16c/20	Longit. horiz.: 1.00 m Longit. vert.: 1.50 m Ancho: 0.60 m

3.- COMPROBACIÓN

Referencia: V-1		
Comprobación	Valores	Estado
Recubrimiento geométrico: <i>Norma EC-2. Artículo 4.4.1.2</i>	Mínimo: 3 cm Calculado: 4 cm	Cumple
Separación mínima entre barras: <i>Norma EC-2. Artículo 8.2 (2)</i>	Mínimo: 2.5 cm	
- Armadura longitudinal inferior:	Calculado: 18.8 cm	Cumple
- Armado base del alma vertical:	Calculado: 18.8 cm	Cumple
- Armado base del alma horizontal:	Calculado: 18.8 cm	Cumple
- Armadura base del alma:	Calculado: 17.2 cm	Cumple
Separación máxima entre barras: <i>Criterio de CYPE</i>	Máximo: 30 cm	
- Armadura longitudinal inferior:	Calculado: 20 cm	Cumple
- Armado base del alma vertical:	Calculado: 20 cm	Cumple
- Armado base del alma horizontal:	Calculado: 20 cm	Cumple
Comprobación de reacción en apoyos: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Máximo: 1499.95 kN	
- Izquierdo:	Calculado: 44.9298 kN	Cumple
- Derecho:	Calculado: 44.9298 kN	Cumple
Ancho mínimo viga: <i>Artículo 59.2 de la norma EH-91</i>	Mínimo: 1.1 cm Calculado: 30 cm	Cumple
Armadura longitudinal inferior:		
- Área: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Mínimo: 0.4 cm ² Calculado: 6.8 cm ²	Cumple
- Ancho de disposición de las barras: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Mínimo: 34.5 cm Calculado: 40 cm	Cumple
- Disposición de la armadura:		Cumple
Armadura base del alma: <i>Artículo 5.4.5 de la norma EC-2</i>	Mínimo: 9 cm ² /m	
- Área barras verticales:	Calculado: 11.4 cm ² /m	Cumple
- Área barras horizontales:	Calculado: 11.4 cm ² /m	Cumple
Armadura de refuerzo del alma:		
- Longitud de barras horizontales: <i>Criterio de CYPE</i>	Mínimo: 71.4 cm Calculado: 80 cm	Cumple

Referencia: V-1		
Comprobación	Valores	Estado
- Longitud de barras verticales: <i>Criterio de CYPE</i>	Mínimo: 119 cm Calculado: 125 cm	Cumple
- Ancho de disposición de las barras: <i>Criterio de CYPE</i>	Mínimo: 47.6 cm Calculado: 60 cm	Cumple
- Disposición de la armadura:		Cumple
Se cumplen todas las comprobaciones		
Referencia: V-2		
Comprobación	Valores	Estado
Recubrimiento geométrico: <i>Norma EC-2. Artículo 4.4.1.2</i>	Mínimo: 3 cm Calculado: 4 cm	Cumple
Separación mínima entre barras: <i>Norma EC-2. Artículo 8.2 (2)</i>	Mínimo: 2.5 cm	
- Armadura longitudinal inferior:	Calculado: 12.1 cm	Cumple
- Armado base del alma vertical:	Calculado: 18.4 cm	Cumple
- Armado base del alma horizontal:	Calculado: 18.4 cm	Cumple
- Armadura base del alma:	Calculado: 35.6 cm	Cumple
Separación máxima entre barras: <i>Criterio de CYPE</i>	Máximo: 30 cm	
- Armadura longitudinal inferior:	Calculado: 13.3 cm	Cumple
- Armado base del alma vertical:	Calculado: 20 cm	Cumple
- Armado base del alma horizontal:	Calculado: 20 cm	Cumple
Comprobación de reacción en apoyos: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Máximo: 2499.98 kN	
- Izquierdo:	Calculado: 93.3912 kN	Cumple
- Derecho:	Calculado: 93.3912 kN	Cumple
Ancho mínimo viga: <i>Artículo 59.2 de la norma EH-91</i>	Mínimo: 1.9 cm Calculado: 50 cm	Cumple
Armadura longitudinal inferior:		
- Área: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Mínimo: 0.9 cm ² Calculado: 9.1 cm ²	Cumple
- Ancho de disposición de las barras: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Mínimo: 34.5 cm Calculado: 40 cm	Cumple
- Disposición de la armadura:		Cumple
Armadura base del alma: <i>Artículo 5.4.5 de la norma EC-2</i>	Mínimo: 15 cm ² /m	

Referencia: V-2		
Comprobación	Valores	Estado
- Área barras verticales:	Calculado: 20.2 cm ² /m	Cumple
- Área barras horizontales:	Calculado: 20.2 cm ² /m	Cumple
Armadura de refuerzo del alma:		
- Longitud de barras horizontales: <i>Criterio de CYPE</i>	Mínimo: 86.2 cm Calculado: 100 cm	Cumple
- Longitud de barras verticales: <i>Criterio de CYPE</i>	Mínimo: 143.7 cm Calculado: 150 cm	Cumple
- Ancho de disposición de las barras: <i>Criterio de CYPE</i>	Mínimo: 57.5 cm Calculado: 60 cm	Cumple
- Disposición de la armadura:		Cumple
Se cumplen todas las comprobaciones		

12.2.CANTARA

Model - General Data

General	Model name	: CANTARA v4
	Project name	: CANAL SAN JOSE
Options	Type of model	: 3D
	Positive direction of global axis Z	: Upward
Standard Gravity	Classification of load cases and combinations	: According to Standard: EN 1990 National Annex: UNE - España
	x Automatically create combinations	: x Load Combinations
Options	- RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures	
	- RF-CUTTING-PATTERN	
	- Piping analysis	
	- Use CQC Rule	
	- Enable CAD/BIM model	
Standard Gravity	g	: 10.00 m/s ²

FE Mesh Settings

General	Target length of finite elements	l_{FE}	: 0.500 m
	Maximum distance between a node and a line to integrate it into the line	ϵ	: 0.001 m
	Maximum number of mesh nodes (in thousands)		: 500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		: 10
	x Activate member divisions for large deformation or post-critical analysis		
	x Use division for members with node lying on them		
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	: 1.800
	Maximum out-of-plane inclination of two finite elements	α	: 0.50 °
	Shape direction of finite elements		: Triangles and quadrangles x Same squares where possible

1.3 Materials

Matl. No.	Modulus E [kN/cm ²]	Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m ³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
2	Steel S 275 EN 10025-2:2004-11 21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
3	Concrete C30/37 EN 1992-1-1:2004/A1:2014 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 Surfaces

Surface No.	Surface Type		Boundary Lines No.	Matl. No.	Thickness		Area A [m ²]	Weight W [kg]
	Geometry	Stiffness			Type	d [mm]		
1	Plane	Standard	2,11,55,15	3	Constant	800.0	52.890	105780.00
2	Plane	Standard	4,48,15,64,17	3	Constant	800.0	24.209	48418.00
3	Plane	Standard	1,39,11,53,16	3	Constant	800.0	24.209	48418.00
4	Plane	Standard	16,44,47,31,103,65	3	Constant	800.0	51.412	102824.00
5	Plane	Standard	17,43,45,42,104,46	3	Constant	800.0	51.412	102824.00
6	Plane	Standard	7,31,71,20	3	Constant	800.0	17.460	34920.00
7	Plane	Standard	33,32,50,35,5,20,84,21	3	Constant	800.0	17.580	35160.00
8	Plane	Standard	8,42,72,21	3	Constant	800.0	17.460	34920.00
9	Plane	Standard	73,67,74,84	3	Constant	400.0	16.200	16200.00
10	Plane	Standard	7,30,8,33,36,5	3	Constant	900.0	20.952	47142.00
11	Plane	Standard	30,104,102,103	3	Constant	900.0	65.189	146675.00
12	Plane	Standard	3,46,102,65	3	Constant	900.0	34.868	78453.30
13	Plane	Standard	1,39,2,48,4,3	3	Constant	900.0	69.249	155810.00
14	Plane	Standard	27,75,29,76	3	Constant	300.0	66.626	49969.70
15	Plane	Standard	26,28,40,63,61,41	3	Constant	300.0	16.200	12150.00
16	Plane	Standard	60,29,66,64	3	Constant	400.0	24.209	24209.00
17	Plane	Standard	66,43,45,61,86,49,51,52,54,5,6,57	3	Constant	400.0	45.002	45002.50
18	Plane	Standard	61,87,23,74,72	3	Constant	400.0	11.640	11640.00
19	Plane	Standard	58,75,60,55	3	Constant	400.0	52.890	52890.00
20	Plane	Standard	58,27,62,53	3	Constant	400.0	24.209	24209.00
21	Plane	Standard	26,100,12-14,18,19,24,62,44,47	3	Constant	400.0	45.002	45002.50
22	Plane	Standard	26,85,22,73,71	3	Constant	400.0	11.640	11640.00
23	Plane	Standard	59,93,91,92	3	Constant	300.0	12.180	9135.00
24	Plane	Standard	94,97,95,96	3	Constant	300.0	12.180	9135.00
25	Plane	Standard	99,106,101,105	3	Constant	300.0	12.180	9135.00
26	Plane	Standard	108,111,109,110	3	Constant	300.0	12.180	9135.00
27	Plane	Standard	113,116,114,115	3	Constant	300.0	12.180	9135.00
28	Plane	Standard	118,121,119,120	3	Constant	300.0	12.180	9135.00

1.4.2 Surfaces - Integrated Objects

Surface No.	Nodes	Integrated Objects No.		Openings	Comment
		Lines			
13		38,59,90,94,98,99,107,108,112,113,117,118,122			
14				1-7	

1.9 Surface Supports

Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m ³]			Shear Spring [kN/m]	
			u _x	u _y	u _z	V _{xz}	V _{yz}
1	10-13	-	x	x	90000.000	-	-

1.13 Cross-Sections

Section No.	Matl. No.	J [cm ⁴] A [cm ²]	I _y [cm ⁴] A _y [cm ²]	I _z [cm ⁴] A _z [cm ²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm]	
							Width b	Height h
1	IPE 180 2	4.79	1317.00	100.90	0.00	0.00	91.0	180.0
		23.95	12.19	8.76				
2	Rectángulo 300/500 3	281719.56	312500.00	112500.01	0.00	0.00	300.0	500.0
		1500.00	1250.00	1250.00				
3	IPE 500 2	89.29	48200.00	2142.00	0.00	0.00	200.0	500.0

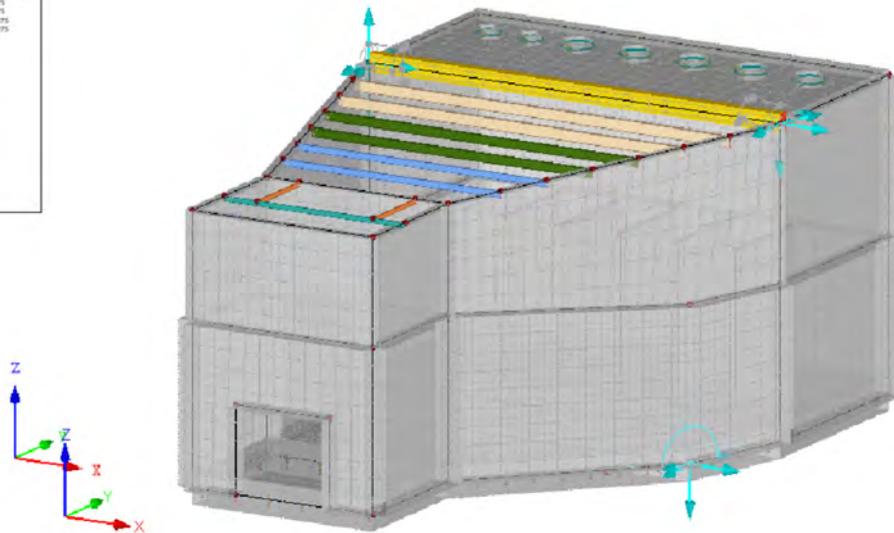
1.13 Cross-Sections

Section No.	Matl. No.	J [cm ⁴]		I _y [cm ⁴]		I _z [cm ⁴]		Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm]	
		A [cm ²]		A _y [cm ²]		A _z [cm ²]				Width b	Height h
		115.50		53.55		48.06					
4	IPE 360 2	37.32		16270.00		1043.00		0.00	0.00	170.0	360.0
		72.73		36.05		26.92					
5	IPE 450 2	66.87		33740.00		1676.00		0.00	0.00	190.0	450.0
		98.82		46.36		39.79					
6	IPE 500 2	89.29		48200.00		2142.00		0.00	0.00	200.0	500.0
		115.50		53.55		48.06					
7	Rectángulo 500/500 3	879166.69		520833.34		520833.33		0.00	0.00	500.0	500.0
		2500.00		2083.33		2083.33					
8	IPE 240 2	12.88		3892.00		283.60		0.00	0.00	120.0	240.0
		39.12		19.65		13.82					
9	IPE 300 2	20.12		8356.00		603.80		0.00	0.00	150.0	300.0
		53.81		26.81		19.82					
10	Rectángulo 400/400 3	360106.66		213333.34		213333.34		0.00	0.00	400.0	400.0
		1600.00		1333.33		1333.33					
11	IPE 120 2	1.74		317.80		27.67		0.00	0.00	64.0	120.0
		13.21		6.77		4.79					
12	IPE 140 2	2.45		541.20		44.92		0.00	0.00	73.0	140.0
		16.43		8.45		5.99					

Model



Isometric



Máx a-s,1,+z (inferior): 36.35, Min. a-s,1,+z (inferior): 0.00 cm²/m

LC2

SOBRE CARGA

3.4 Surface Loads

LC2: SOBRE CARGA

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters	
						Value	Unit
1	14	Force	Uniform	z	p	3.00	kN/m ²

LC2

SOBRE CARGA

3.15 Generated Loads

LC2: SOBRE CARGA

No.	Load Description													
1	From Area Loads via Plane													
	Area load direction	Perpendicular to the plane : x z												
	Member load direction	Direction of generated member loads: : x Local in x, y, z												
	Area of load application	x Fully closed plane												
	Load distribution type:	x Combined												
	Area load magnitude	x Constant : 3.00 kN/m ²												
	Boundary of the area load plane	Corner nodes : 36,13,14,37 Note : Each row in the drop down list box denotes one plane												
	Generating total loads in direction	ΣP_{Areas} <table style="margin-left: 20px;"> <tr><td>X</td><td>: 0.000 kN</td></tr> <tr><td>Y</td><td>: 0.000 kN</td></tr> <tr><td>Z</td><td>: -298.422 kN</td></tr> </table> $\Sigma P_{Members}$ <table style="margin-left: 20px;"> <tr><td>X</td><td>: 0.000 kN</td></tr> <tr><td>Y</td><td>: 0.000 kN</td></tr> <tr><td>Z</td><td>: -298.422 kN</td></tr> </table>	X	: 0.000 kN	Y	: 0.000 kN	Z	: -298.422 kN	X	: 0.000 kN	Y	: 0.000 kN	Z	: -298.422 kN
	X	: 0.000 kN												
	Y	: 0.000 kN												
	Z	: -298.422 kN												
	X	: 0.000 kN												
	Y	: 0.000 kN												
	Z	: -298.422 kN												
Total moment to the origin	ΣM_{Areas} <table style="margin-left: 20px;"> <tr><td>X</td><td>: -3231.990 kNm</td></tr> <tr><td>Y</td><td>: 1835.300 kNm</td></tr> <tr><td>Z</td><td>: 0.000 kNm</td></tr> </table> $\Sigma M_{Members}$ <table style="margin-left: 20px;"> <tr><td>X</td><td>: -3264.280 kNm</td></tr> <tr><td>Y</td><td>: 1835.300 kNm</td></tr> <tr><td>Z</td><td>: 0.000 kNm</td></tr> </table>	X	: -3231.990 kNm	Y	: 1835.300 kNm	Z	: 0.000 kNm	X	: -3264.280 kNm	Y	: 1835.300 kNm	Z	: 0.000 kNm	
X	: -3231.990 kNm													
Y	: 1835.300 kNm													
Z	: 0.000 kNm													
X	: -3264.280 kNm													
Y	: 1835.300 kNm													
Z	: 0.000 kNm													
Cells selected for generating	Σ number of cells : 7 Σ cell area : 99.474 m ²													
Convert loads to members No.	: 3,8-13													
2	From Area Loads via Plane													
	Area load direction	Perpendicular to the plane : x z												
	Member load direction	Direction of generated member loads: : x Local in x, y, z												
	Area of load application	x Fully closed plane												
	Load distribution type:	x Combined												
	Area load magnitude	x Constant : 3.00 kN/m ²												
	Boundary of the area load plane	Corner nodes : 17,36,37,18 Note : Each row in the drop down list box denotes one plane												
	Generating total loads in direction	ΣP_{Areas} <table style="margin-left: 20px;"> <tr><td>X</td><td>: 0.000 kN</td></tr> <tr><td>Y</td><td>: 0.000 kN</td></tr> </table>	X	: 0.000 kN	Y	: 0.000 kN								
X	: 0.000 kN													
Y	: 0.000 kN													

3.15 Generated Loads

LC2: SOBRE CARGA

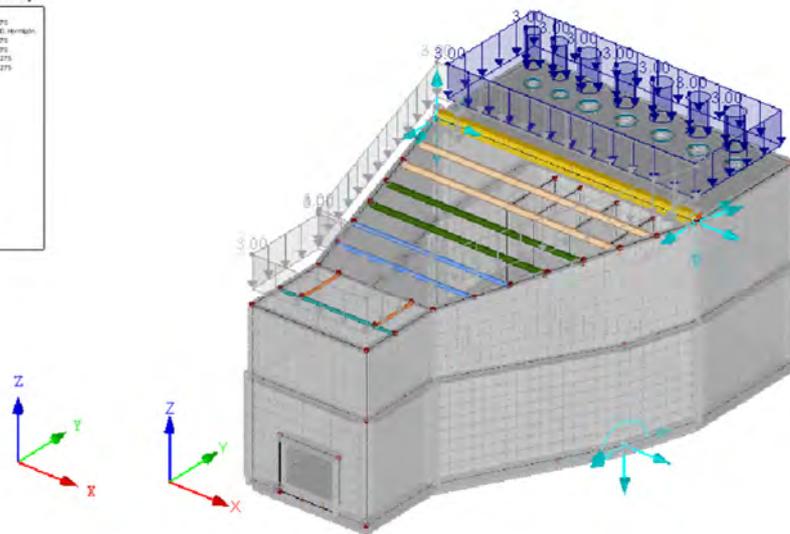
No.	Load Description				
	ΣP Members		Z	:	-62.856 kN
			X	:	0.000 kN
			Y	:	0.000 kN
			Z	:	-62.856 kN
	Total moment to the origin	ΣM Areas	X	:	-159.654 kNm
			Y	:	386.565 kNm
			Z	:	0.000 kNm
		ΣM Members	X	:	-182.516 kNm
			Y	:	386.564 kNm
			Z	:	0.000 kNm
	Cells selected for generating	Σ number of cells		:	4
		Σ cell area		:	20.952 m ²
	Convert loads to members No.			:	14-18

LC2: SOBRE CARGA

LC2: SOBRE CARGA
Cargas [kN/m²]

Isometric

Color	Value
Blue	90.30
Yellow	0.00
Green	0.00
Red	0.00
Orange	0.00
Purple	0.00



Máx. u-z: 8.1, Mín. u-z: -2.2 mm

LC3

EMPUJE DE TIERRAS

LC3: EMPUJE DE TIERRAS

3.4 Surface Loads

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters		On Node No.
						Value	Unit	
1	1-3,16,19,20	Force	Linear in Z	z	p ₁	90.30	kN/m ²	4
						0.00	kN/m ²	11

LC3

EMPUJE DE TIERRAS

3.8 Free Rectangular Loads

LC3: EMPUJE DE TIERRAS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Symbol	Magnitude		Load Position		
						Value	Unit	X [m]	Y [m]	Z [m]
1	8,18	YZ	Linear Z	z	p ₁	57.75	kN/m ²		0.000	1.100
					p ₂	0.00	kN/m ²		3.880	5.500
2	6,22	YZ	Linear Z	z	p ₁	57.75	kN/m ²		0.000	1.100
					p ₂	0.00	kN/m ²		3.880	5.500
3	7,9	XZ	Linear Z	z	p ₁	57.75	kN/m ²	8.850		1.100
					p ₂	0.00	kN/m ²	3.450		5.500

LC3

EMPUJE DE TIERRAS

3.10 Free Polygon Loads

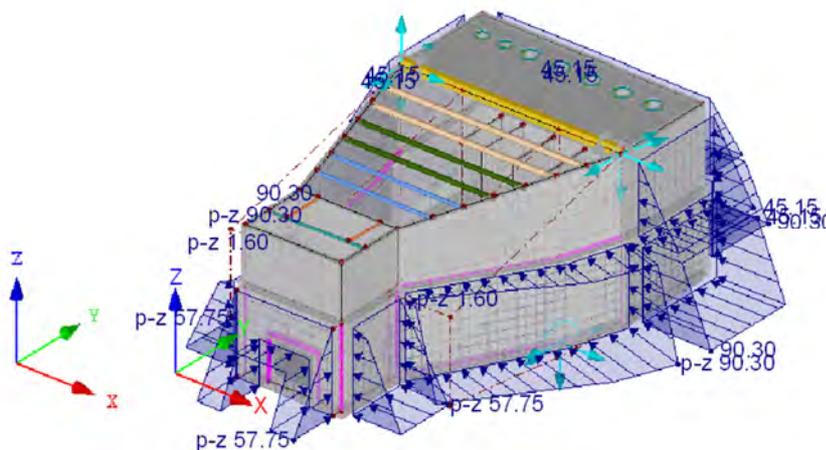
LC3: EMPUJE DE TIERRAS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Load Parameters			Load Position		
					Symbol	Value	Unit	X [m]	Y [m]	Z [m]
1	5	YZ	Linear	z	p ₁	90.30	kN/m ²	12.300	15.720	0.000
					p ₂	0.00	kN/m ²	12.300	15.720	8.600
					p ₃	0.00	kN/m ²	12.300	3.880	5.600
								12.300	3.880	1.100
2	4	YZ	Linear	z	p ₁	90.30	kN/m ²	0.000	15.720	0.000
					p ₂	0.00	kN/m ²	0.000	15.720	8.600
					p ₃	0.00	kN/m ²	0.000	3.880	5.600
								0.000	3.880	1.100
								0.000	12.650	0.000
								0.000	12.650	0.000

LC3: EMPUJE DE TIERRAS

LC3: EMPUJE DE TIERRAS
 Cargas [kN/m²]

Isometric



Máx. u-z: 8.1, Mín. u-z: -2.2 mm

LC4

EMPUJE DE AGUAS

3.4 Surface Loads

LC4: EMPUJE DE AGUAS

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters		On Node No.
						Value	Unit	
1	1-3,16,19,20	Force	Linear in Z	z	p ₁	-86.00	kN/m ²	3
						0.00	kN/m ²	11
2	6-9,18,22	Force	Linear in Z	z	p ₁	-86.00	kN/m ²	35
						0.00	kN/m ²	37
3	10	Force	Uniform	z	p	83.00	kN/m ²	
4	12,13	Force	Uniform	z	p	86.00	kN/m ²	
5	11	Force	Uniform	ZP	p	-86.00	kN/m ²	

LC4

EMPUJE DE AGUAS

3.10 Free Polygon Loads

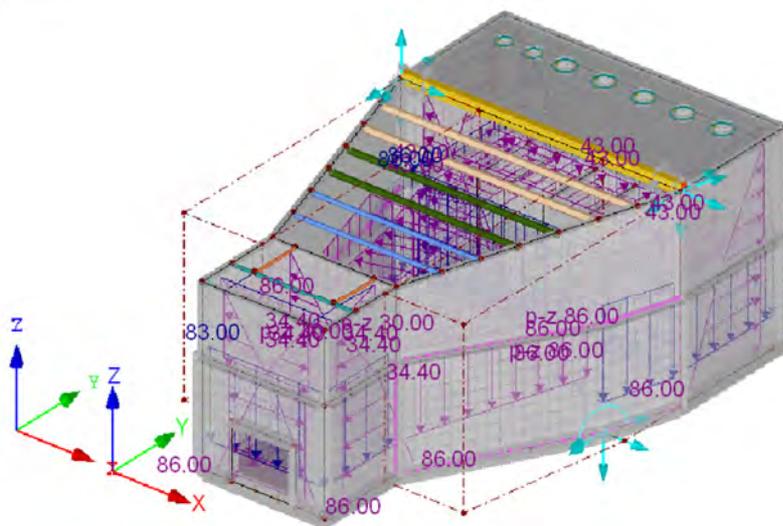
LC4: EMPUJE DE AGUAS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Symbol	Load Parameters		Load Position		
						Value	Unit	X [m]	Y [m]	Z [m]
1	4	YZ	Linear	z	p ₁	-86.00	kN/m ²	0.000	15.720	0.000
						0.00	kN/m ²	0.000	15.720	8.600
						0.00	kN/m ²	0.000	3.880	8.600
						0.00	kN/m ²	0.000	3.880	1.100
2	5	YZ	Linear	z	p ₁	-86.00	kN/m ²	0.000	12.650	0.000
						0.00	kN/m ²	0.000	15.720	0.000
						0.00	kN/m ²	0.000	15.720	8.600
						0.00	kN/m ²	0.000	3.880	8.600
								0.000	3.880	1.100
								0.000	12.650	0.000

LC4: EMPUJE DE AGUAS

LC4: EMPUJE DE AGUAS
 Cargas [kN/m²]

Isometric



Máx u-z: 8.1, Mín. u-z: -2.2 mm

LC5

EQUIPOS MECÁNICOS

3.3 Line Loads

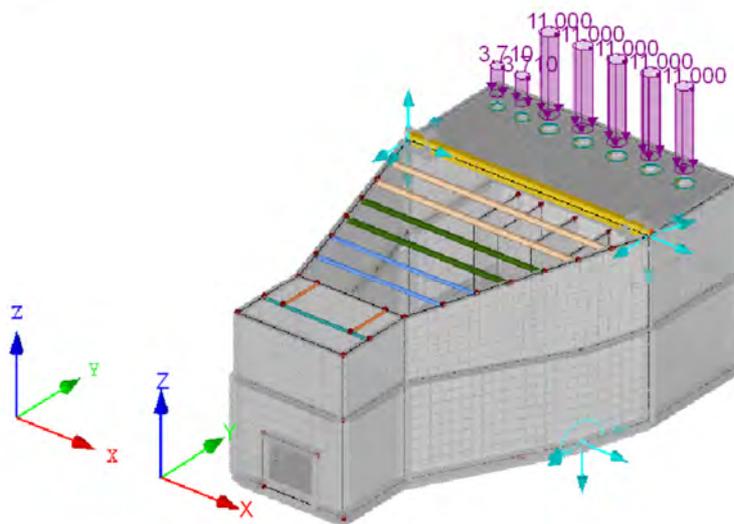
LC5: EQUIPOS MECÁNICOS

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters	
							Value	Unit
1	Lines	77,78	Force	Uniform	ZL	p	-3.710	kN/m
2	Lines	79-83	Force	Uniform	ZL	p	-11.000	kN/m

LC5: EQUIPOS MECÁNICOS

LC5: EQUIPOS MECÁNICOS
Cargas [kN/m]

Isometric



Máx. u-z: 8.1, Mín. u-z: -2.2 mm

LC6

NIEVE

3.15 Generated Loads

LC6: NIEVE

No.	Load Description		
1	From Snow Loads (Flat/Monopitch Roof)		
	Snow load parameters	According to Standard	: EN 1991-1-3
		National Annex	: Spain
		Snow load zone	Z : 1
	Altitude	A : 650.000	m
	Ground snow load	s_k : 0.40	kN/m ²
	Topography type		: Sheltered
	Coefficients	Exposure	C_e : 1.20
		Thermal coefficient	C_t : 1.00
	Roof geometry	Node	A : 36
			B : 13
			C : 14

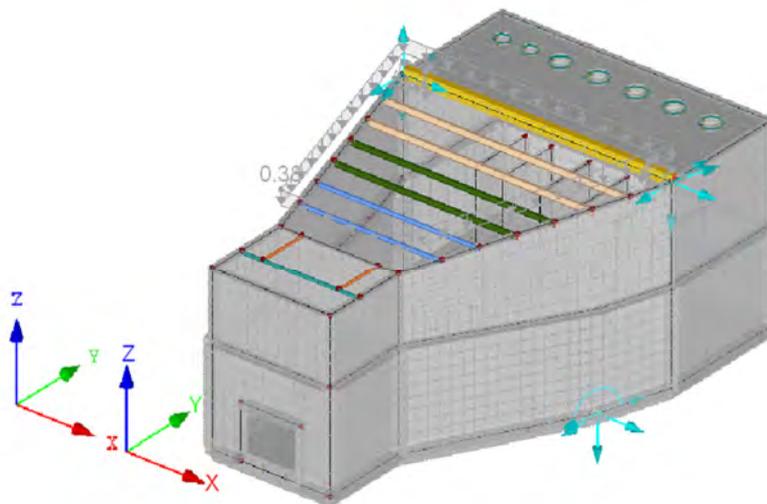
3.15 Generated Loads

No.	Load Description		
		D	: 37
	Generate LC	x LC s1	: LC6
	Create load type	x Member loads	
	Load distribution type	x Combined	
	Generate snow loads on members No.		: 3,8-13
	Parameters	A_R	: 99.474 m ²
		α	: 0.0 °
		S_k	: 0.40 kN/m ²
		μ_1	: 0.800
		s_1	: 0.38 kN/m ²
	Generated total loads	ΣP_{Areas}	: 38.198 kN
		ΣP	: 38.198 kN
	Total moment to the origin	ΣM_{Areas}	: 475.742 kNm
		ΣM	: 479.340 kNm
	Cells selected for generating	Σ number of cells	: 7
		Σ cell area	: 99.474 m ²

LC6: NIEVE

LC6: NIEVE
Cargas [kN/m²]

Isometric



Máx.u-z: 8.1, Mín. u-z: -2.2 mm

LC7

NIVEL FREATICO

3.4 Surface Loads

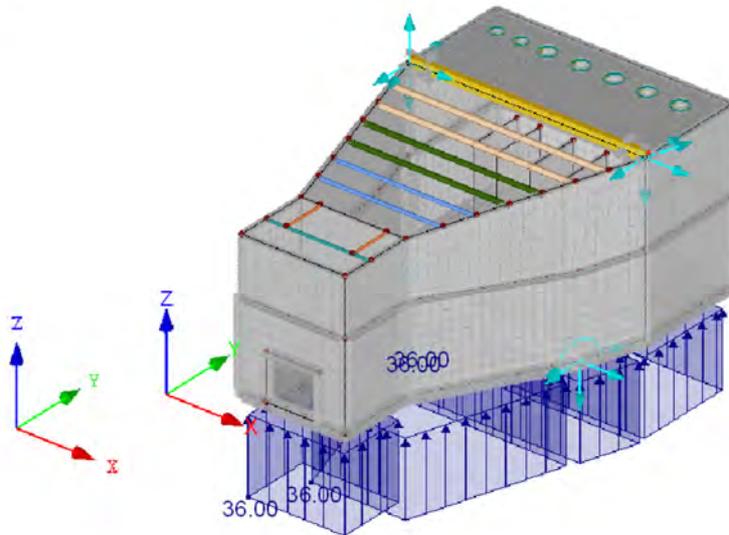
LC7: NIVEL FREATICO

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Symbol	Load Parameters	
						Value	Unit
1	10-13	Force	Uniform	ZP	p	36.00	kN/m ²

LC7: NIVEL FREATICO

LC7: NIVEL FREATICO
 Cargas [kN/m²]

Isometric



Máx u-z: 8.1, Mín. u-z: -2.2 mm

4.12 Cross-Sections - Internal Forces

Result Combinations

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
8	RC1	15	0.000 Left	Max N	> 14.04	0.00	0.82	0.00	-0.59	0.01	CO 28
				Min N	> -18.94	0.01	41.26	-0.00	-47.01	0.01	CO 66
				Max V _y	-18.92	> 0.01	41.26	-0.00	-47.01	0.01	CO 73
				Min V _y	4.46	> -0.00	36.67	0.00	-41.10	0.01	CO 12
				Max V _z	-18.90	0.01	> 41.26	-0.00	-47.01	0.01	CO 72
				Min V _z	14.02	0.00	> 0.82	0.00	-0.59	0.01	CO 29
				Max M _T	3.25	0.00	41.26	> 0.00	-46.30	0.01	CO 77
				Min M _T	-18.92	0.01	41.26	> -0.00	-47.01	0.01	CO 71
				Max M _y	14.04	0.00	0.82	0.00	> -0.59	0.01	CO 28
				Min M _y	-18.94	0.01	41.26	-0.00	> -47.01	0.01	CO 66
				Max M _z	14.02	0.00	0.82	0.00	-0.59	> 0.01	CO 29
				Min M _z	-8.05	0.00	0.82	-0.00	-1.02	> -0.00	CO 23
			0.000 Right	Max N	> 14.04	0.00	0.82	0.00	-0.59	0.01	CO 28
				Min N	> -18.94	0.01	41.26	-0.00	-47.01	0.01	CO 66
				Max V _y	-18.92	> 0.01	41.26	-0.00	-47.01	0.01	CO 73
				Min V _y	4.46	> -0.00	36.67	0.00	-41.10	0.01	CO 12
				Max V _z	-18.90	0.01	> 41.26	-0.00	-47.00	0.01	CO 72
				Min V _z	14.02	0.00	> 0.82	0.00	-0.59	0.01	CO 29
				Max M _T	3.25	0.00	41.26	> 0.00	-46.30	0.01	CO 77
				Min M _T	-18.92	0.01	41.26	> -0.00	-47.01	0.01	CO 71

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Max M _y	14.04	0.00	0.82	0.00	> -0.59	0.01	CO 28
				Min M _y	-18.94	0.01	41.26	-0.00	> -47.01	0.01	CO 66
				Max M _z	14.02	0.00	0.82	0.00	-0.59	> 0.01	CO 29
				Min M _z	-8.05	0.00	0.82	-0.00	-1.02	> -0.00	CO 23
			0.549	Max N	> 14.04	0.00	0.68	0.00	-0.18	0.01	CO 28
			Left	Min N	> -18.68	0.01	36.50	-0.00	-25.41	0.01	CO 66
				Max V _y	-18.66	> 0.01	36.50	-0.00	-25.41	0.01	CO 73
				Min V _y	4.65	> -0.00	32.28	0.00	-21.96	0.01	CO 12
				Max V _z	-18.68	0.01	> 36.50	-0.00	-25.41	0.01	CO 66
				Min V _z	14.02	0.00	> 0.68	0.00	-0.18	0.01	CO 29
				Max M _T	3.50	0.00	36.33	> 0.00	-24.76	0.01	CO 77
				Min M _T	-18.66	0.01	36.50	> -0.00	-25.41	0.01	CO 71
				Max M _y	14.04	0.00	0.68	0.00	> -0.18	0.01	CO 28
				Min M _y	-18.68	0.01	36.50	-0.00	> -25.41	0.01	CO 66
				Max M _z	14.02	0.00	0.68	0.00	-0.18	> 0.01	CO 29
				Min M _z	-8.05	0.00	0.69	-0.00	-0.60	> -0.00	CO 23
			0.549	Max N	> 14.04	0.00	0.68	0.00	-0.18	0.01	CO 28
			Right	Min N	> -18.68	0.01	36.50	-0.00	-25.41	0.01	CO 66
				Max V _y	-18.66	> 0.01	36.50	-0.00	-25.41	0.01	CO 73
				Min V _y	4.65	> -0.00	32.28	0.00	-21.96	0.01	CO 12
				Max V _z	-18.68	0.01	> 36.50	-0.00	-25.41	0.01	CO 66
				Min V _z	14.02	0.00	> 0.68	0.00	-0.18	0.01	CO 29
				Max M _T	3.50	0.00	36.33	> 0.00	-24.76	0.01	CO 77
				Min M _T	-18.66	0.01	36.50	> -0.00	-25.41	0.01	CO 71
				Max M _y	14.04	0.00	0.68	0.00	> -0.18	0.01	CO 28
				Min M _y	-18.68	0.01	36.50	-0.00	> -25.41	0.01	CO 66
				Max M _z	14.02	0.00	0.68	0.00	-0.18	> 0.01	CO 29
				Min M _z	-8.05	0.00	0.69	-0.00	-0.60	> -0.00	CO 23
			5.949	Max N	> 14.04	-0.00	-0.68	-0.00	-0.18	0.01	CO 28
			Left	Min N	> -18.68	-0.01	-36.50	0.00	-25.41	0.00	CO 66
				Max V _y	4.64	> 0.00	-32.28	-0.00	-21.96	0.00	CO 11
				Min V _y	-18.66	> -0.01	-36.50	0.00	-25.41	0.00	CO 73
				Max V _z	14.04	-0.00	> -0.68	-0.00	-0.18	0.01	CO 28
				Min V _z	-18.68	-0.01	> -36.50	0.00	-25.41	0.00	CO 66
				Max M _T	-18.68	-0.01	-36.50	> 0.00	-25.41	0.00	CO 66
				Min M _T	3.52	0.00	-36.33	> -0.00	-24.76	0.01	CO 76
				Max M _y	14.04	-0.00	-0.68	-0.00	> -0.18	0.01	CO 28
				Min M _y	-18.68	-0.01	-36.50	0.00	> -25.41	0.00	CO 66
				Max M _z	14.04	-0.00	-0.68	-0.00	-0.18	> 0.01	CO 28
				Min M _z	-8.06	-0.00	-0.69	0.00	-0.60	> -0.00	CO 18
			5.949	Max N	> 14.04	-0.00	-0.68	-0.00	-0.18	0.01	CO 28
			Right	Min N	> -18.68	-0.01	-36.50	0.00	-25.41	0.00	CO 66
				Max V _y	4.64	> 0.00	-32.28	-0.00	-21.96	0.00	CO 11
				Min V _y	-18.66	> -0.01	-36.50	0.00	-25.41	0.00	CO 73
				Max V _z	14.04	-0.00	> -0.68	-0.00	-0.18	0.01	CO 28
				Min V _z	-18.68	-0.01	> -36.50	0.00	-25.41	0.00	CO 66
				Max M _T	-18.68	-0.01	-36.50	> 0.00	-25.41	0.00	CO 66
				Min M _T	3.52	0.00	-36.33	> -0.00	-24.76	0.01	CO 76
				Max M _y	14.04	-0.00	-0.68	-0.00	> -0.18	0.01	CO 28
				Min M _y	-18.68	-0.01	-36.50	0.00	> -25.41	0.00	CO 66
				Max M _z	14.04	-0.00	-0.68	-0.00	-0.18	> 0.01	CO 28
				Min M _z	-8.06	-0.00	-0.69	0.00	-0.60	> -0.00	CO 18
			6.499	Max N	> 14.04	-0.00	-0.82	-0.00	-0.59	0.01	CO 28
			Left	Min N	> -18.94	-0.01	-41.26	0.00	-47.01	0.00	CO 66
				Max V _y	4.44	> 0.00	-36.67	-0.00	-41.10	0.01	CO 11
				Min V _y	-18.92	> -0.01	-41.26	0.00	-47.01	0.01	CO 73

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
		31	6.499 Right	Max V _z	14.04	-0.00	> -0.82	-0.00	-0.59	0.01	CO 28	
				Min V _z	-18.92	-0.01	> -41.26	0.00	-47.01	0.01	CO 73	
				Max M _T	-18.94	-0.01	-41.26	> 0.00	-47.01	0.00	CO 66	
				Min M _T	3.27	0.00	-41.26	> -0.00	-46.30	0.01	CO 76	
				Max M _y	14.04	-0.00	-0.82	-0.00	> -0.59	0.01	CO 28	
				Min M _y	-18.94	-0.01	-41.26	0.00	> -47.01	0.00	CO 66	
				Max M _z	14.04	-0.00	-0.82	-0.00	-0.59	> 0.01	CO 28	
				Min M _z	-8.06	-0.00	-0.82	0.00	-1.02	> -0.00	CO 18	
				Max N	> 14.04	-0.00	-0.82	-0.00	-0.59	0.01	CO 28	
				Min N	> -18.94	-0.01	-41.26	0.00	-47.01	0.00	CO 66	
				Max V _y	4.44	> 0.00	-36.67	-0.00	-41.10	0.01	CO 11	
				Min V _y	-18.92	> -0.01	-41.26	0.00	-47.01	0.01	CO 73	
				Max V _z	14.04	-0.00	> -0.82	-0.00	-0.59	0.01	CO 28	
				Min V _z	-18.92	-0.01	> -41.26	0.00	-47.01	0.01	CO 73	
				Max M _T	-18.94	-0.01	-41.26	> 0.00	-47.01	0.00	CO 66	
				Min M _T	3.27	0.00	-41.26	> -0.00	-46.30	0.01	CO 76	
				Max M _y	14.04	-0.00	-0.82	-0.00	> -0.59	0.01	CO 28	
				Min M _y	-18.94	-0.01	-41.26	0.00	> -47.01	0.00	CO 66	
				Max M _z	14.04	-0.00	-0.82	-0.00	-0.59	> 0.01	CO 28	
				Min M _z	-8.06	-0.00	-0.82	0.00	-1.02	> -0.00	CO 18	
	RC3	15	0.000 Left	Max N	> 7.77	0.00	0.61	0.00	-0.49	0.00	CO 218	
					Min N	> -9.16	0.00	19.73	-0.00	-22.40	0.00	CO 193
					Max V _y	-9.15	> 0.00	19.73	-0.00	-22.40	0.00	CO 200
					Min V _y	2.65	> -0.00	19.73	0.00	-22.11	0.00	CO 202
					Max V _z	-9.14	0.00	> 19.73	-0.00	-22.40	0.00	CO 199
					Min V _z	7.76	0.00	> 0.61	0.00	-0.49	0.01	CO 219
					Max M _T	2.65	-0.00	19.73	> 0.00	-22.11	0.00	CO 204
					Min M _T	-9.15	0.00	19.73	> -0.00	-22.40	0.00	CO 198
					Max M _y	7.77	0.00	0.61	0.00	> -0.49	0.00	CO 218
					Min M _y	-9.16	0.00	19.73	-0.00	> -22.40	0.00	CO 193
					Max M _z	7.76	0.00	0.61	0.00	-0.49	> 0.01	CO 219
					Min M _z	-4.01	0.00	0.61	-0.00	-0.72	> -0.00	CO 213
					Max N	> 7.77	0.00	0.61	0.00	-0.49	0.00	CO 218
					Min N	> -9.16	0.00	19.73	-0.00	-22.40	0.00	CO 193
					Max V _y	-9.15	> 0.00	19.73	-0.00	-22.40	0.00	CO 200
					Min V _y	2.65	> -0.00	19.73	0.00	-22.11	0.00	CO 202
					Max V _z	-9.14	0.00	> 19.73	-0.00	-22.40	0.00	CO 199
					Min V _z	7.76	0.00	> 0.61	0.00	-0.49	0.01	CO 219
					Max M _T	2.65	-0.00	19.73	> 0.00	-22.11	0.00	CO 204
					Min M _T	-9.15	0.00	19.73	> -0.00	-22.40	0.00	CO 198
			Max M _y	7.77	0.00	0.61	0.00	> -0.49	0.00	CO 218		
			Min M _y	-9.16	0.00	19.73	-0.00	> -22.40	0.00	CO 193		
			Max M _z	7.76	0.00	0.61	0.00	-0.49	> 0.01	CO 219		
			Min M _z	-4.01	0.00	0.61	-0.00	-0.72	> -0.00	CO 213		
			Max N	> 7.77	0.00	0.51	0.00	-0.18	0.00	CO 218		
			Min N	> -9.10	0.00	17.41	-0.00	-12.09	0.00	CO 193		
			Max V _y	-9.09	> 0.00	17.41	-0.00	-12.09	0.00	CO 200		
			Min V _y	2.71	> -0.00	17.36	0.00	-11.81	0.00	CO 202		
			Max V _z	-9.10	0.00	> 17.41	-0.00	-12.09	0.00	CO 193		
			Min V _z	7.76	0.00	> 0.51	0.00	-0.18	0.00	CO 219		
			Max M _T	2.71	-0.00	17.36	> 0.00	-11.81	0.00	CO 204		
			Min M _T	-9.09	0.00	17.41	> -0.00	-12.09	-0.00	CO 198		
			Max M _y	7.77	0.00	0.51	0.00	> -0.18	0.00	CO 218		
			Min M _y	-9.10	0.00	17.41	-0.00	> -12.09	0.00	CO 193		
			Max M _z	7.76	0.00	0.51	0.00	-0.18	> 0.00	CO 219		
			Min M _z	-4.01	0.00	0.51	-0.00	-0.41	> -0.00	CO 213		

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		31	0.549 Right	Max N	> 7.77	0.00	0.51	0.00	-0.18	0.00	CO 218
				Min N	> -9.10	0.00	17.41	-0.00	-12.09	0.00	CO 193
				Max V _y	-9.09	> 0.00	17.41	-0.00	-12.09	0.00	CO 200
				Min V _y	2.71	> -0.00	17.36	0.00	-11.81	0.00	CO 202
				Max V _z	-9.10	0.00	> 17.41	-0.00	-12.09	0.00	CO 193
				Min V _z	7.76	0.00	> 0.51	0.00	-0.18	0.00	CO 219
				Max M _T	2.71	-0.00	17.36	> 0.00	-11.81	0.00	CO 204
				Min M _T	-9.09	0.00	17.41	> -0.00	-12.09	-0.00	CO 198
				Max M _y	7.77	0.00	0.51	0.00	> -0.18	0.00	CO 218
				Min M _y	-9.10	0.00	17.41	-0.00	> -12.09	0.00	CO 193
				Max M _z	7.76	0.00	0.51	0.00	-0.18	> 0.00	CO 219
				Min M _z	-4.01	0.00	0.51	-0.00	-0.41	> -0.00	CO 213
			5.949 Left	Max N	> 7.77	-0.00	-0.51	-0.00	-0.18	0.00	CO 218
				Min N	> -9.10	-0.00	-17.41	0.00	-12.09	-0.00	CO 193
				Max V _y	2.70	> 0.00	-17.36	-0.00	-11.81	0.00	CO 201
				Min V _y	-9.08	> -0.00	-17.41	0.00	-12.09	-0.00	CO 199
				Max V _z	7.77	-0.00	> -0.51	-0.00	-0.18	0.00	CO 218
				Min V _z	-9.10	-0.00	> -17.41	0.00	-12.09	-0.00	CO 193
				Max M _T	-9.10	-0.00	-17.41	> 0.00	-12.09	-0.00	CO 193
				Min M _T	2.72	0.00	-17.36	> -0.00	-11.81	0.00	CO 203
				Max M _y	7.77	-0.00	-0.51	-0.00	> -0.18	0.00	CO 218
				Min M _y	-9.10	-0.00	-17.41	0.00	> -12.09	-0.00	CO 193
				Max M _z	7.77	-0.00	-0.51	-0.00	-0.18	> 0.00	CO 218
				Min M _z	-4.02	0.00	-0.51	0.00	-0.41	> -0.00	CO 208
			5.949 Right	Max N	> 7.77	-0.00	-0.51	-0.00	-0.18	0.00	CO 218
				Min N	> -9.10	-0.00	-17.41	0.00	-12.09	-0.00	CO 193
				Max V _y	2.70	> 0.00	-17.36	-0.00	-11.81	0.00	CO 201
				Min V _y	-9.08	> -0.00	-17.41	0.00	-12.09	-0.00	CO 199
				Max V _z	7.77	-0.00	> -0.51	-0.00	-0.18	0.00	CO 218
				Min V _z	-9.10	-0.00	> -17.41	0.00	-12.09	-0.00	CO 193
				Max M _T	-9.10	-0.00	-17.41	> 0.00	-12.09	-0.00	CO 193
				Min M _T	2.72	0.00	-17.36	> -0.00	-11.81	0.00	CO 203
				Max M _y	7.77	-0.00	-0.51	-0.00	> -0.18	0.00	CO 218
				Min M _y	-9.10	-0.00	-17.41	0.00	> -12.09	-0.00	CO 193
				Max M _z	7.77	-0.00	-0.51	-0.00	-0.18	> 0.00	CO 218
				Min M _z	-4.02	0.00	-0.51	0.00	-0.41	> -0.00	CO 208
6.499 Left	Max N	> 7.77	-0.00	-0.61	-0.00	-0.49	0.00	CO 218			
	Min N	> -9.16	-0.00	-19.73	0.00	-22.40	-0.00	CO 193			
	Max V _y	2.64	> 0.00	-19.73	-0.00	-22.11	0.00	CO 201			
	Min V _y	-9.14	> -0.00	-19.73	0.00	-22.40	-0.00	CO 199			
	Max V _z	7.77	-0.00	> -0.61	-0.00	-0.49	0.00	CO 218			
	Min V _z	-9.15	-0.00	> -19.73	0.00	-22.40	-0.00	CO 200			
	Max M _T	-9.16	-0.00	-19.73	> 0.00	-22.40	-0.00	CO 193			
	Min M _T	2.66	0.00	-19.73	> -0.00	-22.11	0.00	CO 203			
	Max M _y	7.77	-0.00	-0.61	-0.00	> -0.49	0.00	CO 218			
	Min M _y	-9.16	-0.00	-19.73	0.00	> -22.40	-0.00	CO 193			
	Max M _z	7.77	-0.00	-0.61	-0.00	-0.49	> 0.00	CO 218			
	Min M _z	-4.02	-0.00	-0.61	0.00	-0.72	> -0.00	CO 208			
6.499 Right	Max N	> 7.77	-0.00	-0.61	-0.00	-0.49	0.00	CO 218			
	Min N	> -9.16	-0.00	-19.73	0.00	-22.40	-0.00	CO 193			
	Max V _y	2.64	> 0.00	-19.73	-0.00	-22.11	0.00	CO 201			
	Min V _y	-9.14	> -0.00	-19.73	0.00	-22.40	-0.00	CO 199			
	Max V _z	7.77	-0.00	> -0.61	-0.00	-0.49	0.00	CO 218			
	Min V _z	-9.15	-0.00	> -19.73	0.00	-22.40	-0.00	CO 200			
	Max M _T	-9.16	-0.00	-19.73	> 0.00	-22.40	-0.00	CO 193			
	Min M _T	2.66	0.00	-19.73	> -0.00	-22.11	0.00	CO 203			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
9	RC1	10	0.000 Left	Max M _y	7.77	-0.00	-0.61	-0.00	> -0.49	0.00	CO 218
				Min M _y	-9.16	-0.00	-19.73	0.00	> -22.40	-0.00	CO 193
				Max M _z	7.77	-0.00	-0.61	-0.00	-0.49	> 0.00	CO 218
				Min M _z	-4.02	-0.00	-0.61	0.00	-0.72	> -0.00	CO 208
				Max N	> 32.32	0.00	0.93	0.00	-0.74	0.01	CO 28
				Min N	> -27.00	0.01	30.26	-0.00	-38.39	0.01	CO 66
				Max V _y	-26.70	> 0.01	30.26	-0.00	-38.38	0.01	CO 73
				Min V _y	23.47	> -0.00	26.91	0.00	-32.98	0.00	CO 12
				Max V _z	-26.67	0.01	> 30.26	-0.00	-38.38	0.01	CO 72
				Min V _z	32.32	0.00	> 0.93	0.00	-0.74	0.01	CO 28
				Max M _T	22.64	0.00	30.23	> 0.00	-37.12	0.00	CO 77
				Min M _T	-26.97	0.01	30.26	> -0.00	-38.39	0.01	CO 71
				Max M _y	32.32	0.00	0.93	0.00	> -0.74	0.01	CO 28
				Min M _y	-27.00	0.01	30.26	-0.00	> -38.39	0.01	CO 66
				Max M _z	-26.70	0.01	30.26	-0.00	-38.38	> 0.01	CO 73
				Min M _z	-17.15	0.00	0.94	-0.00	-1.37	> -0.00	CO 23
				Max N	> 32.32	0.00	0.93	0.00	-0.74	0.01	CO 28
				Min N	> -27.00	0.01	30.26	-0.00	-38.39	0.01	CO 66
				Max V _y	-26.70	> 0.01	30.26	-0.00	-38.38	0.01	CO 73
				Min V _y	23.47	> -0.00	26.91	0.00	-32.98	0.00	CO 12
				Max V _z	-26.67	0.01	> 30.26	-0.00	-38.38	0.01	CO 72
				Min V _z	32.32	0.00	> 0.93	0.00	-0.74	0.01	CO 28
				Max M _T	22.64	0.00	30.23	> 0.00	-37.12	0.00	CO 77
				Min M _T	-26.97	0.01	30.26	> -0.00	-38.39	0.01	CO 71
			Max M _y	32.32	0.00	0.93	0.00	> -0.74	0.01	CO 28	
			Min M _y	-27.00	0.01	30.26	-0.00	> -38.39	0.01	CO 66	
			Max M _z	-26.70	0.01	30.26	-0.00	-38.38	> 0.01	CO 73	
			Min M _z	-17.15	0.00	0.94	-0.00	-1.37	> -0.00	CO 23	
			Max N	> 32.32	0.00	0.87	0.00	-0.53	0.01	CO 28	
			Min N	> -26.91	0.01	28.84	-0.00	-31.34	0.01	CO 66	
			Max V _y	-26.62	> 0.01	28.84	-0.00	-31.33	0.01	CO 73	
			Min V _y	23.53	> -0.00	25.52	0.00	-26.73	0.00	CO 12	
			Max V _z	-26.91	0.01	> 28.84	-0.00	-31.34	0.01	CO 66	
			Min V _z	32.32	0.00	> 0.87	0.00	-0.53	0.01	CO 28	
			Max M _T	22.72	0.00	28.67	> 0.00	-30.09	0.00	CO 77	
			Min M _T	-26.88	0.01	28.84	> -0.00	-31.34	0.01	CO 71	
			Max M _y	32.32	0.00	0.87	0.00	> -0.53	0.01	CO 28	
			Min M _y	-26.91	0.01	28.84	-0.00	> -31.34	0.01	CO 66	
			Max M _z	-26.62	0.01	28.84	-0.00	-31.33	> 0.01	CO 73	
			Min M _z	-17.15	0.00	0.88	-0.00	-1.15	> -0.00	CO 23	
			Max N	> 32.32	0.00	0.87	0.00	-0.53	0.01	CO 28	
			Min N	> -26.91	0.01	28.84	-0.00	-31.34	0.01	CO 66	
			Max V _y	-26.62	> 0.01	28.84	-0.00	-31.33	0.01	CO 73	
			Min V _y	23.53	> -0.00	25.52	0.00	-26.73	0.00	CO 12	
			Max V _z	-26.91	0.01	> 28.84	-0.00	-31.34	0.01	CO 66	
			Min V _z	32.32	0.00	> 0.87	0.00	-0.53	0.01	CO 28	
			Max M _T	22.72	0.00	28.67	> 0.00	-30.09	0.00	CO 77	
			Min M _T	-26.88	0.01	28.84	> -0.00	-31.34	0.01	CO 71	
Max M _y	32.32	0.00	0.87	0.00	> -0.53	0.01	CO 28				
Min M _y	-26.91	0.01	28.84	-0.00	> -31.34	0.01	CO 66				
Max M _z	-26.62	0.01	28.84	-0.00	-31.33	> 0.01	CO 73				
Min M _z	-17.15	0.00	0.88	-0.00	-1.15	> -0.00	CO 23				
Max N	> 32.32	-0.00	-0.87	-0.00	-0.53	0.01	CO 28				
Min N	> -26.91	-0.01	-28.84	0.00	-31.34	0.01	CO 66				
Max V _y	23.50	> 0.00	-25.52	-0.00	-26.73	0.00	CO 11				
Min V _y	-26.62	> -0.01	-28.84	0.00	-31.33	0.01	CO 73				
			7.212 Left	Max N	> 32.32	-0.00	-0.87	-0.00	-0.53	0.01	CO 28
				Min N	> -26.91	-0.01	-28.84	0.00	-31.34	0.01	CO 66
				Max V _y	23.50	> 0.00	-25.52	-0.00	-26.73	0.00	CO 11
				Min V _y	-26.62	> -0.01	-28.84	0.00	-31.33	0.01	CO 73

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Max V _z	32.32	-0.00	> -0.87	-0.00	-0.53	0.01	CO 28
				Min V _z	-26.91	-0.01	> -28.84	0.00	-31.34	0.01	CO 66
				Max M _T	-26.91	-0.01	-28.84	> 0.00	-31.34	0.01	CO 66
				Min M _T	22.75	0.00	-28.67	> -0.00	-30.09	0.00	CO 76
				Max M _y	32.32	-0.00	-0.87	-0.00	> -0.53	0.01	CO 28
				Min M _y	-26.91	-0.01	-28.84	0.00	> -31.34	0.01	CO 66
				Max M _z	-26.58	-0.01	-28.84	0.00	-31.33	> 0.01	CO 72
				Min M _z	-17.18	-0.00	-0.88	0.00	-1.15	> -0.00	CO 18
			7.212 Right	Max N	> 32.32	-0.00	-0.87	-0.00	-0.53	0.01	CO 28
				Min N	> -26.91	-0.01	-28.84	0.00	-31.34	0.01	CO 66
				Max V _y	23.50	> 0.00	-25.52	-0.00	-26.73	0.00	CO 11
				Min V _y	-26.62	> -0.01	-28.84	0.00	-31.33	0.01	CO 73
				Max V _z	32.32	-0.00	> -0.87	-0.00	-0.53	0.01	CO 28
				Min V _z	-26.91	-0.01	> -28.84	0.00	-31.34	0.01	CO 66
				Max M _T	-26.91	-0.01	-28.84	> 0.00	-31.34	0.01	CO 66
				Min M _T	22.75	0.00	-28.67	> -0.00	-30.09	0.00	CO 76
				Max M _y	32.32	-0.00	-0.87	-0.00	> -0.53	0.01	CO 28
				Min M _y	-26.91	-0.01	-28.84	0.00	> -31.34	0.01	CO 66
				Max M _z	-26.58	-0.01	-28.84	0.00	-31.33	> 0.01	CO 72
				Min M _z	-17.18	-0.00	-0.88	0.00	-1.15	> -0.00	CO 18
			7.450 Left	Max N	> 32.32	-0.00	-0.93	-0.00	-0.74	0.01	CO 28
				Min N	> -27.00	-0.01	-30.26	0.00	-38.39	0.01	CO 66
				Max V _y	23.44	> 0.00	-26.91	-0.00	-32.98	0.00	CO 11
				Min V _y	-26.70	> -0.01	-30.26	0.00	-38.38	0.01	CO 73
				Max V _z	32.32	-0.00	> -0.93	-0.00	-0.74	0.01	CO 28
				Min V _z	-26.67	-0.01	> -30.26	0.00	-38.38	0.01	CO 72
				Max M _T	-27.00	-0.01	-30.26	> 0.00	-38.39	0.01	CO 66
				Min M _T	22.67	0.00	-30.23	> -0.00	-37.11	0.00	CO 76
				Max M _y	32.32	-0.00	-0.93	-0.00	> -0.74	0.01	CO 28
				Min M _y	-27.00	-0.01	-30.26	0.00	> -38.39	0.01	CO 66
				Max M _z	-26.67	-0.01	-30.26	0.00	-38.38	> 0.01	CO 72
				Min M _z	-17.18	-0.00	-0.94	0.00	-1.37	> -0.00	CO 18
		39	7.450 Right	Max N	> 32.32	-0.00	-0.93	-0.00	-0.74	0.01	CO 28
				Min N	> -27.00	-0.01	-30.26	0.00	-38.39	0.01	CO 66
				Max V _y	23.44	> 0.00	-26.91	-0.00	-32.98	0.00	CO 11
				Min V _y	-26.70	> -0.01	-30.26	0.00	-38.38	0.01	CO 73
				Max V _z	32.32	-0.00	> -0.93	-0.00	-0.74	0.01	CO 28
				Min V _z	-26.67	-0.01	> -30.26	0.00	-38.38	0.01	CO 72
				Max M _T	-27.00	-0.01	-30.26	> 0.00	-38.39	0.01	CO 66
				Min M _T	22.67	0.00	-30.23	> -0.00	-37.12	0.00	CO 76
				Max M _y	32.32	-0.00	-0.93	-0.00	> -0.74	0.01	CO 28
				Min M _y	-27.00	-0.01	-30.26	0.00	> -38.39	0.01	CO 66
				Max M _z	-26.67	-0.01	-30.26	0.00	-38.38	> 0.01	CO 72
				Min M _z	-17.18	-0.00	-0.94	0.00	-1.37	> -0.00	CO 18
	RC3	10	0.000 Left	Max N	> 17.89	0.00	0.69	0.00	-0.63	0.00	CO 218
				Min N	> -13.14	0.00	14.56	-0.00	-18.38	0.00	CO 193
				Max V _y	-12.98	> 0.00	14.56	-0.00	-18.37	0.00	CO 200
				Min V _y	13.15	> -0.00	14.55	0.00	-17.89	0.00	CO 202
				Max V _z	-12.97	0.00	> 14.56	-0.00	-18.37	0.00	CO 199
				Min V _z	17.89	0.00	> 0.69	0.00	-0.63	0.00	CO 218
				Max M _T	13.30	-0.00	14.55	> 0.00	-17.89	0.00	CO 204
				Min M _T	-13.12	0.00	14.56	> -0.00	-18.38	0.00	CO 198
				Max M _y	17.89	0.00	0.69	0.00	> -0.63	0.00	CO 218
				Min M _y	-13.14	0.00	14.56	-0.00	> -18.38	0.00	CO 193
				Max M _z	17.87	0.00	0.69	0.00	-0.63	> 0.00	CO 219
				Min M _z	-8.51	0.00	0.70	-0.00	-0.96	> -0.00	CO 213

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
			0.000	Max N	> 17.89	0.00	0.69	0.00	-0.63	0.00	CO 218
			Right	Min N	> -13.14	0.00	14.56	-0.00	-18.38	0.00	CO 193
				Max V _y	-12.98	> 0.00	14.56	-0.00	-18.37	0.00	CO 200
				Min V _y	13.15	> -0.00	14.55	0.00	-17.89	0.00	CO 202
				Max V _z	-12.97	0.00	> 14.56	-0.00	-18.37	0.00	CO 199
				Min V _z	17.89	0.00	> 0.69	0.00	-0.63	0.00	CO 218
				Max M _T	13.30	-0.00	14.55	> 0.00	-17.89	0.00	CO 204
				Min M _T	-13.12	0.00	14.56	> -0.00	-18.38	0.00	CO 198
				Max M _y	17.89	0.00	0.69	0.00	> -0.63	0.00	CO 218
				Min M _y	-13.14	0.00	14.56	-0.00	> -18.38	0.00	CO 193
				Max M _z	17.87	0.00	0.69	0.00	-0.63	> 0.00	CO 219
				Min M _z	-8.51	0.00	0.70	-0.00	-0.96	> -0.00	CO 213
			0.238	Max N	> 17.89	0.00	0.65	0.00	-0.47	0.00	CO 218
			Left	Min N	> -13.12	0.00	13.86	-0.00	-14.99	0.00	CO 193
				Max V _y	-12.96	> 0.00	13.85	-0.00	-14.99	0.00	CO 200
				Min V _y	13.17	> -0.00	13.81	0.00	-14.51	0.00	CO 202
				Max V _z	-13.12	0.00	> 13.86	-0.00	-14.99	0.00	CO 193
				Min V _z	17.89	0.00	> 0.65	0.00	-0.47	0.00	CO 218
				Max M _T	13.31	-0.00	13.81	> 0.00	-14.51	0.00	CO 204
				Min M _T	-13.10	0.00	13.86	> -0.00	-14.99	0.00	CO 198
				Max M _y	17.89	0.00	0.65	0.00	> -0.47	0.00	CO 218
				Min M _y	-13.12	0.00	13.86	-0.00	> -14.99	0.00	CO 193
				Max M _z	17.87	0.00	0.65	0.00	-0.47	> 0.00	CO 219
				Min M _z	-8.51	0.00	0.66	-0.00	-0.80	> -0.00	CO 213
			0.238	Max N	> 17.89	0.00	0.65	0.00	-0.47	0.00	CO 218
			Right	Min N	> -13.12	0.00	13.86	-0.00	-14.99	0.00	CO 193
				Max V _y	-12.96	> 0.00	13.85	-0.00	-14.99	0.00	CO 200
				Min V _y	13.17	> -0.00	13.81	0.00	-14.51	0.00	CO 202
				Max V _z	-13.12	0.00	> 13.86	-0.00	-14.99	0.00	CO 193
				Min V _z	17.89	0.00	> 0.65	0.00	-0.47	0.00	CO 218
				Max M _T	13.31	-0.00	13.81	> 0.00	-14.51	0.00	CO 204
				Min M _T	-13.10	0.00	13.86	> -0.00	-14.99	0.00	CO 198
				Max M _y	17.89	0.00	0.65	0.00	> -0.47	0.00	CO 218
				Min M _y	-13.12	0.00	13.86	-0.00	> -14.99	0.00	CO 193
				Max M _z	17.87	0.00	0.65	0.00	-0.47	> 0.00	CO 219
				Min M _z	-8.51	0.00	0.66	-0.00	-0.80	> -0.00	CO 213
			7.212	Max N	> 17.89	-0.00	-0.65	-0.00	-0.47	0.00	CO 218
			Left	Min N	> -13.12	-0.00	-13.85	0.00	-14.99	0.00	CO 193
				Max V _y	13.15	> 0.00	-13.81	-0.00	-14.51	0.00	CO 201
				Min V _y	-12.95	> -0.00	-13.85	0.00	-14.98	0.00	CO 199
				Max V _z	17.89	-0.00	> -0.65	-0.00	-0.47	0.00	CO 218
				Min V _z	-13.12	-0.00	> -13.85	0.00	-14.99	0.00	CO 193
				Max M _T	-13.12	-0.00	-13.85	> 0.00	-14.99	0.00	CO 193
				Min M _T	13.33	0.00	-13.81	> -0.00	-14.51	0.00	CO 203
				Max M _y	17.89	-0.00	-0.65	-0.00	> -0.47	0.00	CO 218
				Min M _y	-13.12	-0.00	-13.85	0.00	> -14.99	0.00	CO 193
				Max M _z	17.89	-0.00	-0.65	-0.00	-0.47	> 0.00	CO 218
				Min M _z	-8.52	-0.00	-0.66	0.00	-0.80	> -0.00	CO 208
			7.212	Max N	> 17.89	-0.00	-0.65	-0.00	-0.47	0.00	CO 218
			Right	Min N	> -13.12	-0.00	-13.86	0.00	-14.99	0.00	CO 193
				Max V _y	13.15	> 0.00	-13.81	-0.00	-14.51	0.00	CO 201
				Min V _y	-12.95	> -0.00	-13.85	0.00	-14.99	0.00	CO 199
				Max V _z	17.89	-0.00	> -0.65	-0.00	-0.47	0.00	CO 218
				Min V _z	-13.12	-0.00	> -13.86	0.00	-14.99	0.00	CO 193
				Max M _T	-13.12	-0.00	-13.86	> 0.00	-14.99	0.00	CO 193
				Min M _T	13.33	0.00	-13.81	> -0.00	-14.51	0.00	CO 203

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		39	7.450 Left	Max M _y	17.89	-0.00	-0.65	-0.00	> -0.47	0.00	CO 218
				Min M _y	-13.12	-0.00	-13.86	0.00	> -14.99	0.00	CO 193
				Max M _z	17.89	-0.00	-0.65	-0.00	-0.47	> 0.00	CO 218
				Min M _z	-8.52	-0.00	-0.66	0.00	-0.80	> -0.00	CO 208
				Max N	> 17.89	-0.00	-0.69	-0.00	-0.63	0.00	CO 218
				Min N	> -13.14	-0.00	-14.56	0.00	-18.38	0.00	CO 193
				Max V _y	13.13	> 0.00	-14.55	-0.00	-17.89	0.00	CO 201
				Min V _y	-12.97	> -0.00	-14.56	0.00	-18.37	0.00	CO 199
				Max V _z	17.89	-0.00	> -0.69	-0.00	-0.63	0.00	CO 218
				Min V _z	-12.97	-0.00	> -14.56	0.00	-18.37	0.00	CO 199
				Max M _T	-13.14	-0.00	-14.56	> 0.00	-18.38	0.00	CO 193
				Min M _T	13.31	0.00	-14.55	> -0.00	-17.89	0.00	CO 203
			7.450 Right	Max M _y	17.89	-0.00	-0.69	-0.00	> -0.63	0.00	CO 218
				Min M _y	-13.14	-0.00	-14.56	0.00	> -18.38	0.00	CO 193
				Max M _z	17.89	-0.00	-0.69	-0.00	-0.63	> 0.00	CO 218
				Min M _z	-8.52	-0.00	-0.70	0.00	-0.96	> -0.00	CO 208
				Max N	> 17.89	-0.00	-0.69	-0.00	-0.63	0.00	CO 218
				Min N	> -13.14	-0.00	-14.56	0.00	-18.38	0.00	CO 193
				Max V _y	13.13	> 0.00	-14.55	-0.00	-17.89	0.00	CO 201
				Min V _y	-12.97	> -0.00	-14.56	0.00	-18.37	0.00	CO 199
				Max V _z	17.89	-0.00	> -0.69	-0.00	-0.63	0.00	CO 218
				Min V _z	-12.97	-0.00	> -14.56	0.00	-18.37	0.00	CO 199
				Max M _T	-13.14	-0.00	-14.56	> 0.00	-18.38	0.00	CO 193
				Min M _T	13.31	0.00	-14.55	> -0.00	-17.89	0.00	CO 203
Section No. 2: Rectángulo 300/500	RC1	13	0.000	Max N	> -41.42	3.91	33.07	4.27	-82.83	-1.33	CO 29
				Min N	> -136.85	8.41	39.20	-0.26	-126.57	8.59	CO 71
				Max V _y	-56.46	> 15.69	52.86	4.23	-127.18	0.88	CO 76
				Min V _y	-121.88	> -3.42	19.41	-0.20	-82.27	6.36	CO 18
				Max V _z	-56.46	15.69	> 52.86	4.23	-127.18	0.88	CO 76
				Min V _z	-121.88	-3.42	> 19.41	-0.20	-82.27	6.36	CO 18
				Max M _T	-53.24	13.77	51.16	> 4.55	-119.76	0.42	CO 14
				Min M _T	-125.10	-1.50	21.10	> -0.53	-89.68	6.82	CO 86
				Max M _y	-51.15	3.71	28.49	2.23	> -80.13	1.15	CO 32
				Min M _y	-127.04	8.60	43.79	1.79	> -129.31	6.10	CO 68
				Max M _z	-136.85	8.41	39.20	-0.26	-126.57	> 8.59	CO 71
				Min M _z	-41.42	3.91	33.07	4.27	-82.83	> -1.33	CO 29
	RC3	13	0.000	Max N	> -39.59	-3.35	-32.94	-4.34	-82.49	-1.65	CO 29
				Min N	> -135.15	-8.25	-39.19	0.33	-126.81	8.37	CO 71
				Max V _y	-119.87	> 3.96	-19.34	0.13	-81.89	6.03	CO 18
				Min V _y	-54.93	> -15.50	-52.78	-4.16	-127.46	0.66	CO 76
				Max V _z	-119.87	3.96	> -19.34	0.13	-81.89	6.03	CO 18
				Min V _z	-54.93	-15.50	> -52.78	-4.16	-127.46	0.66	CO 76
				Max M _T	-123.35	1.65	-21.09	> 0.60	-89.86	6.61	CO 86
				Min M _T	-51.45	-13.19	-51.03	> -4.63	-119.47	0.09	CO 14
				Max M _y	-49.29	-3.16	-28.39	-2.30	> -79.77	0.82	CO 32
				Min M _y	-125.36	-8.42	-43.74	-1.73	> -129.56	5.88	CO 68
				Max M _z	-135.15	-8.25	-39.19	0.33	-126.81	> 8.37	CO 71
				Min M _z	-39.59	-3.35	-32.94	-4.34	-82.49	> -1.65	CO 29
				Max N	> -36.53	2.40	23.33	2.70	-61.17	-0.30	CO 219
				Min N	> -87.31	4.27	26.04	0.30	-83.90	4.87	CO 198
				Max V _y	-44.43	> 8.17	33.31	2.69	-84.20	0.77	CO 203

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		14	12.300	Min V _y	-79.44	> -1.51	16.06	0.31	-60.89	3.80	CO 208
				Max V _z	-44.43	8.17	> 33.31	2.69	-84.20	0.77	CO 203
				Min V _z	-79.44	-1.51	> 16.06	0.31	-60.89	3.80	CO 208
				Max M _T	-42.83	7.66	32.98	> 2.85	-80.86	0.64	CO 204
				Min M _T	-81.04	-1.00	16.38	> 0.16	-64.24	3.93	CO 213
				Max M _y	-41.74	2.29	20.89	1.61	> -59.75	1.02	CO 222
				Min M _y	-82.09	4.38	28.48	1.39	> -85.34	3.55	CO 195
				Max M _z	-87.31	4.27	26.04	0.30	-83.90	> 4.87	CO 198
				Min M _z	-36.53	2.40	23.33	2.70	-61.17	> -0.30	CO 219
				Max N	> -35.16	-1.99	-23.24	-2.75	-60.91	-0.54	CO 219
				Min N	> -86.01	-4.07	-26.01	-0.28	-83.95	4.69	CO 198
				Max V _y	-77.98	> 1.91	-16.00	-0.37	-60.61	3.56	CO 208
				Min V _y	-43.21	> -7.95	-33.25	-2.67	-84.27	0.59	CO 203
				Max V _z	-77.98	1.91	> -16.00	-0.37	-60.61	3.56	CO 208
				Min V _z	-43.21	-7.95	> -33.25	-2.67	-84.27	0.59	CO 203
				Max M _T	-79.71	1.19	-16.36	> -0.13	-64.25	3.75	CO 213
				Min M _T	-41.48	-7.24	-32.89	> -2.90	-80.63	0.39	CO 204
				Max M _y	-40.35	-1.89	-20.82	-1.66	> -59.48	0.78	CO 222
				Min M _y	-80.80	-4.17	-28.43	-1.37	> -85.40	3.36	CO 195
				Max M _z	-86.01	-4.07	-26.01	-0.28	-83.95	> 4.69	CO 198
Min M _z	-35.16	-1.99	-23.24	-2.75	-60.91	> -0.54	CO 219				
Section No. 8: IPE 240											
3	RC1	9	0.000 Left	Max N	> 50.20	-0.00	1.90	-0.00	-1.67	-0.01	CO 28
				Min N	> -45.73	0.01	38.74	-0.00	-61.36	0.02	CO 66
				Max V _y	-45.20	> 0.01	38.74	-0.00	-61.34	0.02	CO 73
				Min V _y	37.61	> -0.01	34.51	-0.00	-51.95	-0.02	CO 12
				Max V _z	-45.09	0.01	> 38.74	-0.00	-61.33	0.02	CO 72
				Min V _z	50.20	-0.00	> 1.90	-0.00	-1.67	-0.01	CO 28
				Max M _T	-32.93	0.00	6.10	> 0.00	-10.24	0.00	CO 88
				Min M _T	36.01	-0.01	38.69	> -0.00	-58.40	-0.02	CO 75
				Max M _y	50.20	-0.00	1.90	-0.00	> -1.67	-0.01	CO 28
				Min M _y	-45.73	0.01	38.74	-0.00	> -61.36	0.02	CO 66
				Max M _z	-45.20	0.01	38.74	-0.00	-61.34	> 0.02	CO 73
				Min M _z	37.61	-0.01	34.51	-0.00	-51.95	> -0.02	CO 12
			0.000 Right	Max N	> 50.20	-0.00	1.90	-0.00	-1.67	-0.01	CO 28
				Min N	> -45.73	0.01	38.74	-0.00	-61.36	0.02	CO 66
				Max V _y	-45.20	> 0.01	38.74	-0.00	-61.34	0.02	CO 73
				Min V _y	37.61	> -0.01	34.51	-0.00	-51.95	-0.02	CO 12
				Max V _z	-45.09	0.01	> 38.74	-0.00	-61.33	0.02	CO 72
				Min V _z	50.20	-0.00	> 1.90	-0.00	-1.67	-0.01	CO 28
				Max M _T	-32.93	0.00	6.10	> 0.00	-10.24	0.00	CO 88
				Min M _T	36.01	-0.01	38.69	> -0.00	-58.40	-0.02	CO 75
				Max M _y	50.20	-0.00	1.90	-0.00	> -1.67	-0.01	CO 28
				Min M _y	-45.73	0.01	38.74	-0.00	> -61.36	0.02	CO 66
				Max M _z	-45.20	0.01	38.74	-0.00	-61.34	> 0.02	CO 73
				Min M _z	37.61	-0.01	34.51	-0.00	-51.95	> -0.02	CO 12
			0.238 Left	Max N	> 50.20	-0.00	1.80	-0.00	-1.23	-0.01	CO 28
				Min N	> -45.67	0.01	37.29	-0.00	-52.30	0.02	CO 66
				Max V _y	-45.14	> 0.01	37.29	-0.00	-52.27	0.02	CO 73
				Min V _y	37.65	> -0.01	33.10	-0.00	-43.89	-0.02	CO 12
				Max V _z	-45.67	0.01	> 37.29	-0.00	-52.30	0.02	CO 66
				Min V _z	50.20	-0.00	> 1.80	-0.00	-1.23	-0.01	CO 28
				Max M _T	-32.93	0.00	5.85	> 0.00	-8.81	0.00	CO 88
				Min M _T	36.07	-0.01	37.11	> -0.00	-49.37	-0.02	CO 75
				Max M _y	50.20	-0.00	1.80	-0.00	> -1.23	-0.01	CO 28
				Min M _y	-45.67	0.01	37.29	-0.00	> -52.30	0.02	CO 66

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		29	0.238 Right	Max M _z	-45.14	0.01	37.29	-0.00	-52.27	> 0.02	CO 73
				Min M _z	37.65	-0.01	33.10	-0.00	-43.89	> -0.02	CO 12
				Max N	> 50.20	-0.00	1.80	-0.00	-1.23	-0.01	CO 28
				Min N	> -45.67	0.01	37.29	-0.00	-52.30	0.02	CO 66
				Max V _y	-45.14	> 0.01	37.29	-0.00	-52.27	0.02	CO 73
				Min V _y	37.65	> -0.01	33.10	-0.00	-43.89	-0.02	CO 12
				Max V _z	-45.67	0.01	> 37.29	-0.00	-52.30	0.02	CO 66
				Min V _z	50.20	-0.00	> 1.80	-0.00	-1.23	-0.01	CO 28
				Max M _T	-32.93	0.00	5.85	> 0.00	-8.81	0.00	CO 88
				Min M _T	36.07	-0.01	37.11	> -0.00	-49.37	-0.02	CO 75
				Max M _y	50.20	-0.00	1.80	-0.00	> -1.23	-0.01	CO 28
				Min M _y	-45.67	0.01	37.29	-0.00	> -52.30	0.02	CO 66
			9.116 Left	Max M _z	-45.14	0.01	37.29	-0.00	-52.27	> 0.02	CO 73
				Min M _z	37.65	-0.01	33.10	-0.00	-43.89	> -0.02	CO 12
				Max N	> 50.20	0.00	-1.80	0.00	-1.22	-0.01	CO 28
				Min N	> -45.67	-0.01	-37.29	0.00	-52.29	0.02	CO 66
				Max V _y	37.54	> 0.01	-33.10	0.00	-43.89	-0.02	CO 11
				Min V _y	-45.14	> -0.01	-37.29	0.00	-52.27	0.02	CO 73
				Max V _z	50.20	0.00	> -1.80	0.00	-1.22	-0.01	CO 28
				Min V _z	-45.56	-0.01	> -37.29	0.00	-52.29	0.02	CO 71
				Max M _T	35.96	0.01	-37.11	> 0.00	-49.37	-0.02	CO 74
				Min M _T	-31.21	-0.00	-1.83	> 0.00	-3.25	0.00	CO 24
				Max M _y	50.20	0.00	-1.80	0.00	> -1.22	-0.01	CO 28
				Min M _y	-45.67	-0.01	-37.29	0.00	> -52.29	0.02	CO 66
			9.116 Right	Max M _z	-45.03	-0.01	-37.29	0.00	-52.26	> 0.02	CO 72
				Min M _z	37.54	0.01	-33.10	0.00	-43.89	> -0.02	CO 11
				Max N	> 50.20	0.00	-1.80	0.00	-1.22	-0.01	CO 28
				Min N	> -45.67	-0.01	-37.29	0.00	-52.29	0.02	CO 66
				Max V _y	37.54	> 0.01	-33.10	0.00	-43.89	-0.02	CO 11
				Min V _y	-45.14	> -0.01	-37.29	0.00	-52.27	0.02	CO 73
				Max V _z	50.20	0.00	> -1.80	0.00	-1.22	-0.01	CO 28
				Min V _z	-45.56	-0.01	> -37.29	0.00	-52.29	0.02	CO 71
				Max M _T	35.96	0.01	-37.11	> 0.00	-49.37	-0.02	CO 74
				Min M _T	-31.21	-0.00	-1.83	> 0.00	-3.25	0.00	CO 24
				Max M _y	50.20	0.00	-1.80	0.00	> -1.22	-0.01	CO 28
				Min M _y	-45.67	-0.01	-37.29	0.00	> -52.29	0.02	CO 66
9.353 Left	Max M _z	-45.03	-0.01	-37.29	0.00	-52.26	> 0.02	CO 72			
	Min M _z	37.54	0.01	-33.10	0.00	-43.89	> -0.02	CO 11			
	Max N	> 50.20	0.00	-1.90	0.00	-1.66	-0.01	CO 28			
	Min N	> -45.73	-0.01	-38.74	0.00	-61.36	0.02	CO 66			
	Max V _y	37.50	> 0.01	-34.51	0.00	-51.95	-0.02	CO 11			
	Min V _y	-45.20	> -0.01	-38.74	0.00	-61.33	0.02	CO 73			
	Max V _z	50.20	0.00	> -1.90	0.00	-1.66	-0.01	CO 28			
	Min V _z	-45.09	-0.01	> -38.74	0.00	-61.33	0.02	CO 72			
	Max M _T	35.90	0.01	-38.69	> 0.00	-58.40	-0.02	CO 74			
	Min M _T	-31.21	-0.00	-1.93	> 0.00	-3.70	0.00	CO 24			
	Max M _y	50.20	0.00	-1.90	0.00	> -1.66	-0.01	CO 28			
	Min M _y	-45.73	-0.01	-38.74	0.00	> -61.36	0.02	CO 66			
9.353 Right	Max M _z	-45.09	-0.01	-38.74	0.00	-61.33	> 0.02	CO 72			
	Min M _z	37.50	0.01	-34.51	0.00	-51.95	> -0.02	CO 11			
	Max N	> 50.20	0.00	-1.90	0.00	-1.66	-0.01	CO 28			
	Min N	> -45.73	-0.01	-38.74	0.00	-61.36	0.02	CO 66			
	Max V _y	37.50	> 0.01	-34.51	0.00	-51.95	-0.02	CO 11			
	Min V _y	-45.20	> -0.01	-38.74	0.00	-61.33	0.02	CO 73			
	Max V _z	50.20	0.00	> -1.90	0.00	-1.66	-0.01	CO 28			
	Min V _z	-45.09	-0.01	> -38.74	0.00	-61.33	0.02	CO 72			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
	RC3	9	0.000 Left	Max M _T	35.90	0.01	-38.69	> 0.00	-58.40	-0.02	CO 74
Min M _T				-31.21	-0.00	-1.93	> 0.00	-3.70	0.00	CO 24	
Max M _y				50.20	0.00	-1.90	0.00	> -1.66	-0.01	CO 28	
Min M _y				-45.73	-0.01	-38.74	0.00	> -61.36	0.02	CO 66	
Max M _z				-45.09	-0.01	-38.74	0.00	-61.33	> 0.02	CO 72	
Min M _z				37.50	0.01	-34.51	0.00	-51.95	> -0.02	CO 11	
Max N				> 27.70	-0.00	1.43	-0.00	-1.49	-0.00	CO 218	
Min N				> -22.58	0.00	18.84	-0.00	-29.70	0.00	CO 193	
Max V _y				-22.29	> 0.00	18.84	-0.00	-29.69	0.01	CO 200	
Min V _y				20.96	> -0.00	18.82	-0.00	-28.39	-0.01	CO 202	
Max V _z				-22.29	0.00	> 18.84	-0.00	-29.69	0.01	CO 200	
Min V _z				27.70	-0.00	> 1.43	-0.00	-1.49	-0.00	CO 218	
Max M _T			-15.78	0.00	1.43	> -0.00	-2.57	0.00	CO 215		
Min M _T			20.96	-0.00	18.82	> -0.00	-28.39	-0.01	CO 202		
Max M _y			27.70	-0.00	1.43	-0.00	> -1.49	-0.00	CO 218		
Min M _y			-22.58	0.00	18.84	-0.00	> -29.70	0.00	CO 193		
Max M _z			-22.29	0.00	18.84	-0.00	-29.69	> 0.01	CO 200		
Min M _z			20.96	-0.00	18.82	-0.00	-28.39	> -0.01	CO 202		
Max N			> 27.70	-0.00	1.43	-0.00	-1.49	-0.00	CO 218		
Min N			> -22.58	0.00	18.84	-0.00	-29.70	0.00	CO 193		
Max V _y			-22.29	> 0.00	18.84	-0.00	-29.69	0.01	CO 200		
Min V _y			20.96	> -0.00	18.82	-0.00	-28.39	-0.01	CO 202		
Max V _z			-22.29	0.00	> 18.84	-0.00	-29.69	0.01	CO 200		
Min V _z			27.70	-0.00	> 1.43	-0.00	-1.49	-0.00	CO 218		
Max M _T			-15.78	0.00	1.43	> -0.00	-2.57	0.00	CO 215		
Min M _T			20.96	-0.00	18.82	> -0.00	-28.39	-0.01	CO 202		
Max M _y			27.70	-0.00	1.43	-0.00	> -1.49	-0.00	CO 218		
Min M _y			-22.58	0.00	18.84	-0.00	> -29.70	0.00	CO 193		
Max M _z			-22.29	0.00	18.84	-0.00	-29.69	> 0.01	CO 200		
Min M _z			20.96	-0.00	18.82	-0.00	-28.39	> -0.01	CO 202		
Max N			> 27.70	-0.00	1.35	-0.00	-1.16	-0.00	CO 218		
Min N			> -22.56	0.00	18.11	-0.00	-25.30	0.00	CO 193		
Max V _y			-22.28	> 0.00	18.11	-0.00	-25.29	0.00	CO 200		
Min V _y			20.97	> -0.00	18.06	-0.00	-24.00	-0.01	CO 202		
Max V _z			-22.56	0.00	> 18.11	-0.00	-25.30	0.00	CO 193		
Min V _z			27.70	-0.00	> 1.35	-0.00	-1.16	-0.00	CO 218		
Max M _T			-15.78	0.00	1.36	> -0.00	-2.24	0.00	CO 215		
Min M _T			20.97	-0.00	18.06	> -0.00	-24.00	-0.01	CO 202		
Max M _y			27.70	-0.00	1.35	-0.00	> -1.16	-0.00	CO 218		
Min M _y			-22.56	0.00	18.11	-0.00	> -25.30	0.00	CO 193		
Max M _z			-22.28	0.00	18.11	-0.00	-25.29	> 0.00	CO 200		
Min M _z			20.97	-0.00	18.06	-0.00	-24.00	> -0.01	CO 202		
Max N			> 27.70	-0.00	1.35	-0.00	-1.16	-0.00	CO 218		
Min N			> -22.56	0.00	18.11	-0.00	-25.30	0.00	CO 193		
Max V _y			-22.28	> 0.00	18.11	-0.00	-25.29	0.00	CO 200		
Min V _y			20.97	> -0.00	18.06	-0.00	-24.00	-0.01	CO 202		
Max V _z			-22.56	0.00	> 18.11	-0.00	-25.30	0.00	CO 193		
Min V _z			27.70	-0.00	> 1.35	-0.00	-1.16	-0.00	CO 218		
Max M _T	-15.78	0.00	1.36	> -0.00	-2.24	0.00	CO 215				
Min M _T	20.97	-0.00	18.06	> -0.00	-24.00	-0.01	CO 202				
Max M _y	27.70	-0.00	1.35	-0.00	> -1.16	-0.00	CO 218				
Min M _y	-22.56	0.00	18.11	-0.00	> -25.30	0.00	CO 193				
Max M _z	-22.28	0.00	18.11	-0.00	-25.29	> 0.00	CO 200				
Min M _z	20.97	-0.00	18.06	-0.00	-24.00	> -0.01	CO 202				
Max N	> 27.70	0.00	-1.35	0.00	-1.16	-0.01	CO 218				
Min N	> -22.56	-0.00	-18.10	0.00	-25.29	0.00	CO 193				
			9.116 Left	Max N	> 27.70	0.00	-1.35	0.00	-1.16	-0.01	CO 218
				Min N	> -22.56	-0.00	-18.10	0.00	-25.29	0.00	CO 193

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
11	RC1	2	9.116 Right	Max V _y	20.92	> 0.00	-18.06	0.00	-24.00	-0.01	CO 201
				Min V _y	-22.22	> -0.00	-18.10	0.00	-25.28	0.00	CO 199
				Max V _z	27.70	0.00	> -1.35	0.00	-1.16	-0.01	CO 218
				Min V _z	-22.51	-0.00	> -18.10	0.00	-25.29	0.00	CO 198
				Max M _T	20.92	0.00	-18.06	> 0.00	-24.00	-0.01	CO 201
				Min M _T	-15.72	-0.00	-1.36	> 0.00	-2.23	-0.00	CO 214
				Max M _y	27.70	0.00	-1.35	0.00	> -1.16	-0.01	CO 218
				Min M _y	-22.56	-0.00	-18.10	0.00	> -25.29	0.00	CO 193
				Max M _z	-22.22	-0.00	-18.10	0.00	-25.28	> 0.00	CO 199
				Min M _z	20.92	0.00	-18.06	0.00	-24.00	> -0.01	CO 201
				Max N	> 27.70	0.00	-1.35	0.00	-1.16	-0.01	CO 218
				Min N	> -22.56	-0.00	-18.10	0.00	-25.29	0.00	CO 193
				Max V _y	20.92	> 0.00	-18.06	0.00	-24.00	-0.01	CO 201
				Min V _y	-22.22	> -0.00	-18.10	0.00	-25.28	0.00	CO 199
				Max V _z	27.70	0.00	> -1.35	0.00	-1.16	-0.01	CO 218
				Min V _z	-22.51	-0.00	> -18.10	0.00	-25.29	0.00	CO 198
				Max M _T	20.92	0.00	-18.06	> 0.00	-24.00	-0.01	CO 201
				Min M _T	-15.72	-0.00	-1.36	> 0.00	-2.23	-0.00	CO 214
			Max M _y	27.70	0.00	-1.35	0.00	> -1.16	-0.01	CO 218	
			Min M _y	-22.56	-0.00	-18.10	0.00	> -25.29	0.00	CO 193	
			Max M _z	-22.22	-0.00	-18.10	0.00	-25.28	> 0.00	CO 199	
			Min M _z	20.92	0.00	-18.06	0.00	-24.00	> -0.01	CO 201	
			Max N	> 27.70	0.00	-1.42	0.00	-1.49	-0.01	CO 218	
			Min N	> -22.58	-0.00	-18.83	0.00	-29.70	0.00	CO 193	
			Max V _y	20.90	> 0.00	-18.82	0.00	-28.39	-0.01	CO 201	
			Min V _y	-22.29	> -0.00	-18.83	0.00	-29.68	0.00	CO 200	
			Max V _z	27.70	0.00	> -1.42	0.00	-1.49	-0.01	CO 218	
			Min V _z	-22.24	-0.00	> -18.83	0.00	-29.68	0.00	CO 199	
			Max M _T	20.90	0.00	-18.82	> 0.00	-28.39	-0.01	CO 201	
			Min M _T	-15.72	-0.00	-1.43	> 0.00	-2.56	-0.00	CO 214	
			Max M _y	27.70	0.00	-1.42	0.00	> -1.49	-0.01	CO 218	
			Min M _y	-22.58	-0.00	-18.83	0.00	> -29.70	0.00	CO 193	
			Max M _z	-22.24	-0.00	-18.83	0.00	-29.68	> 0.00	CO 199	
			Min M _z	20.90	0.00	-18.82	0.00	-28.39	> -0.01	CO 201	
			Max N	> 27.70	0.00	-1.42	0.00	-1.49	-0.01	CO 218	
			Min N	> -22.58	-0.00	-18.83	0.00	-29.70	0.00	CO 193	
			Max V _y	20.90	> 0.00	-18.82	0.00	-28.39	-0.01	CO 201	
			Min V _y	-22.29	> -0.00	-18.83	0.00	-29.68	0.00	CO 200	
			Max V _z	27.70	0.00	> -1.42	0.00	-1.49	-0.01	CO 218	
			Min V _z	-22.24	-0.00	> -18.83	0.00	-29.68	0.00	CO 199	
			Max M _T	20.90	0.00	-18.82	> 0.00	-28.39	-0.01	CO 201	
			Min M _T	-15.72	-0.00	-1.43	> 0.00	-2.56	-0.00	CO 214	
Max M _y	27.70	0.00	-1.42	0.00	> -1.49	-0.01	CO 218				
Min M _y	-22.58	-0.00	-18.83	0.00	> -29.70	0.00	CO 193				
Max M _z	-22.24	-0.00	-18.83	0.00	-29.68	> 0.00	CO 199				
Min M _z	20.90	0.00	-18.82	0.00	-28.39	> -0.01	CO 201				
Max N	> 58.97	-0.00	1.70	-0.00	-1.05	-0.00	CO 28				
Min N	> -46.13	0.01	34.80	-0.00	-49.47	0.01	CO 66				
Max V _y	-45.69	> 0.01	34.80	-0.00	-49.46	-0.02	CO 73				
Min V _y	47.45	> -0.00	30.99	-0.00	-41.55	-0.01	CO 12				
Max V _z	-45.61	0.01	> 34.80	-0.00	-49.45	0.01	CO 72				
Min V _z	58.97	-0.00	> 1.70	-0.00	-1.05	-0.00	CO 28				
Max M _T	58.90	-0.00	1.70	> -0.00	-1.05	0.00	CO 29				
Min M _T	-46.05	0.01	34.80	> -0.00	-49.47	0.01	CO 71				
Max M _y	58.97	-0.00	1.70	-0.00	> -1.05	-0.00	CO 28				
Min M _y	-46.13	0.01	34.80	-0.00	> -49.47	0.01	CO 66				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
			0.000 Right	Max M _z	-45.69	0.01	34.80	-0.00	-49.46	> 0.02	CO 73	
				Min M _z	47.45	-0.00	30.99	-0.00	-41.55	> -0.01	CO 12	
				Max N	> 58.97	-0.00	1.70	-0.00	-1.05	-0.00	CO 28	
				Min N	> -46.13	0.01	34.80	-0.00	-49.47	0.01	CO 66	
				Max V _y	-45.69	> 0.01	34.80	-0.00	-49.46	0.02	CO 73	
				Min V _y	47.45	> -0.00	30.99	-0.00	-41.55	-0.01	CO 12	
				Max V _z	-45.61	0.01	> 34.80	-0.00	-49.45	0.01	CO 72	
				Min V _z	58.97	-0.00	> 1.70	-0.00	-1.05	-0.00	CO 28	
				Max M _T	58.90	-0.00	1.70	> -0.00	-1.05	0.00	CO 29	
				Min M _T	-46.05	0.01	34.80	> -0.00	-49.47	0.01	CO 71	
				Max M _y	58.97	-0.00	1.70	-0.00	> -1.05	-0.00	CO 28	
				Min M _y	-46.13	0.01	34.80	-0.00	> -49.47	0.01	CO 66	
				Max M _z	-45.69	0.01	34.80	-0.00	-49.46	> 0.02	CO 73	
				Min M _z	47.45	-0.00	30.99	-0.00	-41.55	> -0.01	CO 12	
			0.238 Left	Max N	> 58.97	-0.00	1.60	-0.00	-0.66	-0.00	CO 28	
				Min N	> -46.09	0.01	33.33	-0.00	-41.35	0.01	CO 66	
				Max V _y	-45.65	> 0.01	33.33	-0.00	-41.33	0.01	CO 73	
				Min V _y	47.48	> -0.00	29.57	-0.00	-34.33	-0.01	CO 12	
				Max V _z	-46.09	0.01	> 33.33	-0.00	-41.35	0.01	CO 66	
				Min V _z	58.97	-0.00	> 1.60	-0.00	-0.66	-0.00	CO 28	
				Max M _T	58.90	-0.00	1.60	> -0.00	-0.66	0.00	CO 29	
				Min M _T	-46.01	0.01	33.33	> -0.00	-41.34	0.01	CO 71	
				Max M _y	58.97	-0.00	1.60	-0.00	> -0.66	-0.00	CO 28	
				Min M _y	-46.09	0.01	33.33	-0.00	> -41.35	0.01	CO 66	
				Max M _z	-45.65	0.01	33.33	-0.00	-41.33	> 0.01	CO 73	
				Min M _z	47.48	-0.00	29.57	-0.00	-34.33	> -0.01	CO 12	
				0.238 Right	Max N	> 58.97	-0.00	1.60	-0.00	-0.66	-0.00	CO 28
					Min N	> -46.09	0.01	33.33	-0.00	-41.35	0.01	CO 66
			Max V _y		-45.65	> 0.01	33.33	-0.00	-41.33	0.01	CO 73	
			Min V _y		47.48	> -0.00	29.57	-0.00	-34.33	-0.01	CO 12	
			Max V _z		-46.09	0.01	> 33.33	-0.00	-41.35	0.01	CO 66	
			Min V _z		58.97	-0.00	> 1.60	-0.00	-0.66	-0.00	CO 28	
			Max M _T		58.90	-0.00	1.60	> -0.00	-0.66	0.00	CO 29	
			Min M _T		-46.01	0.01	33.33	> -0.00	-41.34	0.01	CO 71	
			Max M _y		58.97	-0.00	1.60	-0.00	> -0.66	-0.00	CO 28	
			Min M _y		-46.09	0.01	33.33	-0.00	> -41.35	0.01	CO 66	
			Max M _z		-45.65	0.01	33.33	-0.00	-41.33	> 0.01	CO 73	
			Min M _z		47.48	-0.00	29.57	-0.00	-34.33	> -0.01	CO 12	
			8.164 Left		Max N	> 58.97	0.00	-1.60	0.00	-0.65	-0.00	CO 28
					Min N	> -46.09	-0.01	-33.33	0.00	-41.35	0.01	CO 66
				Max V _y	47.40	> 0.00	-29.57	0.00	-34.33	-0.01	CO 11	
				Min V _y	-45.65	> -0.01	-33.33	0.00	-41.33	0.01	CO 73	
				Max V _z	58.97	0.00	> -1.60	0.00	-0.65	-0.00	CO 28	
				Min V _z	-46.01	-0.01	> -33.33	0.00	-41.34	0.01	CO 71	
				Max M _T	-46.09	-0.01	-33.33	> 0.00	-41.35	0.01	CO 66	
				Min M _T	58.97	0.00	-1.60	> 0.00	-0.65	-0.00	CO 28	
				Max M _y	58.97	0.00	-1.60	0.00	> -0.65	-0.00	CO 28	
				Min M _y	-46.09	-0.01	-33.33	0.00	> -41.35	0.01	CO 66	
				Max M _z	-45.57	-0.01	-33.33	0.00	-41.32	> 0.01	CO 72	
				Min M _z	47.40	0.00	-29.57	0.00	-34.33	> -0.01	CO 11	
				8.164 Right	Max N	> 58.97	0.00	-1.60	0.00	-0.65	-0.00	CO 28
					Min N	> -46.09	-0.01	-33.33	0.00	-41.35	0.01	CO 66
			Max V _y		47.40	> 0.00	-29.57	0.00	-34.33	-0.01	CO 11	
			Min V _y		-45.65	> -0.01	-33.33	0.00	-41.33	0.01	CO 73	
			Max V _z		58.97	0.00	> -1.60	0.00	-0.65	-0.00	CO 28	
			Min V _z		-46.01	-0.01	> -33.33	0.00	-41.34	0.01	CO 71	

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Max M _T	-46.09	-0.01	-33.33	> 0.00	-41.35	0.01	CO 66
				Min M _T	58.97	0.00	-1.60	> 0.00	-0.65	-0.00	CO 28
				Max M _y	58.97	0.00	-1.60	0.00	> -0.65	-0.00	CO 28
				Min M _y	-46.09	-0.01	-33.33	0.00	> -41.35	0.01	CO 66
				Max M _z	-45.57	-0.01	-33.33	0.00	-41.32	> 0.01	CO 72
				Min M _z	47.40	0.00	-29.57	0.00	-34.33	> -0.01	CO 11
			8.402	Max N	> 58.97	0.00	-1.70	0.00	-1.05	-0.00	CO 28
			Left	Min N	> -46.13	-0.01	-34.80	0.00	-49.47	0.01	CO 66
				Max V _y	47.37	> 0.00	-30.99	0.00	-41.55	-0.01	CO 11
				Min V _y	-45.69	> -0.01	-34.80	0.00	-49.45	0.01	CO 73
				Max V _z	58.97	0.00	> -1.70	0.00	-1.05	-0.00	CO 28
				Min V _z	-45.61	-0.01	> -34.80	0.00	-49.45	0.01	CO 72
				Max M _T	-46.13	-0.01	-34.80	> 0.00	-49.47	0.01	CO 66
				Min M _T	58.97	0.00	-1.70	> 0.00	-1.05	-0.00	CO 28
				Max M _y	58.97	0.00	-1.70	0.00	> -1.05	-0.00	CO 28
				Min M _y	-46.13	-0.01	-34.80	0.00	> -49.47	0.01	CO 66
				Max M _z	-45.61	-0.01	-34.80	0.00	-49.45	> 0.01	CO 72
				Min M _z	47.37	0.00	-30.99	0.00	-41.55	> -0.01	CO 11
		20	8.402	Max N	> 58.97	0.00	-1.70	0.00	-1.05	-0.00	CO 28
			Right	Min N	> -46.13	-0.01	-34.80	0.00	-49.47	0.01	CO 66
				Max V _y	47.37	> 0.00	-30.99	0.00	-41.55	-0.01	CO 11
				Min V _y	-45.69	> -0.01	-34.80	0.00	-49.45	0.01	CO 73
				Max V _z	58.97	0.00	> -1.70	0.00	-1.05	-0.00	CO 28
				Min V _z	-45.61	-0.01	> -34.80	0.00	-49.45	0.01	CO 72
				Max M _T	-46.13	-0.01	-34.80	> 0.00	-49.47	0.01	CO 66
				Min M _T	58.97	0.00	-1.70	> 0.00	-1.05	-0.00	CO 28
				Max M _y	58.97	0.00	-1.70	0.00	> -1.05	-0.00	CO 28
				Min M _y	-46.13	-0.01	-34.80	0.00	> -49.47	0.01	CO 66
				Max M _z	-45.61	-0.01	-34.80	0.00	-49.45	> 0.01	CO 72
				Min M _z	47.37	0.00	-30.99	0.00	-41.55	> -0.01	CO 11
	RC3	2	0.000	Max N	> 32.62	-0.00	1.28	-0.00	-1.04	-0.00	CO 218
			Left	Min N	> -22.63	0.00	16.92	-0.00	-23.96	0.00	CO 193
				Max V _y	-22.40	> 0.00	16.92	-0.00	-23.95	0.00	CO 200
				Min V _y	26.46	> -0.00	16.90	-0.00	-22.71	-0.00	CO 202
				Max V _z	-22.40	0.00	> 16.92	-0.00	-23.95	0.00	CO 200
				Min V _z	32.62	-0.00	> 1.28	-0.00	-1.04	-0.00	CO 218
				Max M _T	32.59	-0.00	1.28	> -0.00	-1.04	0.00	CO 219
				Min M _T	-22.59	0.00	16.92	> -0.00	-23.96	0.00	CO 198
				Max M _y	32.62	-0.00	1.28	-0.00	> -1.04	-0.00	CO 218
				Min M _y	-22.63	0.00	16.92	-0.00	> -23.96	0.00	CO 193
				Max M _z	-22.40	0.00	16.92	-0.00	-23.95	> 0.00	CO 200
				Min M _z	26.46	-0.00	16.90	-0.00	-22.71	> -0.00	CO 202
			0.000	Max N	> 32.62	-0.00	1.28	-0.00	-1.04	-0.00	CO 218
			Right	Min N	> -22.63	0.00	16.92	-0.00	-23.96	0.00	CO 193
				Max V _y	-22.40	> 0.00	16.92	-0.00	-23.95	0.00	CO 200
				Min V _y	26.46	> -0.00	16.90	-0.00	-22.71	-0.00	CO 202
				Max V _z	-22.40	0.00	> 16.92	-0.00	-23.95	0.00	CO 200
				Min V _z	32.62	-0.00	> 1.28	-0.00	-1.04	-0.00	CO 218
				Max M _T	32.59	-0.00	1.28	> -0.00	-1.04	0.00	CO 219
				Min M _T	-22.59	0.00	16.92	> -0.00	-23.96	0.00	CO 198
				Max M _y	32.62	-0.00	1.28	-0.00	> -1.04	-0.00	CO 218
				Min M _y	-22.63	0.00	16.92	-0.00	> -23.96	0.00	CO 193
				Max M _z	-22.40	0.00	16.92	-0.00	-23.95	> 0.00	CO 200
				Min M _z	26.46	-0.00	16.90	-0.00	-22.71	> -0.00	CO 202
			0.238	Max N	> 32.62	-0.00	1.20	-0.00	-0.75	-0.00	CO 218
			Left	Min N	> -22.62	0.00	16.18	-0.00	-20.02	0.00	CO 193

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Max V _y	-22.39	> 0.00	16.18	-0.00	-20.01	0.00	CO 200
				Min V _y	26.47	> -0.00	16.14	-0.00	-18.77	-0.00	CO 202
				Max V _z	-22.62	0.00	> 16.18	-0.00	-20.02	0.00	CO 193
				Min V _z	32.62	-0.00	> 1.20	-0.00	-0.75	-0.00	CO 218
				Max M _T	32.59	-0.00	1.20	> -0.00	-0.75	0.00	CO 219
				Min M _T	-22.58	0.00	16.18	> -0.00	-20.01	0.00	CO 198
				Max M _y	32.62	-0.00	1.20	-0.00	> -0.75	-0.00	CO 218
				Min M _y	-22.62	0.00	16.18	-0.00	> -20.02	0.00	CO 193
				Max M _z	-22.39	0.00	16.18	-0.00	-20.01	> 0.00	CO 200
				Min M _z	26.47	-0.00	16.14	-0.00	-18.77	> -0.00	CO 202
			0.238	Max N	> 32.62	-0.00	1.20	-0.00	-0.75	-0.00	CO 218
			Right	Min N	> -22.62	0.00	16.18	-0.00	-20.01	0.00	CO 193
				Max V _y	-22.39	> 0.00	16.18	-0.00	-20.01	0.00	CO 200
				Min V _y	26.47	> -0.00	16.14	-0.00	-18.77	-0.00	CO 202
				Max V _z	-22.62	0.00	> 16.18	-0.00	-20.01	0.00	CO 193
				Min V _z	32.62	-0.00	> 1.20	-0.00	-0.75	-0.00	CO 218
				Max M _T	32.59	-0.00	1.20	> -0.00	-0.75	0.00	CO 219
				Min M _T	-22.58	0.00	16.18	> -0.00	-20.01	0.00	CO 198
				Max M _y	32.62	-0.00	1.20	-0.00	> -0.75	-0.00	CO 218
				Min M _y	-22.62	0.00	16.18	-0.00	> -20.01	0.00	CO 193
				Max M _z	-22.39	0.00	16.18	-0.00	-20.01	> 0.00	CO 200
				Min M _z	26.47	-0.00	16.14	-0.00	-18.77	> -0.00	CO 202
			8.164	Max N	> 32.62	0.00	-1.20	0.00	-0.74	-0.00	CO 218
			Left	Min N	> -22.62	-0.00	-16.18	0.00	-20.01	0.00	CO 193
				Max V _y	26.43	> 0.00	-16.14	0.00	-18.77	-0.00	CO 201
				Min V _y	-22.35	> -0.00	-16.18	0.00	-20.00	0.00	CO 199
				Max V _z	32.62	0.00	> -1.20	0.00	-0.74	-0.00	CO 218
				Min V _z	-22.58	-0.00	> -16.18	0.00	-20.01	0.00	CO 198
				Max M _T	-22.62	-0.00	-16.18	> 0.00	-20.01	0.00	CO 193
				Min M _T	32.62	0.00	-1.20	> 0.00	-0.74	-0.00	CO 218
				Max M _y	32.62	0.00	-1.20	0.00	> -0.74	-0.00	CO 218
				Min M _y	-22.62	-0.00	-16.18	0.00	> -20.01	0.00	CO 193
				Max M _z	-22.35	-0.00	-16.18	0.00	-20.00	> 0.00	CO 199
				Min M _z	26.43	0.00	-16.14	0.00	-18.77	> -0.00	CO 201
			8.164	Max N	> 32.62	0.00	-1.20	0.00	-0.74	-0.00	CO 218
			Right	Min N	> -22.62	-0.00	-16.18	0.00	-20.01	0.00	CO 193
				Max V _y	26.43	> 0.00	-16.14	0.00	-18.77	-0.00	CO 201
				Min V _y	-22.35	> -0.00	-16.18	0.00	-20.00	0.00	CO 199
				Max V _z	32.62	0.00	> -1.20	0.00	-0.74	-0.00	CO 218
				Min V _z	-22.58	-0.00	> -16.18	0.00	-20.01	0.00	CO 198
				Max M _T	-22.62	-0.00	-16.18	> 0.00	-20.01	0.00	CO 193
				Min M _T	32.62	0.00	-1.20	> 0.00	-0.74	-0.00	CO 218
				Max M _y	32.62	0.00	-1.20	0.00	> -0.74	-0.00	CO 218
				Min M _y	-22.62	-0.00	-16.18	0.00	> -20.01	0.00	CO 193
				Max M _z	-22.35	-0.00	-16.18	0.00	-20.00	> 0.00	CO 199
				Min M _z	26.43	0.00	-16.14	0.00	-18.77	> -0.00	CO 201
			8.402	Max N	> 32.62	0.00	-1.28	0.00	-1.04	-0.00	CO 218
			Left	Min N	> -22.63	-0.00	-16.92	0.00	-23.96	0.00	CO 193
				Max V _y	26.42	> 0.00	-16.90	0.00	-22.71	-0.00	CO 201
				Min V _y	-22.36	> -0.00	-16.92	0.00	-23.95	0.00	CO 199
				Max V _z	32.62	0.00	> -1.28	0.00	-1.04	-0.00	CO 218
				Min V _z	-22.36	-0.00	> -16.92	0.00	-23.95	0.00	CO 199
				Max M _T	-22.63	-0.00	-16.92	> 0.00	-23.96	0.00	CO 193
				Min M _T	32.62	0.00	-1.28	> 0.00	-1.04	-0.00	CO 218
				Max M _y	32.62	0.00	-1.28	0.00	> -1.04	-0.00	CO 218
				Min M _y	-22.63	-0.00	-16.92	0.00	> -23.96	0.00	CO 193

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
		20	8.402 Right	Max M _z	-22.36	-0.00	-16.92	0.00	-23.95	> 0.00	CO 199
				Min M _z	26.42	0.00	-16.90	0.00	-22.71	> -0.00	CO 201
				Max N	> 32.62	0.00	-1.28	0.00	-1.04	-0.00	CO 218
				Min N	> -22.63	-0.00	-16.92	0.00	-23.96	0.00	CO 193
				Max V _y	26.42	> 0.00	-16.90	0.00	-22.71	-0.00	CO 201
				Min V _y	-22.36	> -0.00	-16.92	0.00	-23.95	0.00	CO 199
				Max V _z	32.62	0.00	> -1.28	0.00	-1.04	-0.00	CO 218
				Min V _z	-22.36	-0.00	> -16.92	0.00	-23.95	0.00	CO 199
				Max M _T	-22.63	-0.00	-16.92	> 0.00	-23.96	0.00	CO 193
				Min M _T	32.62	0.00	-1.28	> 0.00	-1.04	-0.00	CO 218
				Max M _y	32.62	0.00	-1.28	0.00	> -1.04	-0.00	CO 218
				Min M _y	-22.63	-0.00	-16.92	0.00	> -23.96	0.00	CO 193
				Max M _z	-22.36	-0.00	-16.92	0.00	-23.95	> 0.00	CO 199
				Min M _z	26.42	0.00	-16.90	0.00	-22.71	> -0.00	CO 201
Section No. 9: IPE 300											
10	RC1	16	0.000 Left	Max N	> 29.97	-0.00	3.19	-0.00	-4.03	-0.02	CO 28
				Min N	> -37.66	0.01	49.77	0.01	-93.85	0.04	CO 66
				Max V _y	-32.13	> 0.01	49.77	0.01	-93.69	0.04	CO 73
				Min V _y	18.60	> -0.01	44.46	-0.00	-80.25	-0.02	CO 12
				Max V _z	-15.64	0.00	> 49.78	0.00	-92.06	0.01	CO 67
				Min V _z	29.97	-0.00	> 3.19	-0.00	-4.03	-0.02	CO 28
				Max M _T	-31.15	0.01	49.77	> 0.01	-93.66	0.04	CO 72
				Min M _T	17.62	-0.01	44.46	> -0.00	-80.27	-0.02	CO 11
				Max M _y	29.97	-0.00	3.19	-0.00	> -4.03	-0.02	CO 28
				Min M _y	-37.66	0.01	49.77	0.01	> -93.85	0.04	CO 66
			Max M _z	-32.13	0.01	49.77	0.01	-93.69	> 0.04	CO 73	
			Min M _z	22.16	-0.00	8.48	-0.00	-13.90	> -0.02	CO 89	
			0.000 Right	Max N	> 29.97	-0.00	3.19	-0.00	-4.03	-0.02	CO 28
				Min N	> -37.66	0.01	49.77	0.01	-93.85	0.04	CO 66
				Max V _y	-32.13	> 0.01	49.77	0.01	-93.69	0.04	CO 73
				Min V _y	18.60	> -0.01	44.46	-0.00	-80.25	-0.02	CO 12
				Max V _z	-15.64	0.00	> 49.78	0.00	-92.06	0.01	CO 67
				Min V _z	29.97	-0.00	> 3.19	-0.00	-4.03	-0.02	CO 28
				Max M _T	-31.15	0.01	49.77	> 0.01	-93.66	0.04	CO 72
				Min M _T	17.62	-0.01	44.46	> -0.00	-80.27	-0.02	CO 11
				Max M _y	29.97	-0.00	3.19	-0.00	> -4.03	-0.02	CO 28
		Min M _y		-37.66	0.01	49.77	0.01	> -93.85	0.04	CO 66	
		Max M _z	-32.13	0.01	49.77	0.01	-93.69	> 0.04	CO 73		
		Min M _z	22.16	-0.00	8.48	-0.00	-13.90	> -0.02	CO 89		
		0.238 Left	Max N	> 29.97	-0.00	3.06	-0.00	-3.29	-0.02	CO 28	
			Min N	> -37.60	0.01	48.16	0.01	-82.18	0.04	CO 66	
			Max V _y	-32.07	> 0.01	48.16	0.01	-82.02	0.04	CO 73	
			Min V _y	18.64	> -0.01	42.96	-0.00	-69.83	-0.02	CO 12	
			Max V _z	-37.60	0.01	> 48.16	0.01	-82.18	0.04	CO 66	
			Min V _z	29.97	-0.00	> 3.06	-0.00	-3.29	-0.02	CO 28	
			Max M _T	-31.09	0.01	48.16	> 0.01	-81.99	0.04	CO 72	
			Min M _T	17.66	-0.01	42.96	> -0.00	-69.86	-0.02	CO 11	
			Max M _y	29.97	-0.00	3.06	-0.00	> -3.29	-0.02	CO 28	
			Min M _y	-37.60	0.01	48.16	0.01	> -82.18	0.04	CO 66	
			Max M _z	-32.07	0.01	48.16	0.01	-82.02	> 0.04	CO 73	
		Min M _z	22.16	-0.00	8.17	-0.00	-11.92	> -0.02	CO 89		
		0.238 Right	Max N	> 29.97	-0.00	3.06	-0.00	-3.29	-0.02	CO 28	
			Min N	> -37.60	0.01	48.16	0.01	-82.18	0.04	CO 66	
			Max V _y	-32.07	> 0.01	48.16	0.01	-82.02	0.04	CO 73	
			Min V _y	18.64	> -0.01	42.96	-0.00	-69.83	-0.02	CO 12	
			Max V _z	-37.60	0.01	> 48.16	0.01	-82.18	0.04	CO 66	

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Min V _z	29.97	-0.00	> 3.06	-0.00	-3.29	-0.02	CO 28
				Max M _T	-31.09	0.01	48.16	> 0.01	-81.99	0.04	CO 72
				Min M _T	17.66	-0.01	42.96	> -0.00	-69.86	-0.02	CO 11
				Max M _y	29.97	-0.00	3.06	-0.00	> -3.29	-0.02	CO 28
				Min M _y	-37.60	0.01	48.16	0.01	> -82.18	0.04	CO 66
				Max M _z	-32.07	0.01	48.16	0.01	-82.02	> 0.04	CO 73
				Min M _z	22.16	-0.00	8.17	-0.00	-11.92	> -0.02	CO 89
			11.019	Max N	> 29.97	0.00	-3.05	0.00	-3.25	-0.02	CO 28
			Left	Min N	> -37.60	-0.01	-48.16	-0.01	-82.13	0.04	CO 66
				Max V _y	18.64	> 0.01	-42.95	0.00	-69.80	-0.02	CO 12
				Min V _y	-32.07	> -0.01	-48.15	-0.01	-81.98	0.04	CO 73
				Max V _z	29.97	0.00	> -3.05	0.00	-3.25	-0.02	CO 28
				Min V _z	-37.60	-0.01	> -48.16	-0.01	-82.13	0.04	CO 66
				Max M _T	17.66	0.01	-42.95	> 0.00	-69.83	-0.02	CO 11
				Min M _T	-31.09	-0.01	-48.15	> -0.01	-81.95	0.04	CO 72
				Max M _y	29.97	0.00	-3.05	0.00	> -3.25	-0.02	CO 28
				Min M _y	-37.60	-0.01	-48.16	-0.01	> -82.13	0.04	CO 66
				Max M _z	-31.09	-0.01	-48.15	-0.01	-81.95	> 0.04	CO 72
				Min M _z	22.16	0.00	-8.16	0.00	-11.88	> -0.02	CO 89
			11.019	Max N	> 29.97	0.00	-3.05	0.00	-3.25	-0.02	CO 28
			Right	Min N	> -37.60	-0.01	-48.16	-0.01	-82.14	0.04	CO 66
				Max V _y	18.64	> 0.01	-42.95	0.00	-69.80	-0.02	CO 12
				Min V _y	-32.07	> -0.01	-48.15	-0.01	-81.98	0.04	CO 73
				Max V _z	29.97	0.00	> -3.05	0.00	-3.25	-0.02	CO 28
				Min V _z	-37.60	-0.01	> -48.16	-0.01	-82.14	0.04	CO 66
				Max M _T	17.66	0.01	-42.95	> 0.00	-69.83	-0.02	CO 11
				Min M _T	-31.09	-0.01	-48.15	> -0.01	-81.95	0.04	CO 72
				Max M _y	29.97	0.00	-3.05	0.00	> -3.25	-0.02	CO 28
				Min M _y	-37.60	-0.01	-48.16	-0.01	> -82.14	0.04	CO 66
				Max M _z	-31.09	-0.01	-48.15	-0.01	-81.95	> 0.04	CO 72
				Min M _z	22.16	0.00	-8.16	0.00	-11.88	> -0.02	CO 89
			11.256	Max N	> 29.97	0.00	-3.19	0.00	-4.00	-0.02	CO 28
			Left	Min N	> -37.65	-0.01	-49.77	-0.01	-93.80	0.03	CO 66
				Max V _y	18.60	> 0.01	-44.45	0.00	-80.21	-0.02	CO 12
				Min V _y	-32.13	> -0.01	-49.77	-0.01	-93.64	0.04	CO 73
				Max V _z	29.97	0.00	> -3.19	0.00	-4.00	-0.02	CO 28
				Min V _z	-15.64	-0.00	> -49.77	0.00	-92.02	0.00	CO 67
				Max M _T	17.62	0.01	-44.45	> 0.00	-80.24	-0.02	CO 11
				Min M _T	-31.15	-0.01	-49.77	> -0.01	-93.62	0.04	CO 72
				Max M _y	29.97	0.00	-3.19	0.00	> -4.00	-0.02	CO 28
				Min M _y	-37.65	-0.01	-49.77	-0.01	> -93.80	0.03	CO 66
				Max M _z	-31.15	-0.01	-49.77	-0.01	-93.62	> 0.04	CO 72
				Min M _z	22.16	0.00	-8.47	0.00	-13.87	> -0.02	CO 89
		38	11.256	Max N	> 29.97	0.00	-3.19	0.00	-4.00	-0.02	CO 28
			Right	Min N	> -37.65	-0.01	-49.77	-0.01	-93.80	0.03	CO 66
				Max V _y	18.60	> 0.01	-44.45	0.00	-80.21	-0.02	CO 12
				Min V _y	-32.13	> -0.01	-49.77	-0.01	-93.65	0.04	CO 73
				Max V _z	29.97	0.00	> -3.19	0.00	-4.00	-0.02	CO 28
				Min V _z	-15.64	-0.00	> -49.77	0.00	-92.03	0.00	CO 67
				Max M _T	17.62	0.01	-44.45	> 0.00	-80.24	-0.02	CO 11
				Min M _T	-31.15	-0.01	-49.77	> -0.01	-93.62	0.04	CO 72
				Max M _y	29.97	0.00	-3.19	0.00	> -4.00	-0.02	CO 28
				Min M _y	-37.65	-0.01	-49.77	-0.01	> -93.80	0.03	CO 66
				Max M _z	-31.15	-0.01	-49.77	-0.01	-93.62	> 0.04	CO 72
				Min M _z	22.16	0.00	-8.47	0.00	-13.87	> -0.02	CO 89
	RC3	16	0.000	Max N	> 16.31	-0.00	2.37	-0.00	-3.35	-0.01	CO 218

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases		
				N	V _y	V _z	M _T	M _y	M _z			
			0.000	Left	Min N	> -19.03	0.00	24.39	0.00	-45.89	0.01	CO 193
				Max V _y	-16.08	> 0.00	24.39	0.00	-45.83	0.01	CO 200	
				Min V _y	10.23	> -0.00	24.38	-0.00	-44.04	-0.01	CO 202	
				Max V _z	-7.31	0.00	> 24.39	-0.00	-45.01	0.00	CO 194	
				Min V _z	16.31	-0.00	> 2.37	-0.00	-3.35	-0.01	CO 218	
				Max M _T	-15.56	0.00	24.39	> 0.00	-45.81	0.01	CO 199	
				Min M _T	9.70	-0.00	24.38	> -0.00	-44.05	-0.01	CO 201	
				Max M _y	16.31	-0.00	2.37	-0.00	> -3.35	-0.01	CO 218	
				Min M _y	-19.03	0.00	24.39	0.00	> -45.89	0.01	CO 193	
				Max M _z	-16.08	0.00	24.39	0.00	-45.83	> 0.01	CO 200	
				Min M _z	12.85	-0.00	2.38	-0.00	-3.41	> -0.01	CO 216	
				Max N	> 16.31	-0.00	2.37	-0.00	-3.35	-0.01	CO 218	
				Right	Min N	> -19.03	0.00	24.39	0.00	-45.89	0.01	CO 193
				Max V _y	-16.08	> 0.00	24.39	0.00	-45.82	0.01	CO 200	
				Min V _y	10.23	> -0.00	24.38	-0.00	-44.04	-0.01	CO 202	
				Max V _z	-7.31	0.00	> 24.39	-0.00	-45.01	0.00	CO 194	
				Min V _z	16.31	-0.00	> 2.37	-0.00	-3.35	-0.01	CO 218	
				Max M _T	-15.56	0.00	24.39	> 0.00	-45.81	0.01	CO 199	
			Min M _T	9.70	-0.00	24.38	> -0.00	-44.05	-0.01	CO 201		
			Max M _y	16.31	-0.00	2.37	-0.00	> -3.35	-0.01	CO 218		
			Min M _y	-19.03	0.00	24.39	0.00	> -45.89	0.01	CO 193		
			Max M _z	-16.08	0.00	24.39	0.00	-45.82	> 0.01	CO 200		
			Min M _z	12.85	-0.00	2.38	-0.00	-3.41	> -0.01	CO 216		
			0.238	Max N	> 16.31	-0.00	2.27	-0.00	-2.79	-0.01	CO 218	
			0.238	Left	Min N	> -19.01	0.00	23.58	0.00	-40.18	0.01	CO 193
				Max V _y	-16.07	> 0.00	23.58	0.00	-40.11	0.02	CO 200	
				Min V _y	10.24	> -0.00	23.56	-0.00	-38.33	-0.01	CO 202	
				Max V _z	-19.01	0.00	> 23.58	0.00	-40.18	0.01	CO 193	
				Min V _z	16.31	-0.00	> 2.27	-0.00	-2.79	-0.01	CO 218	
				Max M _T	-15.55	0.00	23.58	> 0.00	-40.10	0.01	CO 199	
				Min M _T	9.72	-0.00	23.56	> -0.00	-38.34	-0.01	CO 201	
				Max M _y	16.31	-0.00	2.27	-0.00	> -2.79	-0.01	CO 218	
				Min M _y	-19.01	0.00	23.58	0.00	> -40.18	0.01	CO 193	
				Max M _z	-16.07	0.00	23.58	0.00	-40.11	> 0.02	CO 200	
				Min M _z	12.85	-0.00	2.27	-0.00	-2.86	> -0.01	CO 216	
				Max N	> 16.31	-0.00	2.27	-0.00	-2.79	-0.01	CO 218	
				Right	Min N	> -19.01	0.00	23.58	0.00	-40.18	0.01	CO 193
				Max V _y	-16.07	> 0.00	23.58	0.00	-40.11	0.02	CO 200	
				Min V _y	10.24	> -0.00	23.56	-0.00	-38.33	-0.01	CO 202	
				Max V _z	-19.01	0.00	> 23.58	0.00	-40.18	0.01	CO 193	
				Min V _z	16.31	-0.00	> 2.27	-0.00	-2.79	-0.01	CO 218	
				Max M _T	-15.55	0.00	23.58	> 0.00	-40.10	0.01	CO 199	
			Min M _T	9.72	-0.00	23.56	> -0.00	-38.34	-0.01	CO 201		
			Max M _y	16.31	-0.00	2.27	-0.00	> -2.79	-0.01	CO 218		
			Min M _y	-19.01	0.00	23.58	0.00	> -40.18	0.01	CO 193		
			Max M _z	-16.07	0.00	23.58	0.00	-40.11	> 0.02	CO 200		
			Min M _z	12.85	-0.00	2.27	-0.00	-2.86	> -0.01	CO 216		
			11.019	Max N	> 16.31	0.00	-2.27	0.00	-2.77	-0.01	CO 218	
				Left	Min N	> -19.01	-0.00	-23.58	-0.00	-40.15	0.01	CO 193
					Max V _y	10.24	> 0.00	-23.55	0.00	-38.30	-0.01	CO 202
					Min V _y	-16.07	> -0.00	-23.58	-0.00	-40.08	0.01	CO 200
					Max V _z	16.31	0.00	> -2.27	0.00	-2.77	-0.01	CO 218
					Min V _z	-19.01	-0.00	> -23.58	-0.00	-40.15	0.01	CO 193
					Max M _T	9.72	0.00	-23.55	> 0.00	-38.31	-0.01	CO 201
					Min M _T	-15.55	-0.00	-23.58	> -0.00	-40.07	0.01	CO 199
					Max M _y	16.31	0.00	-2.27	0.00	> -2.77	-0.01	CO 218

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
12	RC1	1	11.019 Right	Min M _y	-19.01	-0.00	-23.58	-0.00	> -40.15	0.01	CO 193
				Max M _z	-15.55	-0.00	-23.58	-0.00	-40.07	> 0.01	CO 199
				Min M _z	12.85	0.00	-2.27	0.00	-2.83	> -0.01	CO 216
				Max N	> 16.31	0.00	-2.27	0.00	-2.77	-0.01	CO 218
				Min N	> -19.01	-0.00	-23.58	-0.00	-40.15	0.01	CO 193
				Max V _y	10.24	> 0.00	-23.55	0.00	-38.30	-0.01	CO 202
				Min V _y	-16.07	> -0.00	-23.58	-0.00	-40.08	0.01	CO 200
				Max V _z	16.31	0.00	> -2.27	0.00	-2.77	-0.01	CO 218
				Min V _z	-19.01	-0.00	> -23.58	-0.00	-40.15	0.01	CO 193
				Max M _T	9.72	0.00	-23.55	> 0.00	-38.31	-0.01	CO 201
				Min M _T	-15.55	-0.00	-23.58	> -0.00	-40.07	0.01	CO 199
				Max M _y	16.31	0.00	-2.27	0.00	> -2.77	-0.01	CO 218
				Min M _y	-19.01	-0.00	-23.58	-0.00	> -40.15	0.01	CO 193
				Max M _z	-15.55	-0.00	-23.58	-0.00	-40.07	> 0.01	CO 199
				Min M _z	12.85	0.00	-2.27	0.00	-2.83	> -0.01	CO 216
				Max N	> 16.31	0.00	-2.37	0.00	-3.32	-0.01	CO 218
				Min N	> -19.03	-0.00	-24.39	-0.00	-45.86	0.01	CO 193
				Max V _y	10.23	> 0.00	-24.38	0.00	-44.01	-0.01	CO 202
				Min V _y	-16.08	> -0.00	-24.39	-0.00	-45.79	0.01	CO 200
				Max V _z	16.31	0.00	> -2.37	0.00	-3.32	-0.01	CO 218
				Min V _z	-7.31	0.00	> -24.39	0.00	-44.98	-0.00	CO 194
				Max M _T	9.71	0.00	-24.38	> 0.00	-44.02	-0.01	CO 201
				Min M _T	-15.56	-0.00	-24.39	> -0.00	-45.78	0.01	CO 199
				Max M _y	16.31	0.00	-2.37	0.00	> -3.32	-0.01	CO 218
			Min M _y	-19.03	-0.00	-24.39	-0.00	> -45.86	0.01	CO 193	
			Max M _z	-15.56	-0.00	-24.39	-0.00	-45.78	> 0.01	CO 199	
			Min M _z	12.85	0.00	-2.37	0.00	-3.38	> -0.01	CO 216	
			Max N	> 16.31	0.00	-2.37	0.00	-3.32	-0.01	CO 218	
			Min N	> -19.03	-0.00	-24.39	-0.00	-45.86	0.01	CO 193	
			Max V _y	10.23	> 0.00	-24.38	0.00	-44.01	-0.01	CO 202	
			Min V _y	-16.08	> -0.00	-24.39	-0.00	-45.79	0.01	CO 200	
			Max V _z	16.31	0.00	> -2.37	0.00	-3.32	-0.01	CO 218	
			Min V _z	-7.31	0.00	> -24.39	0.00	-44.98	-0.00	CO 194	
			Max M _T	9.71	0.00	-24.38	> 0.00	-44.02	-0.01	CO 201	
			Min M _T	-15.56	-0.00	-24.39	> -0.00	-45.78	0.01	CO 199	
			Max M _y	16.31	0.00	-2.37	0.00	> -3.32	-0.01	CO 218	
			Min M _y	-19.03	-0.00	-24.39	-0.00	> -45.86	0.01	CO 193	
			Max M _z	-15.56	-0.00	-24.39	-0.00	-45.78	> 0.01	CO 199	
			Min M _z	12.85	0.00	-2.37	0.00	-3.38	> -0.01	CO 216	
			Max N	> 50.68	-0.00	2.90	-0.00	-2.58	-0.02	CO 28	
			Min N	> -53.91	0.01	43.49	0.00	-75.23	0.03	CO 66	
			Max V _y	-53.91	> 0.01	43.49	0.00	-75.23	0.03	CO 66	
			Min V _y	35.33	> -0.01	38.84	-0.00	-62.95	-0.03	CO 12	
			Max V _z	-51.57	0.01	> 43.49	0.00	-75.15	0.03	CO 73	
			Min V _z	50.68	-0.00	> 2.90	-0.00	-2.58	-0.02	CO 28	
			Max M _T	-51.19	0.01	43.49	> 0.00	-75.13	0.03	CO 72	
			Min M _T	33.06	-0.01	43.44	> -0.01	-70.71	-0.03	CO 74	
			Max M _y	50.68	-0.00	2.90	-0.00	> -2.58	-0.02	CO 28	
Min M _y	-53.91	0.01	43.49	0.00	> -75.23	0.03	CO 66				
Max M _z	-51.57	0.01	43.49	0.00	-75.15	> 0.03	CO 73				
Min M _z	35.33	-0.01	38.84	-0.00	-62.95	> -0.03	CO 12				
Max N	> 50.68	-0.00	2.90	-0.00	-2.58	-0.02	CO 28				
Min N	> -53.91	0.01	43.49	0.00	-75.23	0.03	CO 66				
Max V _y	-53.91	> 0.01	43.49	0.00	-75.23	0.03	CO 66				
Min V _y	35.33	> -0.01	38.84	-0.00	-62.95	-0.03	CO 12				
Max V _z	-51.57	0.01	> 43.49	0.00	-75.15	0.03	CO 73				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
				Min V _z	50.68	-0.00	> 2.90	-0.00	-2.58	-0.02	CO 28
				Max M _T	-51.19	0.01	43.49	> 0.00	-75.13	0.03	CO 72
				Min M _T	33.06	-0.01	43.44	> -0.01	-70.71	-0.03	CO 74
				Max M _y	50.68	-0.00	2.90	-0.00	> -2.58	-0.02	CO 28
				Min M _y	-53.91	0.01	43.49	0.00	> -75.23	0.03	CO 66
				Max M _z	-51.57	0.01	43.49	0.00	-75.15	> 0.03	CO 73
				Min M _z	35.33	-0.01	38.84	-0.00	-62.95	> -0.03	CO 12
			0.238 Left	Max N	> 50.68	-0.00	2.77	-0.00	-1.90	-0.02	CO 28
				Min N	> -53.87	0.01	41.98	0.00	-65.04	0.03	CO 66
				Max V _y	-53.87	> 0.01	41.98	0.00	-65.04	0.03	CO 66
				Min V _y	35.36	> -0.01	37.41	-0.00	-53.87	-0.03	CO 12
				Max V _z	-53.87	0.01	> 41.98	0.00	-65.04	0.03	CO 66
				Min V _z	50.68	-0.00	> 2.77	-0.00	-1.90	-0.02	CO 28
				Max M _T	-51.15	0.01	41.98	> 0.00	-64.94	0.03	CO 72
				Min M _T	33.09	-0.01	41.85	> -0.01	-60.55	-0.03	CO 74
				Max M _y	50.68	-0.00	2.77	-0.00	> -1.90	-0.02	CO 28
				Min M _y	-53.87	0.01	41.98	0.00	> -65.04	0.03	CO 66
				Max M _z	-51.53	0.01	41.98	0.00	-64.96	> 0.03	CO 73
				Min M _z	35.36	-0.01	37.41	-0.00	-53.87	> -0.03	CO 12
			0.238 Right	Max N	> 50.68	-0.00	2.77	-0.00	-1.90	-0.02	CO 28
				Min N	> -53.87	0.01	41.98	0.00	-65.04	0.03	CO 66
				Max V _y	-53.87	> 0.01	41.98	0.00	-65.04	0.03	CO 66
				Min V _y	35.36	> -0.01	37.41	-0.00	-53.87	-0.03	CO 12
				Max V _z	-53.87	0.01	> 41.98	0.00	-65.04	0.03	CO 66
				Min V _z	50.68	-0.00	> 2.77	-0.00	-1.90	-0.02	CO 28
				Max M _T	-51.15	0.01	41.98	> 0.00	-64.94	0.03	CO 72
				Min M _T	33.09	-0.01	41.85	> -0.01	-60.55	-0.03	CO 74
				Max M _y	50.68	-0.00	2.77	-0.00	> -1.90	-0.02	CO 28
				Min M _y	-53.87	0.01	41.98	0.00	> -65.04	0.03	CO 66
				Max M _z	-51.53	0.01	41.98	0.00	-64.96	> 0.03	CO 73
				Min M _z	35.36	-0.01	37.41	-0.00	-53.87	> -0.03	CO 12
			10.067 Left	Max N	> 50.68	0.00	-2.76	0.00	-1.88	-0.02	CO 28
				Min N	> -53.87	-0.01	-41.98	-0.00	-65.01	0.02	CO 66
				Max V _y	34.98	> 0.01	-37.40	0.00	-53.86	-0.04	CO 11
				Min V _y	-53.87	> -0.01	-41.98	-0.00	-65.01	0.02	CO 66
				Max V _z	50.68	0.00	> -2.76	0.00	-1.88	-0.02	CO 28
				Min V _z	-53.87	-0.01	> -41.98	-0.00	-65.01	0.02	CO 66
				Max M _T	33.09	0.01	-41.84	> 0.01	-60.53	-0.03	CO 74
				Min M _T	-51.15	-0.01	-41.97	> -0.00	-64.92	0.03	CO 72
				Max M _y	50.68	0.00	-2.76	0.00	> -1.88	-0.02	CO 28
				Min M _y	-53.87	-0.01	-41.98	-0.00	> -65.01	0.02	CO 66
				Max M _z	-51.15	-0.01	-41.97	-0.00	-64.92	> 0.03	CO 72
				Min M _z	34.98	0.01	-37.40	0.00	-53.86	> -0.04	CO 11
			10.067 Right	Max N	> 50.68	0.00	-2.76	0.00	-1.88	-0.02	CO 28
				Min N	> -53.87	-0.01	-41.98	-0.00	-65.02	0.02	CO 66
				Max V _y	34.98	> 0.01	-37.40	0.00	-53.86	-0.04	CO 11
				Min V _y	-53.87	> -0.01	-41.98	-0.00	-65.02	0.02	CO 66
				Max V _z	50.68	0.00	> -2.76	0.00	-1.88	-0.02	CO 28
				Min V _z	-53.87	-0.01	> -41.98	-0.00	-65.02	0.02	CO 66
				Max M _T	33.09	0.01	-41.84	> 0.01	-60.53	-0.03	CO 74
				Min M _T	-51.15	-0.01	-41.97	> -0.00	-64.92	0.03	CO 72
				Max M _y	50.68	0.00	-2.76	0.00	> -1.88	-0.02	CO 28
				Min M _y	-53.87	-0.01	-41.98	-0.00	> -65.02	0.02	CO 66
				Max M _z	-51.15	-0.01	-41.97	-0.00	-64.92	> 0.03	CO 72
				Min M _z	34.98	0.01	-37.40	0.00	-53.86	> -0.04	CO 11
			10.305	Max N	> 50.68	0.00	-2.90	0.00	-2.56	-0.03	CO 28

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases		
				N	V _y	V _z	M _T	M _y	M _z			
	RC3	22	Left	Min N	> -53.91	-0.01	-43.48	-0.00	-75.20	0.02	CO 66	
				Max V _y	34.95	> 0.01	-38.83	0.01	-62.94	-0.04	CO 11	
				Min V _y	-53.91	> -0.01	-43.48	-0.00	-75.20	0.02	CO 66	
				Max V _z	50.68	0.00	> -2.90	0.00	-2.56	-0.03	CO 28	
				Min V _z	-51.19	-0.01	> -43.49	-0.00	-75.11	0.03	CO 72	
				Max M _T	33.06	0.01	-43.43	> 0.01	-70.69	-0.04	CO 74	
				Min M _T	-51.19	-0.01	-43.49	> -0.00	-75.11	0.03	CO 72	
				Max M _y	50.68	0.00	-2.90	0.00	> -2.56	-0.03	CO 28	
				Min M _y	-53.91	-0.01	-43.48	-0.00	> -75.20	0.02	CO 66	
				Max M _z	-51.19	-0.01	-43.49	-0.00	-75.11	> 0.03	CO 72	
				Min M _z	34.95	0.01	-38.83	0.01	-62.94	> -0.04	CO 11	
				Max N	> 50.68	0.00	-2.90	0.00	-2.56	-0.03	CO 28	
			Right	Min N	> -53.91	-0.01	-43.48	-0.00	-75.20	0.02	CO 66	
				Max V _y	34.95	> 0.01	-38.83	0.01	-62.94	-0.04	CO 11	
				Min V _y	-53.91	> -0.01	-43.48	-0.00	-75.20	0.02	CO 66	
				Max V _z	50.68	0.00	> -2.90	0.00	-2.56	-0.03	CO 28	
				Min V _z	-51.19	-0.01	> -43.49	-0.00	-75.11	0.03	CO 72	
				Max M _T	33.06	0.01	-43.43	> 0.01	-70.69	-0.04	CO 74	
				Min M _T	-51.19	-0.01	-43.49	> -0.00	-75.11	0.03	CO 72	
				Max M _y	50.68	0.00	-2.90	0.00	> -2.56	-0.03	CO 28	
				Min M _y	-53.91	-0.01	-43.48	-0.00	> -75.20	0.02	CO 66	
				Max M _z	-51.19	-0.01	-43.49	-0.00	-75.11	> 0.03	CO 72	
				Min M _z	34.95	0.01	-38.83	0.01	-62.94	> -0.04	CO 11	
				1	0.000	Left	Max N	> 27.78	-0.00	2.17	-0.00	-2.36
		Min N	> -26.96				0.00	21.35	0.00	-36.83	0.01	CO 193
		Max V _y	-26.96				> 0.00	21.35	0.00	-36.83	0.01	CO 193
		Min V _y	19.57				> -0.00	21.33	-0.00	-34.62	-0.01	CO 202
		Max V _z	-25.71				0.00	> 21.35	0.00	-36.79	0.01	CO 200
		Min V _z	27.78				-0.00	> 2.17	-0.00	-2.36	-0.01	CO 218
		Right	Max M _T			-25.52	0.00	21.35	> 0.00	-36.78	0.01	CO 199
			Min M _T			19.37	-0.00	21.33	> -0.00	-34.63	-0.01	CO 201
			Max M _y			27.78	-0.00	2.17	-0.00	> -2.36	-0.01	CO 218
			Min M _y			-26.96	0.00	21.35	0.00	> -36.83	0.01	CO 193
			Max M _z			-25.71	0.00	21.35	0.00	-36.79	> 0.01	CO 200
			Min M _z			19.57	-0.00	21.33	-0.00	-34.62	> -0.01	CO 202
		0.238	Left		Max N	> 27.78	-0.00	2.07	-0.00	-1.86	-0.01	CO 218
					Min N	> -26.95	0.00	20.59	0.00	-31.83	0.01	CO 193
					Max V _y	-26.95	> 0.00	20.59	0.00	-31.83	0.01	CO 193
					Min V _y	19.58	> -0.00	20.55	-0.00	-29.63	-0.01	CO 202
					Max V _z	-26.95	0.00	> 20.59	0.00	-31.83	0.01	CO 193
					Min V _z	27.78	-0.00	> 2.07	-0.00	-1.86	-0.01	CO 218
			Right		Max M _T	-25.51	0.00	20.59	> 0.00	-31.78	0.01	CO 199
					Min M _T	19.38	-0.00	20.55	> -0.00	-29.64	-0.01	CO 201
					Max M _y	27.78	-0.00	2.07	-0.00	> -1.86	-0.01	CO 218

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
				Min M _y	-26.95	0.00	20.59	0.00	> -31.83	0.01	CO 193
				Max M _z	-25.71	0.00	20.59	0.00	-31.79	> 0.01	CO 200
				Min M _z	19.58	-0.00	20.55	-0.00	-29.63	> -0.01	CO 202
			0.238	Max N	> 27.78	-0.00	2.07	-0.00	-1.86	-0.01	CO 218
			Right	Min N	> -26.95	0.00	20.59	0.00	-31.83	0.01	CO 193
				Max V _y	-26.95	> 0.00	20.59	0.00	-31.83	0.01	CO 193
				Min V _y	19.58	> -0.00	20.55	-0.00	-29.63	-0.01	CO 202
				Max V _z	-26.95	0.00	> 20.59	0.00	-31.83	0.01	CO 193
				Min V _z	27.78	-0.00	> 2.07	-0.00	-1.86	-0.01	CO 218
				Max M _T	-25.51	0.00	20.59	> 0.00	-31.78	0.01	CO 199
				Min M _T	19.38	-0.00	20.55	> -0.00	-29.64	-0.01	CO 201
				Max M _y	27.78	-0.00	2.07	-0.00	> -1.86	-0.01	CO 218
				Min M _y	-26.95	0.00	20.59	0.00	> -31.83	0.01	CO 193
				Max M _z	-25.71	0.00	20.59	0.00	-31.79	> 0.01	CO 200
				Min M _z	19.58	-0.00	20.55	-0.00	-29.63	> -0.01	CO 202
			10.067	Max N	> 27.78	0.00	-2.06	0.00	-1.84	-0.01	CO 218
			Left	Min N	> -26.95	-0.00	-20.58	-0.00	-31.81	0.00	CO 193
				Max V _y	19.38	> 0.00	-20.55	0.00	-29.62	-0.02	CO 201
				Min V _y	-26.95	> -0.00	-20.58	-0.00	-31.81	0.00	CO 193
				Max V _z	27.58	0.00	> -2.06	0.00	-1.85	-0.01	CO 219
				Min V _z	-26.75	-0.00	> -20.58	-0.00	-31.81	0.01	CO 198
				Max M _T	19.38	0.00	-20.55	> 0.00	-29.62	-0.02	CO 201
				Min M _T	-25.51	-0.00	-20.58	> -0.00	-31.77	0.01	CO 199
				Max M _y	27.78	0.00	-2.06	0.00	> -1.84	-0.01	CO 218
				Min M _y	-26.95	-0.00	-20.58	-0.00	> -31.81	0.00	CO 193
				Max M _z	-25.51	-0.00	-20.58	-0.00	-31.77	> 0.01	CO 199
				Min M _z	19.38	0.00	-20.55	0.00	-29.62	> -0.02	CO 201
			10.067	Max N	> 27.78	0.00	-2.06	0.00	-1.84	-0.01	CO 218
			Right	Min N	> -26.95	-0.00	-20.58	-0.00	-31.81	0.00	CO 193
				Max V _y	19.38	> 0.00	-20.55	0.00	-29.62	-0.02	CO 201
				Min V _y	-26.95	> -0.00	-20.58	-0.00	-31.81	0.00	CO 193
				Max V _z	27.58	0.00	> -2.06	0.00	-1.85	-0.01	CO 219
				Min V _z	-26.75	-0.00	> -20.58	-0.00	-31.81	0.01	CO 198
				Max M _T	19.38	0.00	-20.55	> 0.00	-29.62	-0.02	CO 201
				Min M _T	-25.51	-0.00	-20.58	> -0.00	-31.77	0.01	CO 199
				Max M _y	27.78	0.00	-2.06	0.00	> -1.84	-0.01	CO 218
				Min M _y	-26.95	-0.00	-20.58	-0.00	> -31.81	0.00	CO 193
				Max M _z	-25.51	-0.00	-20.58	-0.00	-31.77	> 0.01	CO 199
				Min M _z	19.38	0.00	-20.55	0.00	-29.62	> -0.02	CO 201
			10.305	Max N	> 27.78	0.00	-2.16	0.00	-2.35	-0.01	CO 218
			Left	Min N	> -26.96	-0.00	-21.34	-0.00	-36.81	0.00	CO 193
				Max V _y	19.37	> 0.00	-21.33	0.00	-34.61	-0.02	CO 201
				Min V _y	-26.96	> -0.00	-21.34	-0.00	-36.81	0.00	CO 193
				Max V _z	27.58	0.00	> -2.16	0.00	-2.35	-0.01	CO 219
				Min V _z	-25.51	-0.00	> -21.34	-0.00	-36.76	0.01	CO 199
				Max M _T	19.37	0.00	-21.33	> 0.00	-34.61	-0.02	CO 201
				Min M _T	-25.51	-0.00	-21.34	> -0.00	-36.76	0.01	CO 199
				Max M _y	27.78	0.00	-2.16	0.00	> -2.35	-0.01	CO 218
				Min M _y	-26.96	-0.00	-21.34	-0.00	> -36.81	0.00	CO 193
				Max M _z	-25.51	-0.00	-21.34	-0.00	-36.76	> 0.01	CO 199
				Min M _z	19.37	0.00	-21.33	0.00	-34.61	> -0.02	CO 201
		22	10.305	Max N	> 27.78	0.00	-2.16	0.00	-2.35	-0.01	CO 218
			Right	Min N	> -26.96	-0.00	-21.34	-0.00	-36.81	0.00	CO 193
				Max V _y	19.37	> 0.00	-21.33	0.00	-34.61	-0.02	CO 201
				Min V _y	-26.96	> -0.00	-21.34	-0.00	-36.81	0.00	CO 193
				Max V _z	27.58	0.00	> -2.16	0.00	-2.35	-0.01	CO 219

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Min V _z	-25.51	-0.00	> -21.34	-0.00	-36.76	0.01	CO 199
				Max M _T	19.37	0.00	-21.33	> 0.00	-34.61	-0.02	CO 201
				Min M _T	-25.51	-0.00	-21.34	> -0.00	-36.76	0.01	CO 199
				Max M _y	27.78	0.00	-2.16	0.00	> -2.35	-0.01	CO 218
				Min M _y	-26.96	-0.00	-21.34	-0.00	> -36.81	0.00	CO 193
				Max M _z	-25.51	-0.00	-21.34	-0.00	-36.76	> 0.01	CO 199
				Min M _z	19.37	0.00	-21.33	0.00	-34.61	> -0.02	CO 201
Section No. 11: IPE 120											
14	RC1	46	0.000 Left	Max N	> 0.06	0.01	0.10	-0.00	0.00	0.01	CO 90
				Min N	> -0.03	-0.02	-0.53	-0.01	0.01	-0.01	CO 10
				Max V _y	0.06	> 0.01	0.10	-0.00	0.00	0.01	CO 91
				Min V _y	-0.03	> -0.02	-0.53	-0.01	0.01	-0.01	CO 3
				Max V _z	0.06	0.01	> 0.10	-0.00	0.00	0.01	CO 91
				Min V _z	-0.03	-0.02	> -0.53	-0.01	0.01	-0.01	CO 3
				Max M _T	0.06	0.01	0.10	> -0.00	0.00	0.01	CO 91
				Min M _T	0.06	-0.00	-0.53	> -0.01	0.01	0.01	CO 13
				Max M _y	0.06	-0.00	-0.53	-0.01	> 0.01	0.01	CO 12
				Min M _y	-0.03	-0.01	0.08	-0.00	> -0.00	-0.01	CO 88
				Max M _z	0.06	0.01	0.10	-0.00	0.00	> 0.01	CO 90
				Min M _z	-0.03	-0.02	-0.53	-0.01	0.01	> -0.01	CO 10
			0.000 Right	Max N	> 0.06	0.01	0.10	-0.00	0.00	0.01	CO 90
				Min N	> -0.03	-0.02	-0.53	-0.01	0.01	-0.01	CO 10
				Max V _y	0.06	> 0.01	0.10	-0.00	0.00	0.01	CO 91
				Min V _y	-0.03	> -0.02	-0.53	-0.01	0.01	-0.01	CO 3
				Max V _z	0.06	0.01	> 0.10	-0.00	0.00	0.01	CO 91
				Min V _z	-0.03	-0.02	> -0.53	-0.01	0.01	-0.01	CO 3
				Max M _T	0.06	0.01	0.10	> -0.00	0.00	0.01	CO 91
				Min M _T	0.06	-0.00	-0.53	> -0.01	0.01	0.01	CO 13
				Max M _y	0.06	-0.00	-0.53	-0.01	> 0.01	0.01	CO 12
				Min M _y	-0.03	-0.01	0.08	-0.00	> -0.00	-0.01	CO 88
				Max M _z	0.06	0.01	0.10	-0.00	0.00	> 0.01	CO 90
				Min M _z	-0.03	-0.02	-0.53	-0.01	0.01	> -0.01	CO 10
			0.968 Left	Max N	> 0.06	0.01	-0.04	-0.00	0.03	0.00	CO 90
				Min N	> -0.03	-0.02	-0.20	-0.01	0.85	-0.00	CO 10
				Max V _y	0.06	> 0.01	-0.04	-0.00	0.03	0.00	CO 91
				Min V _y	-0.03	> -0.02	-0.20	-0.01	0.85	-0.00	CO 3
				Max V _z	0.06	0.01	> -0.04	-0.00	0.03	0.00	CO 91
				Min V _z	-0.03	-0.02	> -0.20	-0.01	0.85	-0.00	CO 3
				Max M _T	0.06	0.01	-0.04	> -0.00	0.03	0.00	CO 91
				Min M _T	-0.03	-0.02	-0.20	> -0.01	0.85	-0.00	CO 3
				Max M _y	0.06	0.00	-0.19	-0.01	> 0.86	0.00	CO 76
				Min M _y	-0.03	-0.01	-0.05	-0.00	> 0.01	-0.00	CO 18
				Max M _z	0.06	0.00	-0.19	-0.01	0.86	> 0.00	CO 75
				Min M _z	-0.03	-0.02	-0.20	-0.01	0.85	> -0.00	CO 10
			0.968 Right	Max N	> 0.06	0.01	-0.04	-0.00	0.03	0.00	CO 90
				Min N	> -0.03	-0.02	-0.20	-0.01	0.85	-0.00	CO 10
				Max V _y	0.06	> 0.01	-0.04	-0.00	0.03	0.00	CO 91
				Min V _y	-0.03	> -0.02	-0.20	-0.01	0.85	-0.00	CO 3
				Max V _z	0.06	0.01	> -0.04	-0.00	0.03	0.00	CO 91
				Min V _z	-0.03	-0.02	> -0.20	-0.01	0.85	-0.00	CO 3
				Max M _T	0.06	0.01	-0.04	> -0.00	0.03	0.00	CO 91
				Min M _T	-0.03	-0.02	-0.20	> -0.01	0.85	-0.00	CO 3
				Max M _y	0.06	0.00	-0.19	-0.01	> 0.86	0.00	CO 76
				Min M _y	-0.03	-0.01	-0.05	-0.00	> 0.01	-0.00	CO 18
				Max M _z	0.06	0.00	-0.19	-0.01	0.86	> 0.00	CO 75
				Min M _z	-0.03	-0.02	-0.20	-0.01	0.85	> -0.00	CO 10

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		41	1.732 Left	Max N	> 0.06	0.01	-0.15	-0.00	-0.04	-0.01	CO 90
				Min N	> -0.03	-0.01	-9.11	-0.01	-2.28	0.01	CO 3
				Max V _y	0.06	> 0.01	-0.14	-0.00	-0.04	-0.01	CO 91
				Min V _y	-0.03	> -0.01	-9.11	-0.01	-2.28	0.01	CO 3
				Max V _z	0.06	0.01	> -0.14	-0.00	-0.04	-0.01	CO 91
				Min V _z	-0.03	-0.01	> -9.11	-0.01	-2.28	0.01	CO 3
				Max M _T	0.06	0.01	-0.14	> -0.00	-0.04	-0.01	CO 91
				Min M _T	-0.03	-0.01	-9.11	> -0.01	-2.28	0.01	CO 3
				Max M _y	0.06	0.01	-0.14	-0.00	> -0.04	-0.01	CO 91
				Min M _y	-0.03	-0.01	-9.11	-0.01	> -2.28	0.01	CO 3
				Max M _z	-0.03	-0.01	-9.11	-0.01	-2.28	> 0.01	CO 3
				Min M _z	0.06	0.01	-0.14	-0.00	-0.04	> -0.01	CO 91
			1.732 Right	Max N	> 0.06	0.01	-0.15	-0.00	-0.04	-0.01	CO 90
				Min N	> -0.03	-0.01	-9.11	-0.01	-2.28	0.01	CO 3
				Max V _y	0.06	> 0.01	-0.14	-0.00	-0.04	-0.01	CO 91
				Min V _y	-0.03	> -0.01	-9.11	-0.01	-2.28	0.01	CO 3
				Max V _z	0.06	0.01	> -0.14	-0.00	-0.04	-0.01	CO 91
				Min V _z	-0.03	-0.01	> -9.11	-0.01	-2.28	0.01	CO 3
				Max M _T	0.06	0.01	-0.14	> -0.00	-0.04	-0.01	CO 91
				Min M _T	-0.03	-0.01	-9.11	> -0.01	-2.28	0.01	CO 3
				Max M _y	0.06	0.01	-0.14	-0.00	> -0.04	-0.01	CO 91
				Min M _y	-0.03	-0.01	-9.11	-0.01	> -2.28	0.01	CO 3
				Max M _z	-0.03	-0.01	-9.11	-0.01	-2.28	> 0.01	CO 3
				Min M _z	0.06	0.01	-0.14	-0.00	-0.04	> -0.01	CO 91
			2.200 Left	Max N	> 0.06	0.01	-0.21	-0.00	-0.12	-0.01	CO 90
				Min N	> -0.03	-0.01	-17.35	-0.01	-8.41	0.02	CO 3
				Max V _y	0.06	> 0.01	-0.21	-0.00	-0.12	-0.01	CO 91
				Min V _y	-0.03	> -0.01	-17.35	-0.01	-8.41	0.02	CO 3
				Max V _z	0.06	0.01	> -0.21	-0.00	-0.12	-0.01	CO 91
				Min V _z	-0.03	-0.01	> -17.35	-0.01	-8.41	0.02	CO 3
				Max M _T	0.06	0.01	-0.21	> -0.00	-0.12	-0.01	CO 91
				Min M _T	-0.03	-0.01	-17.35	> -0.01	-8.41	0.02	CO 3
				Max M _y	0.06	0.01	-0.21	-0.00	> -0.12	-0.01	CO 91
				Min M _y	-0.03	-0.01	-17.35	-0.01	> -8.41	0.02	CO 3
				Max M _z	-0.03	-0.01	-17.35	-0.01	-8.41	> 0.02	CO 3
				Min M _z	0.06	0.01	-0.21	-0.00	-0.12	> -0.01	CO 91
2.200 Right	Max N	> 0.06	0.01	-0.21	-0.00	-0.12	-0.01	CO 90			
	Min N	> -0.03	-0.01	-17.35	-0.01	-8.41	0.02	CO 3			
	Max V _y	0.06	> 0.01	-0.21	-0.00	-0.12	-0.01	CO 91			
	Min V _y	-0.03	> -0.01	-17.35	-0.01	-8.41	0.02	CO 3			
	Max V _z	0.06	0.01	> -0.21	-0.00	-0.12	-0.01	CO 91			
	Min V _z	-0.03	-0.01	> -17.35	-0.01	-8.41	0.02	CO 3			
	Max M _T	0.06	0.01	-0.21	> -0.00	-0.12	-0.01	CO 91			
	Min M _T	-0.03	-0.01	-17.35	> -0.01	-8.41	0.02	CO 3			
	Max M _y	0.06	0.01	-0.21	-0.00	> -0.12	-0.01	CO 91			
	Min M _y	-0.03	-0.01	-17.35	-0.01	> -8.41	0.02	CO 3			
	Max M _z	-0.03	-0.01	-17.35	-0.01	-8.41	> 0.02	CO 3			
	Min M _z	0.06	0.01	-0.21	-0.00	-0.12	> -0.01	CO 91			
RC3 46 0.000 Left	Max N	> 0.04	0.01	0.07	-0.00	0.00	0.01	CO 217			
	Min N	> -0.02	-0.01	-0.27	-0.00	0.00	-0.01	CO 200			
	Max V _y	0.04	> 0.01	0.07	-0.00	0.00	0.01	CO 218			
	Min V _y	-0.02	> -0.01	-0.27	-0.00	0.00	-0.01	CO 193			
	Max V _z	0.04	0.01	> 0.07	-0.00	0.00	0.01	CO 218			
	Min V _z	-0.02	-0.01	> -0.27	-0.00	0.00	-0.01	CO 193			
	Max M _T	0.04	0.01	0.07	> -0.00	0.00	0.01	CO 218			
	Min M _T	0.03	0.00	-0.26	> -0.00	0.00	0.00	CO 203			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
			0.000 Right	Max M _y	0.03	0.00	-0.26	-0.00	> 0.00	0.00	CO 202
				Min M _y	-0.01	-0.00	0.06	-0.00	> -0.00	-0.00	CO 215
				Max M _z	0.04	0.01	0.07	-0.00	0.00	> 0.01	CO 217
				Min M _z	-0.02	-0.01	-0.27	-0.00	0.00	> -0.01	CO 200
				Max N	> 0.04	0.01	0.07	-0.00	0.00	0.01	CO 217
				Min N	> -0.02	-0.01	-0.27	-0.00	0.00	-0.01	CO 200
				Max V _y	0.04	> 0.01	0.07	-0.00	0.00	0.01	CO 218
				Min V _y	-0.02	> -0.01	-0.27	-0.00	0.00	-0.01	CO 193
				Max V _z	0.04	0.01	> 0.07	-0.00	0.00	0.01	CO 218
				Min V _z	-0.02	-0.01	> -0.27	-0.00	0.00	-0.01	CO 193
				Max M _T	0.04	0.01	0.07	> -0.00	0.00	0.01	CO 218
				Min M _T	0.03	0.00	-0.26	> -0.00	0.00	0.00	CO 203
				Max M _y	0.03	0.00	-0.26	-0.00	> 0.00	0.00	CO 202
				Min M _y	-0.01	-0.00	0.06	-0.00	> -0.00	-0.00	CO 215
			Max M _z	0.04	0.01	0.07	-0.00	0.00	> 0.01	CO 217	
			Min M _z	-0.02	-0.01	-0.27	-0.00	0.00	> -0.01	CO 200	
			Max N	> 0.04	0.01	-0.03	-0.00	0.02	0.00	CO 217	
			Min N	> -0.02	-0.01	-0.11	-0.00	0.46	-0.00	CO 200	
			Max V _y	0.04	> 0.01	-0.03	-0.00	0.02	0.00	CO 218	
			Min V _y	-0.02	> -0.01	-0.11	-0.00	0.46	-0.00	CO 193	
			Max V _z	0.04	0.01	> -0.03	-0.00	0.02	0.00	CO 218	
			Min V _z	-0.02	-0.01	> -0.11	-0.00	0.46	-0.00	CO 193	
			Max M _T	0.04	0.01	-0.03	> -0.00	0.02	0.00	CO 218	
			Min M _T	-0.02	-0.01	-0.11	> -0.00	0.46	-0.00	CO 193	
			Max M _y	0.03	0.00	-0.11	-0.00	> 0.46	0.00	CO 203	
			Min M _y	-0.01	-0.00	-0.04	-0.00	> 0.01	-0.00	CO 208	
			Max M _z	0.03	0.00	-0.11	-0.00	0.46	> 0.00	CO 202	
			Min M _z	-0.02	-0.01	-0.11	-0.00	0.46	> -0.00	CO 200	
			Max N	> 0.04	0.01	-0.03	-0.00	0.02	0.00	CO 217	
			Min N	> -0.02	-0.01	-0.11	-0.00	0.46	-0.00	CO 200	
			Max V _y	0.04	> 0.01	-0.03	-0.00	0.02	0.00	CO 218	
			Min V _y	-0.02	> -0.01	-0.11	-0.00	0.46	-0.00	CO 193	
			Max V _z	0.04	0.01	> -0.03	-0.00	0.02	0.00	CO 218	
			Min V _z	-0.02	-0.01	> -0.11	-0.00	0.46	-0.00	CO 193	
			Max M _T	0.04	0.01	-0.03	> -0.00	0.02	0.00	CO 218	
			Min M _T	-0.02	-0.01	-0.11	> -0.00	0.46	-0.00	CO 193	
			Max M _y	0.03	0.00	-0.11	-0.00	> 0.46	0.00	CO 203	
			Min M _y	-0.01	-0.00	-0.04	-0.00	> 0.01	-0.00	CO 208	
			Max M _z	0.03	0.00	-0.11	-0.00	0.46	> 0.00	CO 202	
			Min M _z	-0.02	-0.01	-0.11	-0.00	0.46	> -0.00	CO 200	
			Max N	> 0.04	0.01	-0.11	-0.00	-0.03	-0.00	CO 217	
			Min N	> -0.02	-0.01	-4.89	-0.00	-1.23	0.00	CO 200	
			Max V _y	0.04	> 0.01	-0.11	-0.00	-0.03	-0.00	CO 218	
			Min V _y	-0.02	> -0.01	-4.89	-0.00	-1.23	0.00	CO 193	
			Max V _z	0.04	0.01	> -0.11	-0.00	-0.03	-0.00	CO 218	
			Min V _z	-0.02	-0.01	> -4.89	-0.00	-1.23	0.00	CO 193	
			Max M _T	0.04	0.01	-0.11	> -0.00	-0.03	-0.00	CO 218	
			Min M _T	-0.02	-0.01	-4.89	> -0.00	-1.23	0.00	CO 193	
			Max M _y	0.04	0.01	-0.11	-0.00	> -0.03	-0.00	CO 218	
			Min M _y	-0.02	-0.01	-4.89	-0.00	> -1.23	0.00	CO 193	
			Max M _z	-0.02	-0.01	-4.89	-0.00	-1.23	> 0.00	CO 193	
			Min M _z	0.04	0.01	-0.11	-0.00	-0.03	> -0.00	CO 218	
			Max N	> 0.04	0.01	-0.11	-0.00	-0.03	-0.00	CO 217	
			Min N	> -0.02	-0.01	-4.89	-0.00	-1.23	0.00	CO 200	
			Max V _y	0.04	> 0.01	-0.11	-0.00	-0.03	-0.00	CO 218	
			Min V _y	-0.02	> -0.01	-4.89	-0.00	-1.23	0.00	CO 193	

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
15	RC1	41	2.200 Left	Max V _z	0.04	0.01	> -0.11	-0.00	-0.03	-0.00	CO 218
				Min V _z	-0.02	-0.01	> -4.89	-0.00	-1.23	0.00	CO 193
				Max M _T	0.04	0.01	-0.11	> -0.00	-0.03	-0.00	CO 218
				Min M _T	-0.02	-0.01	-4.89	> -0.00	-1.23	0.00	CO 193
				Max M _y	0.04	0.01	-0.11	-0.00	> -0.03	-0.00	CO 218
				Min M _y	-0.02	-0.01	-4.89	-0.00	> -1.23	0.00	CO 193
				Max M _z	-0.02	-0.01	-4.89	-0.00	-1.23	> 0.00	CO 193
				Min M _z	0.04	0.01	-0.11	-0.00	-0.03	> -0.00	CO 218
				Max N	> 0.04	0.01	-0.16	-0.00	-0.10	-0.01	CO 217
				Min N	> -0.02	-0.01	-9.30	-0.00	-4.51	0.01	CO 200
				Max V _y	0.04	> 0.01	-0.16	-0.00	-0.09	-0.01	CO 218
			Min V _y	-0.02	> -0.01	-9.30	-0.00	-4.52	0.01	CO 193	
			Max V _z	0.04	0.01	> -0.16	-0.00	-0.09	-0.01	CO 218	
			Min V _z	-0.02	-0.01	> -9.30	-0.00	-4.52	0.01	CO 193	
			Max M _T	0.04	0.01	-0.16	> -0.00	-0.09	-0.01	CO 218	
			Min M _T	-0.02	-0.01	-9.30	> -0.00	-4.52	0.01	CO 193	
			Max M _y	0.04	0.01	-0.16	-0.00	> -0.09	-0.01	CO 218	
			Min M _y	-0.02	-0.01	-9.30	-0.00	> -4.52	0.01	CO 193	
			Max M _z	-0.02	-0.01	-9.30	-0.00	-4.52	> 0.01	CO 193	
			Min M _z	0.04	0.01	-0.16	-0.00	-0.09	> -0.01	CO 218	
			Max N	> 0.04	0.01	-0.16	-0.00	-0.10	-0.01	CO 217	
		Min N	> -0.02	-0.01	-9.30	-0.00	-4.51	0.01	CO 200		
		Max V _y	0.04	> 0.01	-0.16	-0.00	-0.09	-0.01	CO 218		
		Min V _y	-0.02	> -0.01	-9.30	-0.00	-4.52	0.01	CO 193		
		Max V _z	0.04	0.01	> -0.16	-0.00	-0.09	-0.01	CO 218		
		Min V _z	-0.02	-0.01	> -9.30	-0.00	-4.52	0.01	CO 193		
		Max M _T	0.04	0.01	-0.16	> -0.00	-0.09	-0.01	CO 218		
		Min M _T	-0.02	-0.01	-9.30	> -0.00	-4.52	0.01	CO 193		
		Max M _y	0.04	0.01	-0.16	-0.00	> -0.09	-0.01	CO 218		
		Min M _y	-0.02	-0.01	-9.30	-0.00	> -4.52	0.01	CO 193		
		Max M _z	-0.02	-0.01	-9.30	-0.00	-4.52	> 0.01	CO 193		
		Min M _z	0.04	0.01	-0.16	-0.00	-0.09	> -0.01	CO 218		
		Max N	> 0.04	0.01	-0.16	-0.00	-0.10	-0.01	CO 217		
		Min N	> -0.02	-0.01	-9.30	-0.00	-4.51	0.01	CO 200		
		Max V _y	0.04	> 0.01	-0.16	-0.00	-0.09	-0.01	CO 218		
		Min V _y	-0.02	> -0.01	-9.30	-0.00	-4.52	0.01	CO 193		
		Max V _z	0.04	0.01	> -0.16	-0.00	-0.09	-0.01	CO 218		
		Min V _z	-0.02	-0.01	> -9.30	-0.00	-4.52	0.01	CO 193		
		Max M _T	0.04	0.01	-0.16	> -0.00	-0.09	-0.01	CO 218		
		Min M _T	-0.02	-0.01	-9.30	> -0.00	-4.52	0.01	CO 193		
		Max M _y	0.04	0.01	-0.16	-0.00	> -0.09	-0.01	CO 218		
		Min M _y	-0.02	-0.01	-9.30	-0.00	> -4.52	0.01	CO 193		
Max M _z	-0.02	-0.01	-9.30	-0.00	-4.52	> 0.01	CO 193				
Min M _z	0.04	0.01	-0.16	-0.00	-0.09	> -0.01	CO 218				
Max N	> 0.06	-0.01	0.10	0.00	0.00	-0.02	CO 89				
Min N	> -0.03	0.02	-0.53	0.01	0.01	0.01	CO 9				
Max V _y	-0.03	> 0.02	-0.53	0.01	0.01	0.01	CO 8				
Min V _y	0.06	> -0.01	0.10	0.00	0.00	-0.02	CO 92				
Max V _z	0.06	-0.01	> 0.10	0.00	0.00	-0.02	CO 92				
Min V _z	-0.03	0.02	> -0.53	0.01	0.01	0.01	CO 8				
Max M _T	0.06	0.00	-0.53	> 0.01	0.01	-0.01	CO 14				
Min M _T	0.06	-0.01	0.10	> 0.00	0.00	-0.02	CO 92				
Max M _y	0.06	0.00	-0.53	0.01	> 0.01	-0.01	CO 11				
Min M _y	-0.03	0.01	0.08	0.00	> -0.00	0.01	CO 87				
Max M _z	-0.03	0.02	-0.53	0.01	0.01	> 0.01	CO 9				
Min M _z	0.06	-0.01	0.10	0.00	0.00	> -0.02	CO 89				
Max N	> 0.06	-0.01	0.10	0.00	0.00	-0.02	CO 89				
Min N	> -0.03	0.02	-0.53	0.01	0.01	0.01	CO 9				
Max V _y	-0.03	> 0.02	-0.53	0.01	0.01	0.01	CO 8				
Min V _y	0.06	> -0.01	0.10	0.00	0.00	-0.02	CO 92				
Max V _z	0.06	-0.01	> 0.10	0.00	0.00	-0.02	CO 92				
Min V _z	-0.03	0.02	> -0.53	0.01	0.01	0.01	CO 8				
Max M _T	0.06	0.00	-0.53	> 0.01	0.01	-0.01	CO 14				
Min M _T	0.06	-0.01	0.10	> 0.00	0.00	-0.02	CO 92				
Max M _y	0.06	0.00	-0.53	0.01	> 0.01	-0.01	CO 42				
Min M _y	-0.03	0.01	0.08	0.00	> -0.00	0.01	CO 87				
Max M _z	-0.03	0.02	-0.53	0.01	0.01	> 0.01	CO 9				
Min M _z	0.06	-0.01	0.10	0.00	0.00	> -0.02	CO 89				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
			0.968 Left	Max N	> 0.06	-0.01	-0.04	0.00	0.03	-0.00	CO 89
				Min N	> -0.03	0.02	-0.20	0.01	0.85	0.00	CO 9
				Max V _y	-0.03	> 0.02	-0.20	0.01	0.85	0.00	CO 8
				Min V _y	0.06	> -0.01	-0.04	0.00	0.03	-0.00	CO 92
				Max V _z	0.06	-0.01	> -0.04	0.00	0.03	-0.00	CO 92
				Min V _z	-0.03	0.02	> -0.20	0.01	0.85	0.00	CO 8
				Max M _T	-0.03	0.02	-0.20	> 0.01	0.85	0.00	CO 8
				Min M _T	0.06	-0.01	-0.04	> 0.00	0.03	-0.00	CO 92
				Max M _y	0.06	-0.00	-0.19	0.01	> 0.86	-0.00	CO 77
				Min M _y	-0.03	0.01	-0.05	0.00	> 0.01	0.00	CO 23
				Max M _z	-0.03	0.02	-0.20	0.01	0.85	> 0.00	CO 9
				Min M _z	0.06	-0.00	-0.19	0.01	0.86	> -0.00	CO 74
			0.968 Right	Max N	> 0.06	-0.01	-0.04	0.00	0.03	-0.00	CO 89
				Min N	> -0.03	0.02	-0.20	0.01	0.85	0.00	CO 9
				Max V _y	-0.03	> 0.02	-0.20	0.01	0.85	0.00	CO 8
				Min V _y	0.06	> -0.01	-0.04	0.00	0.03	-0.00	CO 92
				Max V _z	0.06	-0.01	> -0.04	0.00	0.03	-0.00	CO 92
				Min V _z	-0.03	0.02	> -0.20	0.01	0.85	0.00	CO 8
				Max M _T	-0.03	0.02	-0.20	> 0.01	0.85	0.00	CO 8
				Min M _T	0.06	-0.01	-0.04	> 0.00	0.03	-0.00	CO 92
				Max M _y	0.06	-0.00	-0.19	0.01	> 0.86	-0.00	CO 77
				Min M _y	-0.03	0.01	-0.05	0.00	> 0.01	0.00	CO 23
				Max M _z	-0.03	0.02	-0.20	0.01	0.85	> 0.00	CO 9
				Min M _z	0.06	-0.00	-0.19	0.01	0.86	> -0.00	CO 74
			1.732 Left	Max N	> 0.06	-0.01	-0.14	0.00	-0.04	0.01	CO 89
				Min N	> -0.03	0.01	-9.11	0.01	-2.28	-0.01	CO 8
				Max V _y	-0.03	> 0.01	-9.11	0.01	-2.28	-0.01	CO 8
				Min V _y	0.06	> -0.01	-0.14	0.00	-0.04	0.01	CO 92
				Max V _z	0.06	-0.01	> -0.14	0.00	-0.04	0.01	CO 92
				Min V _z	-0.03	0.01	> -9.11	0.01	-2.28	-0.01	CO 8
				Max M _T	-0.03	0.01	-9.11	> 0.01	-2.28	-0.01	CO 8
				Min M _T	0.06	-0.01	-0.14	> 0.00	-0.04	0.01	CO 92
				Max M _y	0.06	-0.01	-0.14	0.00	> -0.04	0.01	CO 92
				Min M _y	-0.03	0.01	-9.11	0.01	> -2.28	-0.01	CO 8
				Max M _z	0.06	-0.01	-0.14	0.00	-0.04	> 0.01	CO 92
				Min M _z	-0.03	0.01	-9.11	0.01	-2.28	> -0.01	CO 8
1.732 Right	Max N	> 0.06	-0.01	-0.14	0.00	-0.04	0.01	CO 89			
	Min N	> -0.03	0.01	-9.11	0.01	-2.28	-0.01	CO 8			
	Max V _y	-0.03	> 0.01	-9.11	0.01	-2.28	-0.01	CO 8			
	Min V _y	0.06	> -0.01	-0.14	0.00	-0.04	0.01	CO 92			
	Max V _z	0.06	-0.01	> -0.14	0.00	-0.04	0.01	CO 92			
	Min V _z	-0.03	0.01	> -9.11	0.01	-2.28	-0.01	CO 8			
	Max M _T	-0.03	0.01	-9.11	> 0.01	-2.28	-0.01	CO 8			
	Min M _T	0.06	-0.01	-0.14	> 0.00	-0.04	0.01	CO 92			
	Max M _y	0.06	-0.01	-0.14	0.00	> -0.04	0.01	CO 92			
	Min M _y	-0.03	0.01	-9.11	0.01	> -2.28	-0.01	CO 8			
	Max M _z	0.06	-0.01	-0.14	0.00	-0.04	> 0.01	CO 92			
	Min M _z	-0.03	0.01	-9.11	0.01	-2.28	> -0.01	CO 8			
2.200 Left	Max N	> 0.06	-0.01	-0.21	0.00	-0.12	0.01	CO 89			
	Min N	> -0.03	0.01	-17.34	0.01	-8.41	-0.01	CO 8			
	Max V _y	-0.03	> 0.01	-17.34	0.01	-8.41	-0.01	CO 8			
	Min V _y	0.06	> -0.01	-0.21	0.00	-0.12	0.01	CO 92			
	Max V _z	0.06	-0.01	> -0.21	0.00	-0.12	0.01	CO 92			
	Min V _z	-0.03	0.01	> -17.34	0.01	-8.41	-0.01	CO 8			
	Max M _T	-0.03	0.01	-17.34	> 0.01	-8.41	-0.01	CO 8			
	Min M _T	0.06	-0.01	-0.21	> 0.00	-0.12	0.01	CO 92			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
		43	2.200 Right	Max M _y	0.06	-0.01	-0.21	0.00	> -0.12	0.01	CO 92
				Min M _y	-0.03	0.01	-17.34	0.01	> -8.41	-0.01	CO 8
				Max M _z	0.06	-0.01	-0.21	0.00	-0.12	> 0.01	CO 92
				Min M _z	-0.03	0.01	-17.34	0.01	-8.41	> -0.01	CO 8
				Max N	> 0.06	-0.01	-0.21	0.00	-0.12	0.01	CO 89
				Min N	> -0.03	0.01	-17.35	0.01	-8.41	-0.01	CO 8
				Max V _y	-0.03	> 0.01	-17.35	0.01	-8.41	-0.01	CO 8
				Min V _y	0.06	> -0.01	-0.21	0.00	-0.12	0.01	CO 92
				Max V _z	0.06	-0.01	> -0.21	0.00	-0.12	0.01	CO 92
				Min V _z	-0.03	0.01	> -17.35	0.01	-8.41	-0.01	CO 8
				Max M _T	-0.03	0.01	-17.35	> 0.01	-8.41	-0.01	CO 8
				Min M _T	0.06	-0.01	-0.21	> 0.00	-0.12	0.01	CO 92
				Max M _y	0.06	-0.01	-0.21	0.00	> -0.12	0.01	CO 92
				Min M _y	-0.03	0.01	-17.35	0.01	> -8.41	-0.01	CO 8
		Max M _z	0.06	-0.01	-0.21	0.00	-0.12	> 0.01	CO 92		
		Min M _z	-0.03	0.01	-17.35	0.01	-8.41	> -0.01	CO 8		
	RC3	47	0.000 Left	Max N	> 0.04	-0.01	0.07	0.00	0.00	-0.01	CO 216
				Min N	> -0.01	0.01	-0.27	0.00	0.00	0.01	CO 199
				Max V _y	-0.01	> 0.01	-0.27	0.00	0.00	0.01	CO 198
				Min V _y	0.04	> -0.01	0.07	0.00	0.00	-0.01	CO 219
				Max V _z	0.04	-0.01	> 0.07	0.00	0.00	-0.01	CO 219
				Min V _z	-0.01	0.01	> -0.27	0.00	0.00	0.01	CO 198
				Max M _T	0.04	-0.00	-0.26	> 0.00	0.00	-0.01	CO 204
				Min M _T	0.04	-0.01	0.07	> 0.00	0.00	-0.01	CO 219
				Max M _y	0.04	-0.00	-0.26	0.00	> 0.00	-0.01	CO 201
				Min M _y	-0.01	0.00	0.06	0.00	> -0.00	0.00	CO 214
				Max M _z	-0.01	0.01	-0.27	0.00	0.00	> 0.01	CO 199
				Min M _z	0.04	-0.01	0.07	0.00	0.00	> -0.01	CO 216
				Max N	> 0.04	-0.01	0.07	0.00	0.00	-0.01	CO 216
				Min N	> -0.01	0.01	-0.27	0.00	0.00	0.01	CO 199
		Max V _y	-0.01	> 0.01	-0.27	0.00	0.00	0.01	CO 198		
		Min V _y	0.04	> -0.01	0.07	0.00	0.00	-0.01	CO 219		
		Max V _z	0.04	-0.01	> 0.07	0.00	0.00	-0.01	CO 219		
		Min V _z	-0.01	0.01	> -0.27	0.00	0.00	0.01	CO 198		
		Max M _T	0.04	-0.00	-0.26	> 0.00	0.00	-0.01	CO 204		
		Min M _T	0.04	-0.01	0.07	> 0.00	0.00	-0.01	CO 219		
		Max M _y	0.04	-0.00	-0.26	0.00	> 0.00	-0.01	CO 201		
		Min M _y	-0.01	0.00	0.06	0.00	> -0.00	0.00	CO 214		
		Max M _z	-0.01	0.01	-0.27	0.00	0.00	> 0.01	CO 199		
		Min M _z	0.04	-0.01	0.07	0.00	0.00	> -0.01	CO 216		
		Max N	> 0.04	-0.01	-0.03	0.00	0.02	-0.00	CO 216		
		Min N	> -0.01	0.01	-0.11	0.00	0.46	0.00	CO 199		
		Max V _y	-0.01	> 0.01	-0.11	0.00	0.46	0.00	CO 198		
		Min V _y	0.04	> -0.01	-0.03	0.00	0.02	-0.00	CO 219		
		Max V _z	0.04	-0.01	> -0.03	0.00	0.02	-0.00	CO 219		
		Min V _z	-0.01	0.01	> -0.11	0.00	0.46	0.00	CO 198		
		Max M _T	-0.01	0.01	-0.11	> 0.00	0.46	0.00	CO 198		
		Min M _T	0.04	-0.01	-0.03	> 0.00	0.02	-0.00	CO 219		
		Max M _y	0.03	-0.00	-0.11	0.00	> 0.46	-0.00	CO 204		
		Min M _y	-0.01	0.00	-0.04	0.00	> 0.01	0.00	CO 213		
		Max M _z	-0.01	0.01	-0.11	0.00	0.46	> 0.00	CO 199		
		Min M _z	0.04	-0.00	-0.11	0.00	0.46	> -0.00	CO 201		
		Max N	> 0.04	-0.01	-0.03	0.00	0.02	-0.00	CO 216		
		Min N	> -0.01	0.01	-0.11	0.00	0.46	0.00	CO 199		
		Max V _y	-0.01	> 0.01	-0.11	0.00	0.46	0.00	CO 198		
		Min V _y	0.04	> -0.01	-0.03	0.00	0.02	-0.00	CO 219		

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases
					N	V _y	V _z	M _T	M _y	M _z	
				Max V _z	0.04	-0.01	> -0.03	0.00	0.02	-0.00	CO 219
				Min V _z	-0.01	0.01	> -0.11	0.00	0.46	0.00	CO 198
				Max M _T	-0.01	0.01	-0.11	> 0.00	0.46	0.00	CO 198
				Min M _T	0.04	-0.01	-0.03	> 0.00	0.02	-0.00	CO 219
				Max M _y	0.03	-0.00	-0.11	0.00	> 0.46	-0.00	CO 204
				Min M _y	-0.01	0.00	-0.04	0.00	> 0.01	0.00	CO 213
				Max M _z	-0.01	0.01	-0.11	0.00	0.46	> 0.00	CO 199
				Min M _z	0.04	-0.00	-0.11	0.00	0.46	> -0.00	CO 201
			1.732	Max N	> 0.04	-0.01	-0.11	0.00	-0.03	0.00	CO 216
			Left	Min N	> -0.01	0.01	-4.89	0.00	-1.23	-0.00	CO 199
				Max V _y	-0.01	> 0.01	-4.89	0.00	-1.23	-0.00	CO 198
				Min V _y	0.04	> -0.01	-0.11	0.00	-0.03	0.00	CO 219
				Max V _z	0.04	-0.01	> -0.11	0.00	-0.03	0.00	CO 219
				Min V _z	-0.01	0.01	> -4.89	0.00	-1.23	-0.00	CO 198
				Max M _T	-0.01	0.01	-4.89	> 0.00	-1.23	-0.00	CO 198
				Min M _T	0.04	-0.01	-0.11	> 0.00	-0.03	0.00	CO 219
				Max M _y	0.04	-0.01	-0.11	0.00	> -0.03	0.00	CO 219
				Min M _y	-0.01	0.01	-4.89	0.00	> -1.23	-0.00	CO 198
				Max M _z	0.04	-0.01	-0.11	0.00	-0.03	> 0.00	CO 219
				Min M _z	-0.01	0.01	-4.89	0.00	-1.23	> -0.00	CO 198
			1.732	Max N	> 0.04	-0.01	-0.11	0.00	-0.03	0.00	CO 216
			Right	Min N	> -0.01	0.01	-4.89	0.00	-1.23	-0.00	CO 199
				Max V _y	-0.01	> 0.01	-4.89	0.00	-1.23	-0.00	CO 198
				Min V _y	0.04	> -0.01	-0.11	0.00	-0.03	0.00	CO 219
				Max V _z	0.04	-0.01	> -0.11	0.00	-0.03	0.00	CO 219
				Min V _z	-0.01	0.01	> -4.89	0.00	-1.23	-0.00	CO 198
				Max M _T	-0.01	0.01	-4.89	> 0.00	-1.23	-0.00	CO 198
				Min M _T	0.04	-0.01	-0.11	> 0.00	-0.03	0.00	CO 219
				Max M _y	0.04	-0.01	-0.11	0.00	> -0.03	0.00	CO 219
				Min M _y	-0.01	0.01	-4.89	0.00	> -1.23	-0.00	CO 198
				Max M _z	0.04	-0.01	-0.11	0.00	-0.03	> 0.00	CO 219
				Min M _z	-0.01	0.01	-4.89	0.00	-1.23	> -0.00	CO 198
			2.200	Max N	> 0.04	-0.01	-0.16	0.00	-0.10	0.01	CO 216
			Left	Min N	> -0.01	0.01	-9.30	0.00	-4.51	-0.01	CO 199
				Max V _y	-0.01	> 0.01	-9.30	0.00	-4.52	-0.01	CO 198
				Min V _y	0.04	> -0.01	-0.16	0.00	-0.09	0.01	CO 219
				Max V _z	0.04	-0.01	> -0.16	0.00	-0.09	0.01	CO 219
				Min V _z	-0.01	0.01	> -9.30	0.00	-4.52	-0.01	CO 198
				Max M _T	-0.01	0.01	-9.30	> 0.00	-4.52	-0.01	CO 198
				Min M _T	0.04	-0.01	-0.16	> 0.00	-0.09	0.01	CO 219
				Max M _y	0.04	-0.01	-0.16	0.00	> -0.09	0.01	CO 219
				Min M _y	-0.01	0.01	-9.30	0.00	> -4.52	-0.01	CO 198
				Max M _z	0.04	-0.01	-0.16	0.00	-0.09	> 0.01	CO 219
				Min M _z	-0.01	0.01	-9.30	0.00	-4.52	> -0.01	CO 198
		43	2.200	Max N	> 0.04	-0.01	-0.16	0.00	-0.10	0.01	CO 216
			Right	Min N	> -0.01	0.01	-9.30	0.00	-4.51	-0.01	CO 199
				Max V _y	-0.01	> 0.01	-9.30	0.00	-4.52	-0.01	CO 198
				Min V _y	0.04	> -0.01	-0.16	0.00	-0.09	0.01	CO 219
				Max V _z	0.04	-0.01	> -0.16	0.00	-0.09	0.01	CO 219
				Min V _z	-0.01	0.01	> -9.30	0.00	-4.52	-0.01	CO 198
				Max M _T	-0.01	0.01	-9.30	> 0.00	-4.52	-0.01	CO 198
				Min M _T	0.04	-0.01	-0.16	> 0.00	-0.09	0.01	CO 219
				Max M _y	0.04	-0.01	-0.16	0.00	> -0.09	0.01	CO 219
				Min M _y	-0.01	0.01	-9.30	0.00	> -4.52	-0.01	CO 198
				Max M _z	0.04	-0.01	-0.16	0.00	-0.09	> 0.01	CO 219
				Min M _z	-0.01	0.01	-9.30	0.00	-4.52	> -0.01	CO 198

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]		Forces [kN]			Moments [kNm]			Corresponding Load Cases	
					N	V _y	V _z	M _T	M _y	M _z		
Section No. 12: IPE 140												
16	RC1	44	0.000 Left	Max N	> 4.44	0.03	0.55	0.00	-0.49	0.02	CO 18	
				Min N	> -10.76	-0.06	30.58	0.01	-25.26	-0.04	CO 76	
				Max V _y	-0.86	> 0.04	30.58	0.01	-25.17	0.02	CO 10	
				Min V _y	-5.44	> -0.06	0.57	-0.00	-0.47	-0.04	CO 90	
				Max V _z	-10.76	-0.06	> 30.58	0.01	-25.26	-0.04	CO 76	
				Min V _z	4.44	0.03	> 0.55	0.00	-0.49	0.02	CO 18	
				Max M _T	-4.75	-0.01	30.58	> 0.01	-25.19	-0.01	CO 4	
				Min M _T	-5.73	-0.06	0.57	> -0.00	-0.47	-0.04	CO 91	
				Max M _y	0.27	-0.02	0.56	0.00	> -0.47	-0.01	CO 19	
				Min M _y	-10.76	-0.06	30.58	0.01	> -25.26	-0.04	CO 76	
				Max M _z	-0.86	0.04	30.58	0.01	-25.17	> 0.02	CO 10	
				Min M _z	-10.47	-0.06	30.58	0.01	-25.26	> -0.04	CO 75	
				0.000 Right	Max N	> 4.44	0.03	0.55	0.00	-0.49	0.02	CO 18
					Min N	> -10.76	-0.06	30.58	0.01	-25.26	-0.04	CO 76
					Max V _y	-0.86	> 0.04	30.58	0.01	-25.17	0.02	CO 10
					Min V _y	-5.44	> -0.06	0.57	-0.00	-0.47	-0.04	CO 90
					Max V _z	-10.76	-0.06	> 30.58	0.01	-25.26	-0.04	CO 76
					Min V _z	4.44	0.03	> 0.55	0.00	-0.49	0.02	CO 18
			Max M _T		-4.75	-0.01	30.58	> 0.01	-25.19	-0.01	CO 4	
			Min M _T		-5.73	-0.06	0.57	> -0.00	-0.47	-0.04	CO 91	
			Max M _y		0.27	-0.02	0.56	0.00	> -0.47	-0.01	CO 19	
			Min M _y		-10.76	-0.06	30.58	0.01	> -25.26	-0.04	CO 76	
			Max M _z		-0.86	0.04	30.58	0.01	-25.17	> 0.02	CO 10	
			Min M _z		-10.47	-0.06	30.58	0.01	-25.26	> -0.04	CO 75	
			0.968 Left		Max N	> 4.44	0.03	0.38	0.00	-0.03	-0.01	CO 18
					Min N	> -10.56	-0.00	17.73	0.01	-3.84	0.03	CO 76
					Max V _y	-0.66	> 0.09	17.60	0.01	-3.83	-0.00	CO 10
					Min V _y	-5.44	> -0.06	0.40	0.00	-0.01	0.02	CO 90
					Max V _z	-10.56	-0.00	> 17.73	0.01	-3.84	0.03	CO 76
					Min V _z	4.44	0.03	> 0.38	0.00	-0.03	-0.01	CO 18
				Max M _T	-10.23	-0.00	17.72	> 0.01	-3.84	0.03	CO 12	
				Min M _T	-5.73	-0.06	0.40	> -0.00	-0.01	0.02	CO 91	
				Max M _y	-5.44	-0.06	0.40	0.00	> -0.01	0.02	CO 89	
				Min M _y	-6.39	0.05	17.67	0.01	> -3.84	0.01	CO 79	
				Max M _z	-10.27	-0.00	17.72	0.01	-3.84	> 0.03	CO 75	
				Min M _z	4.16	0.03	0.38	0.00	-0.03	> -0.01	CO 25	
0.968 Right	Max N	> 4.44		0.03	0.38	0.00	-0.03	-0.01	CO 18			
	Min N	> -10.56		-0.00	17.73	0.01	-3.84	0.03	CO 76			
	Max V _y	-0.66		> 0.09	17.60	0.01	-3.83	-0.00	CO 10			
	Min V _y	-5.44		> -0.06	0.40	0.00	-0.01	0.02	CO 90			
	Max V _z	-10.56		-0.00	> 17.73	0.01	-3.84	0.03	CO 76			
	Min V _z	4.44		0.03	> 0.38	0.00	-0.03	-0.01	CO 18			
	Max M _T	-10.23	-0.00	17.72	> 0.01	-3.84	0.03	CO 12				
	Min M _T	-5.73	-0.06	0.40	> -0.00	-0.01	0.02	CO 91				
	Max M _y	-5.44	-0.06	0.40	0.00	> -0.01	0.02	CO 89				
	Min M _y	-6.39	0.05	17.67	0.01	> -3.84	0.01	CO 79				
	Max M _z	-10.27	-0.00	17.72	0.01	-3.84	> 0.03	CO 75				
	Min M _z	4.16	0.03	0.38	0.00	-0.03	> -0.01	CO 25				
	0.000 Left	Max N	> 2.12	0.01	0.41	0.00	-0.36	0.01	CO 208			
		Min N	> -5.97	-0.03	16.43	0.00	-13.55	-0.02	CO 203			
		Max V _y	-0.72	> 0.02	16.42	0.00	-13.52	0.01	CO 200			
		Min V _y	-3.13	> -0.04	0.42	0.00	-0.35	-0.02	CO 217			
		Max V _z	-5.97	-0.03	> 16.43	0.00	-13.55	-0.02	CO 203			
		Min V _z	2.12	0.01	> 0.41	0.00	-0.36	0.01	CO 208			
Max M _T		-2.79	-0.01	16.43	> 0.00	-13.53	-0.01	CO 194				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
17	RC1	46	0.000 Right	Min M _T	-3.29	-0.04	0.42	> 0.00	-0.35	-0.02	CO 218
				Max M _y	-0.11	-0.01	0.41	0.00	> -0.35	-0.01	CO 209
				Min M _y	-5.97	-0.03	16.43	0.00	> -13.55	-0.02	CO 203
				Max M _z	1.96	0.01	0.41	0.00	-0.36	> 0.01	CO 215
				Min M _z	-5.81	-0.03	16.43	0.00	-13.55	> -0.02	CO 202
				Max N	> 2.12	0.01	0.41	0.00	-0.36	0.01	CO 208
				Min N	> -5.97	-0.03	16.43	0.00	-13.55	-0.02	CO 203
				Max V _y	-0.72	> 0.02	16.42	0.00	-13.52	0.01	CO 200
				Min V _y	-3.13	> -0.04	0.42	0.00	-0.35	-0.02	CO 217
				Max V _z	-5.97	-0.03	> 16.43	0.00	-13.55	-0.02	CO 203
				Min V _z	2.12	0.01	> 0.41	0.00	-0.36	0.01	CO 208
				Max M _T	-2.79	-0.01	16.43	> 0.00	-13.53	-0.01	CO 194
			Min M _T	-3.29	-0.04	0.42	> 0.00	-0.35	-0.02	CO 218	
			Max M _y	-0.11	-0.01	0.41	0.00	> -0.35	-0.01	CO 209	
			Min M _y	-5.97	-0.03	16.43	0.00	> -13.55	-0.02	CO 203	
			Max M _z	1.96	0.01	0.41	0.00	-0.36	> 0.01	CO 215	
			Min M _z	-5.81	-0.03	16.43	0.00	-13.54	> -0.02	CO 202	
			Max N	> 2.12	0.01	0.29	0.00	-0.02	-0.00	CO 208	
			Min N	> -5.91	-0.02	9.51	0.00	-2.04	0.01	CO 203	
			Max V _y	-0.66	> 0.03	9.47	0.00	-2.05	-0.00	CO 200	
			Min V _y	-3.13	> -0.04	0.29	0.00	-0.01	0.01	CO 217	
			Max V _z	-5.91	-0.02	> 9.51	0.00	-2.04	0.01	CO 203	
			Min V _z	2.12	0.01	> 0.29	0.00	-0.02	-0.00	CO 208	
			Max M _T	-5.76	-0.02	9.51	> 0.00	-2.04	0.01	CO 202	
			Min M _T	-3.29	-0.04	0.29	> 0.00	-0.01	0.01	CO 218	
			Max M _y	-3.13	-0.04	0.29	0.00	> -0.01	0.01	CO 216	
			Min M _y	-3.69	0.01	9.49	0.00	> -2.05	0.00	CO 206	
			Max M _z	-5.76	-0.02	9.51	0.00	-2.04	> 0.01	CO 202	
			Min M _z	1.96	0.01	0.29	0.00	-0.02	> -0.00	CO 215	
			Max N	> 2.12	0.01	0.29	0.00	-0.02	-0.00	CO 208	
			Min N	> -5.91	-0.02	9.51	0.00	-2.04	0.01	CO 203	
			Max V _y	-0.66	> 0.03	9.47	0.00	-2.05	-0.00	CO 200	
			Min V _y	-3.13	> -0.04	0.29	0.00	-0.01	0.01	CO 217	
			Max V _z	-5.91	-0.02	> 9.51	0.00	-2.04	0.01	CO 203	
			Min V _z	2.12	0.01	> 0.29	0.00	-0.02	-0.00	CO 208	
			Max M _T	-5.76	-0.02	9.51	> 0.00	-2.04	0.01	CO 202	
			Min M _T	-3.29	-0.04	0.29	> 0.00	-0.01	0.01	CO 218	
			Max M _y	-3.13	-0.04	0.29	0.00	> -0.01	0.01	CO 216	
			Min M _y	-3.69	0.01	9.49	0.00	> -2.05	0.00	CO 206	
			Max M _z	-5.76	-0.02	9.51	0.00	-2.04	> 0.01	CO 202	
			Min M _z	1.96	0.01	0.29	0.00	-0.02	> -0.00	CO 215	
			Max N	> 4.45	0.00	0.30	-0.00	-0.03	-0.00	CO 18	
			Min N	> -10.56	0.06	18.25	0.00	-3.85	0.02	CO 76	
			Max V _y	-0.64	> 0.06	18.14	-0.00	-3.83	0.01	CO 10	
			Min V _y	-5.75	> -0.00	0.30	0.00	-0.01	0.01	CO 91	
			Max V _z	-10.56	0.06	> 18.25	0.00	-3.85	0.02	CO 76	
			Min V _z	4.45	0.00	> 0.30	-0.00	-0.03	-0.00	CO 18	
			Max M _T	-10.27	0.05	18.25	> 0.00	-3.84	0.02	CO 75	
Min M _T	-0.64	0.06	18.14	> -0.00	-3.83	0.01	CO 9				
Max M _y	-5.45	-0.00	0.30	0.00	> -0.01	0.01	CO 89				
Min M _y	-6.38	0.06	18.20	0.00	> -3.85	0.02	CO 79				
Max M _z	-10.23	0.06	18.25	0.00	-3.84	> 0.02	CO 11				
Min M _z	4.16	-0.00	0.30	-0.00	-0.03	> -0.00	CO 24				
Max N	> 4.45	0.00	0.30	-0.00	-0.03	-0.00	CO 18				
Min N	> -10.56	0.06	18.25	0.00	-3.85	0.02	CO 76				
Max V _y	-0.64	> 0.06	18.14	-0.00	-3.83	0.01	CO 10				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
				Min V _y	-5.75	> -0.00	0.30	0.00	-0.01	0.01	CO 91
				Max V _z	-10.56	0.06	> 18.25	0.00	-3.85	0.02	CO 76
				Min V _z	4.45	0.00	> 0.30	-0.00	-0.03	-0.00	CO 18
				Max M _T	-10.27	0.05	18.25	> 0.00	-3.84	0.02	CO 75
				Min M _T	-0.64	0.06	18.14	> -0.00	-3.83	0.01	CO 9
				Max M _y	-5.45	-0.00	0.30	0.00	> -0.01	0.01	CO 89
				Min M _y	-6.38	0.06	18.20	0.00	> -3.85	0.02	CO 79
				Max M _z	-10.23	0.06	18.25	0.00	-3.84	> 0.02	CO 11
				Min M _z	4.16	-0.00	0.30	-0.00	-0.03	> -0.00	CO 24
			1.732	Max N	> 4.45	0.00	-0.00	0.00	0.23	-0.00	CO 18
			Left	Min N	> -10.78	0.00	0.00	0.00	13.96	0.02	CO 76
				Max V _y	-10.48	> 0.00	0.00	0.00	13.96	0.02	CO 74
				Min V _y	-1.52	> 0.00	-0.00	0.00	0.23	0.00	CO 31
				Max V _z	-10.46	0.00	> 0.00	0.00	13.96	0.02	CO 43
				Min V _z	4.45	0.00	> -0.00	0.00	0.23	-0.00	CO 18
				Max M _T	-0.61	0.00	0.00	> 0.00	13.82	0.01	CO 66
				Min M _T	4.45	0.00	-0.00	> 0.00	0.23	-0.00	CO 23
				Max M _y	-10.78	0.00	0.00	0.00	> 13.96	0.02	CO 76
				Min M _y	4.45	0.00	-0.00	0.00	> 0.23	-0.00	CO 23
				Max M _z	-10.49	0.00	0.00	0.00	13.96	> 0.02	CO 75
				Min M _z	4.16	0.00	-0.00	0.00	0.23	> -0.00	CO 25
			1.732	Max N	> 4.45	0.00	-0.00	0.00	0.23	-0.00	CO 18
			Right	Min N	> -10.78	0.00	-0.00	0.00	13.96	0.02	CO 76
				Max V _y	-10.48	> 0.00	-0.00	0.00	13.96	0.02	CO 74
				Min V _y	-1.52	> 0.00	-0.00	0.00	0.23	0.00	CO 31
				Max V _z	-5.75	0.00	> -0.00	0.00	0.26	0.01	CO 91
				Min V _z	-10.73	0.00	> -0.00	0.00	13.96	0.02	CO 14
				Max M _T	-0.59	0.00	-0.00	> 0.00	13.82	0.01	CO 34
				Min M _T	4.45	0.00	-0.00	> 0.00	0.23	-0.00	CO 23
				Max M _y	-10.78	0.00	-0.00	0.00	> 13.96	0.02	CO 76
				Min M _y	4.45	0.00	-0.00	0.00	> 0.23	-0.00	CO 23
				Max M _z	-10.49	0.00	-0.00	0.00	13.96	> 0.02	CO 75
				Min M _z	4.16	0.00	-0.00	0.00	0.23	> -0.00	CO 25
			3.464	Max N	> 4.45	0.00	-0.30	0.00	-0.03	-0.00	CO 18
			Left	Min N	> -10.56	-0.05	-18.25	-0.00	-3.85	0.02	CO 76
				Max V _y	-5.74	> 0.00	-0.30	-0.00	-0.01	0.01	CO 92
				Min V _y	-0.64	> -0.06	-18.14	0.00	-3.83	0.01	CO 9
				Max V _z	4.45	0.00	> -0.30	0.00	-0.03	-0.00	CO 23
				Min V _z	-10.56	-0.05	> -18.25	-0.00	-3.85	0.02	CO 76
				Max M _T	-0.64	-0.06	-18.14	> 0.00	-3.83	0.01	CO 10
				Min M _T	-10.27	-0.05	-18.25	> -0.00	-3.84	0.02	CO 75
				Max M _y	-5.45	0.00	-0.30	-0.00	> -0.01	0.01	CO 89
				Min M _y	-6.38	-0.06	-18.20	-0.00	> -3.85	0.01	CO 79
				Max M _z	-10.23	-0.05	-18.25	-0.00	-3.84	> 0.02	CO 12
				Min M _z	4.16	0.00	-0.30	0.00	-0.04	> -0.00	CO 25
		47	3.464	Max N	> 4.45	0.00	-0.30	0.00	-0.03	-0.00	CO 18
			Right	Min N	> -10.56	-0.05	-18.25	-0.00	-3.85	0.02	CO 76
				Max V _y	-5.74	> 0.00	-0.30	-0.00	-0.01	0.01	CO 92
				Min V _y	-0.64	> -0.06	-18.14	0.00	-3.83	0.01	CO 9
				Max V _z	4.45	0.00	> -0.30	0.00	-0.03	-0.00	CO 23
				Min V _z	-10.56	-0.05	> -18.25	-0.00	-3.85	0.02	CO 76
				Max M _T	-0.64	-0.06	-18.14	> 0.00	-3.83	0.01	CO 10
				Min M _T	-10.27	-0.05	-18.25	> -0.00	-3.84	0.02	CO 75
				Max M _y	-5.45	0.00	-0.30	-0.00	> -0.01	0.01	CO 89
				Min M _y	-6.38	-0.06	-18.20	-0.00	> -3.85	0.01	CO 79
				Max M _z	-10.23	-0.05	-18.25	-0.00	-3.84	> 0.02	CO 12

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
	RC3	46	0.000 Left	Min M _z	4.16	0.00	-0.30	0.00	-0.04	> -0.00	CO 25
				Max N	> 2.12	0.00	0.22	-0.00	-0.02	-0.00	CO 208
				Min N	> -5.91	0.02	9.77	0.00	-2.05	0.01	CO 203
				Max V _y	-0.65	> 0.02	9.74	-0.00	-2.05	0.00	CO 200
				Min V _y	-3.30	> -0.00	0.22	0.00	-0.01	0.00	CO 218
				Max V _z	-5.91	0.02	> 9.77	0.00	-2.05	0.01	CO 203
				Min V _z	2.12	0.00	> 0.22	-0.00	-0.02	-0.00	CO 208
				Max M _T	-5.76	0.02	9.77	> 0.00	-2.05	0.01	CO 202
				Min M _T	-0.65	0.02	9.74	> -0.00	-2.05	0.00	CO 199
				Max M _y	-3.14	-0.00	0.22	0.00	> -0.01	0.00	CO 216
				Min M _y	-3.68	0.02	9.75	0.00	> -2.05	0.01	CO 206
				Max M _z	-5.76	0.02	9.77	0.00	-2.05	> 0.01	CO 201
			Min M _z	1.96	0.00	0.22	-0.00	-0.02	> -0.00	CO 214	
			0.000 Right	Max N	> 2.12	0.00	0.22	-0.00	-0.02	-0.00	CO 208
				Min N	> -5.91	0.02	9.77	0.00	-2.05	0.01	CO 203
				Max V _y	-0.65	> 0.02	9.74	-0.00	-2.05	0.00	CO 200
				Min V _y	-3.30	> -0.00	0.22	0.00	-0.01	0.00	CO 218
				Max V _z	-5.91	0.02	> 9.77	0.00	-2.05	0.01	CO 203
				Min V _z	2.12	0.00	> 0.22	-0.00	-0.02	-0.00	CO 208
				Max M _T	-5.76	0.02	9.77	> 0.00	-2.05	0.01	CO 202
				Min M _T	-0.65	0.02	9.74	> -0.00	-2.05	0.00	CO 199
				Max M _y	-3.14	-0.00	0.22	0.00	> -0.01	0.00	CO 216
				Min M _y	-3.68	0.02	9.75	0.00	> -2.05	0.01	CO 206
				Max M _z	-5.76	0.02	9.77	0.00	-2.05	> 0.01	CO 201
				Min M _z	1.96	0.00	0.22	-0.00	-0.02	> -0.00	CO 214
			1.732 Left	Max N	> 2.12	0.00	-0.00	0.00	0.17	-0.00	CO 208
				Min N	> -5.97	0.00	0.00	0.00	7.47	0.01	CO 203
				Max V _y	-2.79	> 0.00	0.00	0.00	7.45	0.01	CO 194
				Min V _y	-3.30	> 0.00	-0.00	0.00	0.19	0.00	CO 218
				Max V _z	-5.97	0.00	> 0.00	0.00	7.47	0.01	CO 203
				Min V _z	2.12	0.00	> -0.00	0.00	0.17	-0.00	CO 208
				Max M _T	-0.56	0.00	0.00	> 0.00	7.42	0.00	CO 193
				Min M _T	2.12	0.00	-0.00	> 0.00	0.17	-0.00	CO 213
				Max M _y	-5.97	0.00	0.00	0.00	> 7.47	0.01	CO 204
				Min M _y	2.12	0.00	-0.00	0.00	> 0.17	-0.00	CO 213
				Max M _z	-5.82	0.00	0.00	0.00	7.47	> 0.01	CO 202
				Min M _z	1.96	0.00	-0.00	0.00	0.17	> -0.00	CO 215
			1.732 Right	Max N	> 2.12	0.00	-0.00	0.00	0.17	-0.00	CO 208
				Min N	> -5.97	0.00	-0.00	0.00	7.47	0.01	CO 203
				Max V _y	-2.79	> 0.00	-0.00	0.00	7.45	0.01	CO 194
				Min V _y	-3.30	> 0.00	-0.00	0.00	0.19	0.00	CO 218
				Max V _z	-3.30	0.00	> -0.00	0.00	0.19	0.00	CO 218
				Min V _z	-0.71	0.00	> -0.00	0.00	7.42	0.00	CO 200
				Max M _T	-0.56	0.00	-0.00	> 0.00	7.42	0.00	CO 193
				Min M _T	2.12	0.00	-0.00	> 0.00	0.17	-0.00	CO 213
				Max M _y	-5.97	0.00	-0.00	0.00	> 7.47	0.01	CO 204
				Min M _y	2.12	0.00	-0.00	0.00	> 0.17	-0.00	CO 213
				Max M _z	-5.82	0.00	-0.00	0.00	7.47	> 0.01	CO 202
Min M _z	1.96	0.00		-0.00	0.00	0.17	> -0.00	CO 215			
3.464 Left	Max N	> 2.12	0.00	-0.22	0.00	-0.02	-0.00	CO 208			
	Min N	> -5.91	-0.02	-9.77	-0.00	-2.05	0.01	CO 203			
	Max V _y	-3.29	> 0.00	-0.22	-0.00	-0.01	0.00	CO 219			
	Min V _y	-0.65	> -0.02	-9.74	0.00	-2.05	0.00	CO 199			
	Max V _z	2.12	0.00	> -0.22	0.00	-0.02	-0.00	CO 213			
	Min V _z	-5.91	-0.02	> -9.77	-0.00	-2.05	0.01	CO 203			
	Max M _T	-0.65	-0.02	-9.74	> 0.00	-2.05	0.00	CO 200			

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
18	RC1	47	3.464 Right	Min M _T	-5.76	-0.02	-9.77	> -0.00	-2.05	0.01	CO 202
				Max M _y	-3.14	0.00	-0.22	-0.00	> -0.01	0.00	CO 216
				Min M _y	-3.68	-0.02	-9.75	-0.00	> -2.05	0.01	CO 206
				Max M _z	-5.76	-0.02	-9.77	-0.00	-2.05	> 0.01	CO 202
				Min M _z	1.96	0.00	-0.22	0.00	-0.02	> -0.00	CO 215
				Max N	> 2.12	0.00	-0.22	0.00	-0.02	-0.00	CO 208
				Min N	> -5.91	-0.02	-9.77	-0.00	-2.05	0.01	CO 203
				Max V _y	-3.29	> 0.00	-0.22	-0.00	-0.01	0.00	CO 219
				Min V _y	-0.65	> -0.02	-9.74	0.00	-2.05	0.00	CO 199
				Max V _z	2.12	0.00	> -0.22	0.00	-0.02	-0.00	CO 213
				Min V _z	-5.91	-0.02	> -9.77	-0.00	-2.05	0.01	CO 203
				Max M _T	-0.65	-0.02	-9.74	> 0.00	-2.05	0.00	CO 200
			Min M _T	-5.76	-0.02	-9.77	> -0.00	-2.05	0.01	CO 202	
			Max M _y	-3.14	0.00	-0.22	-0.00	> -0.01	0.00	CO 216	
			Min M _y	-3.68	-0.02	-9.75	-0.00	> -2.05	0.01	CO 206	
			Max M _z	-5.76	-0.02	-9.77	-0.00	-2.05	> 0.01	CO 202	
			Min M _z	1.96	0.00	-0.22	0.00	-0.02	> -0.00	CO 215	
			Max N	> 4.45	-0.03	-0.38	-0.00	-0.03	-0.01	CO 18	
			Min N	> -10.56	0.00	-17.73	-0.01	-3.84	0.03	CO 76	
			Max V _y	-5.44	> 0.07	-0.40	0.00	-0.01	0.02	CO 89	
			Min V _y	-0.66	> -0.09	-17.60	-0.01	-3.83	-0.00	CO 9	
			Max V _z	4.44	-0.03	> -0.38	-0.00	-0.03	-0.01	CO 23	
			Min V _z	-10.56	0.00	> -17.73	-0.01	-3.84	0.03	CO 77	
			Max M _T	-5.73	0.07	-0.40	> 0.00	-0.01	0.02	CO 92	
		Min M _T	-10.23	0.00	-17.72	> -0.01	-3.84	0.03	CO 11		
		Max M _y	-5.44	0.07	-0.40	0.00	> -0.01	0.02	CO 89		
		Min M _y	-6.39	-0.05	-17.67	-0.01	> -3.84	0.01	CO 79		
		Max M _z	-10.27	0.00	-17.72	-0.01	-3.84	> 0.03	CO 74		
		Min M _z	4.15	-0.03	-0.38	-0.00	-0.03	> -0.01	CO 24		
		Max N	> 4.45	-0.03	-0.38	-0.00	-0.03	-0.01	CO 18		
		Min N	> -10.56	0.00	-17.73	-0.01	-3.84	0.03	CO 76		
		Max V _y	-5.44	> 0.07	-0.40	0.00	-0.01	0.02	CO 89		
		Min V _y	-0.66	> -0.09	-17.60	-0.01	-3.83	-0.00	CO 9		
		Max V _z	4.44	-0.03	> -0.38	-0.00	-0.03	-0.01	CO 23		
		Min V _z	-10.56	0.00	> -17.73	-0.01	-3.84	0.03	CO 77		
		Max M _T	-5.73	0.07	-0.40	> 0.00	-0.01	0.02	CO 92		
		Min M _T	-10.23	0.00	-17.72	> -0.01	-3.84	0.03	CO 11		
		Max M _y	-5.44	0.07	-0.40	0.00	> -0.01	0.02	CO 89		
		Min M _y	-6.39	-0.05	-17.67	-0.01	> -3.85	0.01	CO 79		
		Max M _z	-10.27	0.00	-17.72	-0.01	-3.84	> 0.03	CO 74		
		Min M _z	4.15	-0.03	-0.38	-0.00	-0.03	> -0.01	CO 24		
		Max N	> 4.45	-0.03	-0.55	-0.00	-0.49	0.02	CO 18		
		Min N	> -10.76	0.06	-30.58	-0.01	-25.26	-0.04	CO 76		
		Max V _y	-5.44	> 0.06	-0.57	0.00	-0.47	-0.04	CO 89		
		Min V _y	-0.86	> -0.04	-30.58	-0.01	-25.17	0.02	CO 9		
		Max V _z	4.44	-0.03	> -0.55	-0.00	-0.49	0.02	CO 23		
		Min V _z	-10.76	0.06	> -30.58	-0.01	-25.26	-0.04	CO 77		
		Max M _T	-5.73	0.06	-0.57	> 0.00	-0.48	-0.04	CO 92		
Min M _T	-4.75	0.01	-30.58	> -0.01	-25.19	-0.01	CO 5				
Max M _y	0.27	0.02	-0.56	-0.00	> -0.47	-0.01	CO 20				
Min M _y	-10.76	0.06	-30.58	-0.01	> -25.26	-0.04	CO 77				
Max M _z	4.15	-0.03	-0.55	-0.00	-0.49	> 0.02	CO 24				
Min M _z	-10.47	0.06	-30.58	-0.01	-25.26	> -0.04	CO 74				
Max N	> 4.45	-0.03	-0.55	-0.00	-0.49	0.02	CO 18				
Min N	> -10.76	0.06	-30.58	-0.01	-25.26	-0.04	CO 76				
Max V _y	-5.44	> 0.06	-0.57	0.00	-0.47	-0.04	CO 89				

4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
				Min V _y	-0.86	> -0.04	-30.58	-0.01	-25.17	0.02	CO 9
				Max V _z	4.44	-0.03	> -0.55	-0.00	-0.49	0.02	CO 23
				Min V _z	-10.76	0.06	> -30.58	-0.01	-25.26	-0.04	CO 77
				Max M _T	-5.73	0.06	-0.57	> 0.00	-0.48	-0.04	CO 92
				Min M _T	-4.75	0.01	-30.58	> -0.01	-25.19	-0.01	CO 5
				Max M _y	0.27	0.02	-0.56	-0.00	> -0.47	-0.01	CO 20
				Min M _y	-10.76	0.06	-30.58	-0.01	> -25.26	-0.04	CO 77
				Max M _z	4.15	-0.03	-0.55	-0.00	-0.49	> 0.02	CO 24
				Min M _z	-10.47	0.06	-30.58	-0.01	-25.26	> -0.04	CO 74
			0.000	Max N	> 2.12	-0.01	-0.29	-0.00	-0.02	-0.00	CO 208
			Left	Min N	> -5.91	0.02	-9.51	-0.00	-2.04	0.01	CO 203
				Max V _y	-3.13	> 0.04	-0.29	-0.00	-0.01	0.01	CO 216
				Min V _y	-0.66	> -0.03	-9.47	-0.00	-2.05	-0.00	CO 199
				Max V _z	2.11	-0.01	> -0.29	-0.00	-0.02	-0.00	CO 213
				Min V _z	-5.91	0.02	> -9.51	-0.00	-2.04	0.01	CO 204
				Max M _T	-3.29	0.04	-0.30	> -0.00	-0.01	0.01	CO 219
				Min M _T	-5.76	0.02	-9.51	> -0.00	-2.04	0.01	CO 201
				Max M _y	-3.13	0.04	-0.29	-0.00	> -0.01	0.01	CO 216
				Min M _y	-3.69	-0.01	-9.49	-0.00	> -2.05	0.00	CO 206
				Max M _z	-5.76	0.02	-9.51	-0.00	-2.04	> 0.01	CO 201
				Min M _z	1.96	-0.01	-0.29	-0.00	-0.02	> -0.00	CO 214
			0.000	Max N	> 2.12	-0.01	-0.29	-0.00	-0.02	-0.00	CO 208
			Right	Min N	> -5.91	0.02	-9.51	-0.00	-2.04	0.01	CO 203
				Max V _y	-3.13	> 0.04	-0.29	-0.00	-0.01	-0.01	CO 216
				Min V _y	-0.66	> -0.03	-9.47	-0.00	-2.05	-0.00	CO 199
				Max V _z	2.11	-0.01	> -0.29	-0.00	-0.02	-0.00	CO 213
				Min V _z	-5.91	0.02	> -9.51	-0.00	-2.04	0.01	CO 204
				Max M _T	-3.29	0.04	-0.30	> -0.00	-0.01	0.01	CO 219
				Min M _T	-5.76	0.02	-9.51	> -0.00	-2.04	0.01	CO 201
				Max M _y	-3.13	0.04	-0.29	-0.00	> -0.01	0.01	CO 216
				Min M _y	-3.69	-0.01	-9.49	-0.00	> -2.05	0.00	CO 206
				Max M _z	-5.76	0.02	-9.51	-0.00	-2.04	> 0.01	CO 201
				Min M _z	1.96	-0.01	-0.29	-0.00	-0.02	> -0.00	CO 214
			0.968	Max N	> 2.12	-0.01	-0.41	-0.00	-0.36	0.01	CO 208
			Left	Min N	> -5.97	0.04	-16.43	-0.00	-13.55	-0.03	CO 203
				Max V _y	-3.13	> 0.04	-0.42	-0.00	-0.35	-0.02	CO 216
				Min V _y	-0.72	> -0.02	-16.42	-0.00	-13.52	0.01	CO 199
				Max V _z	2.11	-0.01	> -0.41	-0.00	-0.36	0.01	CO 213
				Min V _z	-5.97	0.04	> -16.43	-0.00	-13.55	-0.03	CO 204
				Max M _T	-3.29	0.04	-0.42	> -0.00	-0.35	-0.02	CO 219
				Min M _T	-2.79	0.01	-16.43	> -0.00	-13.53	-0.01	CO 195
				Max M _y	-0.11	0.01	-0.41	-0.00	> -0.35	-0.01	CO 210
				Min M _y	-5.97	0.04	-16.43	-0.00	> -13.55	-0.03	CO 203
				Max M _z	1.96	-0.01	-0.41	-0.00	-0.36	> 0.01	CO 214
				Min M _z	-5.81	0.04	-16.43	-0.00	-13.55	> -0.03	CO 201
			0.968	Max N	> 2.12	-0.01	-0.41	-0.00	-0.36	0.01	CO 208
			Right	Min N	> -5.97	0.04	-16.43	-0.00	-13.55	-0.03	CO 203
				Max V _y	-3.13	> 0.04	-0.42	-0.00	-0.35	-0.02	CO 216
				Min V _y	-0.72	> -0.02	-16.42	-0.00	-13.52	0.01	CO 199
				Max V _z	2.11	-0.01	> -0.41	-0.00	-0.36	0.01	CO 213
				Min V _z	-5.97	0.04	> -16.43	-0.00	-13.55	-0.03	CO 204
				Max M _T	-3.29	0.04	-0.42	> -0.00	-0.35	-0.02	CO 219
				Min M _T	-2.79	0.01	-16.43	> -0.00	-13.53	-0.01	CO 195
				Max M _y	-0.11	0.01	-0.41	-0.00	> -0.35	-0.01	CO 210
				Min M _y	-5.97	0.04	-16.43	-0.00	> -13.55	-0.03	CO 203
				Max M _z	1.96	-0.01	-0.41	-0.00	-0.36	> 0.01	CO 214

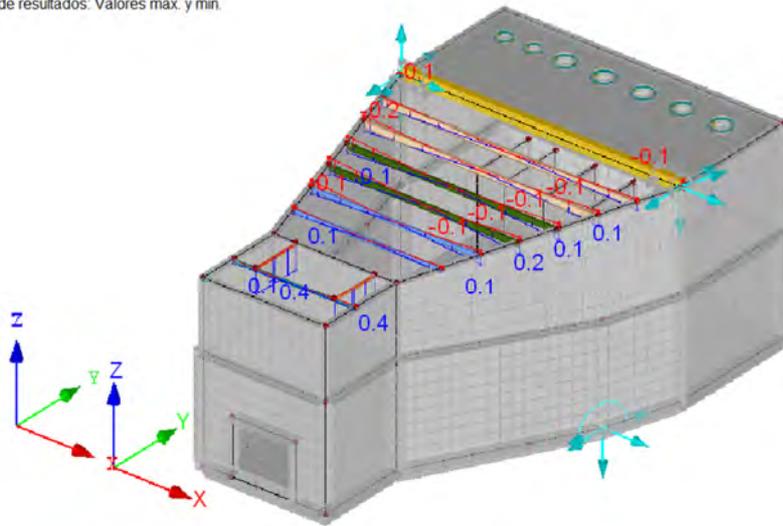
4.12 Cross-Sections - Internal Forces

Member No.	RC	Node No.	Location x [m]	Forces [kN]			Moments [kNm]			Corresponding Load Cases	
				N	V _y	V _z	M _T	M _y	M _z		
				Min M _z	-5.81	0.04	-16.43	-0.00	-13.55	> -0.03	CO 201

Local Deformations u_x

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-x
 Combinaciones de resultados: Valores máx. y mín.

Isometric

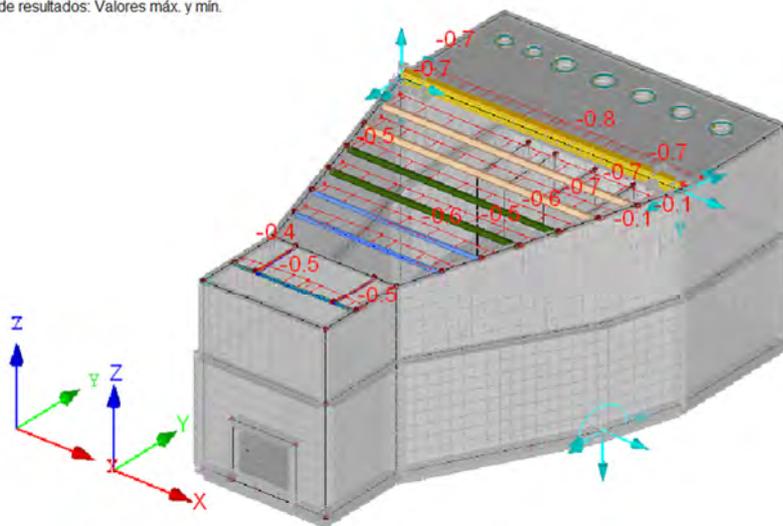


Members Max u-x: 0.4, Min u-x: -0.2 [mm]

Local Deformations u_y

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-y
 Combinaciones de resultados: Valores máx. y mín.

Isometric

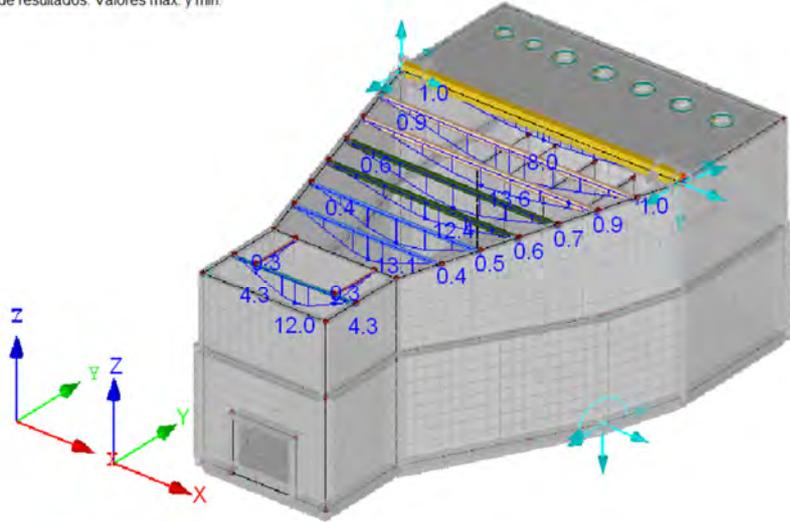


Members Max u-y: 0.1, Min u-y: -0.8 [mm]

Local Deformations u_z

RC3: ELS - Cuasipermanente
 Members Deformaciones locales u-z
 Combinaciones de resultados: Valores máx. y mín.

Isometric

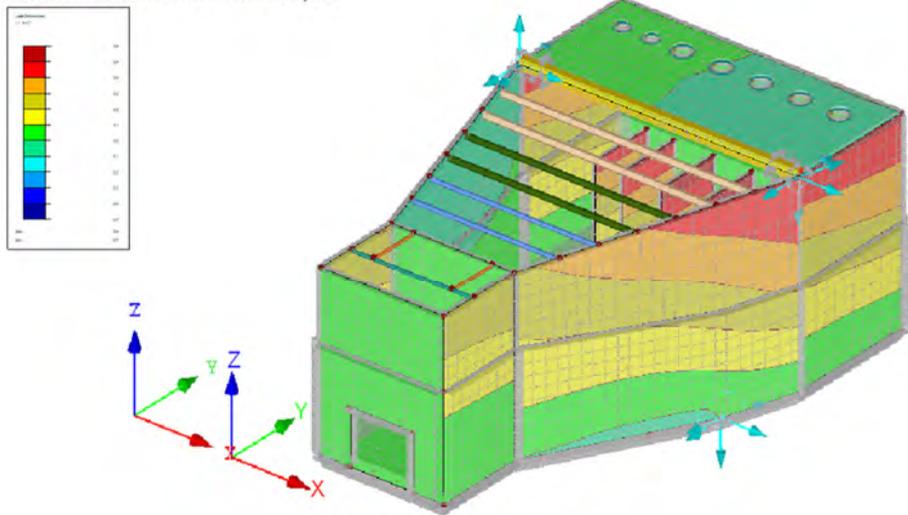


Members Max u-z: 13.6, Min u-z: 0.1 [mm]

Local Deformations u_x

RC3: ELS - Cuasipermanente
 Surfaces Deformaciones locales u-x [mm]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

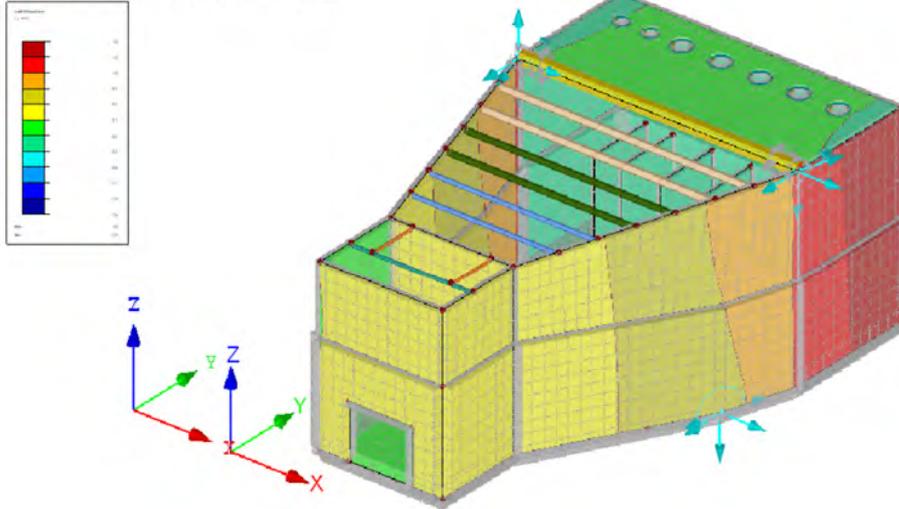


Surfaces Max u-x: 0.8, Min u-x: 0.0 [mm]

Local Deformations u_y

RC3: ELS - Cuasipermanente
Superficies Deformaciones locales u-y [mm]
Combinaciones de resultados: Valores máx. y mín.

Isometric

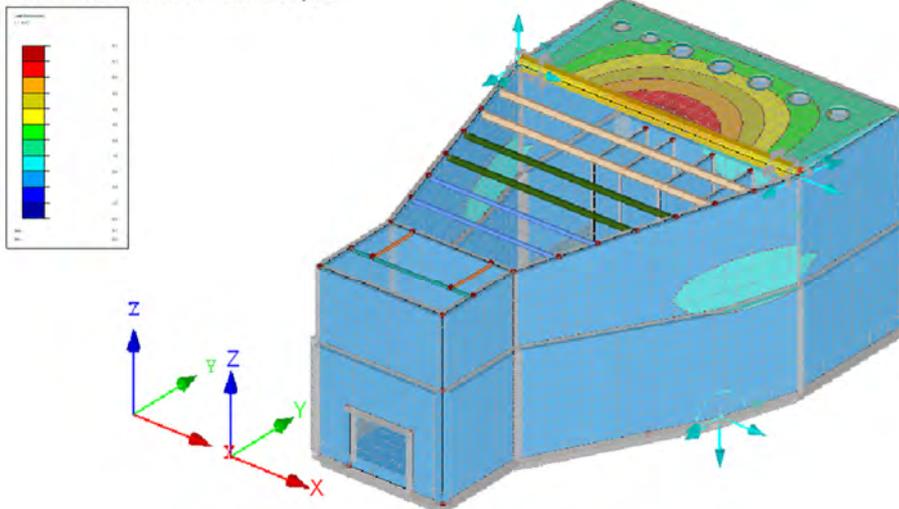


Surfaces Max u-y: 1.6, Min u-y: 0.0 [mm]

Local Deformations u_z

RC3: ELS - Cuasipermanente
Superficies Deformaciones locales u-z [mm]
Combinaciones de resultados: Valores máx. y mín.

Isometric

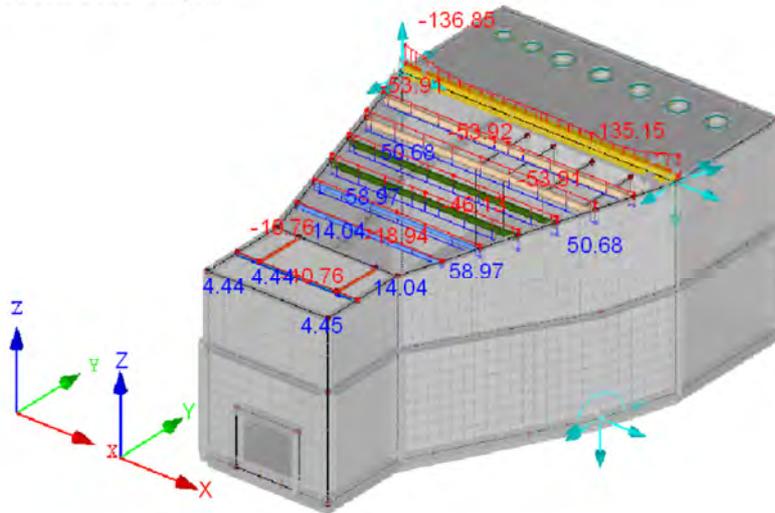


Surfaces Max u-z: 8.1, Min u-z: 0.0 [mm]

Internal forces N

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos N
 Combinaciones de resultados: Valores máx. y mín.

Isometric

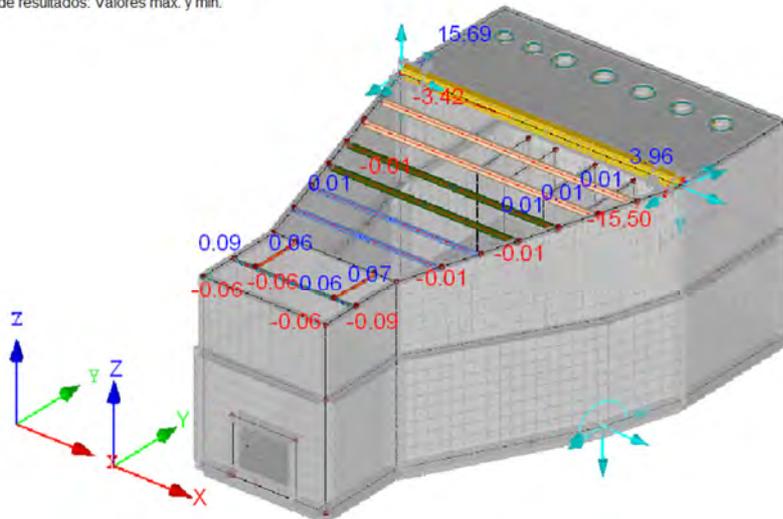


Members Max N: 58.97, Min N: -136.85 [kN]

Internal forces V_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos V-y
 Combinaciones de resultados: Valores máx. y mín.

Isometric

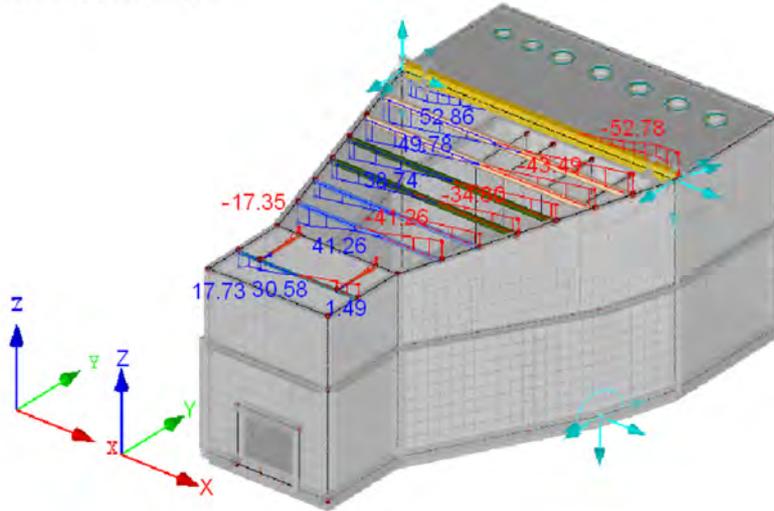


Members Max V-y: 15.69, Min V-y: -15.50 [kN]

Internal forces V_z

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos V-z
 Combinaciones de resultados: Valores máx. y mín.

Isometric

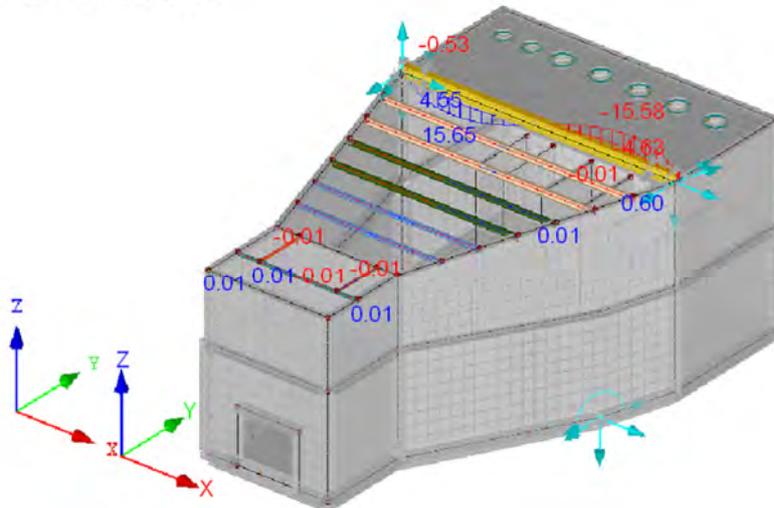


Members Max V-z: 52.86, Min V-z: -52.78 [kN]

Internal forces M_T

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos M-T
 Combinaciones de resultados: Valores máx. y mín.

Isometric

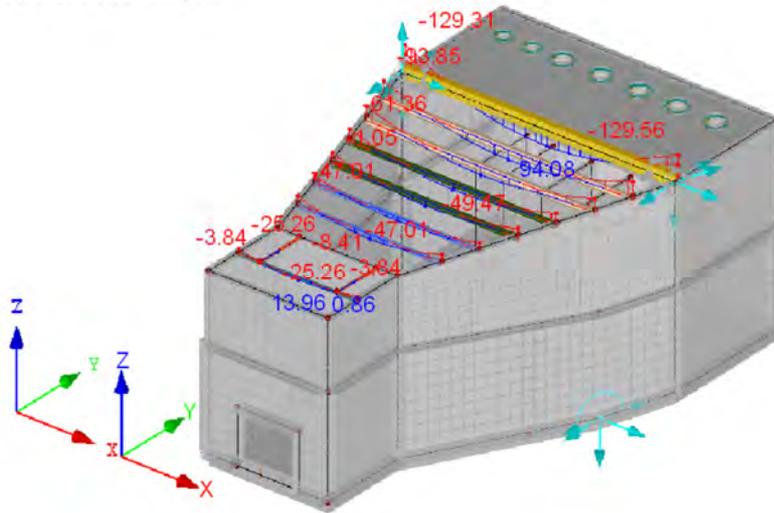


Members Max M-T: 15.65, Min M-T: -15.58 [kNm]

Internal forces M_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos M-y
 Combinaciones de resultados: Valores máx. y mín.

Isometric

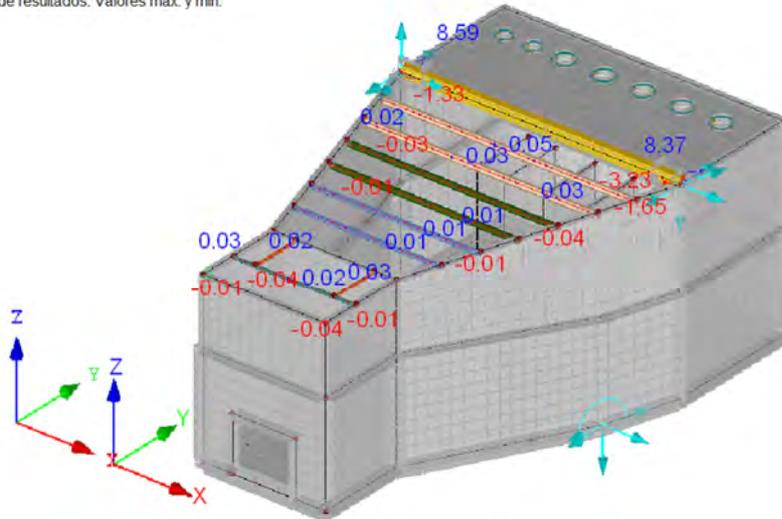


Members Max M-y: 94.08, Min M-y: -129.56 [kNm]

Internal forces M_z

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Members Esfuerzos internos M-z
 Combinaciones de resultados: Valores máx. y mín.

Isometric

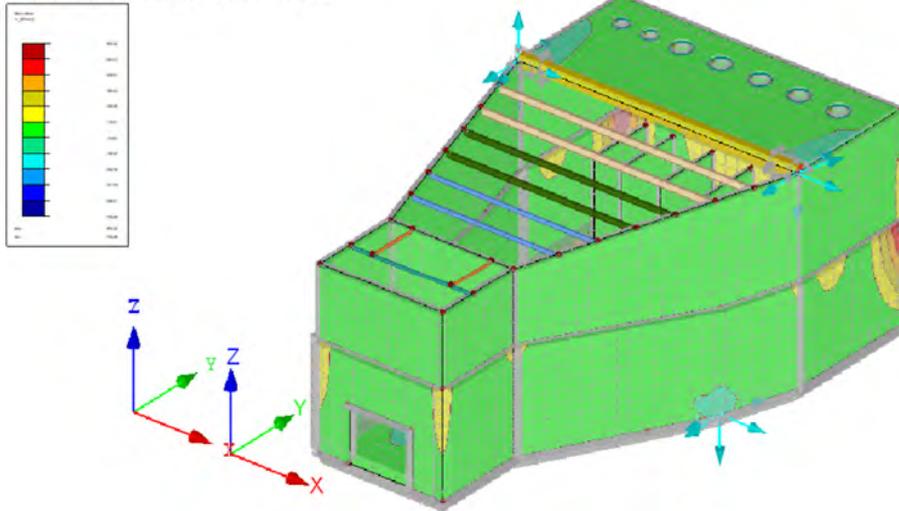


Members Max M-z: 8.59, Min M-z: -3.23 [kNm]

Base values m_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-x [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

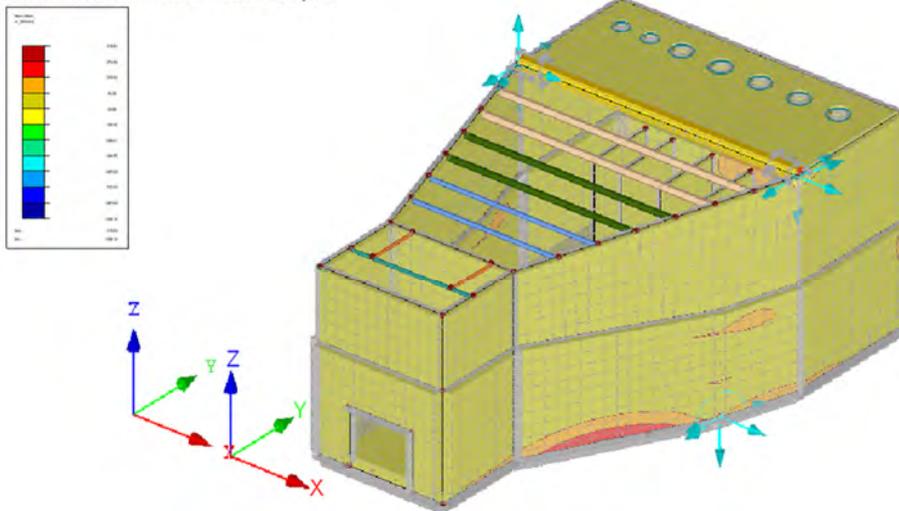


Surfaces Max m-x: 804.34, Min m-x: 0.00 [kNm/m]

Base values m_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-y [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

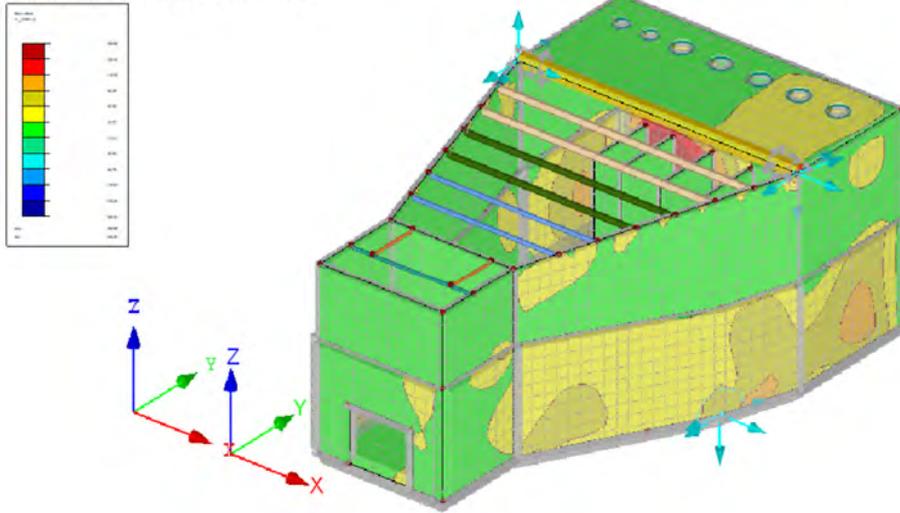


Surfaces Max m-y: 515.24, Min m-y: 0.00 [kNm/m]

Base values m_{xy}

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos m-xy [kNm/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

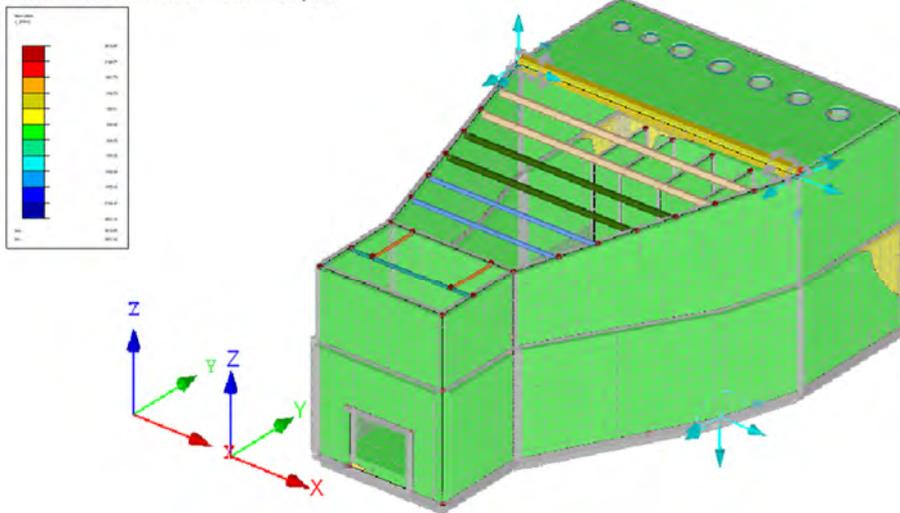


Surfaces Max m-xy: 185.89, Min m-xy: 0.00 [kNm/m]

Base values v_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos v-x [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

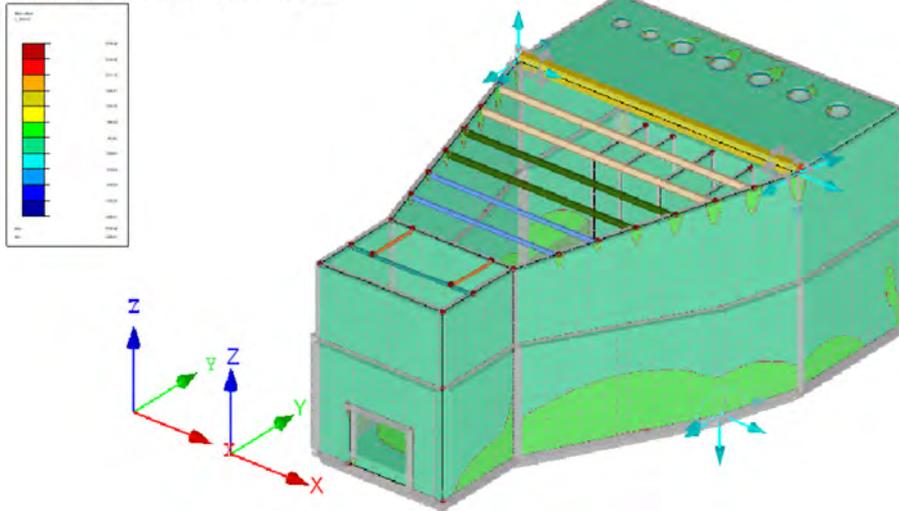


Surfaces Max v-x: 2615.80, Min v-x: 0.00 [kN/m]

Base values v_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos v-y [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

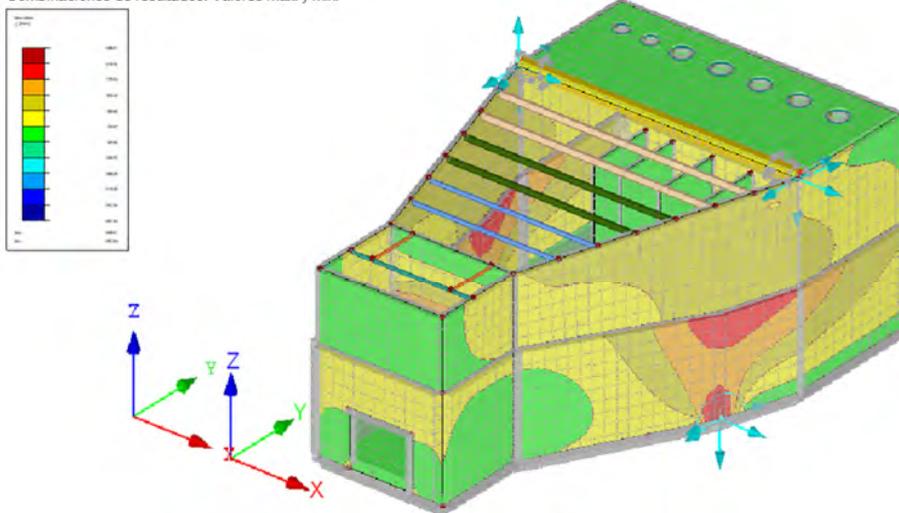


Surfaces Max v-y: 1919.48, Min v-y: 0.00 [kN/m]

Base values n_x

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-x [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

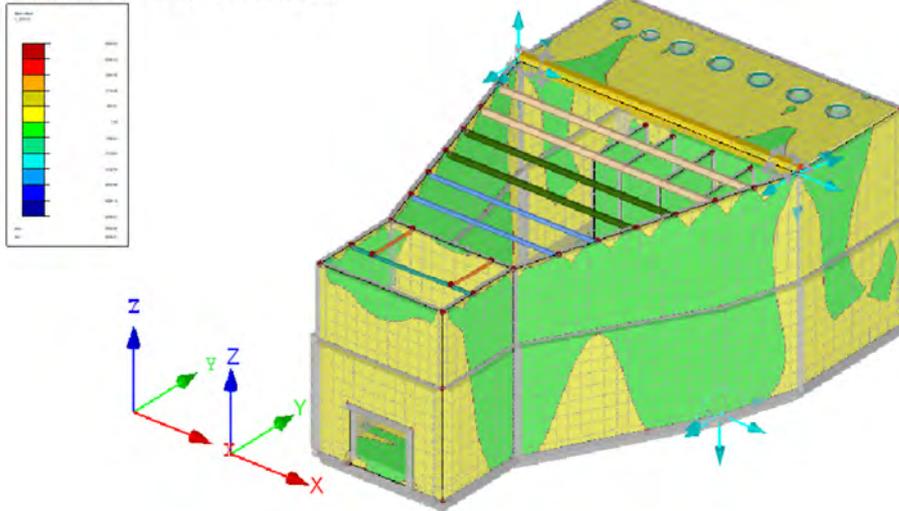


Surfaces Max n-x: 1856.81, Min n-x: 0.00 [kN/m]

Base values n_y

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-y [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric

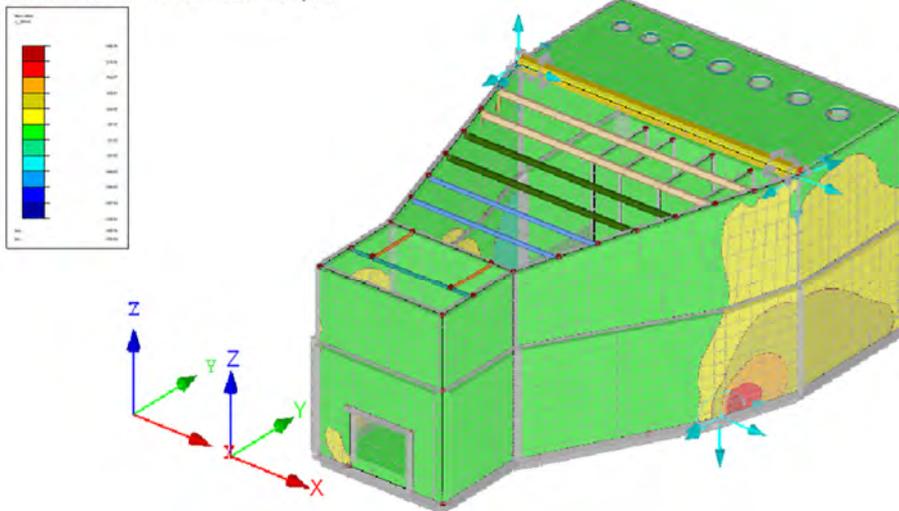


Superficies Max n-y: 2532.60, Min n-y: 0.00 [kN/m]

Base values n_{xy}

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Superficies Esfuerzos internos básicos n-xy [kN/m]
 Combinaciones de resultados: Valores máx. y mín.

Isometric



Superficies Max n-xy: 1482.06, Min n-xy: 0.00 [kN/m]

RF-STEEL EC3

CA1
 Cálculo de barras de
 acero según Eurocódigo 3

1.3 Cross-Sections

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
1	2	IPE 180	I-section rolled	1.04	
8	2	IPE 240	I-section rolled	0.93	
9	2	IPE 300	I-section rolled	0.64	
11	2	IPE 120	I-section rolled	0.50	
12	2	IPE 140	I-section rolled	1.09	

1.12 Parameters - Members

Member No.	Description	Parameter
3	Cross-Section	8 - IPE 240
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
8	Cross-Section	1 - IPE 180
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
9	Cross-Section	1 - IPE 180
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
10	Cross-Section	9 - IPE 300
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
11	Cross-Section	8 - IPE 240
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
12	Cross-Section	9 - IPE 300
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
14	Cross-Section	11 - IPE 120
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
15	Cross-Section	11 - IPE 120
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
16	Cross-Section	12 - IPE 140
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-
17	Cross-Section	12 - IPE 140
	Shear panel	-

1.12 Parameters - Members

Member No.	Description	Parameter
18	Rotational restraint	-
	Cross-sectional area for tension design	-
	Cross-Section	12 - IPE 140
	Shear panel	-
	Rotational restraint	-
	Cross-sectional area for tension design	-

2.4 Design by Member

Member No.	Location x [m]	LC/CO/RC	Design	Equation No.	Description
3	Cross-section No. 8 - IPE 240				
	9.116	CR1	0.05	≤ 1	CS101) Cross-section check - Tension acc. to 6.2.3
	4.677	CR1	0.04	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	0.000	CR1	0.59	≤ 1	CS111) Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.13	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	CR1	0.59	≤ 1	CS141) Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	0.61	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
4.677	CR1	0.93	≤ 1	ST364) Stability analysis - Bending and compression acc. to 6.3.3, Method 2	
8	Cross-section No. 1 - IPE 180				
	0.000	CR1	0.02	≤ 1	CS101) Cross-section check - Tension acc. to 6.2.3
	0.000	CR1	0.03	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	6.499	CR1	0.13	≤ 1	CS111) Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	6.499	CR1	0.23	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	6.499	CR1	0.13	≤ 1	CS141) Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	6.499	CR1	1.03	> 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
0.000	CR1	0.71	≤ 1	ST364) Stability analysis - Bending and compression acc. to 6.3.3, Method 2	
9	Cross-section No. 1 - IPE 180				
	0.238	CR1	0.05	≤ 1	CS101) Cross-section check - Tension acc. to 6.2.3
	3.725	CR1	0.04	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	0.000	CR1	0.17	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	CR1	0.84	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
3.725	CR1	1.04	> 1	ST364) Stability analysis - Bending and compression acc. to 6.3.3, Method 2	
10	Cross-section No. 9 - IPE 300				
	11.019	CR1	0.02	≤ 1	CS101) Cross-section check - Tension acc. to 6.2.3
	6.254	CR1	0.03	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	0.000	CR1	0.53	≤ 1	CS111) Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.12	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	CR1	0.53	≤ 1	CS141) Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	0.54	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
6.254	CR1	0.58	≤ 1	ST364) Stability analysis - Bending and compression acc. to 6.3.3, Method 2	
11	Cross-section No. 8 - IPE 240				
	0.000	CR1	0.05	≤ 1	CS101) Cross-section check - Tension acc. to 6.2.3
	0.000	CR1	0.04	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	0.000	CR1	0.11	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
0.000	CR1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)	

2.4 Design by Member

Member No.	Location x [m]	LC/CO/RC	Design		Equation No.	Description
12	0.000	CR1	0.49	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	CR1	0.76	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	Cross-section No. 9 - IPE 300					
	10.305	CR1	0.03	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	5.152	CR1	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	CR1	0.07	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.11	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	CR1	0.07	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	0.44	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
5.152	CR1	0.64	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2	
14	Cross-section No. 11 - IPE 120					
	0.000	CR1	0.00	≤ 1	CS100)	Negligible internal forces
	2.200	CR1	0.50	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.00	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	2.200	CR1	0.17	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.200	CR1	0.50	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	0.00	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	2.200	CR1	0.26	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	CR2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.732	CR2	0.04	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1.732	CR3	0.02	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
	0.968	CR2	0.00	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
	0.968	CR3	0.00	≤ 1	SE408)	Serviceability - Combination of actions 'Quasi-permanent' - y-direction
15	Cross-section No. 11 - IPE 120					
	0.968	CR1	0.00	≤ 1	CS100)	Negligible internal forces
	2.200	CR1	0.50	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.00	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	2.200	CR1	0.17	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.200	CR1	0.50	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	0.00	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	2.200	CR1	0.26	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	CR2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.732	CR2	0.04	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1.732	CR3	0.02	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
	0.968	CR2	0.00	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
	0.968	CR3	0.00	≤ 1	SE408)	Serviceability - Combination of actions 'Quasi-permanent' - y-direction
16	Cross-section No. 12 - IPE 140					
	0.968	CR1	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0.000	CR1	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.484	CR1	0.53	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	CR1	0.25	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.484	CR1	0.53	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	CR1	1.08	> 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	CR1	1.04	> 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.968	CR1	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0.000	CR1	1.09	> 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.000	CR1	0.66	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2

2.4 Design by Member

Member No.	Location x [m]	LC/CO/RC	Design		Equation No.	Description
	0.000	CR2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	0.484	CR2	0.28	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0.484	CR3	0.15	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
	0.484	CR2	0.00	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
	0.484	CR3	0.00	≤ 1	SE408)	Serviceability - Combination of actions 'Quasi-permanent' - y-direction
17	Cross-section No. 12 - IPE 140					
	0.000	CR1	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	1.732	CR1	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	1.732	CR1	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	3.464	CR1	0.15	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1.732	CR1	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.732	CR1	0.33	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	1.732	CR1	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	1.732	CR1	0.33	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	1.732	CR1	0.01	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	1.732	CR1	0.09	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2
	1.732	CR1	0.57	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0.000	CR2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.732	CR2	0.84	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1.732	CR3	0.45	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
	1.732	CR2	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
	1.732	CR3	0.00	≤ 1	SE408)	Serviceability - Combination of actions 'Quasi-permanent' - y-direction
18	Cross-section No. 12 - IPE 140					
	0.000	CR1	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0.968	CR1	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.484	CR1	0.53	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.968	CR1	0.25	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	CR1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.484	CR1	0.53	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.968	CR1	1.08	> 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.484	CR1	0.53	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	CR1	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0.968	CR1	1.09	> 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.968	CR1	0.66	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0.000	CR2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	0.484	CR2	0.28	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0.484	CR3	0.15	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
	0.484	CR2	0.00	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
	0.484	CR3	0.00	≤ 1	SE408)	Serviceability - Combination of actions 'Quasi-permanent' - y-direction

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1.4 Reinforcement Group No. 1 - LOSAS

Applied to surfaces:

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REINFORCEMENT RATIO

Minimum secondary reinforcement

20.0 %

Basic minimum reinforcement

0.0 %

Minimum compression reinforcement

0.0 %

1.4 Reinforcement Group No. 1 - LOSAS

Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	x
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	x
Minimum longitudinal reinforcement for walls acc. to 9.6	-
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4 Reinforcement Group No. 2 - MUROS

Applied to surfaces: 1-8,15

1.4 Reinforcement Group No. 2 - MUROS

REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	-
Minimum longitudinal reinforcement for walls acc. to 9.6	x
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4 Reinforcement Group No. 3 - MUROS 40

Applied to surfaces: 9,16-22

1.4 Reinforcement Group No. 3 - MUROS 40

REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	x
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	x
Minimum longitudinal reinforcement for walls acc. to 9.6	-
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

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2.2 Required Reinforcement by Surface

Surface No.	Point No.	Point Coordinates [m]			Symbol	Required Reinforcement			Basic Reinf.	Additional Reinforcement		Unit	Notes
		X	Y	Z		ULS	SLS	ULS/SLS		Required	Provided		
1	M25	0.000	21.350	4.300	a _{s,1,-z} (top)	17.47	18.26	18.26	0.00	18.26	18.26	cm ² /m	
	M260	6.888	21.350	0.000	a _{s,2,-z} (top)	13.65	10.59	13.65	0.00	13.65	13.65	cm ² /m	
	M25	0.000	21.350	4.300	a _{s,1,+z} (bottom)	32.04	34.55	34.55	0.00	34.55	34.55	cm ² /m	
	M235	6.396	21.350	0.000	a _{s,2,+z} (bottom)	14.61	8.23	14.61	0.00	14.61	14.61	cm ² /m	
	M236	11.808	21.350	4.300	a _{sw}	10.07	-	10.07	-	-	-	cm ² /m ²	
2	M363	12.300	17.255	4.300	a _{s,1,-z} (top)	17.55	10.39	17.55	0.00	17.55	17.55	cm ² /m	
	M6	12.300	15.720	0.000	a _{s,2,-z} (top)	12.23	7.51	12.23	0.00	12.23	12.23	cm ² /m	
	M27	12.300	21.350	4.300	a _{s,1,+z} (bottom)	34.25	36.35	36.35	0.00	36.35	36.35	cm ² /m	
	M264	12.300	16.216	0.000	a _{s,2,+z} (bottom)	12.57	7.26	12.57	0.00	12.57	12.57	cm ² /m	
	M27	12.300	21.350	4.300	a _{sw}	8.76	-	8.76	-	-	-	cm ² /m ²	
3	M473	0.000	17.255	4.300	a _{s,1,-z} (top)	17.53	10.38	17.53	0.00	17.53	17.53	cm ² /m	
	M5	0.000	15.720	0.000	a _{s,2,-z} (top)	12.25	7.53	12.25	0.00	12.25	12.25	cm ² /m	
	M25	0.000	21.350	4.300	a _{s,1,+z} (bottom)	34.12	36.28	36.28	0.00	36.28	36.28	cm ² /m	
	M372	0.000	16.216	0.000	a _{s,2,+z} (bottom)	12.67	7.33	12.67	0.00	12.67	12.67	cm ² /m	
	M25	0.000	21.350	4.300	a _{sw}	8.76	-	8.76	-	-	-	cm ² /m ²	
4	M544	0.942	12.650	0.956	a _{s,1,-z} (top)	35.88	21.85	35.88	0.00	35.88	35.88	cm ² /m	
	M521	0.471	14.185	0.000	a _{s,2,-z} (top)	13.67	8.25	13.67	0.00	13.67	13.67	cm ² /m	
	M82	0.942	12.650	0.000	a _{s,1,+z} (bottom)	25.00	15.00	25.00	0.00	25.00	25.00	cm ² /m	
	M499	2.122	8.805	0.518	a _{s,2,+z} (bottom)	25.36	19.47	25.36	0.00	25.36	25.36	cm ² /m	
	M49	3.450	4.480	5.600	a _{sw}	12.48	-	12.48	-	-	-	cm ² /m ²	
5	M774	11.358	12.650	0.956	a _{s,1,-z} (top)	35.68	21.71	35.68	0.00	35.68	35.68	cm ² /m	
	M752	11.829	14.185	0.000	a _{s,2,-z} (top)	13.60	8.20	13.60	0.00	13.60	13.60	cm ² /m	
	M81	11.358	12.650	0.000	a _{s,1,+z} (bottom)	24.89	14.92	24.89	0.00	24.89	24.89	cm ² /m	
	M730	10.178	8.805	0.518	a _{s,2,+z} (bottom)	25.34	19.45	25.34	0.00	25.34	25.34	cm ² /m	
	M50	8.850	4.480	5.600	a _{sw}	12.49	-	12.49	-	-	-	cm ² /m ²	
6	M7	3.450	0.600	1.100	a _{s,1,-z} (top)	14.72	0.49	14.72	0.00	14.72	14.72	cm ² /m	
	M7	3.450	0.600	1.100	a _{s,2,-z} (top)	8.00	1.08	8.00	0.00	8.00	8.00	cm ² /m	
	M7	3.450	0.600	1.100	a _{s,1,+z} (bottom)	14.72	0.36	14.72	0.00	14.72	14.72	cm ² /m	
	M7	3.450	0.600	1.100	a _{s,2,+z} (bottom)	8.00	1.09	8.00	0.00	8.00	8.00	cm ² /m	
	M49	3.450	4.480	5.600	a _{sw}	11.07	-	11.07	-	-	-	cm ² /m ²	
7	M7	3.450	0.600	1.100	a _{s,1,-z} (top)	14.72	0.56	14.72	0.00	14.72	14.72	cm ² /m	
	M21	4.750	0.600	1.100	a _{s,2,-z} (top)	15.73	9.38	15.73	0.00	15.73	15.73	cm ² /m	
	M7	3.450	0.600	1.100	a _{s,1,+z} (bottom)	14.72	0.51	14.72	0.00	14.72	14.72	cm ² /m	
	M21	4.750	0.600	1.100	a _{s,2,+z} (bottom)	15.85	9.21	15.85	0.00	15.85	15.85	cm ² /m	
	M7	3.450	0.600	1.100	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
8	M8	8.850	0.600	1.100	a _{s,1,-z} (top)	14.72	0.47	14.72	0.00	14.72	14.72	cm ² /m	
	M8	8.850	0.600	1.100	a _{s,2,-z} (top)	8.00	1.06	8.00	0.00	8.00	8.00	cm ² /m	
	M8	8.850	0.600	1.100	a _{s,1,+z} (bottom)	14.72	0.37	14.72	0.00	14.72	14.72	cm ² /m	
	M8	8.850	0.600	1.100	a _{s,2,+z} (bottom)	8.00	1.10	8.00	0.00	8.00	8.00	cm ² /m	
	M50	8.850	4.480	5.600	a _{sw}	11.11	-	11.11	-	-	-	cm ² /m ²	
9	M18	8.850	0.600	8.600	a _{s,1,-z} (top)	5.20	0.08	5.20	0.00	5.20	5.20	cm ² /m	
	M32	3.450	0.600	5.600	a _{s,2,-z} (top)	5.20	2.13	5.20	0.00	5.20	5.20	cm ² /m	
	M1186	3.450	0.600	6.100	a _{s,1,+z} (bottom)	5.39	3.16	5.39	0.00	5.39	5.39	cm ² /m	
	M17	3.450	0.600	8.600	a _{s,2,+z} (bottom)	5.20	0.18	5.20	0.00	5.20	5.20	cm ² /m	
	M17	3.450	0.600	8.600	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
10	M7	3.450	0.600	1.100	a _{s,1,-z} (top)	12.74	0.90	12.74	0.00	12.74	12.74	cm ² /m	
	M953	3.450	3.510	1.100	a _{s,2,-z} (top)	12.74	1.42	12.74	0.00	12.74	12.74	cm ² /m	
	M34	3.450	4.480	1.100	a _{s,1,+z} (bottom)	12.74	1.51	12.74	0.00	12.74	12.74	cm ² /m	
	M7	3.450	0.600	1.100	a _{s,2,+z} (bottom)	12.74	0.45	12.74	0.00	12.74	12.74	cm ² /m	
	M35	8.850	4.480	1.100	a _{sw}	18.96	-	18.96	-	-	-	cm ² /m ²	

2.2 Required Reinforcement by Surface

Surface No.	Point No.	Point Coordinates [m]			Symbol	Required Reinforcement			Basic Reinf.	Additional Reinforcement		Unit	Notes
		X	Y	Z		ULS	SLS	ULS/SLS		Required	Provided		
11	M1500	2.179	11.208	0.194	a _{s,1,-z} (top)	19.62	15.52	19.62	0.00	19.62	19.62	cm ² /m	
	M82	0.942	12.650	0.000	a _{s,2,-z} (top)	57.05	77.81	77.81	0.00	77.81	77.81	cm ² /m	
	M82	0.942	12.650	0.000	a _{s,1,+z} (bottom)	21.95	13.52	21.95	0.00	21.95	21.95	cm ² /m	
	M1274	6.150	4.480	1.100	a _{s,2,+z} (bottom)	12.74	0.65	12.74	0.00	12.74	12.74	cm ² /m	
	M82	0.942	12.650	0.000	a _{sw}	44.60	-	44.60	-	-	-	cm ² /m ²	
12	M1533	1.810	12.650	0.000	a _{s,1,-z} (top)	17.25	20.66	20.66	0.00	20.66	20.66	cm ² /m	56)
	M81	11.358	12.650	0.000	a _{s,2,-z} (top)	56.32	Not designabile	Not designabile	0.00	Not designabile	Not designabile	cm ² /m	
13	M5	0.000	15.720	0.000	a _{s,1,+z} (bottom)	12.74	4.76	12.74	0.00	12.74	12.74	cm ² /m	
	M1537	5.282	12.650	0.000	a _{s,2,+z} (bottom)	12.74	0.27	12.74	0.00	12.74	12.74	cm ² /m	
	M82	0.942	12.650	0.000	a _{sw}	22.86	-	22.86	-	-	-	cm ² /m ²	
	M3	0.000	21.350	0.000	a _{s,1,-z} (top)	12.74	1.42	12.74	0.00	12.74	12.74	cm ² /m	
	M48-E1517	1.600	20.680	0.000	a _{s,2,-z} (top)	12.74	2.44	12.74	0.00	12.74	12.74	cm ² /m	
	M5	0.000	15.720	0.000	a _{s,1,+z} (bottom)	12.74	4.50	12.74	0.00	12.74	12.74	cm ² /m	
	M2327	5.904	21.350	0.000	a _{s,2,+z} (bottom)	13.78	8.00	13.78	0.00	13.78	13.78	cm ² /m	
14	M3	0.000	21.350	0.000	a _{sw}	0.00	-	0.00	-	-	-	cm ² /m ²	
	M1896	12.300	16.232	8.600	a _{s,1,-z} (top)	13.81	23.11	23.11	0.00	23.11	23.11	cm ² /m	
15	M1874	6.396	21.350	8.600	a _{s,2,-z} (top)	12.33	20.21	20.21	0.00	20.21	20.21	cm ² /m	
	M1955	8.737	19.617	8.600	a _{s,1,+z} (bottom)	6.43	3.80	6.43	0.00	6.43	6.43	cm ² /m	
	M1955	8.737	19.617	8.600	a _{s,2,+z} (bottom)	6.86	4.02	6.86	0.00	6.86	6.86	cm ² /m	
	M1919	1.476	15.720	8.600	a _{sw}	12.58	-	12.58	-	-	-	cm ² /m ²	
	M50	8.850	4.480	5.600	a _{s,1,-z} (top)	24.05	30.25	30.25	0.00	30.25	30.25	cm ² /m	
	M49	3.450	4.480	5.600	a _{s,2,-z} (top)	7.68	10.53	10.53	0.00	10.53	10.53	cm ² /m	
16	M50	8.850	4.480	5.600	a _{s,1,+z} (bottom)	22.73	28.83	28.83	0.00	28.83	28.83	cm ² /m	
	M36	3.450	4.480	8.600	a _{s,2,+z} (bottom)	4.80	0.57	4.80	0.00	4.80	4.80	cm ² /m	
	M2234	4.432	4.480	5.600	a _{sw}	Not designabile	-	Not designabile	-	-	-	cm ² /m ²	
	M14	12.300	15.720	8.600	a _{s,1,-z} (top)	14.55	18.03	18.03	0.00	18.03	18.03	cm ² /m	
	M14	12.300	15.720	8.600	a _{s,2,-z} (top)	24.03	34.09	34.09	0.00	34.09	34.09	cm ² /m	
17	M27	12.300	21.350	4.300	a _{s,1,+z} (bottom)	13.88	15.34	15.34	0.00	15.34	15.34	cm ² /m	
	M27	12.300	21.350	4.300	a _{s,2,+z} (bottom)	4.70	8.28	8.28	0.00	8.28	8.28	cm ² /m	
	M14	12.300	15.720	8.600	a _{sw}	28.28	-	28.28	-	-	-	cm ² /m ²	
	M14	12.300	15.720	8.600	a _{s,1,-z} (top)	13.29	17.44	17.44	0.00	17.44	17.44	cm ² /m	
	M14	12.300	15.720	8.600	a _{s,2,-z} (top)	15.69	24.46	24.46	0.00	24.46	24.46	cm ² /m	
	M2298	12.300	15.720	5.017	a _{s,1,+z} (bottom)	12.94	7.72	12.94	0.00	12.94	12.94	cm ² /m	
	M53	11.358	12.650	4.300	a _{s,2,+z} (bottom)	5.20	2.37	5.20	0.00	5.20	5.20	cm ² /m	
18	M14	12.300	15.720	8.600	a _{sw}	21.80	-	21.80	-	-	-	cm ² /m ²	
	M1185	8.850	3.995	5.600	a _{s,1,-z} (top)	6.47	3.87	6.47	0.00	6.47	6.47	cm ² /m	
	M45	8.850	2.280	8.600	a _{s,2,-z} (top)	5.20	1.89	5.20	0.00	5.20	5.20	cm ² /m	
	M2232	8.850	4.480	6.100	a _{s,1,+z} (bottom)	11.85	9.29	11.85	0.00	11.85	11.85	cm ² /m	
	M33	8.850	0.600	5.600	a _{s,2,+z} (bottom)	4.49	2.65	4.49	0.00	4.49	4.49	cm ² /m	
19	M50	8.850	4.480	5.600	a _{sw}	14.57	-	14.57	-	-	-	cm ² /m ²	
	M2482	0.000	21.350	6.450	a _{s,1,-z} (top)	8.24	4.40	8.24	0.00	8.24	8.24	cm ² /m	
	M1874	6.396	21.350	8.600	a _{s,2,-z} (top)	8.03	15.78	15.78	0.00	15.78	15.78	cm ² /m	
	M2244	12.300	21.350	5.017	a _{s,1,+z} (bottom)	12.62	14.32	14.32	0.00	14.32	14.32	cm ² /m	
	M2542	6.396	21.350	5.017	a _{s,2,+z} (bottom)	6.81	3.82	6.81	0.00	6.81	6.81	cm ² /m	
20	M27	12.300	21.350	4.300	a _{sw}	10.69	-	10.69	-	-	-	cm ² /m ²	
	M13	0.000	15.720	8.600	a _{s,1,-z} (top)	14.75	18.36	18.36	0.00	18.36	18.36	cm ² /m	
	M13	0.000	15.720	8.600	a _{s,2,-z} (top)	23.97	33.98	33.98	0.00	33.98	33.98	cm ² /m	
	M25	0.000	21.350	4.300	a _{s,1,+z} (bottom)	13.85	15.32	15.32	0.00	15.32	15.32	cm ² /m	
	M25	0.000	21.350	4.300	a _{s,2,+z} (bottom)	4.76	8.42	8.42	0.00	8.42	8.42	cm ² /m	
21	M13	0.000	15.720	8.600	a _{sw}	28.35	-	28.35	-	-	-	cm ² /m ²	
	M13	0.000	15.720	8.600	a _{s,1,-z} (top)	13.58	17.80	17.80	0.00	17.80	17.80	cm ² /m	
	M13	0.000	15.720	8.600	a _{s,2,-z} (top)	15.64	24.55	24.55	0.00	24.55	24.55	cm ² /m	

2.2 Required Reinforcement by Surface

Surface No.	Point No.	Point Coordinates [m]			Symbol	Required Reinforcement			Basic Reinf.	Additional Reinforcement		Unit	Notes
		X	Y	Z		ULS	SLS	ULS/SLS		Required	Provided		
22	M2652	0.000	15.720	5.017	$a_{s,1+z}$ (bottom)	12.98	7.75	12.98	0.00	12.98	12.98	cm ² /m	
	M80	0.942	12.650	4.300	$a_{s,2+z}$ (bottom)	5.20	2.36	5.20	0.00	5.20	5.20	cm ² /m	
	M13	0.000	15.720	8.600	a_{sw}	21.84	-	21.84	-	-	-	cm ² /m ²	
	M1020	3.450	3.995	5.600	$a_{s,1-z}$ (top)	6.47	3.88	6.47	0.00	6.47	6.47	cm ² /m	
	M17	3.450	0.600	8.600	$a_{s,2-z}$ (top)	5.20	0.15	5.20	0.00	5.20	5.20	cm ² /m	
	M2222	3.450	4.480	6.100	$a_{s,1+z}$ (bottom)	11.84	9.29	11.84	0.00	11.84	11.84	cm ² /m	
	M32	3.450	0.600	5.600	$a_{s,2+z}$ (bottom)	4.51	2.66	4.51	0.00	4.51	4.51	cm ² /m	
	M49	3.450	4.480	5.600	a_{sw}	14.53	-	14.53	-	-	-	cm ² /m ²	

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Exist. Value	Design		Ratio	Notes
		X	Y	Z				Limit Value	Unit		
1	M235	6.396	21.350	0.000	Envelope ChD	σ_s	311.70	400.00	N/mm ²	0.8	
	M27	12.300	21.350	4.300	Envelope Qp	lim d_s	10.00	19.27	mm	0.6	
	M25	0.000	21.350	4.300	Envelope Qp	lim s_i	0.098	0.200	m	0.5	
	M259	0.492	21.350	4.300	Envelope Qp	w_k	0.200	0.200	mm	1.1	219) 233)
2	M348	12.300	20.803	3.344	Envelope ChD	σ_s	310.06	400.00	N/mm ²	0.8	
	M27	12.300	21.350	4.300	Envelope Qp	lim d_s	10.00	18.97	mm	0.6	
	M27	12.300	21.350	4.300	Envelope Qp	lim s_i	0.098	0.200	m	0.5	
	M370	12.300	20.838	4.300	Envelope Qp	w_k	0.200	0.200	mm	1.1	219) 233)
3	M458	0.000	20.803	3.344	Envelope ChD	σ_s	309.94	400.00	N/mm ²	0.8	
	M25	0.000	21.350	4.300	Envelope Qp	lim d_s	10.00	18.89	mm	0.6	
	M25	0.000	21.350	4.300	Envelope Qp	lim s_i	0.098	0.200	m	0.5	
	M208	0.000	21.350	3.344	Envelope Qp	w_k	0.200	0.200	mm	1.0	
4	M503	1.827	9.766	0.388	Envelope ChD	σ_s	311.48	400.00	N/mm ²	0.8	
	M5	0.000	15.720	0.000	Envelope ChD	lim d_s	10.00	-	mm	0.0	226)
	M5	0.000	15.720	0.000	Envelope ChD	lim s_i	0.066	-	m	0.0	226)
	M5	0.000	15.720	0.000	Envelope Qp	w_k	0.000	0.200	mm	0.0	226)
5	M734	10.473	9.766	0.388	Envelope ChD	σ_s	311.36	400.00	N/mm ²	0.8	
	M6	12.300	15.720	0.000	Envelope ChD	lim d_s	10.00	-	mm	0.0	226)
	M6	12.300	15.720	0.000	Envelope ChD	lim s_i	0.066	-	m	0.0	226)
	M6	12.300	15.720	0.000	Envelope Qp	w_k	0.000	0.200	mm	0.0	226)
6	M7	3.450	0.600	1.100	Envelope ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Design			Notes
		X	Y	Z			Exist. Value	Limit Value	Unit	
7	M7	3.450	0.600	1.100	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	lim s _i	0.098	-	m	0.0 226)
	M7	3.450	0.600	1.100	Envelope Qp	w _k	0.000	0.200	mm	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	σ _s	0.00	400.00	N/mm ²	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	lim s _i	0.098	-	m	0.0 226)
8	M8	8.850	0.600	1.100	Envelope ChD	σ _s	0.00	400.00	N/mm ²	0.0 226)
	M8	8.850	0.600	1.100	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M8	8.850	0.600	1.100	Envelope ChD	lim s _i	0.098	-	m	0.0 226)
	M8	8.850	0.600	1.100	Envelope Qp	w _k	0.000	0.200	mm	0.0 226)
9	M17	3.450	0.600	8.600	Envelope ChD	σ _s	0.00	400.00	N/mm ²	0.0 226)
	M17	3.450	0.600	8.600	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M17	3.450	0.600	8.600	Envelope ChD	lim s _i	22.955	-	m	0.0 226)
	M17	3.450	0.600	8.600	Envelope Qp	w _k	0.000	0.200	mm	0.0 226)
10	M7	3.450	0.600	1.100	Envelope ChD	σ _s	0.00	400.00	N/mm ²	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M7	3.450	0.600	1.100	Envelope ChD	lim s _i	0.308	-	m	0.0 226)
	M7	3.450	0.600	1.100	Envelope Qp	w _k	0.000	0.200	mm	0.0 226)
11	M1523	2.777	12.169	0.065	Envelope ChD	σ _s	322.63	400.00	N/mm ²	0.9
	M1542	9.622	12.650	0.000	Envelope Qp	lim d _s	10.00	24.59	mm	0.5
	M1536	4.414	12.650	0.000	Envelope Qp	lim s _i	0.088	0.191	m	0.5
	M1533	1.810	12.650	0.000	Envelope Qp	w _k	0.200	0.200	mm	1.0
	M1600	2.574	13.162	0.000	Envelope ChD	σ _s	320.04	400.00	N/mm ²	0.9
12	M1533	1.810	12.650	0.000	Envelope Qp	lim d _s	10.00	23.66	mm	0.5
	M1535	3.546	12.650	0.000	Envelope Qp	lim s _i	0.062	0.144	m	0.5
	M82	0.942	12.650	0.000	Envelope Qp	w _k	0.208	0.200	mm	1.1 232)
	M3	0.000	21.350	0.000	Envelope ChD	σ _s	0.00	400.00	N/mm ²	0.0 226)
	M3	0.000	21.350	0.000	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M3	0.000	21.350	0.000	Envelope ChD	lim s _i	0.308	-	m	0.0 226)
13	M3	0.000	21.350	0.000	Envelope Qp	w _k	0.000	0.200	mm	0.0 226)
	M3	0.000	21.350	0.000	Envelope ChD	σ _s	359.92	400.00	N/mm ²	0.9
	M3	0.000	21.350	0.000	Envelope ChD	lim d _s	10.00	-	mm	0.0 226)
	M3	0.000	21.350	0.000	Envelope ChD	lim s _i	0.308	-	m	0.0 226)
14	M1866	2.460	21.350	8.600	Envelope	σ _s	359.92	400.00	N/mm ²	0.9

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Design				Notes
		X	Y	Z			Exist. Value	Limit Value	Unit	Ratio	
15	M1852	0.000	16.744	8.600	Envolvente ChD	lim d _s	10.00	10.00	mm	1.1	213) 233)
	M1875	6.888	21.350	8.600	Envolvente Qp	lim s _l	0.200	0.200	m	1.0	
	M1898	11.808	15.720	8.600	Envolvente Qp	w _k	0.200	0.200	mm	1.0	
	M2234	4.432	4.480	5.600	Envolvente ChD	σ _s	307.78	400.00	N/mm ²	0.8	
	M50	8.850	4.480	5.600	Envolvente Qp	lim d _s	10.00	18.90	mm	0.6	
	M49	3.450	4.480	5.600	Envolvente Qp	lim s _l	0.164	0.200	m	0.9	
	M2233	3.941	4.480	5.600	Envolvente Qp	w _k	0.200	0.200	mm	1.0	
16	M1895	12.300	16.744	8.600	Envolvente ChD	σ _s	322.61	400.00	N/mm ²	0.9	
	M14	12.300	15.720	8.600	Envolvente Qp	lim d _s	10.00	10.12	mm	1.0	
	M2248	12.300	21.350	6.450	Envolvente Qp	lim s _l	0.169	0.200	m	0.9	
	M2246	12.300	21.350	5.733	Envolvente Qp	w _k	0.200	0.200	mm	1.0	
17	M29	10.827	10.920	8.600	Envolvente ChD	σ _s	332.16	400.00	N/mm ²	0.9	
	M14	12.300	15.720	8.600	Envolvente Qp	lim d _s	10.00	10.03	mm	1.0	
	M38	11.778	14.020	8.600	Envolvente Qp	lim s _l	0.094	0.200	m	0.5	
18	M14	12.300	15.720	8.600	Envolvente Qp	w _k	0.199	0.200	mm	1.0	
	M2232	8.850	4.480	6.100	Envolvente ChD	σ _s	310.83	400.00	N/mm ²	0.8	
	M18	8.850	0.600	8.600	Envolvente ChD	lim d _s	10.00	-	mm	0.0	226)
	M18	8.850	0.600	8.600	Envolvente ChD	lim s _l	0.755	-	m	0.0	226)
19	M18	8.850	0.600	8.600	Envolvente Qp	w _k	0.000	0.200	mm	0.0	226)
	M1871	4.920	21.350	8.600	Envolvente ChD	σ _s	400.07	400.00	N/mm ²	1.1	206) 233)
	M1873	5.904	21.350	8.600	Envolvente Qp	lim d _s	10.00	10.00	mm	1.0	
20	M27	12.300	21.350	4.300	Envolvente Qp	lim s _l	0.198	0.200	m	1.0	
	M2248	12.300	21.350	6.450	Envolvente Qp	w _k	0.200	0.200	mm	1.0	
	M1852	0.000	16.744	8.600	Envolvente ChD	σ _s	322.71	400.00	N/mm ²	0.9	
	M13	0.000	15.720	8.600	Envolvente Qp	lim d _s	10.00	10.10	mm	1.0	
	M2482	0.000	21.350	6.450	Envolvente Qp	lim s _l	0.169	0.200	m	0.9	
21	M13	0.000	15.720	8.600	Envolvente Qp	w _k	0.200	0.200	mm	1.0	
	M9	1.473	10.920	8.600	Envolvente ChD	σ _s	332.19	400.00	N/mm ²	0.9	
	M13	0.000	15.720	8.600	Envolvente Qp	lim d _s	10.00	10.07	mm	1.0	
	M16	0.522	14.020	8.600	Envolvente Qp	lim s _l	0.093	0.200	m	0.5	
	M13	0.000	15.720	8.600	Envolvente Qp	w _k	0.199	0.200	mm	1.0	

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Design				Notes
		X	Y	Z			Exist. Value	Limit Value	Unit	Ratio	
22	M2222	3.450	4.480	6.100	Envelope ChD	σ_s	310.82	400.00	N/mm ²	0.8	
	M17	3.450	0.600	8.600	Envelope ChD	lim d_s	10.00	-	mm	0.0	226)
	M17	3.450	0.600	8.600	Envelope ChD	lim s_i	0.755	-	m	0.0	226)
	M17	3.450	0.600	8.600	Envelope ChD	w_k	0.000	0.200	mm	0.0	226)

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

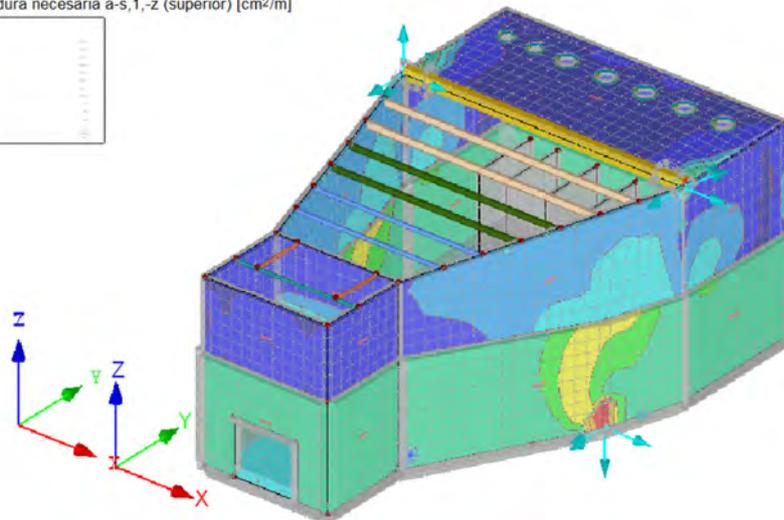
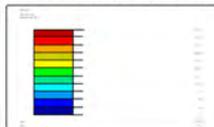
Serviceability Check Notes

No.	Description
206)	Allowable reinforcing steel stress on the top (-z) side of the plate into reinforcement direction Φ_2 was exceeded.
213)	Allowable member diameters at the top (-z) surface of the plate into reinforcement direction Φ_1 exceeded.
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
232)	Rebar spacing was reduced until the limit distance (rebar diameter) was reached. No SLS design of long. reinforcement is possible.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

Required Reinforcement $a_{s,1,-z}$ (superior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Surfaces Armadura necesaria $a_{s,1,-z}$ (superior) [cm²/m]

Isometric

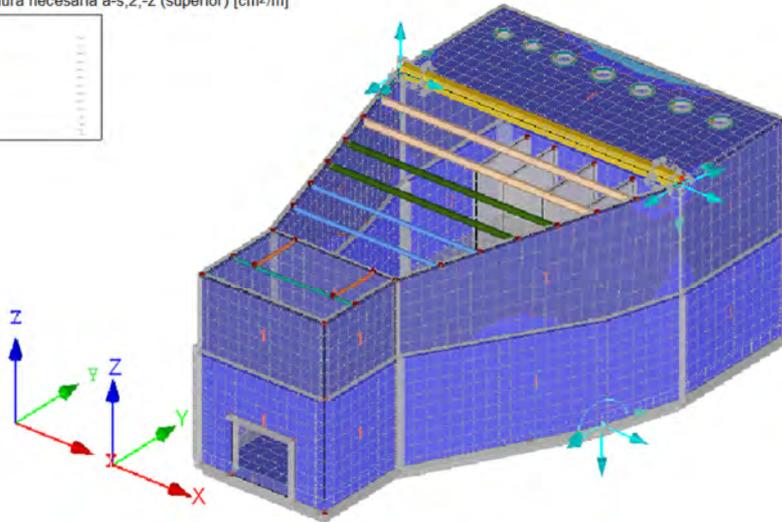
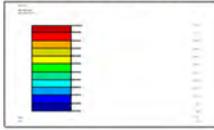


Surfaces Max $a_{s,1,-z}$ (superior): 35.88, Min $a_{s,1,-z}$ (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,-z}$ (superior)

RF-CONCRETE Surfaces CA1
 Cálculo de hormigón armado
 Surfaces Armadura necesaria a-s,2,-z (superior) [cm²/m]

Isometric

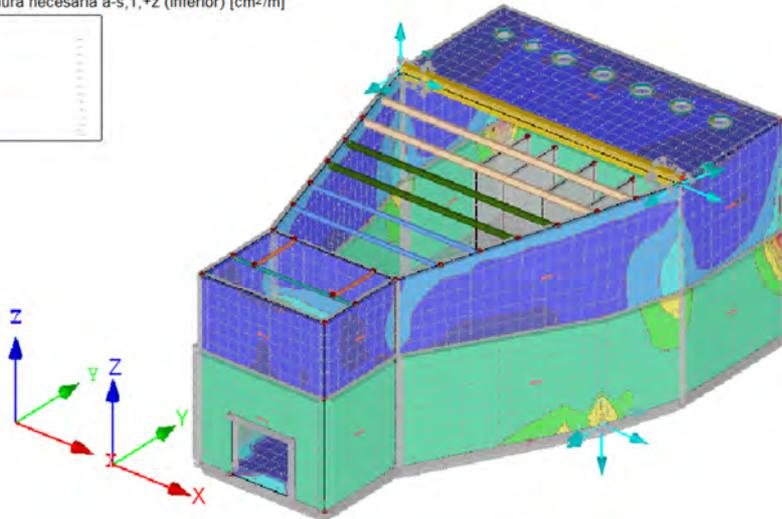
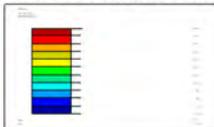


Surfaces Max a-s,2,-z (superior): 77.81, Min a-s,2,-z (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,1,+z}$ (inferior)

Isometric

RF-CONCRETE Surfaces CA1
 Cálculo de hormigón armado
 Surfaces Armadura necesaria a-s,1,+z (inferior) [cm²/m]

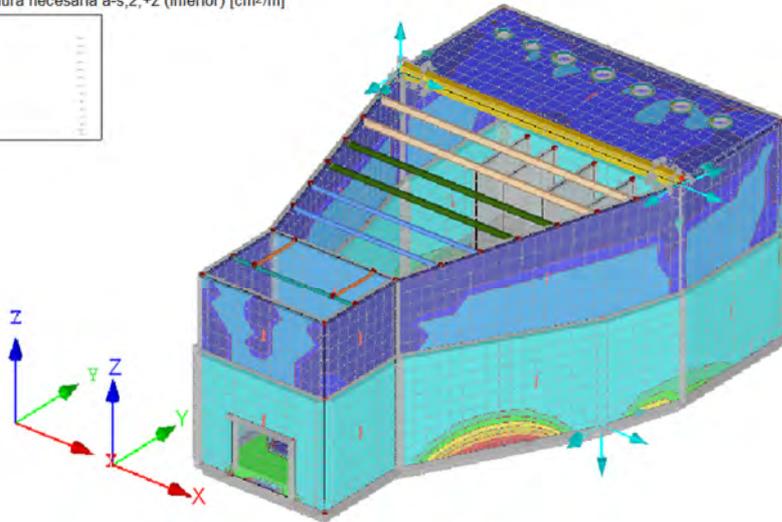
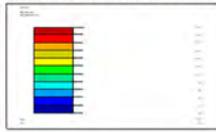


Surfaces Max a-s,1,+z (inferior): 36.35, Min a-s,1,+z (inferior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,+z}$ (inferior)

RF-CONCRETE Surfaces CA1
 Cálculo de hormigón armado
 Surfaces Armadura necesaria a-s,2,+z (inferior) [cm²/m]

Isometric



Surfaces Max a-s,2,+z (inferior): 25.36, Min a-s,2,+z (inferior): 0.00 [cm²/m]

RF-CONCRETE Members

CA1
 Cálculo de barras de
 hormigón

1.1 General Data

Design according to Standard:	EN 1992-1-1:2004/A1:2014
ULTIMATE LIMIT STATES	
Result combinations to design:	RC1 ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10 Persistent and Transient
SERVICEABILITY LIMIT STATES	
Result combinations to design:	RC2 ELS - Característica Characteristic with direct load, k-t: 0.600 RC3 ELS - Cuasipermanente Quasi-permanent, k-t: 0.594
Design Situation Settings for Serviceability Limit State Checks	
Load combination:	
Characteristic with direct load	Checks: $k_1 \cdot f_{ck}$, $k_3 \cdot f_{yk}$
Characteristic with imposed deformation	Checks: $k_1 \cdot f_{ck}$, $k_4 \cdot f_{yk}$
Frequent	Checks: w_k
Quasi-permanent	Checks: $k_2 \cdot f_{ck}$, w_{kr} , u_l
Deformation Relative to:	Undeformed system

RF-CONCRETE Members

CA1
 Cálculo de barras de
 hormigón

1.1 Settings - Nonlinear Calculation (State II)

Activate nonlinear calculation for ULTIMATE LIMIT state:	-
Activate nonlinear calculation for SERVICEABILITY LIMIT state:	-
Activate nonlinear calculation for fire resistance	-

RF-CONCRETE Members

CA1

Cálculo de barras de
hormigón

1.2 Materials

Matl. No.	Material Description		Comment
	Concrete Strength Class	Reinforcing Steel	
3	Hormigón C30/37	B 500 S (A)	

1.3 Cross-Sections

Section No.	Matl. No.	Cross-Section Description	Notes	Comment
2	3	Rectángulo 300/500		

RF-CONCRETE Members

CA1

Cálculo de barras de
hormigón

1.6 Reinforcement Group No. 1

Applied to members:	13
LONGITUDINAL REINFORCEMENT	
Possible diameters:	25.0 mm
Max. number of layers:	1
Min. spacing for first layer:	20.0 mm
Type of anchorage:	Straight
Steel surface:	Ribbed
Reduction of reinforcement:	None
SHEAR REINFORCEMENT	
Possible diameters:	10.0 mm
No. of stirrup legs:	2
Inclination:	90°
Type of anchorage:	Hook
Stirrup layout:	Uniform spacing throughout
REINFORCEMENT LAYOUT	
Concrete cover acc. to Standard	-
Concrete cover c-top:	50.0 mm
Concrete cover c-bottom:	50.0 mm
Concrete cover c-side:	50.0 mm
Reinforcement layout:	-z (top) - +z (bottom) (optimized distribution)
Torsional reinforcement distributed circumferentially:	x
Relevant internal forces:	N, V-y, V-z, M-T, M-y, M-z

1.6 Reinforcement Group No. 1

MINIMUM REINFORCEMENT	
Min. reinforcement area (min. A-s,top):	0.00 cm ²
Min. reinforcement area (min. A-s,bottom):	0.00 cm ²
Min. longitudinal reinforcement acc. to Standard:	x
Min. shear reinforcement acc. to Standard:	x
Longitudinal reinforcement for shear force design:	Use required longitudinal reinforcement
SHEAR JOINT	
Shear joint available:	-
Design of flange connections on segmented cross-sections	-
OPTIONS FOR EN 1992-1-1:2004/A1:2014	
Max. percentage of reinforcement:	8.00 %
Neutral axis depth limitation	x
Partial safety factor Gamma-c	PT 1.50, AC 1.20, ELS 1.00
Partial safety factor Gamma-s	PT 1.15, AC 1.00, ELS 1.00
Reduction factor Alpha-cc	PT 1.00, AC 1.00, ELS 1.00
Reduction factor Alpha-ct	PT 1.00, AC 1.00, ELS 1.00
Min. inclination of concrete strut	21.80 °
Max. inclination of concrete strut	45.00 °
SERVICEABILITY	
Crack Analysis	
Limit values of allowable crack width $w_{k,max,-z}$ (top):	0.3 mm
Limit values of allowable crack width $w_{k,max,+z}$ (bottom):	0.3 mm
Design without direct crack width calculation:	x
Calculation of limit diameter $lim d_s$:	x
Calculation of maximum rebar spacing $lim s_j$:	x
Design with direct crack width calculation:	x
Use Eq. (7.14) for $s_{r,max}$:	-
Effective concrete tensile strength at time of cracking:	1.000 * f_{ctm}
$A_{s,min}$ for effects due to restraint:	x
Stress Distribution Within the Section Prior to Cracking:	Depending on the defined load ($k_c = 0.0 \dots 1.0$)
$A_{s,min}$ Layout:	-z (top) / +z (bottom)
Crack formation within the first 28 days:	-
Stress Analysis	
Limitation of concrete Compressive stress σ_c :	-
Limitation of steel stress σ_s :	x
According to the design situation with $k_3 * f_{yk}$ and $k_4 * f_{yk}$ acc. to EN 1992-1-1, NDP(7.2)	
Coeficiente k_3 para la limitación de tensiones en el acero k_3 :	0.800
Coeficiente k_4 para la limitación de tensiones en el acero k_4 :	1.000
Deflection Analysis	
Deflection $u_{l,z}$:	-
Determination of Longitudinal Reinforcement	
Increase the required longitudinal reinforcement automatically for serviceability limit state design:	x
Find the most economical reinforcement for crack width design:	x
Consider $A_{s,min}$ acc. to 7.3.2 also for the direct calculation of crack width acc. To 7.3.4:	x

RF-CONCRETE Members

CA1
Cálculo de barras de
hormigón

2.3 Required Reinforcement by Member

Reinforcement	Member No.	Location x [m]	Loading	Reinforcement Area	Unit	Error Message or Note
Member No. 13 - Rectángulo 300/500						

2.3 Required Reinforcement by Member

Reinforcement	Member No.	Location x [m]	Loading	Reinforcement Area	Unit	Error Message or Note
$A_{s,z}$ (top)	13	12.300	CR1	6.22	cm ²	29) 58) 69)
$A_{s,z}$ (bottom)	13	8.364	CR1	4.56	cm ²	
$A_{s,T}$	13	1.968	CR1	7.54	cm ²	
$a_{sw,V}$,stirrup	13	0.000	CR1	2.63	cm ² /m	
$a_{sw,T}$,stirrup	13	1.968	CR1	1.10	cm ² /m	

RF-CONCRETE Members

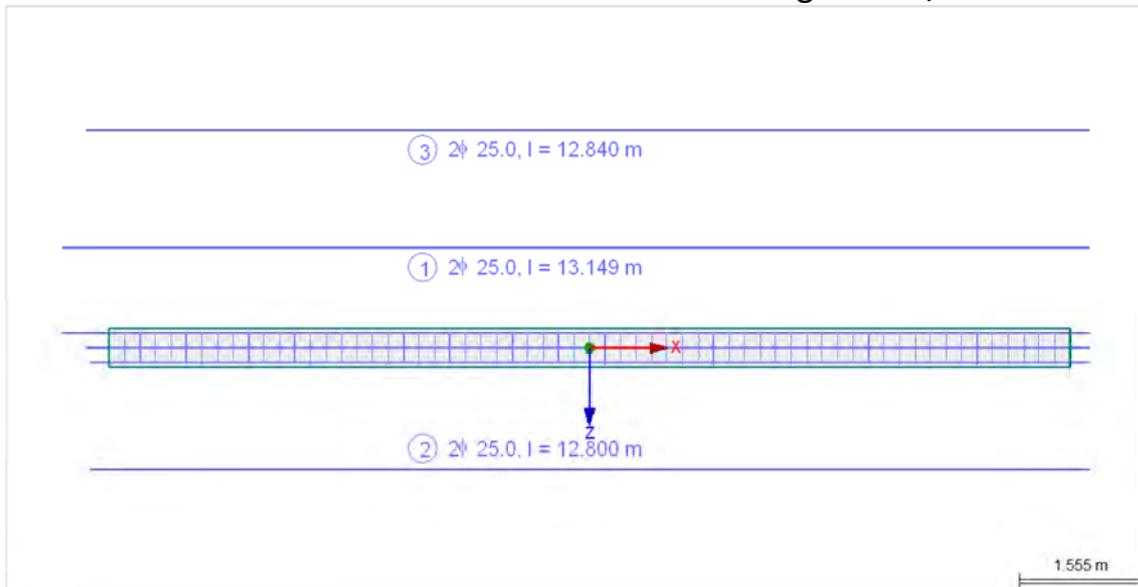
CA1

Cálculo de barras de hormigón

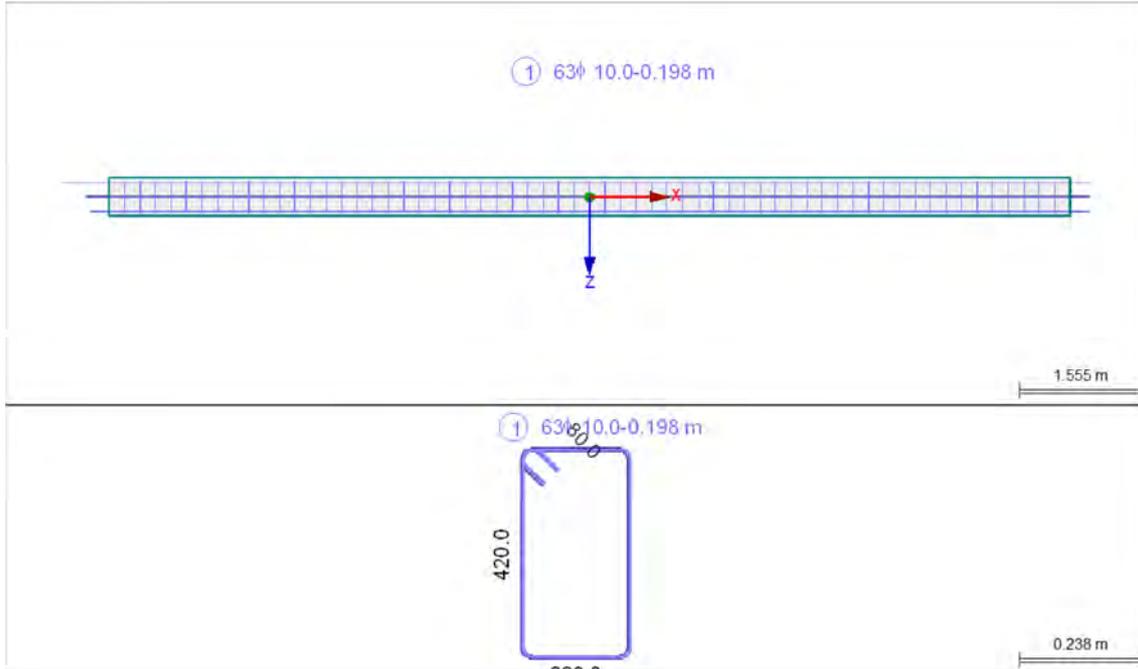
3.1.1 Provided Longitudinal Reinforcement - Anchorage

Item No.	Anchorage Type	Bond	l_{bd} [m]	l_1 [m]	l_2 [m]	Total [m]	d_{br} [m]
Member No.13 - Rectángulo 300/500							
1 Start	Straight	poor	0.599	0.599	-	0.599	-
1 End	Straight	poor	0.250	0.250	-	0.250	-
2 Start	Straight	good	0.250	0.250	-	0.250	-
2 End	Straight	good	0.250	0.250	-	0.250	-
3 Start	Straight	poor	0.290	0.290	-	0.290	-
3 End	Straight	poor	0.250	0.250	-	0.250	-

RF-CONCRETE Members - Member No. 13 - Rectángulo 300/500



RF-CONCRETE Members - Member No. 13 - Rectángulo 300/500



RF-CONCRETE Members

CA1
 Cálculo de barras de
 hormigón

3.4 Steel Schedule

Item No.	Reinforcement Type	d_s [mm]	Surface	No. of Bars	Length [m]	Anchorage Type		Bending Diameter [m]	Weight [kg]
						Start	End		
Material No. 3 - Reinforcing Steel B 500 S (A)									
1	Length	25.0	Ribbed	2	13.149	Straight	Straight		101.34
2	Length	25.0	Ribbed	2	12.800	Straight	Straight		98.65
3	Length	25.0	Ribbed	2	12.840	Straight	Straight		98.96
4	Stirrup	10.0	Ribbed	63	1.498	Hook	Hook	0.040	58.18
Total				69					357.12

RF-CONCRETE Members

CA1
 Cálculo de barras de
 hormigón

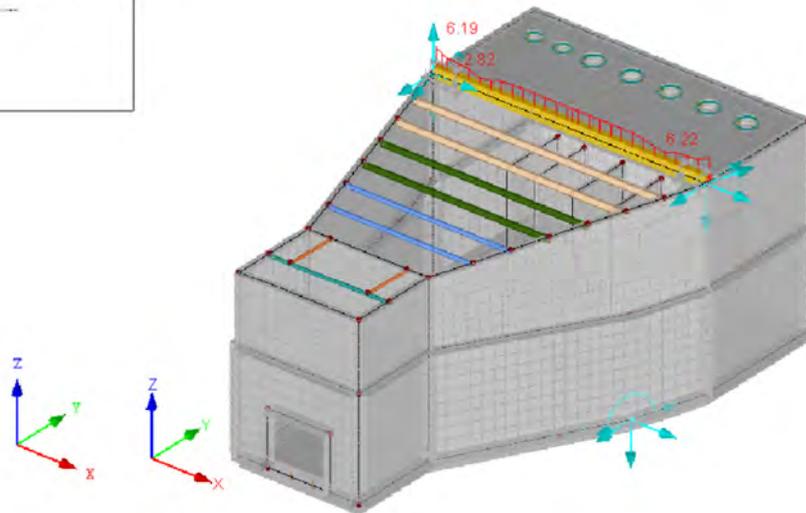
4.3 Serviceability Check by Member

Member No.	Location x [m]	Loading	Type	Existing Value	Design			Capacity	Note
					Limit Value	Unit			
Barra núm. 13 - Rectángulo 300/500									
13	12.290	CR2	σ_s	180.9	400.0	N/mm ²	0.46		
13	8.364	CR3	$A_{s,min}$	9.82	4.56	cm ²	0.47		
13	0.492	CR3	lim d_s	25.0	21.1	mm	1.19		
13	12.290	CR3	lim s_l	0.175	0.293	m	0.60		
13	12.290	CR3	w_k	0.155	0.300	mm	0.52	207)	

Required Reinforcement $A_{s,-z}$ (top)

RF-CONCRETE Members CA1
Cálculo de barras de hormigón

Isometric

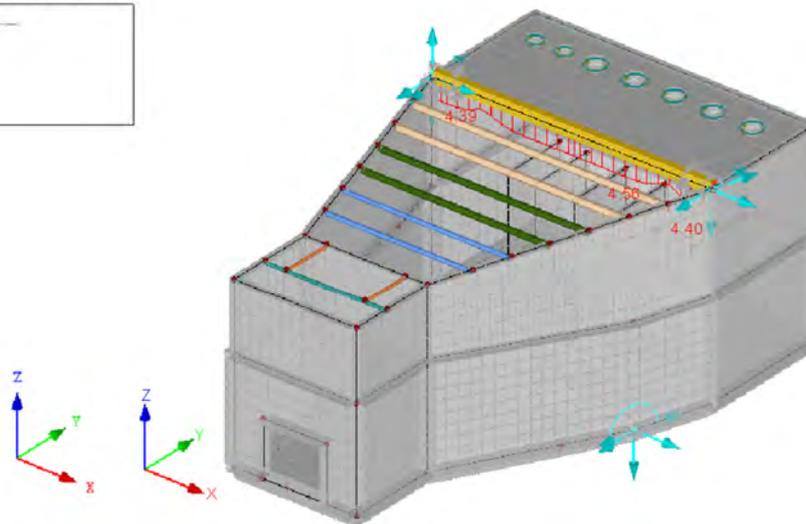


Max A-s,-z (superior): 6.22 cm²

Required Reinforcement $A_{s,+z}$ (bottom)

Isometric

RF-CONCRETE Members CA1
Cálculo de barras de hormigón

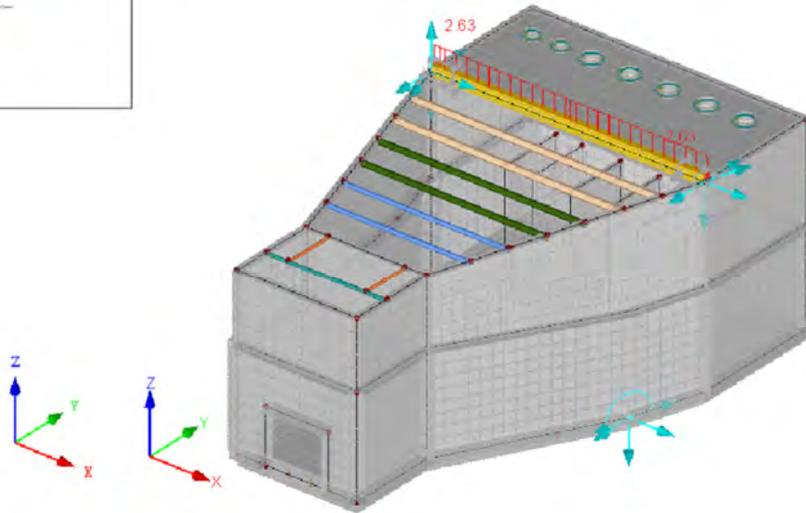


Max A-s,+z (inferior): 4.56 cm²

Required Reinforcement $a_{sw,V,stirrup}$

RF-CONCRETE Members CA1
Cálculo de barras de hormigón

Isometric



Max a-sw,V,cercos: 2.63 cm²/m

1.- DATOS DE OBRA

Hormigón: C25/30

Acero: S-500

Recubrimiento: 3.00 cm

Estados límite

E.L.U. de rotura. Hormigón	EC
	Nieve: Resto de los Estados miembro del CEN, H ≤ 1000 m

2.- DESCRIPCIÓN DE VIGAS

Geometría de vigas

Ref.	Canto (m)	Ancho apoyo (m)		Luz entre ejes (m)	Ancho (m)	Tipo de apoyo
		Izquierdo	Derecho			
V-1	3.00	0.40	0.40	5.80	0.30	No rigidizados

Cargas en vigas

Ref.	Hipótesis	Pp	Qs (kN/m)
V-1	Peso propio	Sí	
	Q 1	No	4.00
	N 1	No	1.10

Abreviaturas utilizadas

- Pp: Se genera el peso propio en esta hipótesis
- Qs: Carga superior

Armado de vigas

Ref.	A. Longitudinal	A. Base del alma		A. Refuerzo del alma
		Vertical	Horizontal	
V-1	4Ø12 Ancho: 0.70 m	Ø12c/20	Ø12c/20	Longit. horiz.: 1.00 m Longit. vert.: 1.50 m Ancho: 0.60 m

3.- COMPROBACIÓN

Referencia: V-1		
Comprobación	Valores	Estado
Recubrimiento geométrico: <i>Norma EC-2. Artículo 4.4.1.2</i>	Mínimo: 1.5 cm Calculado: 3 cm	Cumple
Separación mínima entre barras: <i>Norma EC-2. Artículo 8.2 (2)</i>	Mínimo: 2.5 cm	
- Armadura longitudinal inferior:	Calculado: 22.1 cm	Cumple
- Armado base del alma vertical:	Calculado: 18.8 cm	Cumple
- Armado base del alma horizontal:	Calculado: 18.8 cm	Cumple
- Armadura base del alma:	Calculado: 19.2 cm	Cumple
Separación máxima entre barras: <i>Criterio de CYPE</i>	Máximo: 30 cm	
- Armadura longitudinal inferior:	Calculado: 23.3 cm	Cumple
- Armado base del alma vertical:	Calculado: 20 cm	Cumple
- Armado base del alma horizontal:	Calculado: 20 cm	Cumple
Comprobación de reacción en apoyos: <i>Artículo 2.5.3.6.3 de la norma EC-2</i>	Máximo: 1199.96 kN	
- Izquierdo:	Calculado: 108.695 kN	Cumple
- Derecho:	Calculado: 108.695 kN	Cumple

Referencia: V-1		
Comprobación	Valores	Estado
Ancho mínimo viga: <i>Artículo 59.2 de la norma EH-91</i>	Mínimo: 2.1 cm Calculado: 30 cm	Cumple
Armadura longitudinal inferior: - Área: <i>Artículo 2.5.3.6.3 de la norma EC-2</i> - Ancho de disposición de las barras: <i>Artículo 2.5.3.6.3 de la norma EC-2</i> - Disposición de la armadura:	Mínimo: 1.6 cm ² Calculado: 9.1 cm ² Mínimo: 69.6 cm Calculado: 70 cm	Cumple Cumple Cumple
Armadura base del alma: <i>Artículo 5.4.5 de la norma EC-2</i> - Área barras verticales: - Área barras horizontales:	Mínimo: 9 cm ² /m Calculado: 11.4 cm ² /m Calculado: 11.4 cm ² /m	Cumple Cumple
Armadura de refuerzo del alma: - Longitud de barras horizontales: <i>Criterio de CYPE</i> - Longitud de barras verticales: <i>Criterio de CYPE</i> - Ancho de disposición de las barras: <i>Criterio de CYPE</i> - Disposición de la armadura:	Mínimo: 90 cm Calculado: 100 cm Mínimo: 150 cm Calculado: 150 cm Mínimo: 60 cm Calculado: 60 cm	Cumple Cumple Cumple Cumple
Se cumplen todas las comprobaciones		

12.3. LOSA EDIFICIO PREFABRICADO

Model - General Data

General	Model name	: LOSA EDIFICIO BOMBEO
	Project name	: CANAL SAN JOSE
Options	Type of model	: 3D
	Positive direction of global axis Z	: Upward
	Classification of load cases and combinations	: According to Standard: EN 1990 National Annex: UNE - España
	x Automatically create combinations	: x Result Combinations
	- RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures	
	- RF-CUTTING-PATTERN	
	- Piping analysis	
	- Use CQC Rule	
	- Enable CAD/BIM model	
	Standard Gravity	
	g	: 10.00 m/s ²

FE Mesh Settings

General	Target length of finite elements	l_{FE}	: 0.500 m
	Maximum distance between a node and a line to integrate it into the line	ϵ	: 0.001 m
	Maximum number of mesh nodes (in thousands)		: 500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		: 10
	x Activate member divisions for large deformation or post-critical analysis		
	x Use division for members with node lying on them		
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	: 1.800
	Maximum out-of-plane inclination of two finite elements	α	: 0.50 °
	Shape direction of finite elements		: Triangles and quadrangles x Same squares where possible

1.3 Materials

Matl. No.	Modulus E [kN/cm ²]	Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m ³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Steel S 275 EN 10025-2:2004-11 21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
2	Concrete C30/37 EN 1992-1-1:2004/A1:2014 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 Surfaces

Surface No.	Surface Type		Boundary Lines No.	Matl. No.	Thickness		Area A [m ²]	Weight W [kg]
	Geometry	Stiffness			Type	d [mm]		
1	Plane	Standard	1,3,10,2,5,11,7,8,6,4	2	Constant	500.0	337.720	422150.00

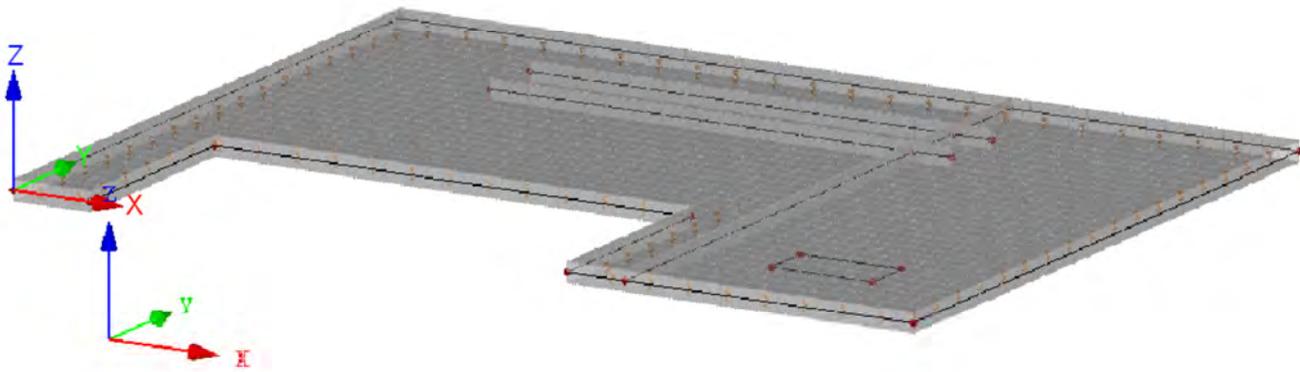
1.4.2 Surfaces - Integrated Objects

Surface No.	Nodes	Integrated Objects No.		Openings	Comment
		Lines			
1			9,12-21		

1.9 Surface Supports

Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m ³]			Shear Spring [kN/m]	
			u _x	u _y	u _z	V _{xz}	V _{yz}
1	1	-	x	x	90000.000	-	-

Model



Máx. a-s, 1, +z (inferior): 36.35, Mín. a-s, 1, +z (inferior): 0.00 cm²/m

LC1

PESO PROPIO

LC1: PESO PROPIO

3.3 Line Loads

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters		
						Symbol	Value	Unit
1	Lines	1-11,19,20	Force	Uniform	ZL	p	-112.500	kN/m

LC2

EQUIPOS MECÁNICOS

3.3 Line Loads

LC2: EQUIPOS MECÁNICOS

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters		
						Symbol	Value	Unit
1	Lines	13,14,18,21	Force	Uniform	ZL	p	-1.880	kN/m

LC2

EQUIPOS MECÁNICOS

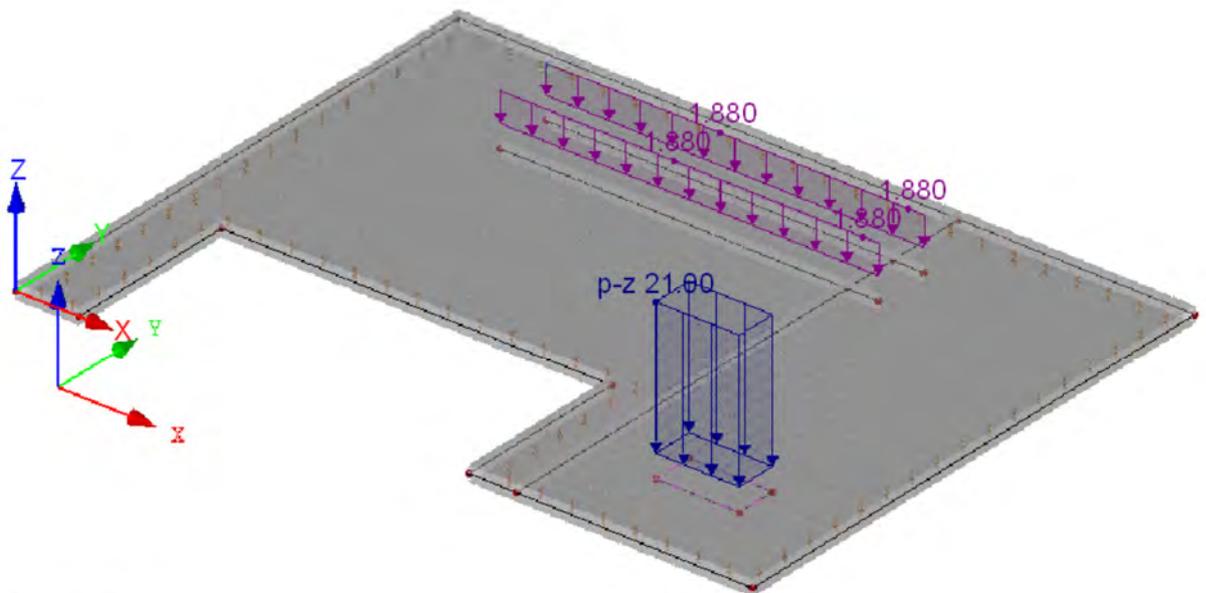
3.10 Free Polygon Loads

LC2: EQUIPOS MECÁNICOS

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Load Parameters			Load Position		
					Symbol	Value	Unit	X [m]	Y [m]	Z [m]
1	1	XY	Uniform	z	p	21.00	kN/m ²	18.150	2.700	0.000
					p	21.00	kN/m ²	18.150	4.000	0.000
					p	21.00	kN/m ²	20.800	4.000	0.000
					p	21.00	kN/m ²	20.800	2.700	0.000

LC2: SOBRE CARGA

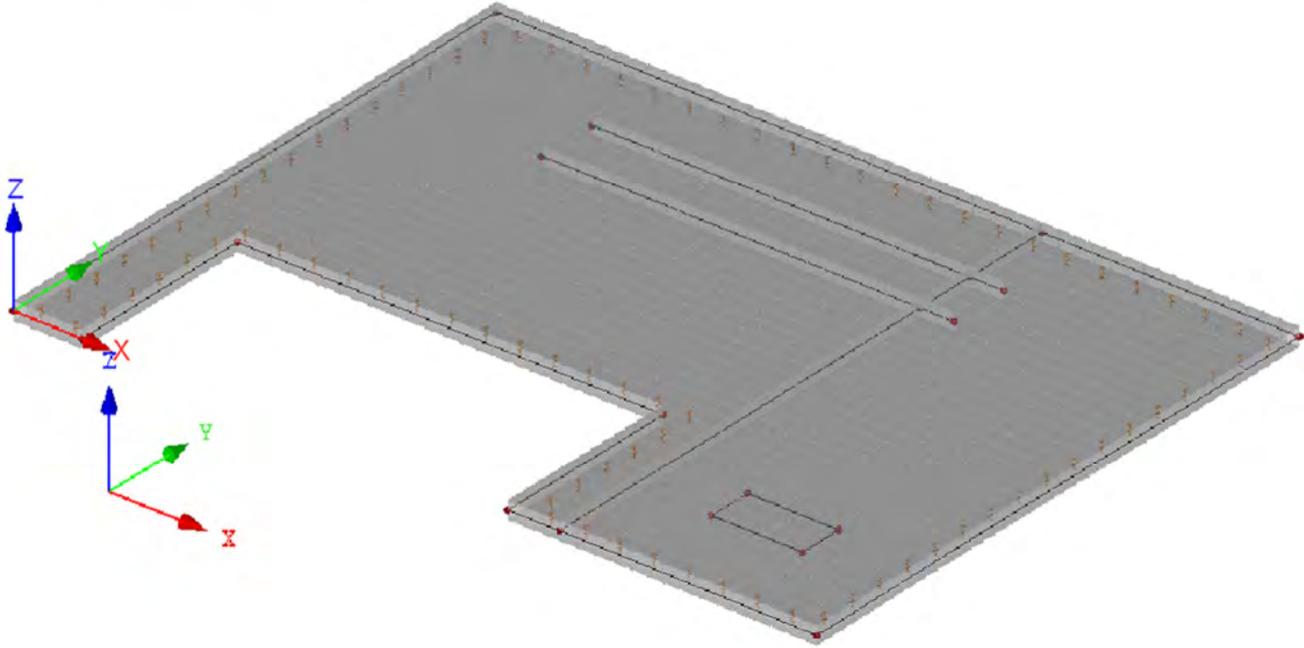
LC2: EQUIPOS MECÁNICOS
Cargas [kN/m], [kN/m²]



Máx. u-z: 4.0, Mín. u-z: -0.1 mm

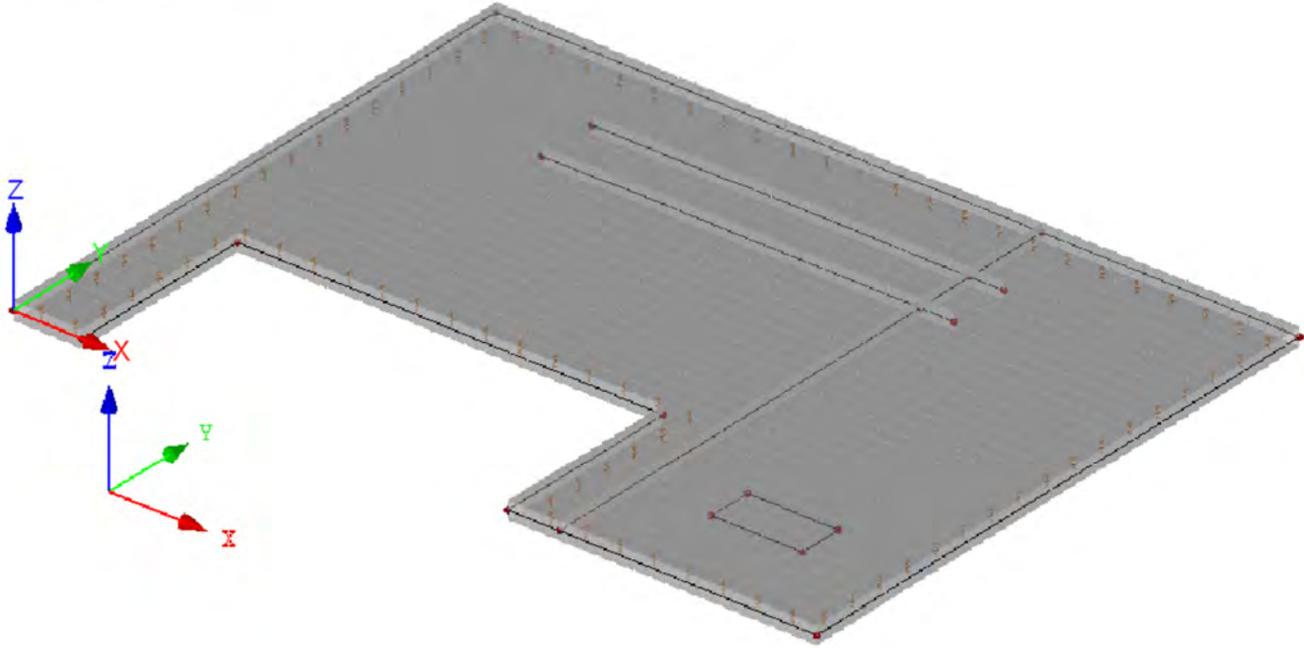
Local Deformations u_x

RC3: 1.35*CR1/p + 1.5*CR2/p
Members Deformaciones locales u-x
Combinaciones de resultados: Valores máx. y mín.



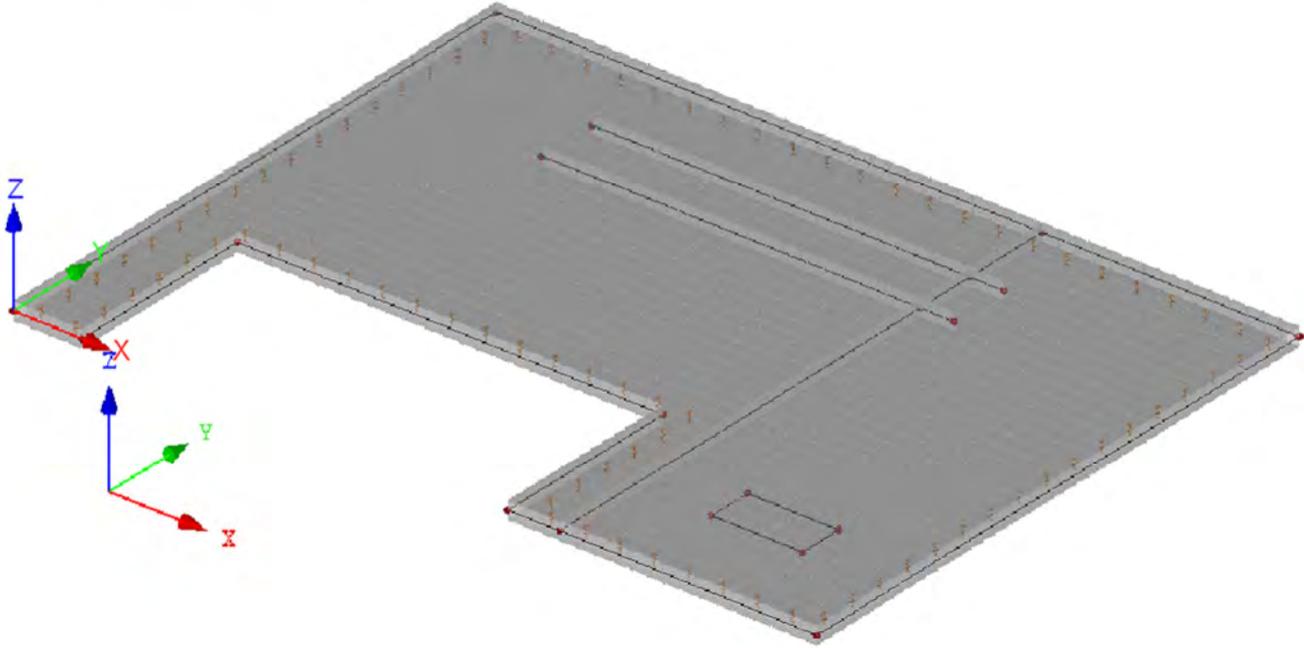
Local Deformations u_y

RC3: 1.35*CR1/p + 1.5*CR2/p
Members Deformaciones locales u-y
Combinaciones de resultados: Valores máx. y mín.



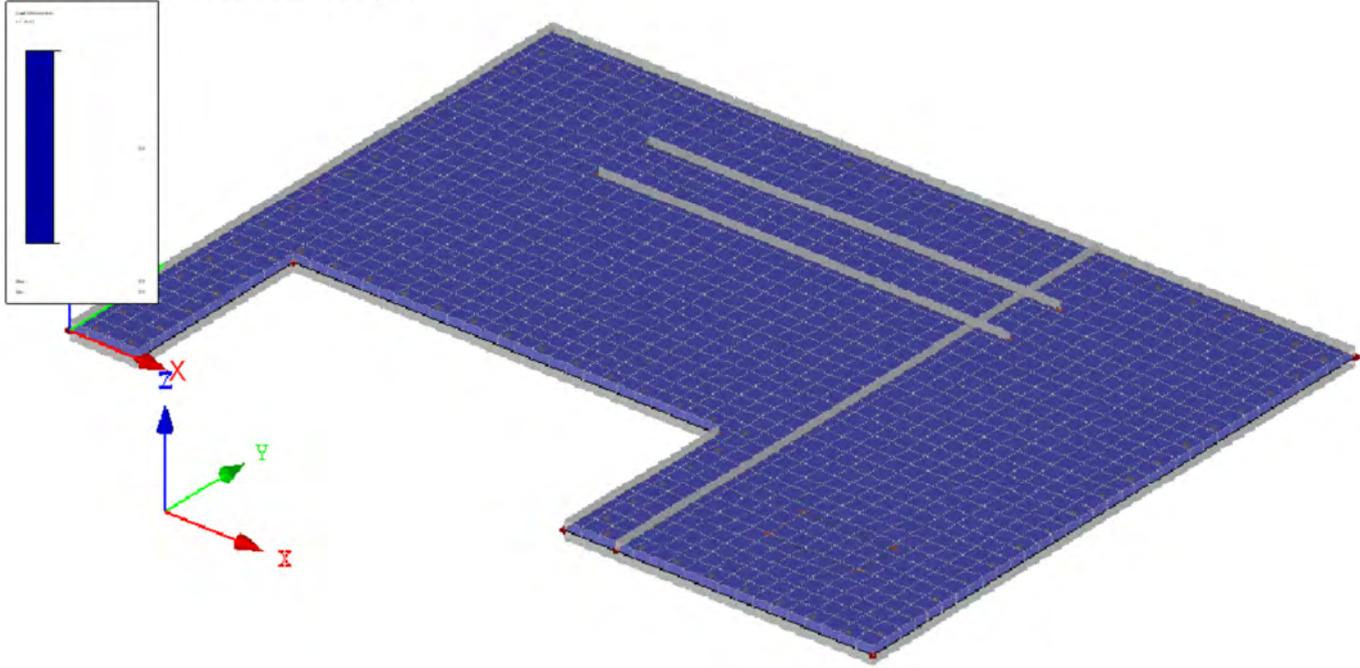
Local Deformations u_z

RC3: 1.35*CR1/p + 1.5*CR2/p
Members Deformaciones locales u-z
Combinaciones de resultados: Valores máx. y mín.



Local Deformations u_x

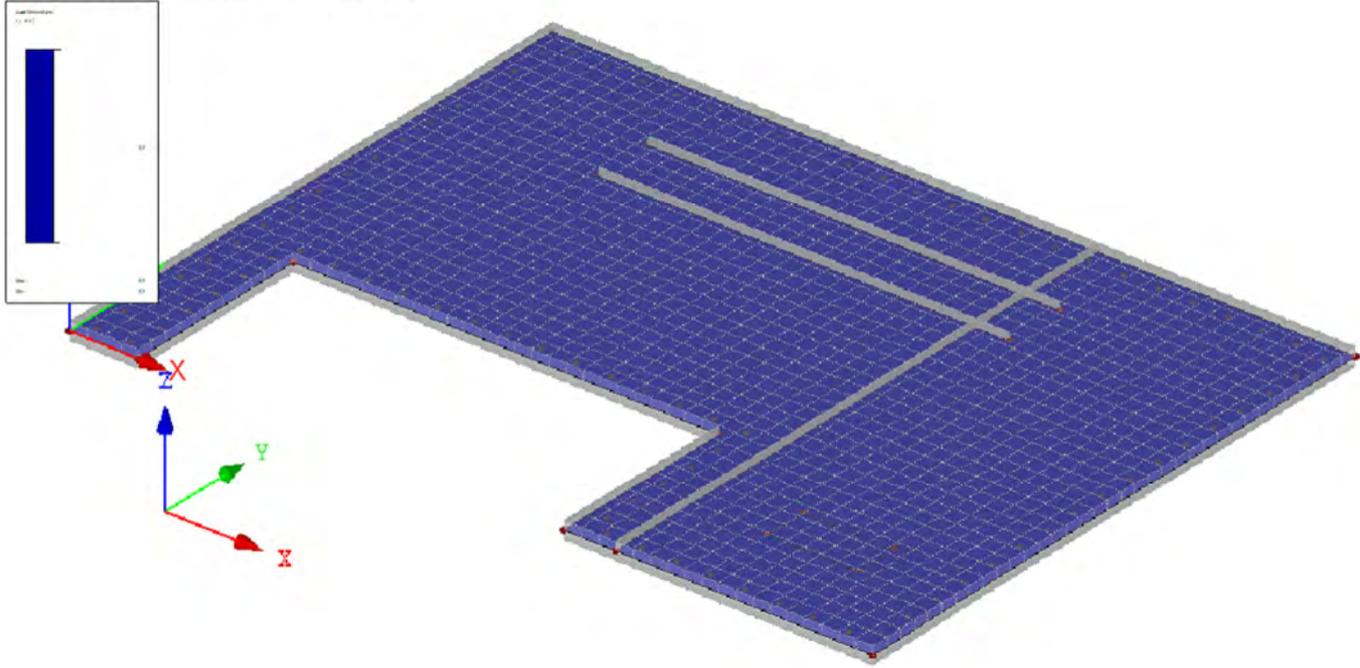
RC3: 1.35*CR1/p + 1.5*CR2/p
Deformaciones locales u-x [mm]
Combinaciones de resultados: Valores máx. y mín.



Max u-x: 0.0, Min u-x: 0.0 [mm]

Local Deformations u_y

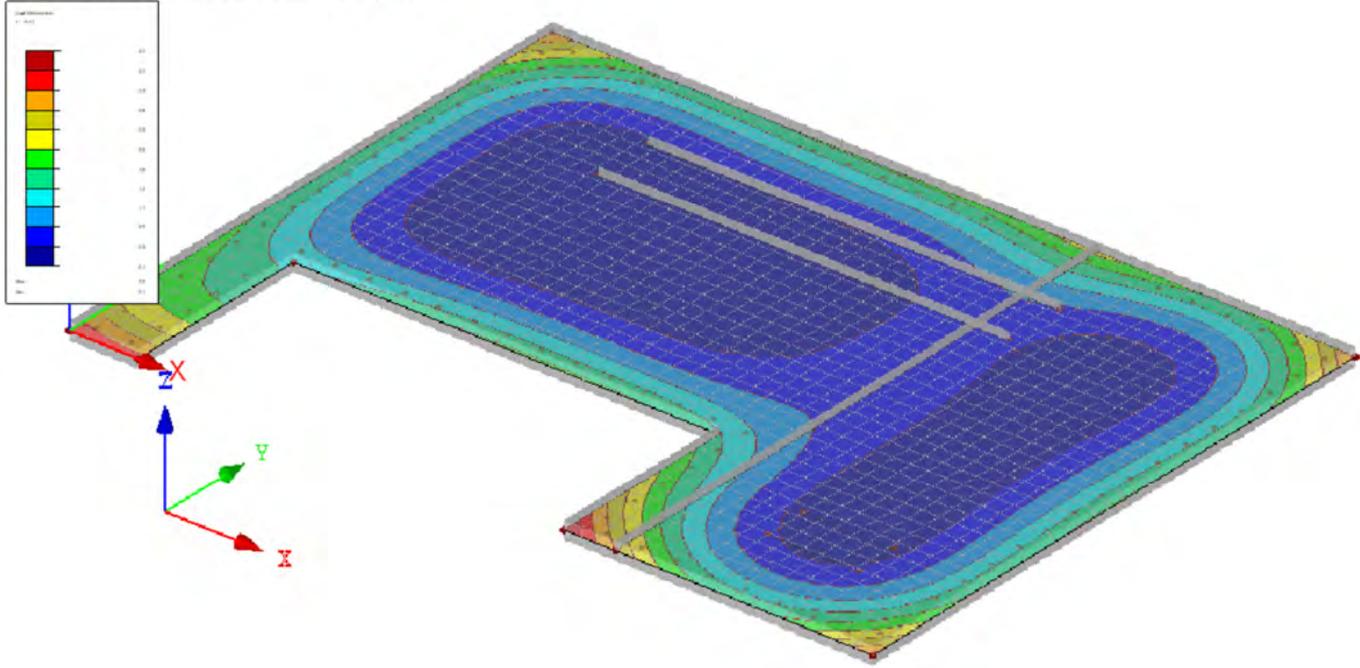
RC3: $1.35 \cdot CR1/p + 1.5 \cdot CR2/p$
Deformaciones locales u-y [mm]
Combinaciones de resultados: Valores máx. y mín.



Max u-y: 0.0, Min u-y: 0.0 [mm]

Local Deformations u_z

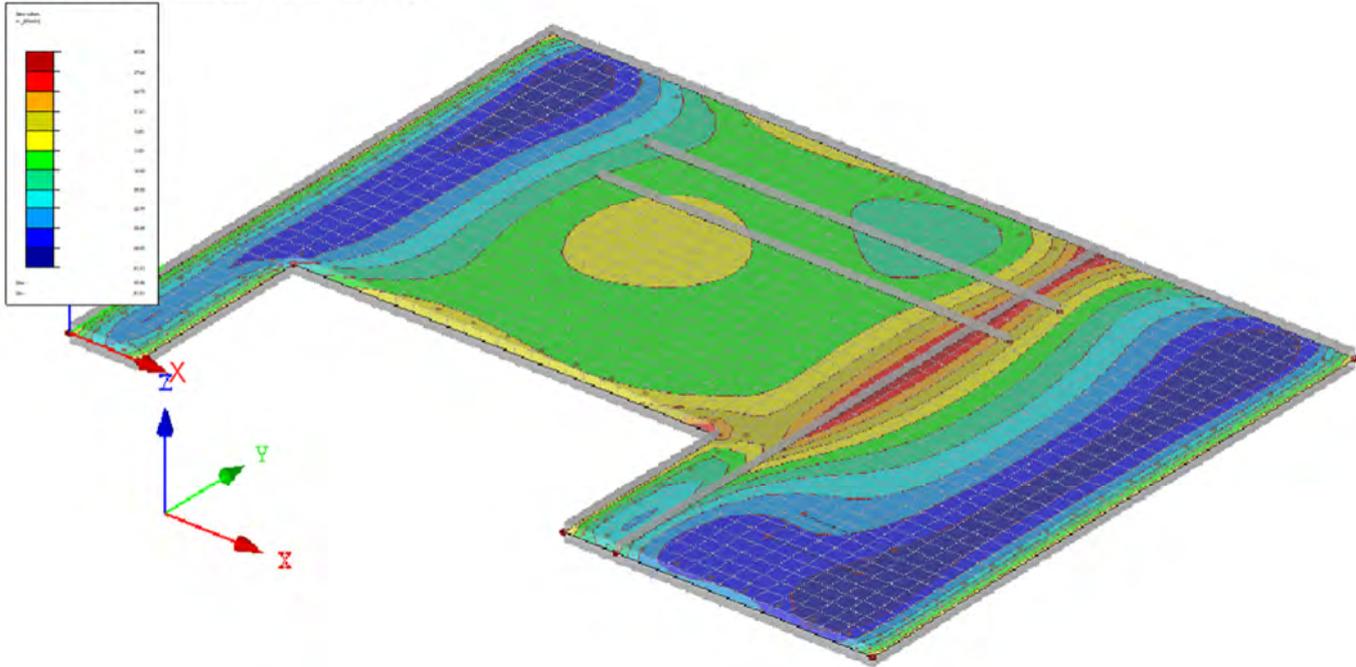
RC3: 1.35*CR1/p + 1.5*CR2/p
Deformaciones locales u-z [mm]
Combinaciones de resultados: Valores máx. y mín.



Max u-z: 4.0, Min u-z: 0.0 [mm]

Base values m_x

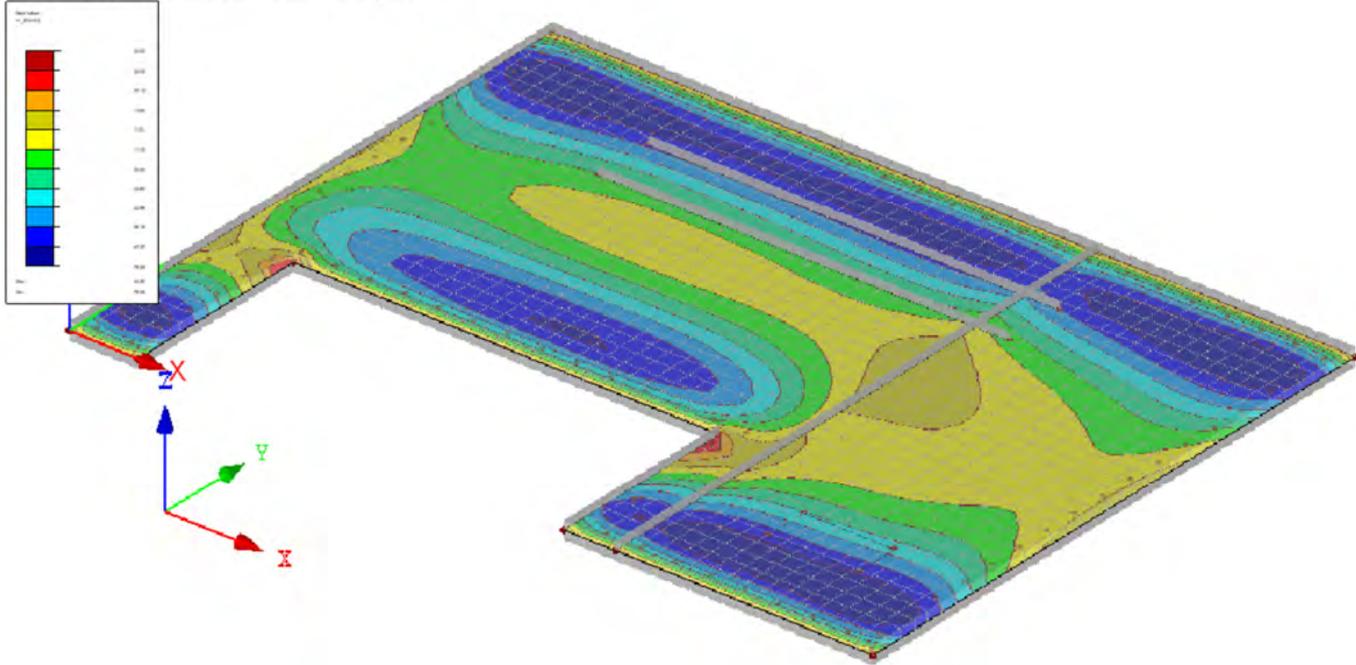
RC1: 1.00*CC1/p
Esfuerzos internos básicos m-x [kNm/m]
Combinaciones de resultados: Valores máx. y mín.



Max m-x: 60.56, Min m-x: 0.00 [kNm/m]

Base values m_y

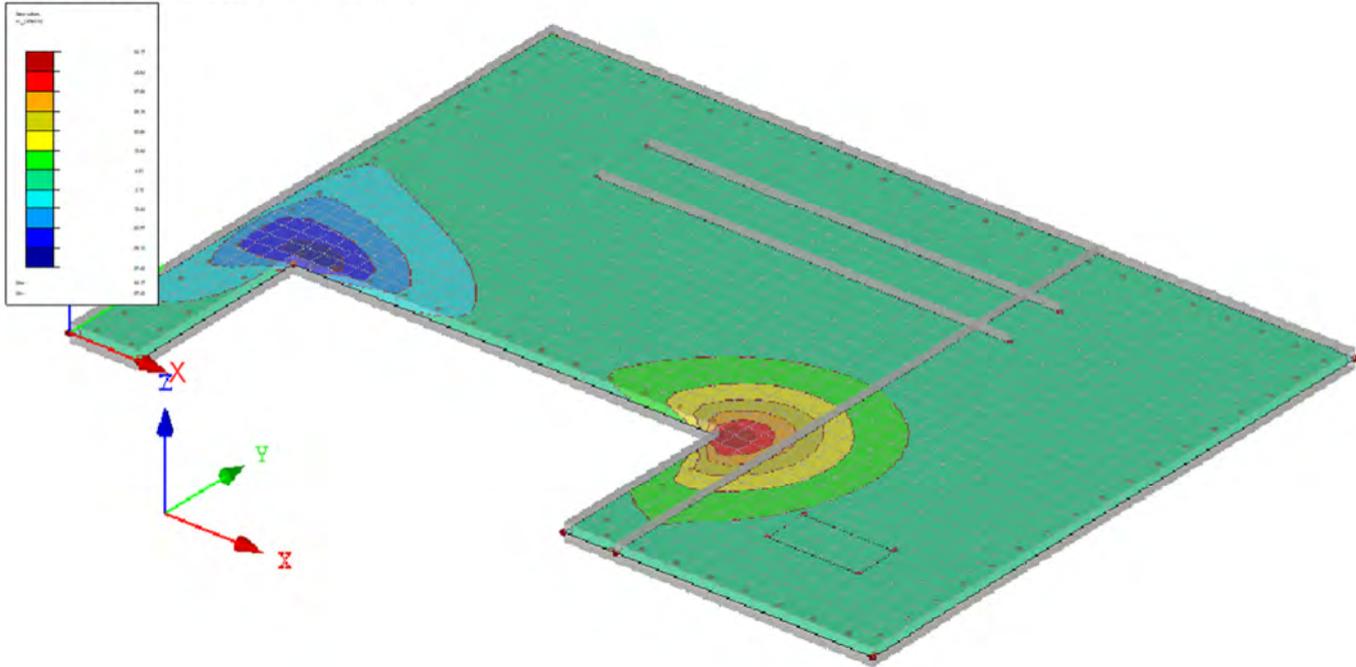
RC1: 1.00*CC1/p
Esfuerzos internos básicos m-y [kNm/m]
Combinaciones de resultados: Valores máx. y mín.



Max m-y: 44.50, Min m-y: 0.00 [kNm/m]

Base values m_{xy}

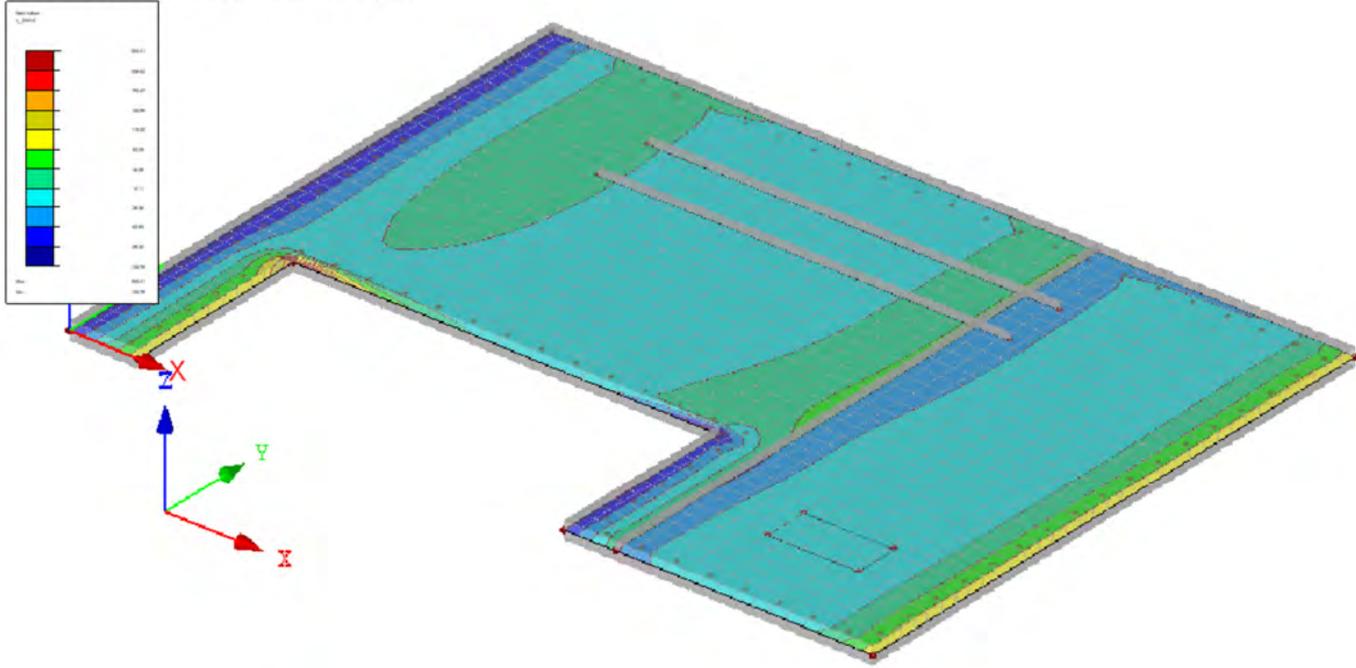
RC1: 1.00*CC1/p
Esfuerzos internos básicos m-xy [kNm/m]
Combinaciones de resultados: Valores máx. y mín.



Max m-xy: 54.17, Min m-xy: 0.00 [kNm/m]

Base values v_x

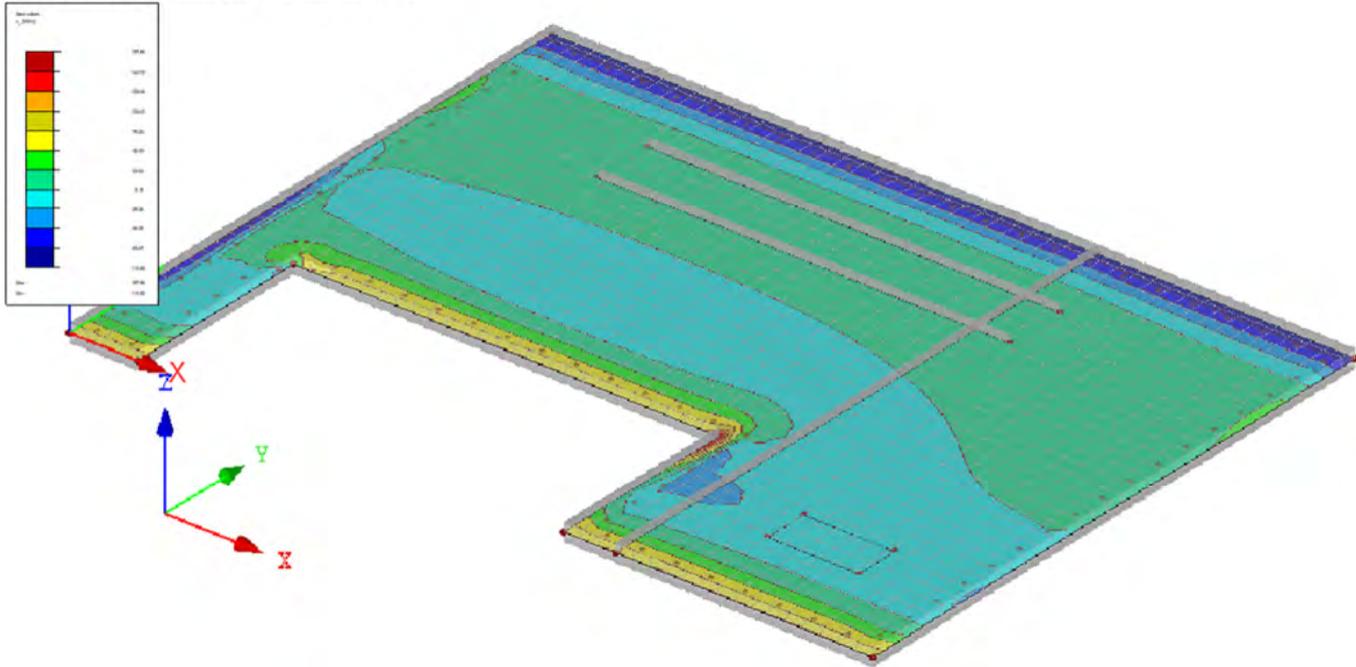
RC1: 1.00*CC1/p
Esfuerzos internos básicos v-x [kN/m]
Combinaciones de resultados: Valores máx. y mín.



Max v-x: 265.41, Min v-x: 0.00 [kN/m]

Base values v_y

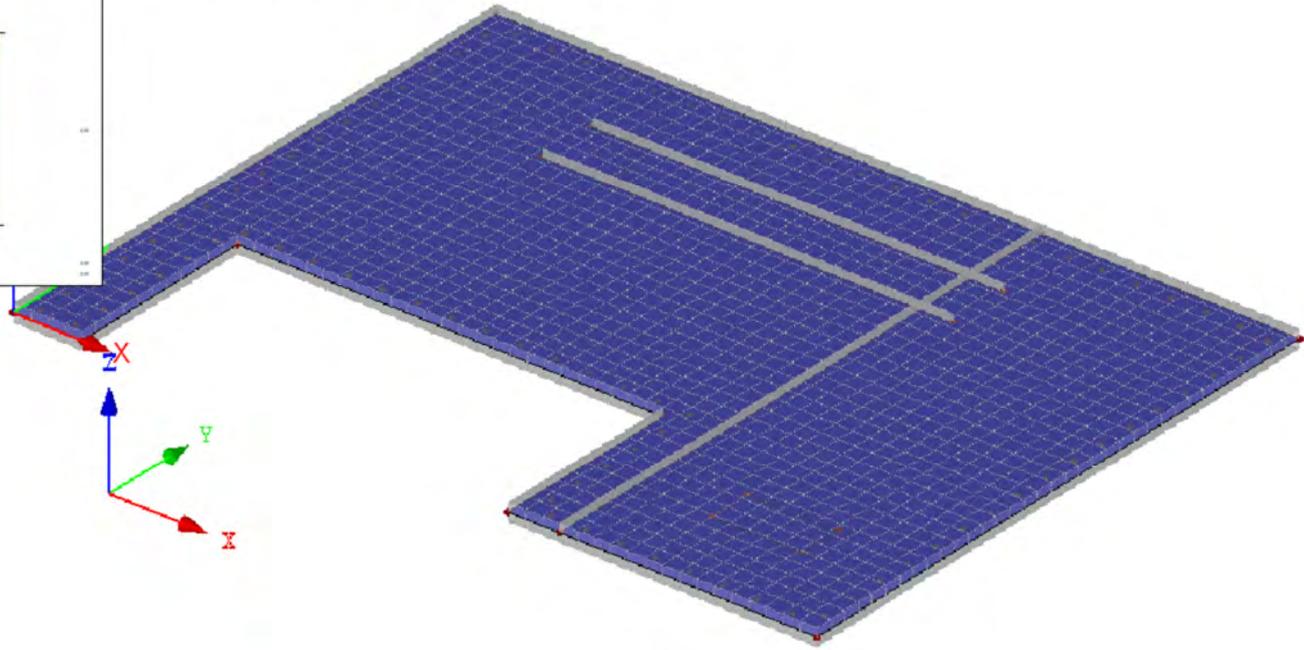
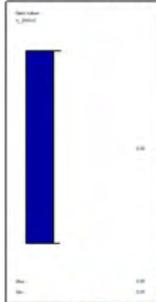
RC1: 1.00*CC1/p
Esfuerzos internos básicos v-y [kN/m]
Combinaciones de resultados: Valores máx. y mín.



Max v-y: 187.86, Min v-y: 0.00 [kN/m]

Base values n_x

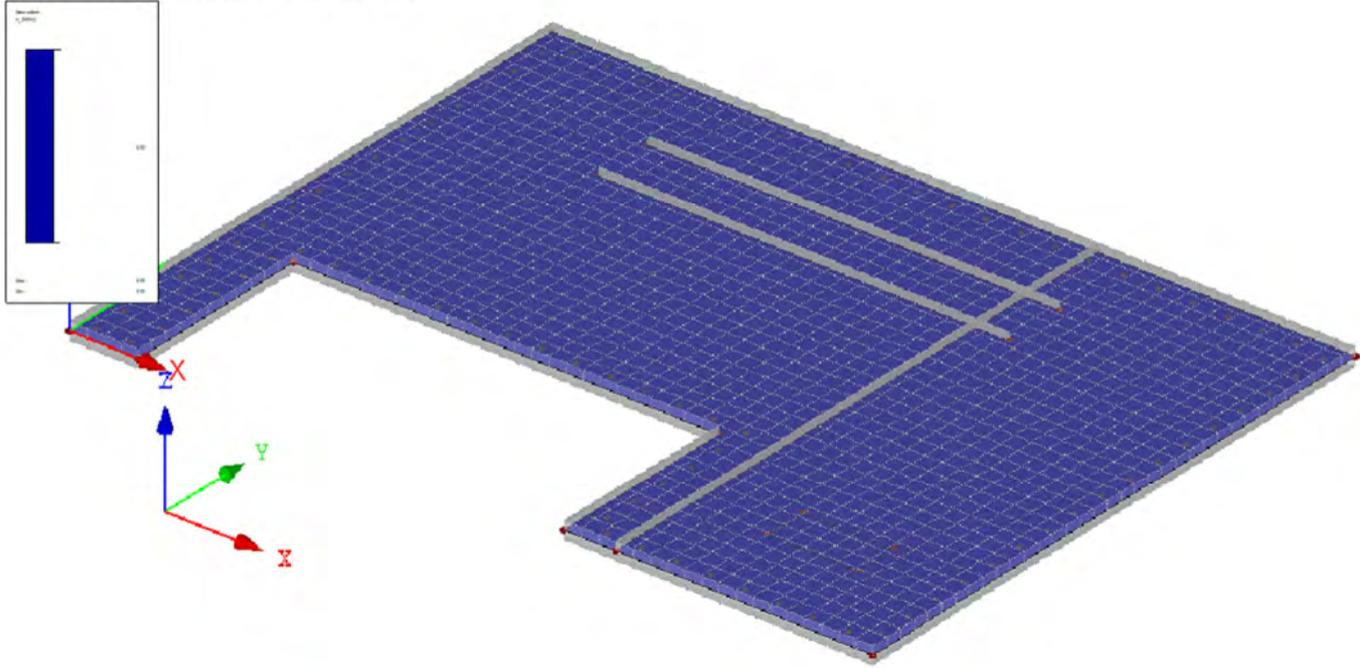
RC1: 1.00*CC1/p
Esfuerzos internos básicos n-x [kN/m]
Combinaciones de resultados: Valores máx. y mín.



Max n-x: 0.00, Min n-x: 0.00 [kN/m]

Base values n_y

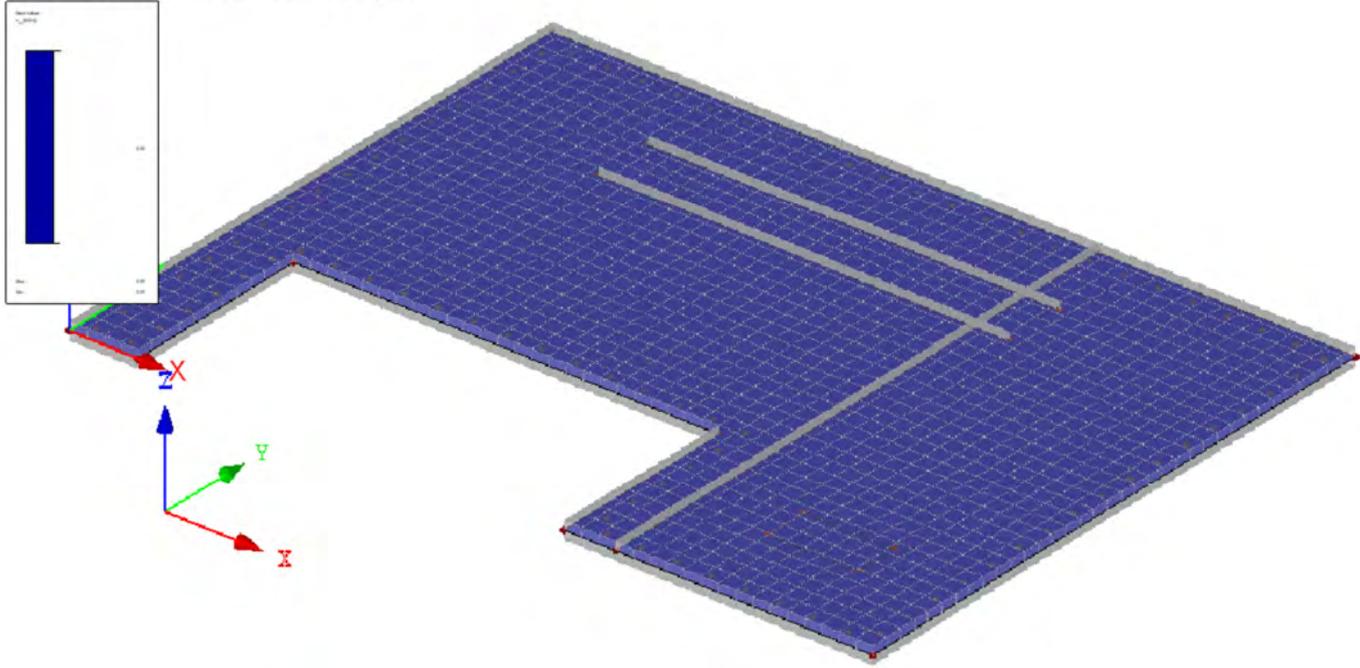
RC1: 1.00*CC1/p
Esfuerzos internos básicos n-y [kN/m]
Combinaciones de resultados: Valores máx. y mín.



Max n-y: 0.00, Min n-y: 0.00 [kN/m]

Base values n_{xy}

RC1: 1.00*CC1/p
 Esfuerzos internos básicos n-xy [kN/m]
 Combinaciones de resultados: Valores máx. y mín.



Max n-xy: 0.00, Min n-xy: 0.00 [kN/m]

RF-CONCRETE Surfaces

CA1
 Cálculo de hormigón armado

1.4 Reinforcement Group No. 1

Applied to surfaces:	All
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	-
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm ² /m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2

1.4 Reinforcement Group No. 1

Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 0.00, As-2,+z (bottom): 0.00 cm ² /m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar centroid	d-1: 50.00, d-2: 60.00 mm
Bar diameter	ds-1: 10.00, ds-2: 10.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR UNE EN 1992-1-1/NA:2013	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	x
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	x
Minimum longitudinal reinforcement for walls acc. to 9.6	-
Minimum shear reinforcement	x
Neutral axis depth limitation	x
Variable strut inclination - min	26.600 °
Variable concrete strut inclination - max	63.400 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.30, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 1.00, AC 1.00, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

2.2 Required Reinforcement by Surface

Surface No.	Point No.	Point Coordinates [m]			Symbol	Required Reinforcement			Basic Reinf.	Additional Reinforcement		Unit	Notes
		X	Y	Z		ULS	SLS	ULS/SLS		Required	Provided		
1	M7	2.000	5.600	0.000	a _{s,1,-z (top)}	6.71	2.46	6.71	0.00	6.71	6.71	cm ² /m	
	M14	4.900	14.800	0.000	a _{s,2,-z (top)}	6.71	2.58	6.71	0.00	6.71	6.71	cm ² /m	
	M1	0.000	0.000	0.000	a _{s,1,+z (bottom)}	6.71	1.03	6.71	0.00	6.71	6.71	cm ² /m	
	M2	-0.000	17.400	0.000	a _{s,2,+z (bottom)}	6.71	0.95	6.71	0.00	6.71	6.71	cm ² /m	
	M107	2.496	5.600	0.000	a _{sw}	9.89	-	9.89	-	-	-	cm ² /m ²	

RF-CONCRETE Surfaces

CA1

Cálculo de hormigón armado

3.2 Serviceability Check by Surface

Surface No.	Point No.	Point Coordinates [m]			Load Case	Type	Exist. Value	Design		Ratio	Notes
		X	Y	Z				Limit Value	Unit		
1	M1	0.000	0.000	0.000	Envelope nte ChD	σ_s	0.00	400.00	N/mm ²	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte ChD	lim d_s	10.00	-	mm	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte ChD	lim s_i	0.501	-	m	0.0	226)
	M1	0.000	0.000	0.000	Envelope nte Qp	w_k	0.000	0.200	mm	0.0	226)

RF-CONCRETE Surfaces

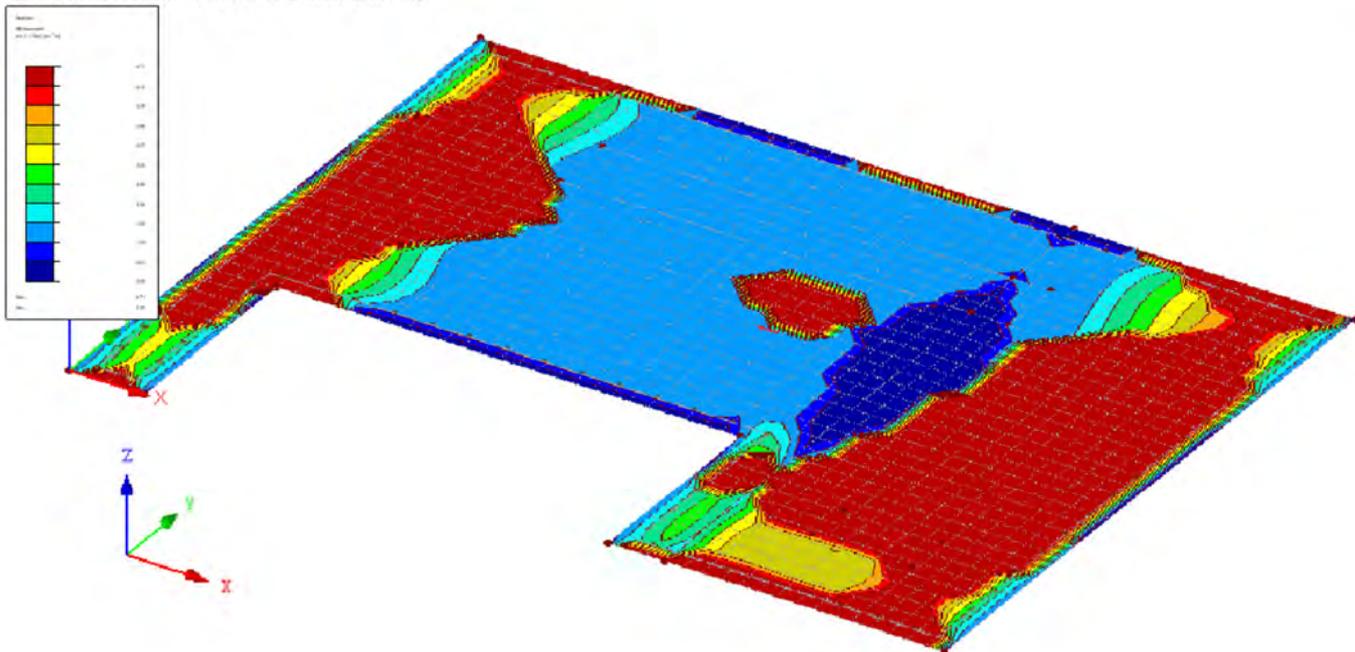
CA1
Cálculo de hormigón armado

Serviceability Check Notes

No.	Description
226)	Concrete cracks on neither side.

Required Reinforcement $a_{s,1,-z}$ (superior)

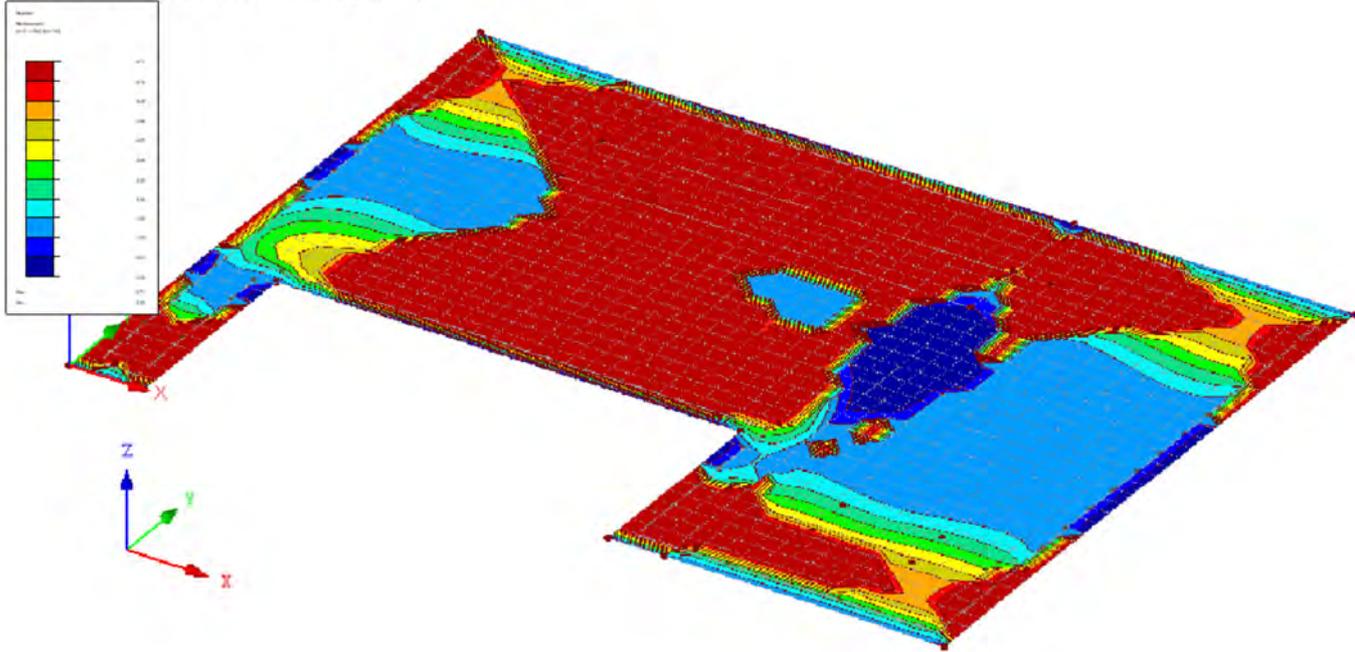
RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Armadura necesaria a-s,1,-z (superior) [cm²/m]



Max $a_{s,1,-z}$ (superior): 6.71, Min $a_{s,1,-z}$ (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,-z}$ (superior)

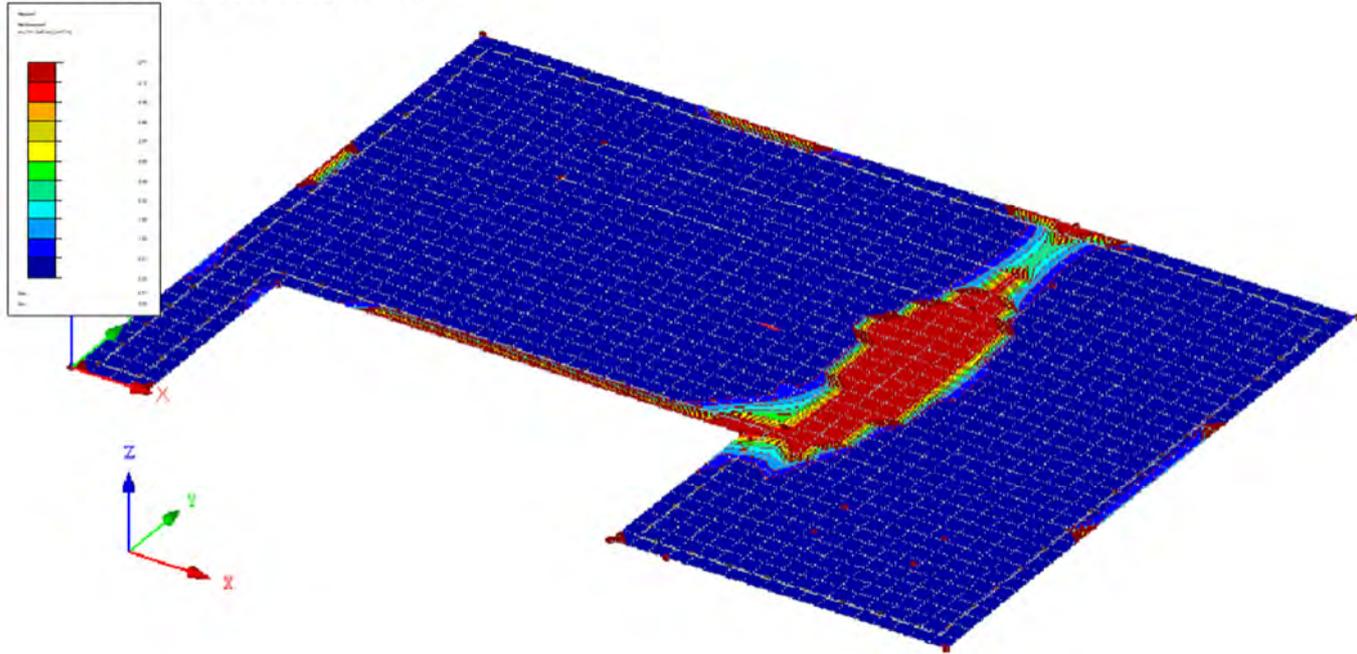
RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Armadura necesaria a-s,2,-z (superior) [cm²/m]



Max a-s,2,-z (superior): 6.71, Min a-s,2,-z (superior): 0.00 [cm²/m]

Required Reinforcement $a_{s,1,+z}$ (inferior)

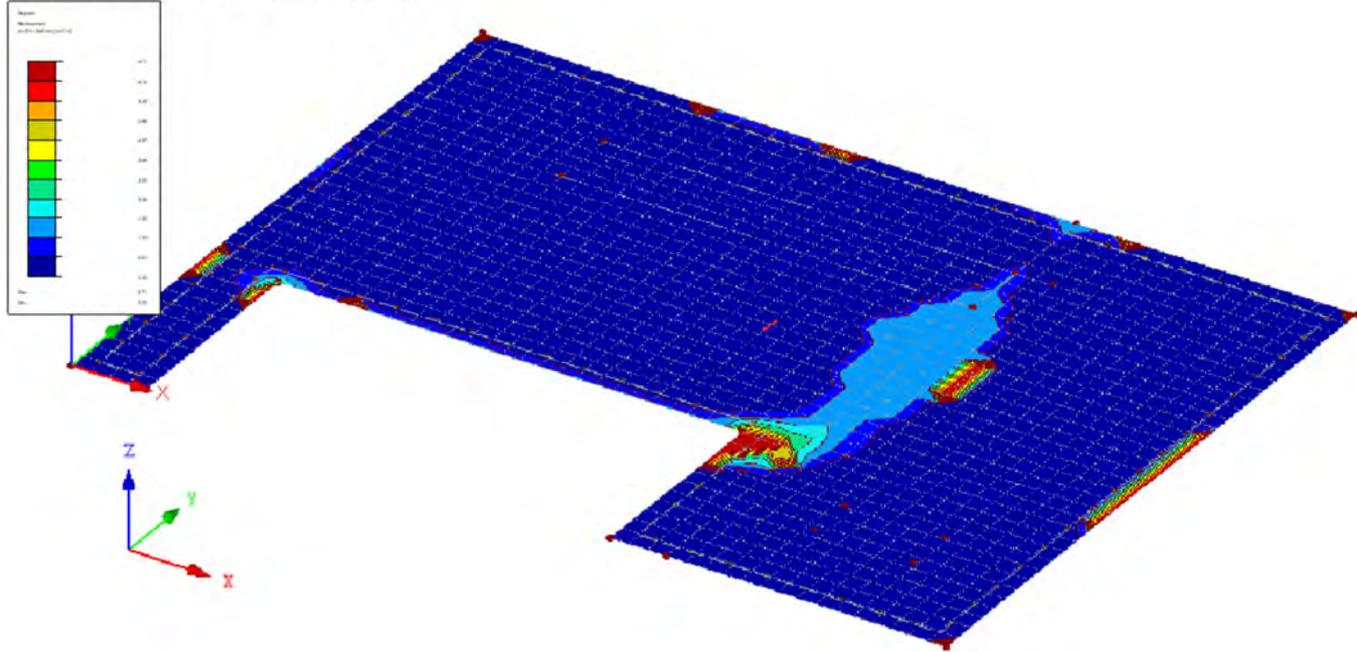
RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Armadura necesaria a-s,1,+z (inferior) [cm²/m]



Max a-s,1,+z (inferior): 6.71, Min a-s,1,+z (inferior): 0.00 [cm²/m]

Required Reinforcement $a_{s,2,+z}$ (inferior)

RF-CONCRETE Surfaces CA1
Cálculo de hormigón armado
Armadura necesaria a-s,2,+z (inferior) [cm²/m]



Max a-s,2,+z (inferior): 6.71, Min a-s,2,+z (inferior): 0.00 [cm²/m]

12.4.CIMENTACIÓN EDIFICIO PREFABRICADO

Model - General Data

General	Model name	: CALICES v2
	Project name	: CANAL SAN JOSE
Options	Type of model	: 3D
	Positive direction of global axis Z	: Upward
	Classification of load cases and combinations	: According to Standard: EN 1990 National Annex: UNE - España
	x Automatically create combinations	: x Load Combinations
	- RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures	
	- RF-CUTTING-PATTERN	
	- Piping analysis	
	- Use CQC Rule	
	- Enable CAD/BIM model	
	Standard Gravity	
	g	: 10.00 m/s ²

FE Mesh Settings

General	Target length of finite elements	l_{FE}	: 0.500 m
	Maximum distance between a node and a line to integrate it into the line	ϵ	: 0.001 m
	Maximum number of mesh nodes (in thousands)		: 500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		: 10
	x Activate member divisions for large deformation or post-critical analysis		
	x Use division for members with node lying on them		
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	: 1.800
	Maximum out-of-plane inclination of two finite elements	α	: 0.50 °
	Shape direction of finite elements		: Triangles and quadrangles
			x Same squares where possible

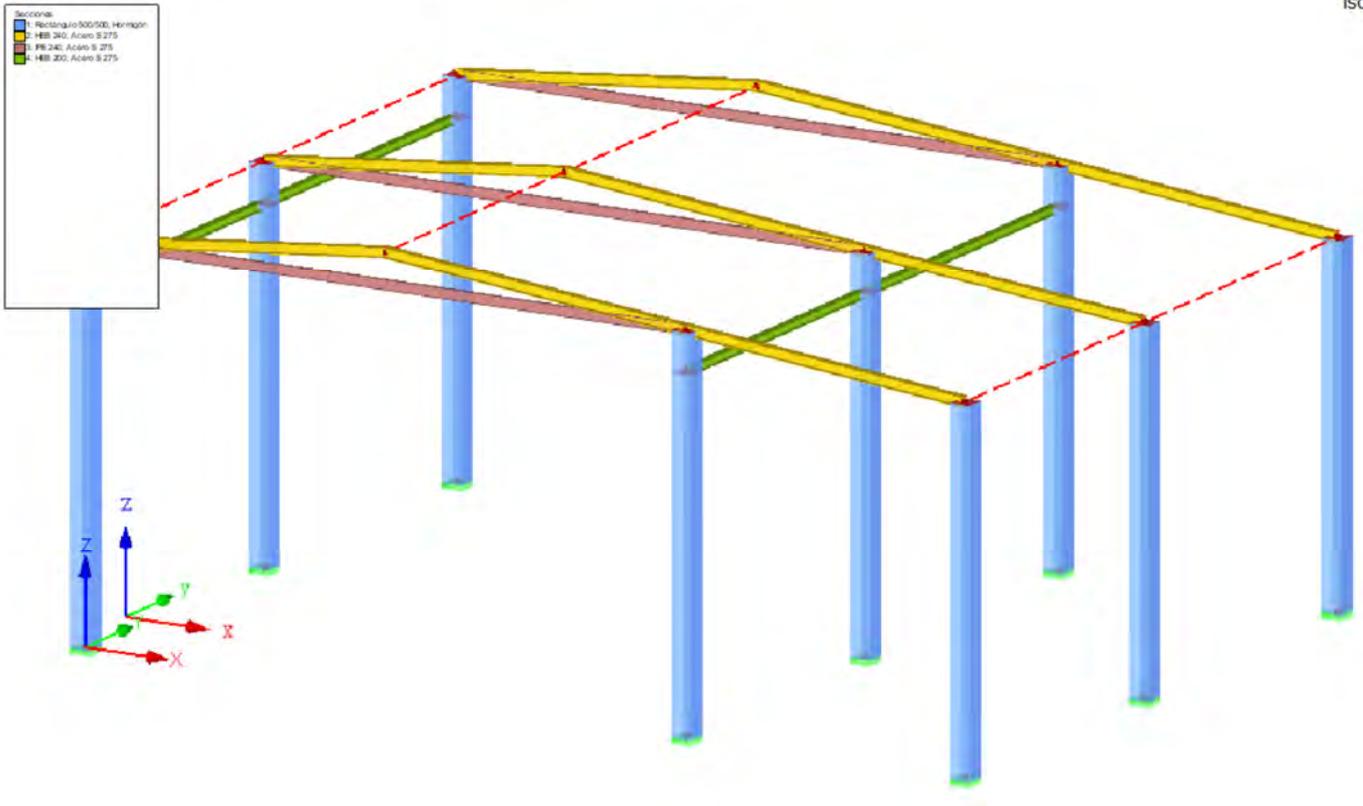
1.3 Materials

Matl. No.	Modulus E [kN/cm ²]	Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m ³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Concrete C30/37 EN 1992-1-1:2004/A1:2014 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
2	Steel S 275 EN 10025-2:2004-11 21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
3	Concrete C25/30 EN 1992-1-1:2004/A1:2014 3100.00	1291.67	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.7 Nodal Supports

Support No.	Nodes No.	Axis System	Column in Z	Support Conditions					
				u _x	u _y	u _z	φ _x	φ _y	φ _z
1	1,3,4,6,8,10,13,20,23	Global X,Y,Z	-	x	x	x	x	x	x

Model



LC1

peso propio

3.15 Generated Loads

LC1: peso propio

No.	Load Description		
1	From Area Loads via Plane		
	Area load direction	Global relative to the projected area:	: x ZP
	Area of load application	x Empty, on members only	
	Area load magnitude	x Constant	: -2.00 kN/m ²
	Boundary of the area load plane	Corner nodes	: 9,12,5,2; 12,14,7,5
		Note	: Each row in the drop down list box denotes one plane
	Generated loads	In X-direction	: 0.000 kN
	In Y-direction	: 0.000 kN	
	In Z-direction	: -31.824 kN	
Convert loads to members No.			: 3,10,11,21-24,28,29,35-40

LC2

sobrecarga

3.15 Generated Loads

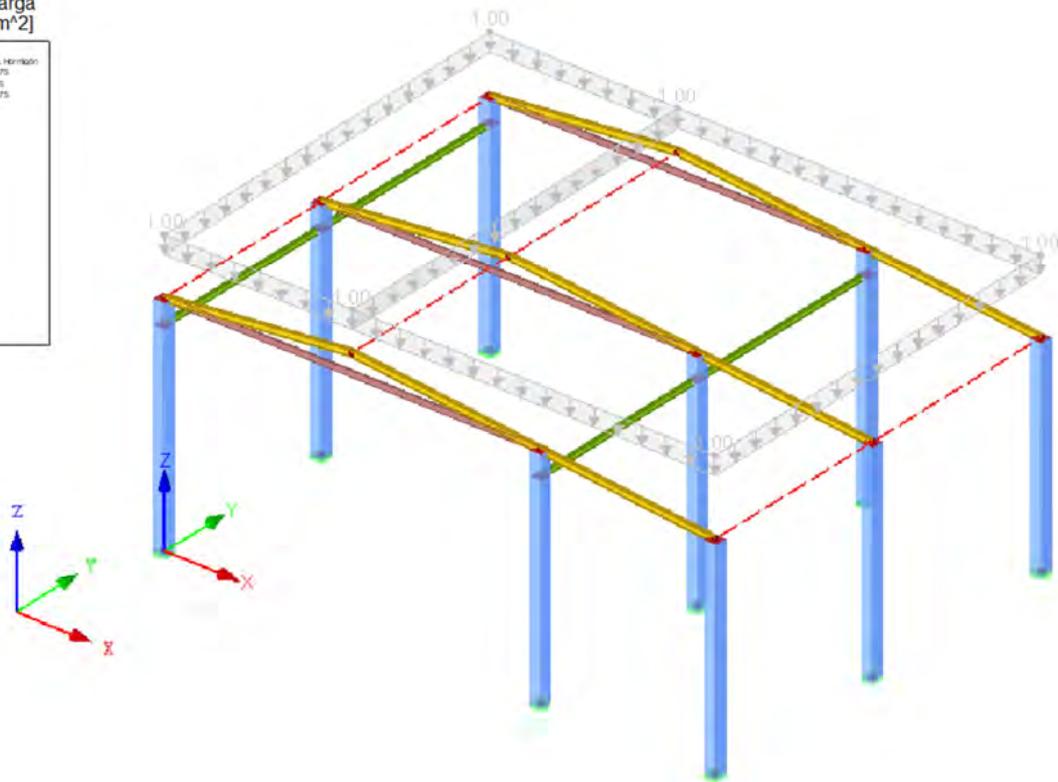
LC2: sobrecarga

No.	Load Description		
1	From Area Loads via Plane		
	Area load direction	Global relative to the projected area:	: x ZP
	Area of load application	x Empty, on members only	
	Area load magnitude	x Constant	: -1.00 kN/m ²
	Boundary of the area load plane	Corner nodes	: 9,12,5,2; 12,14,7,5
		Note	: Each row in the drop down list box denotes one plane
Generated loads	In X-direction	:	0.000 kN
	In Y-direction	:	0.000 kN
	In Z-direction	:	-15.912 kN
Convert loads to members No.		:	3,10,11,21-24,28,29,35-40

LC2: SOBRE CARGA

LC2: sobrecarga
Cargas [kN/m²]

Secciones:	
1	Rectangular 300/300, hormigón
2	HEB 240, Acero S 275
3	PE 240, Acero S 275
4	HEB 200, Acero S 275



LC3

nieve

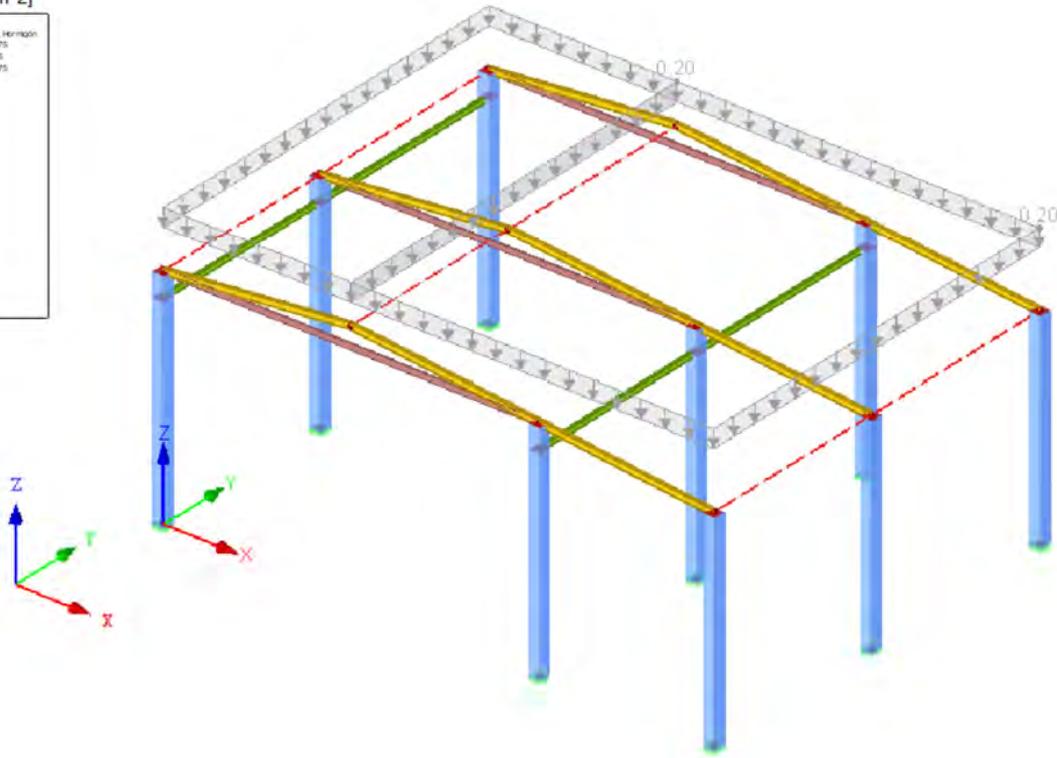
3.15 Generated Loads

No.	Load Description			
1	From Snow Loads (Duopitch Roof)			
	Snow load parameters	According to Standard National Annex Snow load zone Altitude Ground snow load Topography type	: : Z : A : s _k : :	CTE DB-SE-AE Spain 3 300.000 m 0.20 kN/m ² Normal
	Coefficients	Exposure	C _e :	1.00
	Roof geometry	Node	A : B : C : D : E : F :	14 12 9 2 5 7
	Generate LC	x LC s1,a x LC s1,b x LC s1,c	: : :	LC3 LC8 LC9
	Create load type	x Member loads		
	Load distribution type	x Combined		
	Generate snow loads on members No.		:	3,10,11,21-24,28,29,35-40
	Parameters		A _R : α ₁ : α ₂ : S _k :	359.838 m ² 5.8 ° 5.7 ° 0.20 kN/m ²
		Side with α1	μ ₁ : s ₁ :	1.000 0.20 kN/m ²
		Side with α2	μ ₁ : s ₁ :	1.000 0.20 kN/m ²
	Generated total loads	Σ P _{Areas} Σ P	: :	71.604 kN 71.604 kN
	Total moment to the origin	Σ M _{Areas} Σ M	: :	981.034 kNm 981.034 kNm
	Cells selected for generating	Σ number of cells Σ cell area	: :	4 358.020 m ²

LC3: EMPUJE DE TIERRAS

LC3: nieve
Cargas [kN/m²]

Secciones	
1	Planchales 300/300, Hierro
2	HEB 240, Acero S 275
3	PE 240, Acero S 275
4	HEB 300, Acero S 275



LC4

viento y +

3.15 Generated Loads

LC4: viento y +

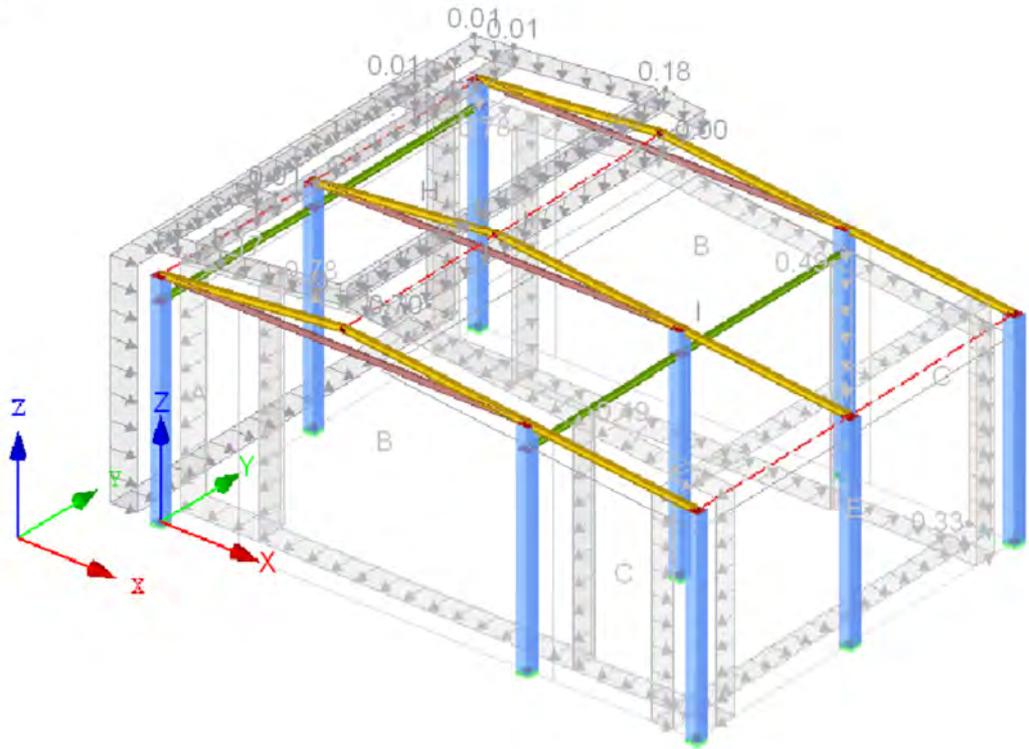
No.	Load Description			
1	From Wind Loads (Building)			
	Velocity pressure	According to Standard	:	CTE DB-SE-AE
		National Annex	:	Spain
		Wind zone	:	A
	Terrain category	:	Category III	
	Structure height	h	:	9.110 m
	Fundamental wind velocity	v _{b,0}	:	26.0 m/s
Base geometry	Node	I	:	13
		J	:	8
		K	:	1
		L	:	6
Roof type and geometry	Type	:	x Duopitch roof	
	Node	A	:	14
		B	:	12
		C	:	9
		D	:	2
		E	:	5
F	:	7		

3.15 Generated Loads

No.	Load Description		
	Generate LC	x LC w+ : LC4 x LC w- : LC5	
	Set wind on side	x C - D	
	Create load type	x Member loads	
	Load distribution type	x Combined	
	Generate wind loads on members No.	: 1-4,6,8-11,13,15,19-25,28-30,32-40	
	Building dimensions	h : 9.110 m b : 16.200 m d : 22.100 m e _{Walls} : 16.200 m e _{Roof} : 16.200 m A _{Walls} : 702.748 m ² A _{Roof} : 359.838 m ² α_1 : 5.7 ° α_2 : 5.8 ° d _A : 3.240 m d _B : 12.960 m d _C : 5.900 m b _F : 4.050 m d _F : 1.620 m d _H : 5.930 m d _I : 12.930 m d _J : 1.620 m Θ : 0.0 °	
	Zone	External pressure coefficient $c_{pe,10}$	External pressure w_e [kN/m ²]
	A	-1.200	-1.17
	B	-0.800	-0.78
	C	-0.500	-0.49
	D	0.722	0.70
	E	-0.343	-0.33
	F	0.015	0.01
	G	0.015	0.01
	H	0.015	0.01
	I	0.000	0.00
	J	0.185	0.18
	Generated total loads	ΣP_{Areas} : 151.385 kN ΣP : 151.362 kN	
	Total moment to the origin	ΣM_{Areas} : 1425.500 kNm ΣM : 1425.050 kNm	
	Cells selected for generating	Σ number of cells : 28 Σ cell area : 1561.627 m ²	

LC4: EMPUJE DE AGUAS

LC4: viento y +
Cargas [kN/m²]



LC5

viento y -

3.15 Generated Loads

LCS: viento y -

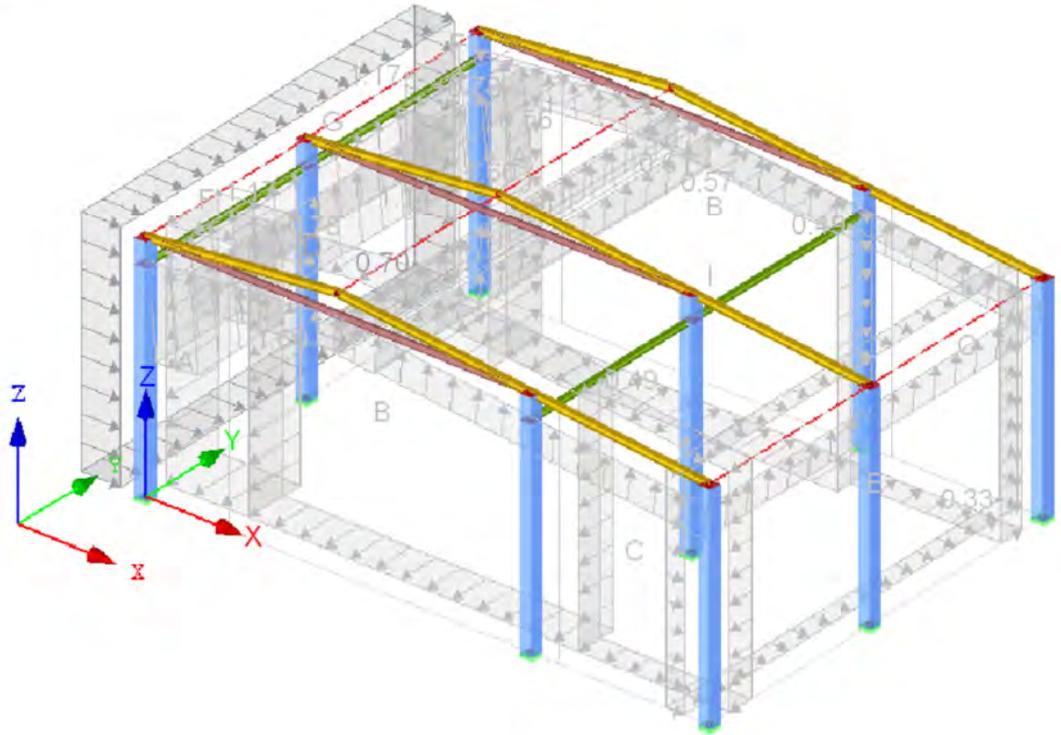
No.	Load Description	
1	From Wind Loads (Building)	
	Velocity pressure	According to Standard : CTE DB-SE-AE National Annex : Spain Wind zone : A Terrain category : Category III Structure height h : 9.110 m Fundamental wind velocity $v_{b,0}$: 26.0 m/s
	Base geometry	Node I : 13 J : 8 K : 1 L : 6
	Roof type and geometry	Type : x Duopitch roof Node A : 14 B : 12 C : 9 D : 2 E : 5 F : 7

3.15 Generated Loads

No.	Load Description		
	Generate LC	x LC w+ : LC4 x LC w- : LC5	
	Set wind on side	x C - D	
	Create load type	x Member loads	
	Load distribution type	x Combined	
	Generate wind loads on members No.	: 1-4,6,8-11,13,15,19-25,28-30,32-40	
	Building dimensions	h : 9.110 m b : 16.200 m d : 22.100 m e _{Walls} : 16.200 m e _{Roof} : 16.200 m A _{Walls} : 702.748 m ² A _{Roof} : 359.838 m ² α_1 : 5.7 ° α_2 : 5.8 ° d _A : 3.240 m d _B : 12.960 m d _C : 5.900 m b _F : 4.050 m d _F : 1.620 m d _H : 5.930 m d _I : 12.930 m d _J : 1.620 m Θ : 0.0 °	
	Zone	External pressure coefficient $c_{pe,10}$	External pressure w_e [kN/m ²]
	A	-1.200	-1.17
	B	-0.800	-0.78
	C	-0.500	-0.49
	D	0.722	0.70
	E	-0.343	-0.33
	F	-1.640	-1.60
	G	-1.170	-1.14
	H	-0.578	-0.56
	I	-0.585	-0.57
	J	-0.631	-0.61
	Generated total loads	ΣP_{Areas} : 274.340 kN ΣP : 274.299 kN	
	Total moment to the origin	ΣM_{Areas} : 2711.850 kNm ΣM : 2711.950 kNm	
	Cells selected for generating	Σ number of cells : 28 Σ cell area : 1561.627 m ²	

LC5: EQUIPOS MECÁNICOS

LC5: viento y -
Cargas [kN/m²]



LC6
viento x +

3.15 Generated Loads

LC6: viento x +

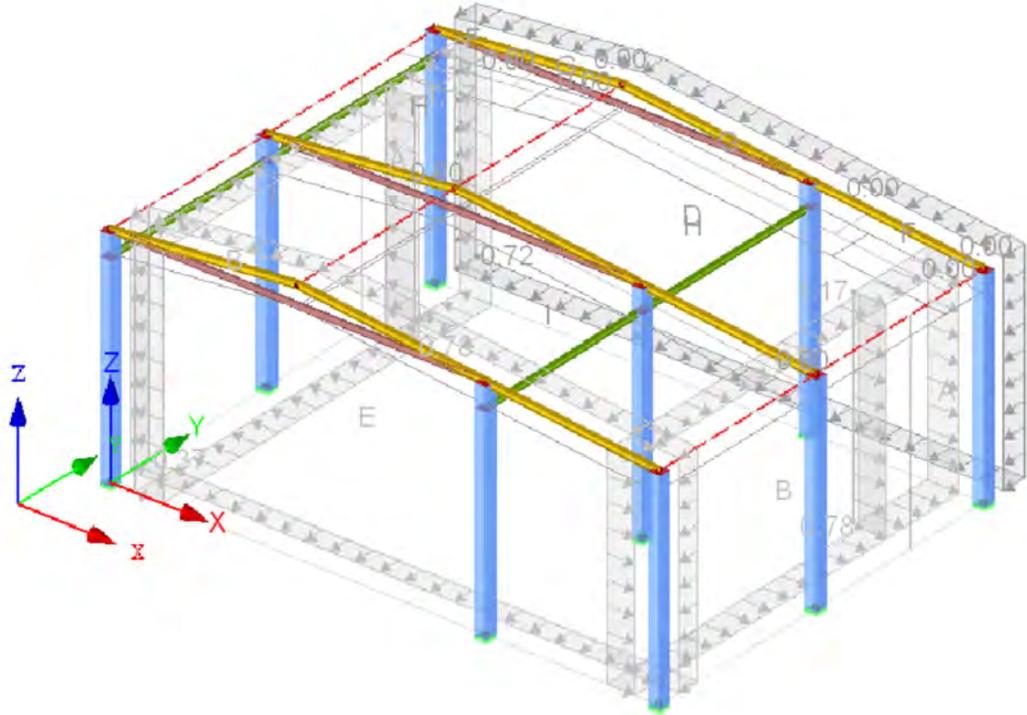
No.	Load Description	
1	From Wind Loads (Building)	
	Velocity pressure	According to Standard : CTE DB-SE-AE National Annex : Spain Wind zone : A Terrain category : Category III Structure height h : 9.110 m Fundamental wind velocity $v_{b,0}$: 26.0 m/s
	Base geometry	Node I : 13 J : 8 K : 1 L : 6
	Roof type and geometry	Type : x Duopitch roof Node A : 14 B : 12 C : 9 D : 2 E : 5 F : 7

3.15 Generated Loads

No.	Load Description																																																																					
	Generate LC	x LC w+ : LC6 x LC w- : LC7																																																																				
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LC6: NIEVE

LC6: viento x +
Cargas [kN/m²]



LC7

viento x -

3.15 Generated Loads

LC7: viento x -

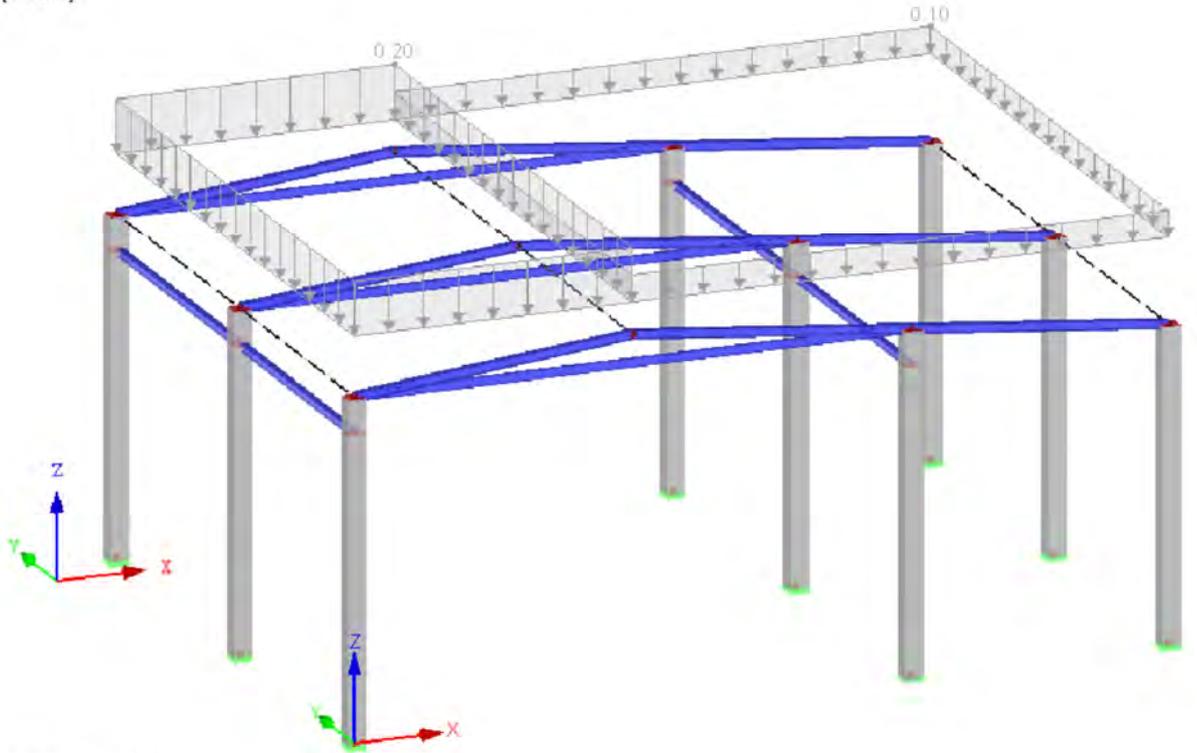
No.	Load Description	
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	Generated total loads	Σ P _{Areas} : 341.514 kN Σ P : 341.506 kN																														
	Total moment to the origin	Σ M _{Areas} : 5063.610 kNm Σ M : 5063.490 kNm																														
	Cells selected for generating	Σ number of cells : 35 Σ cell area : 1823.051 m ²																														

LC8: nieve 2

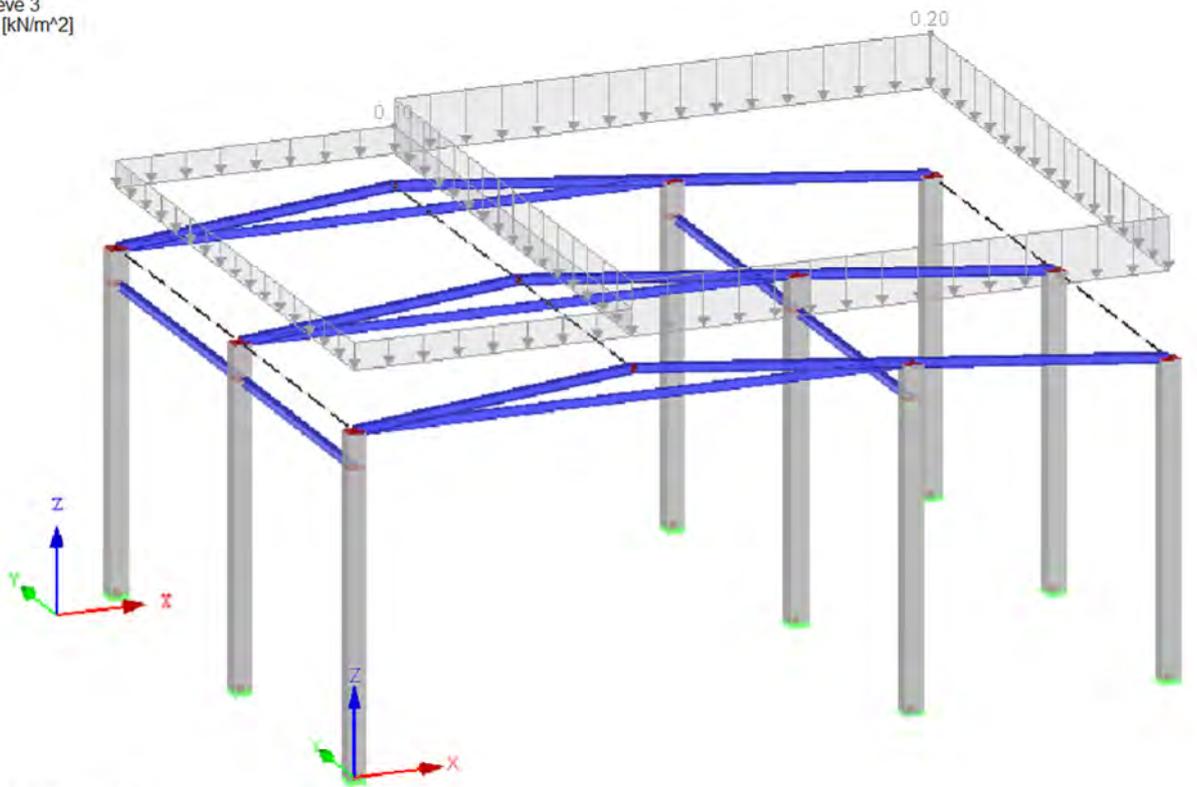
LC8: nieve 2
Cargas [kN/m²]



Máx. u: 2.3, Mín. u: 0.0 mm

LC9: nieve 3

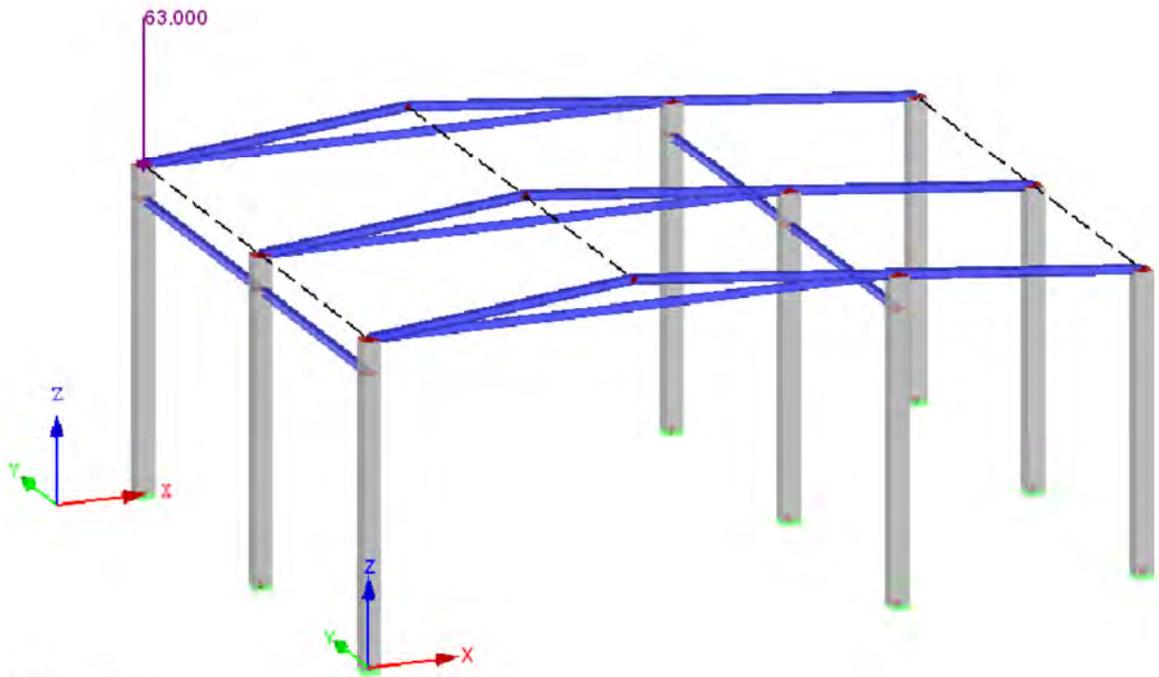
LC9: nieve 3
Cargas [kN/m²]



Máx. u: 2.3, Mín. u: 0.0 mm

LC10: puente grúa

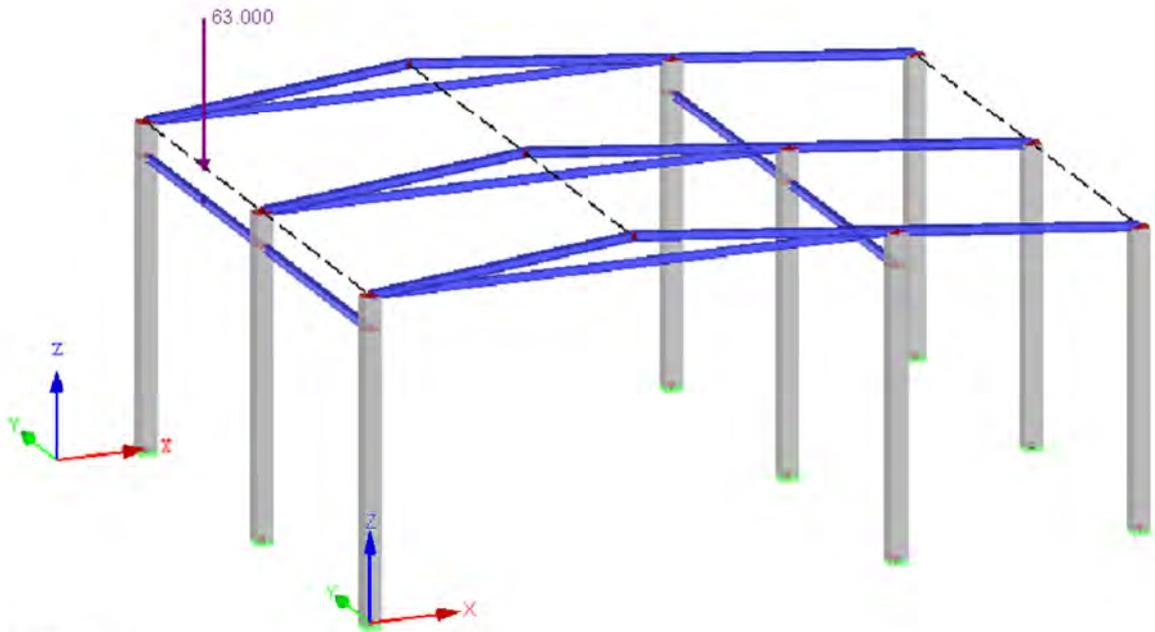
LC10: puente grúa
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC11: puente grúa 2

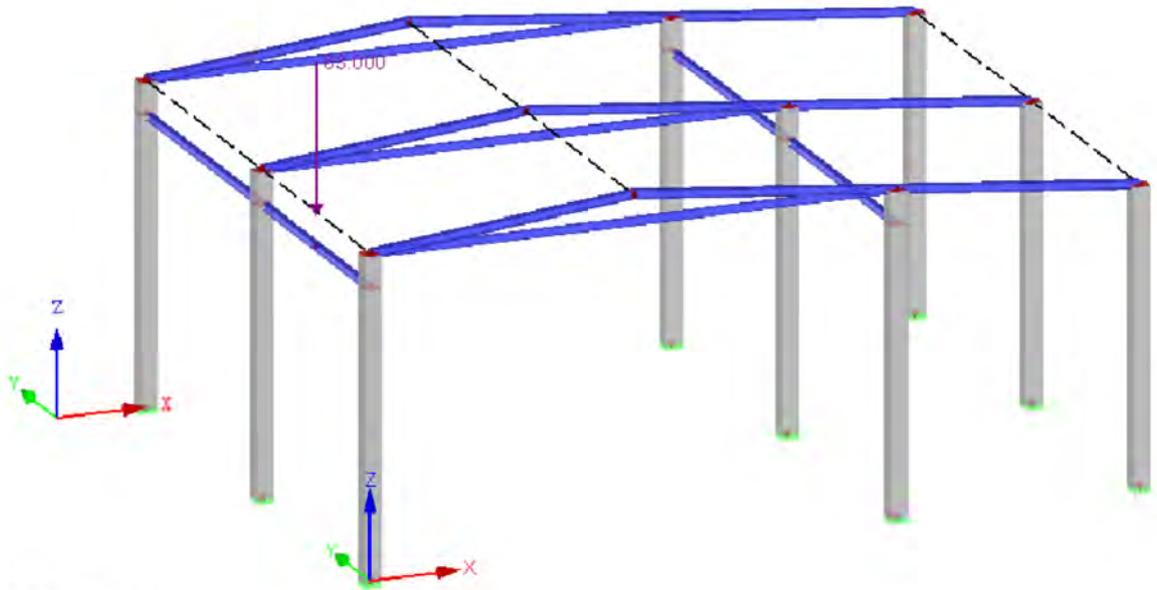
LC11: puente grua 2
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC12: puente grua 3

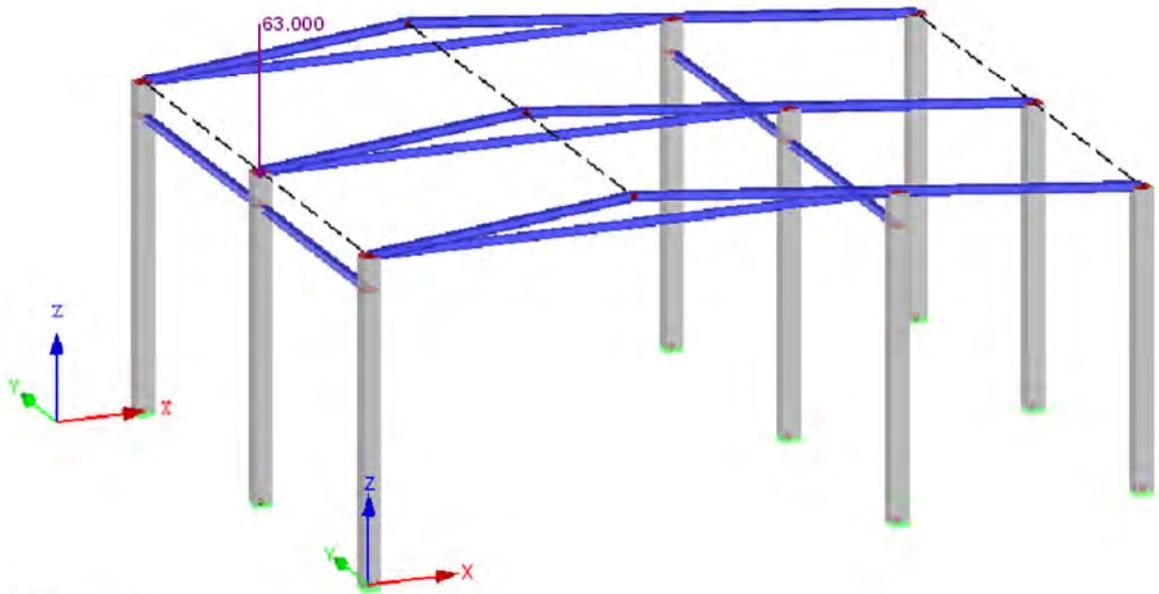
LC12: puente grúa 3
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC13: puente grúa 4

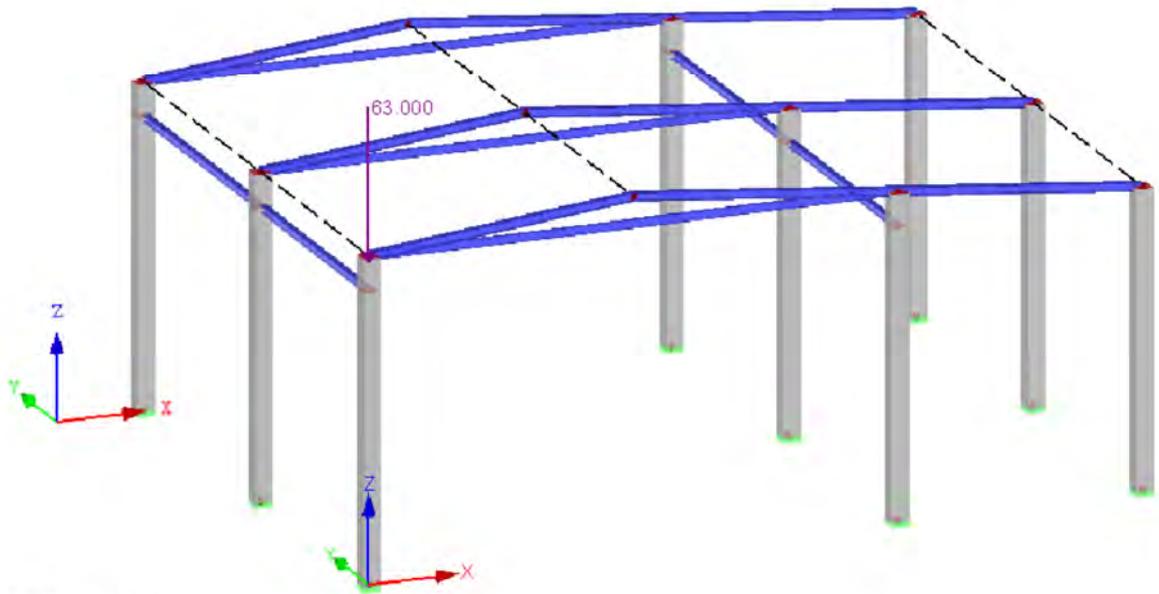
LC13: puente grua 4
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC14: puente grua 5

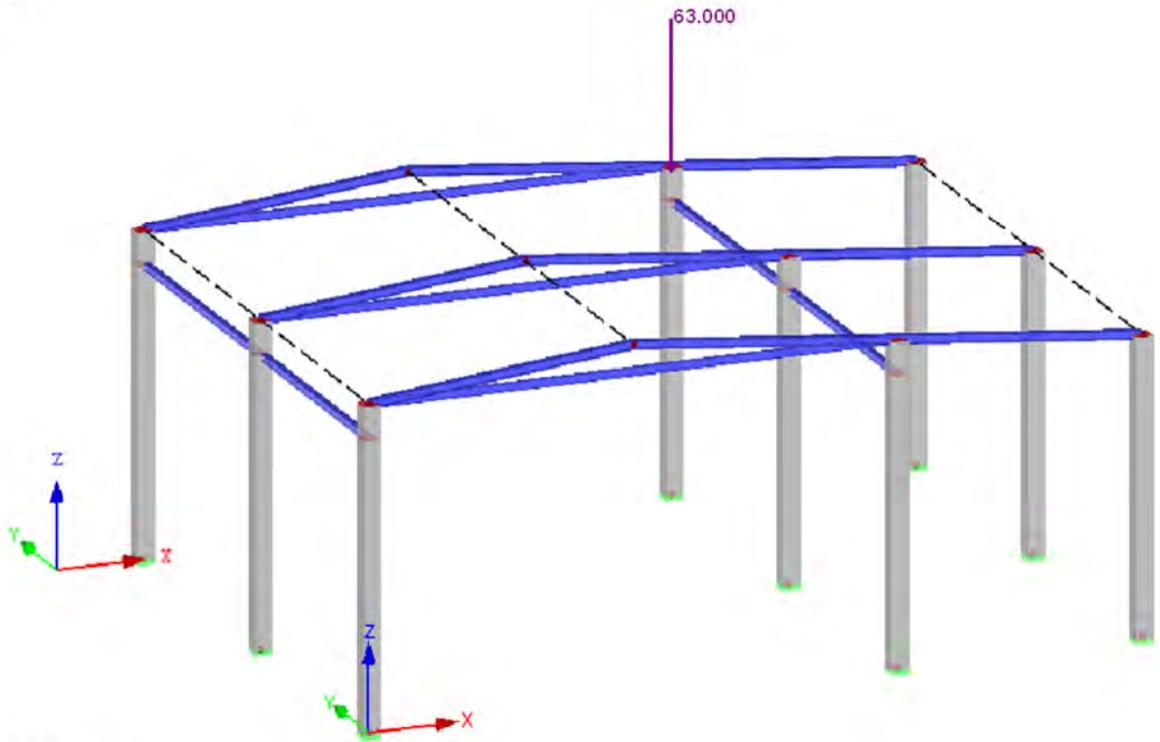
LC14: puente grua 5
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC15: puente grua 6

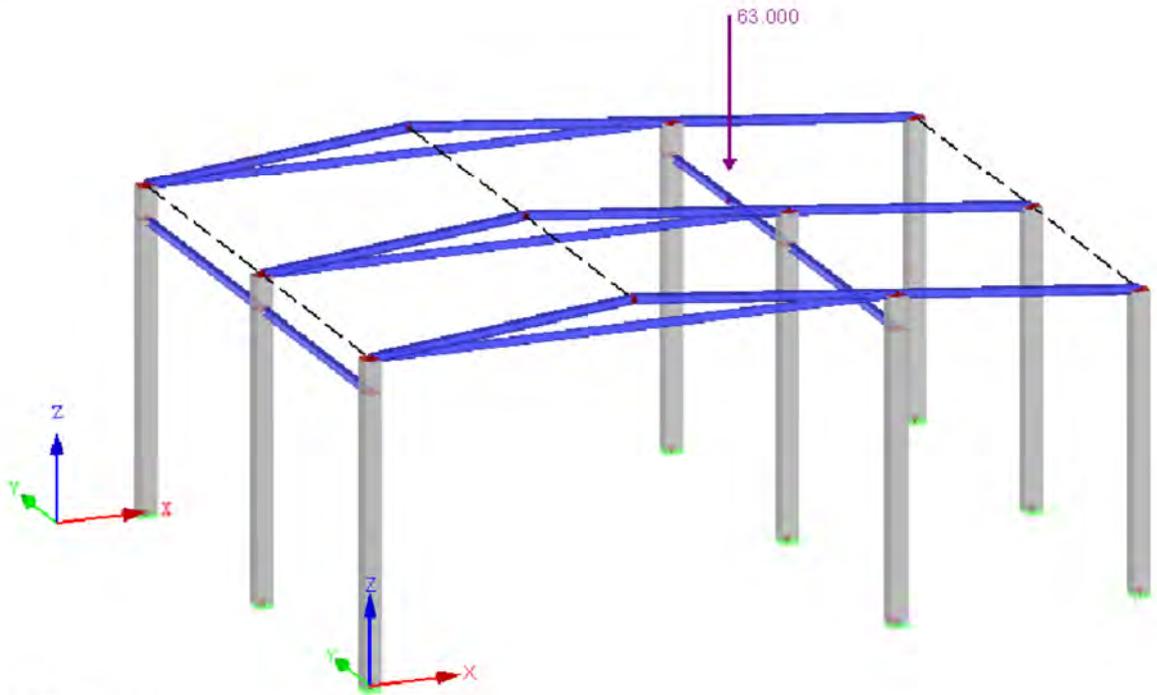
LC15: puente grúa 6
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC16: puente grúa 7

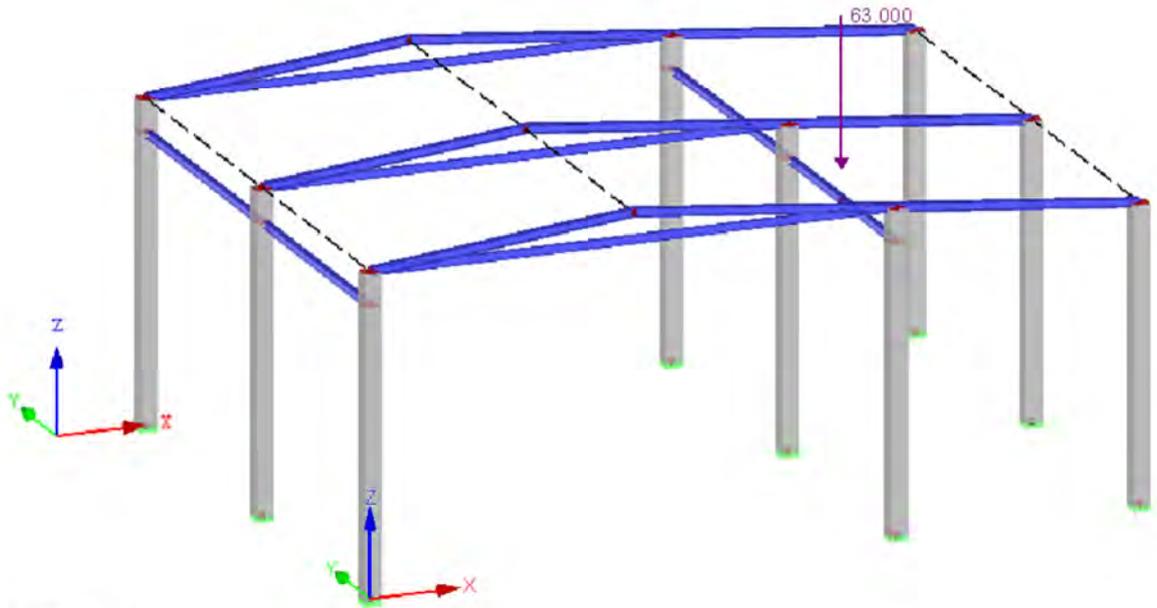
LC16: puente grua 7
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC17: puente grua 8

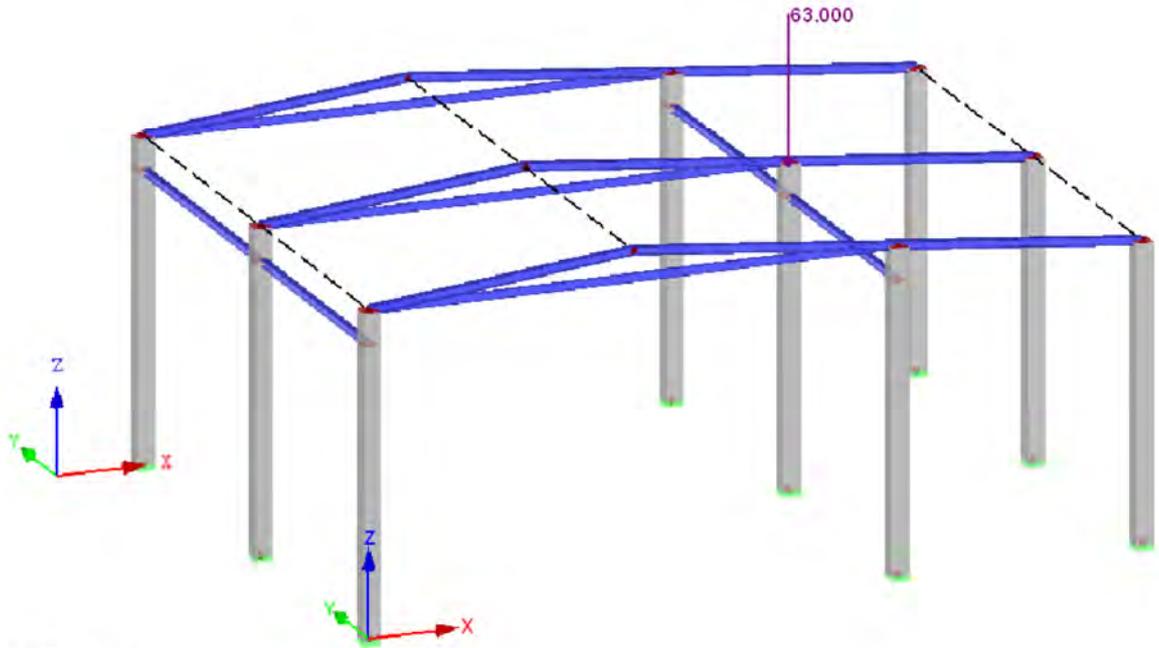
LC17: puente grua 8
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC18: puente grua 9

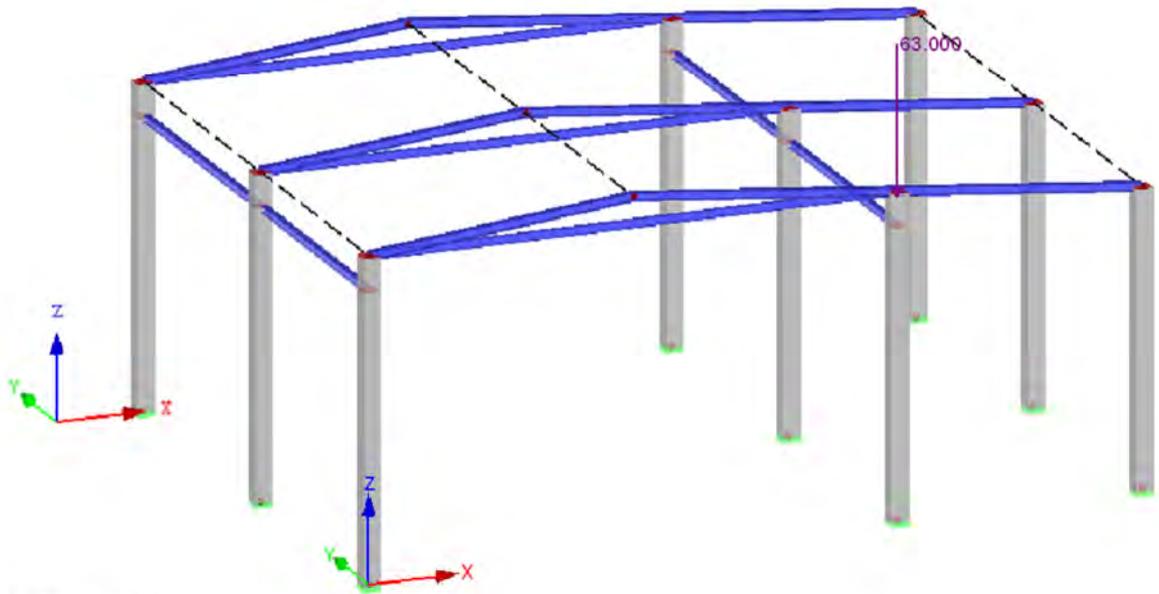
LC18: puente grua 9
Cargas [kN]



Máx. u: 2.3, Mín. u: 0.0 mm

LC19: puente grua 10

LC19: puente grúa 10
Cargas [kN]

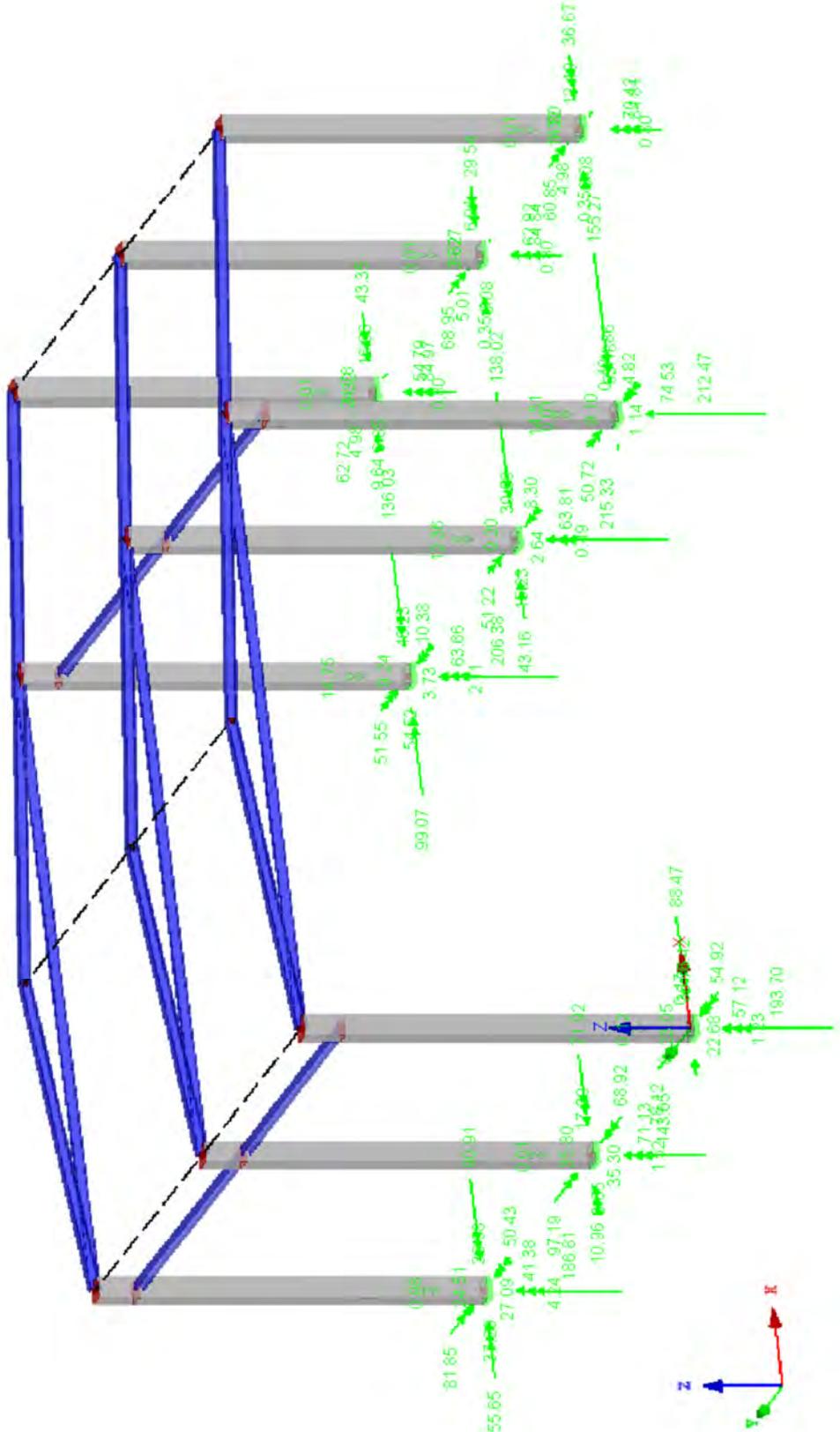


Máx. u: 2.3, Mín. u: 0.0 mm

Reacciones en apoyos

Isometric

RC1: ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10
 Reacciones en apoyos [kN], [kNm]
 Combinaciones de resultados: Valores máx. y mín.



Max P-X: 35.80, Min P-X: -35.30 kN
 Max P-Y: 54.52, Min P-Y: -53.18 kN
 Max P-Z: -41.38, Min P-Z: -215.33 kN
 Max M-X: 455.07, Min M-X: 00.00 kNm
 Max M-Y: 114.75, Min M-Y: 00.00 kNm
 Max M-Z: 206.38, Min M-Z: 00.00 kNm

RF-FOUNDATION Pro

CA1 - Cálculo de
cimentaciones
Foundation No. 1

1.1 General Data

Design according to Standard:	UNE EN 1992-1-1/NA:2013 + UNE EN 1997-1:2010
Design approach:	Approach 2
Foundation at nodes:	All
Type of foundation:	Bucket foundation with smooth bucket sides
Allowable soil pressure:	Defined
σ_{Rk} :	210.00 kN/m ²
Consider	
Consider passive soil pressure:	-

1.1.1 Details

Foundation plate:	x Minimum Reinforcement According to 9.2.1.1 - Without Bending Reinforcement
To design:	x 2.2.1 Equilibrium Limit State (EC 7, 2.4.7.2) x 2.2.2 Uplift Limit State (EC 7, 2.4.7.4) x 2.2.3 Ground Failure (EC 7, 6.5.2) x 2.2.4 Loads with Large Eccentricities (EC 7, 6.5.4) x 2.2.6 Sliding (EC 7, 6.5.3) x 2.2.9 Punching (EC 2, 6.4)
Loads in Window 1.4:	- Equal for all foundations x Apply the same loads for (STR) and (GEO)
Location of design section:	Through column edge
Punching:	Iterated punching cone with expectant critical section within foundation plate
Distance from the edge of the column to the critical section:	1.00*d
Parameter β estimated according:	6.4.3(3) - Full plastic shear distribution
Factor for the consideration of the relieving soil stress inside the control perimeter - k_{red} :	1.00
Horizontal shape of links in bucket wall:	Links enclosing the column

1.1.2 Soil Parameters

Soil parameters:	
Subsoil relationships:	Drained conditions
Profile ground elevation P.G.E.	0.000 m
Profile grade line P.G.L.	0.000 m
Angle of soil friction $\delta_{s,d}$:	ϕ_d , Cast-in-situ concrete foundation
Rock beneath the last layer	-

Original Soil Profile

Soil No.	Soil Description	Thickness Δt [m]	Ordinate BL ΔZ [m]	Coordinate Z [m]	Comment
1	Arena pobremente graduada (SP)	0.000	0.000	0.000	Recubrimiento de tierras
2	Grava limosa (GM)	10.000	10.000	10.000	

Original Soil Profile Data

Soil No.	Main Properties				Additional Properties						
	E	G	v	γ	m	γ_{sat}	E_{def}	φ_k	c'_k	c_{uk}	K_{ph}
	[MN/m ²]	[MN/m ²]	[-]	[kN/m ³]	[-]	[kN/m ³]	[MN/m ²]	[°]	[MN/m ²]	[MN/m ²]	[-]
1	20.000	7.800	0.280	18.00	0.200	20.00	20.000	33.00	0.000	0.000	10.647
2	60.000	25.000	0.200	20.00	0.300	20.50	60.000	28.00	0.015	0.020	7.018

Description of used soil parameters

Var.	Description	Var.	Description
E	Modulus of Elasticity	E_{def}	Modulus of Deformation
G	Shear Modulus	φ_k	Angle of Inter. Friction
v	Poisson's Ratio	c'_k	Cohesion
γ	Specific Weight	c_{uk}	Total Cohesion
m	Coefficient (creep correction)	K_{ph}	Earth Resistance Coefficient

1.2 Geometry

Column			
Dimension in x-Direction	c_x	0.50	m
Dimension in y-Direction	c_y	0.50	m
Centric Alignment			
Foundation Plate			
Rate		x	
Bucket			
Rate		-	
Bucket Height	h	120.00	cm
Embedment Depth of Column	d	120.00	cm
x-Direction			
Bucket Wall Thickness Top	t_t	25.00	cm
Column Allowance Top	a_o	10.00	cm
Bucket Wall Thickness Bottom	t_b	30.00	cm
Column Allowance Bottom	a_b	5.00	cm
Bucket Inclination Inside	α	87.61	°
y-Direction			
Bucket Wall Thickness Top	t_t	25.00	cm
Column Allowance Top	a_o	10.00	cm
Bucket Wall Thickness Bottom	t_b	30.00	cm
Column Allowance Bottom	a_b	5.00	cm
Bucket Inclination Inside	α	87.61	°

1.3 Material

Concrete and Reinforcement			
Concrete grade of foundation plate:			Concrete C25/30
Concrete grade of bucket:			Concrete C25/30
Steel grade of rebars:			B 500 S (C)
Partial Factors			
for concrete γ_c :			PT 1.50, AC 1.30
for reinforcement γ_s :			PT 1.15, AC 1.00
Reduction Factor			
for compression α_{cc} :			PT 1.00, AC 1.00
for tension α_{ct} :			PT 1.00, AC 1.00
Designated Concrete Cover			
nom c_k			3.00 cm
nom c_{top}			3.00 cm

1.3 Material

nom C _{bottom}			3.00	cm
nom C _{sides}			3.00	cm
nom d _{column}			3.00	cm
Keep minimum concrete cover acc. to Standard				
Available reinforcing steel mats				
Standard mats:			Germany - 2008-01-01	
			Q257A, Q335A, Q424A, Q524A	
Available diameters [mm]:			16.0, 20.0	
Mandrel Diameter				
For bars:				
d _{md,Ø≤16} :			4.00	Ø
d _{md,Ø>16} :			7.00	Ø
For horizontal bucket links:				
d _{md,Lh} :			10.00	Ø
For mesh:				
d _{md,mesh} :			20.00	Ø

1.3.1 Material Parameters

Description	Name	Size	Unit
Concrete Strength Class: Concrete C25/30			
Specific Weight	γ	25.00	kN/m ³
Characteristic Cylinder Compressive Strength	f _{ck}	25.00	N/mm ²
Mean Axial Tensile Strength	f _{ctm}	2.60	N/mm ²
5% Fractile of Axial Tensile Strength	f _{ctk0,05}	1.80	N/mm ²
Parabola Exponent	n	2.000	-
Ultimate Strain for Pure Compression	ϵ_{c2}	-2.000	%
Ultimate Strain at Failure	ϵ_{c2u}	-3.500	%
Ultimate Strain for Pure Compression	ϵ_{c3}	-1.750	%
Ultimate Strain at Failure	ϵ_{c3u}	-3.500	%
Reinforcing Steel: B 500 S (C)			
Modulus of Elasticity	E _s	200000.00	N/mm ²
Characteristic Yield Strength	f _{yk}	500.00	N/mm ²
Characteristic Tensile Strength	f _{tk}	575.00	N/mm ²
Ultimate Strain	ϵ_{uk}	0.075	-

1.4 Loading

STRUCTURAL (STR) AND GEOTECHNICAL (GEO)			
Result combination for design:	RC1	ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10	Persistent and Transient
UPLIFT (UPL)			
Result combination for design:	RC1	ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10	Persistent and Transient
STATIC EQUILIBRIUM (EQU)			
Result combination for design:	RC1	ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10	Persistent and Transient
CHARACTERISTIC VALUES			
Result combination for design:	RC1	ELU (STR/GEO) - Permanente / transitoria - Ec. 6.10	

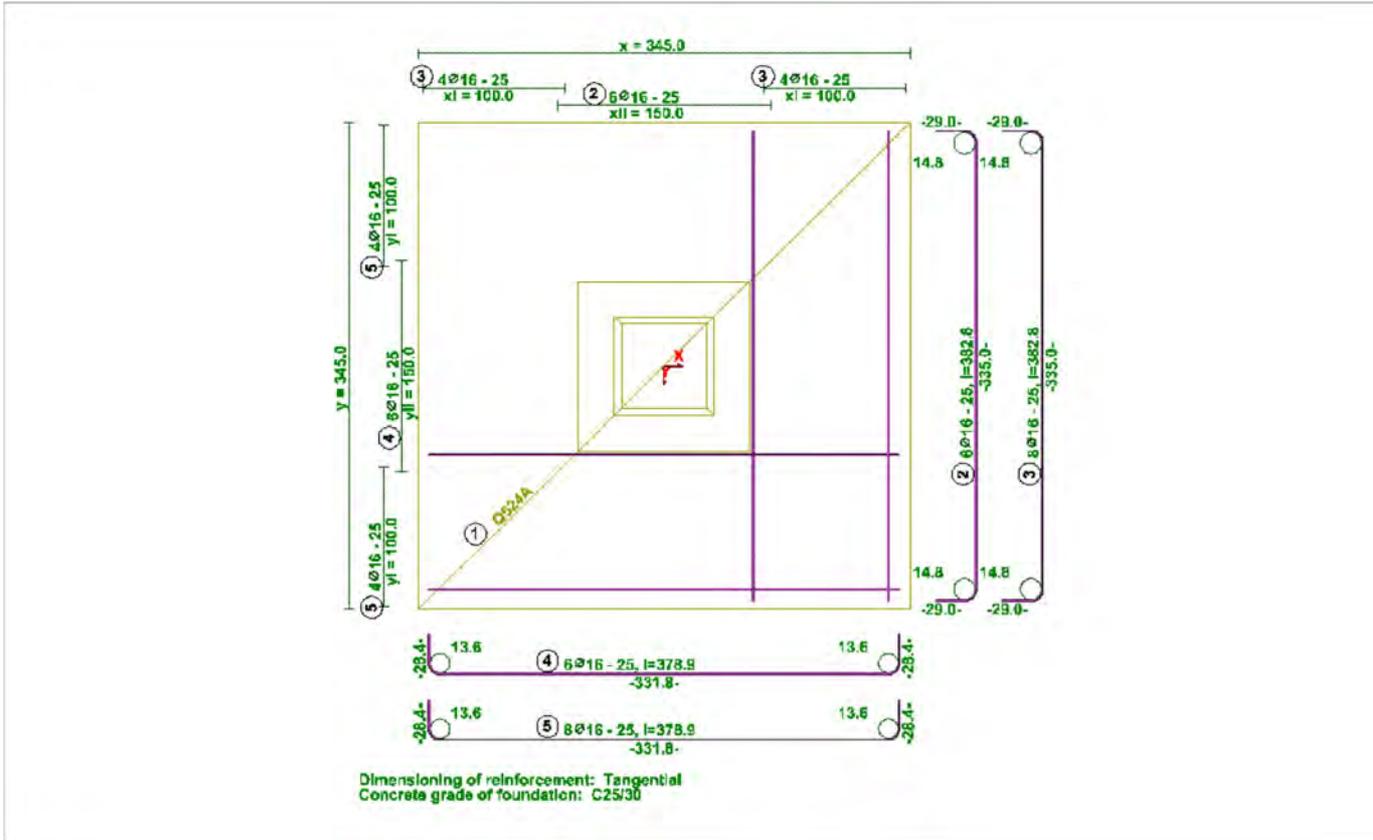
Additional Loads

Earth Covering	c	95.00	cm
	γ	20.00	kN/m ³

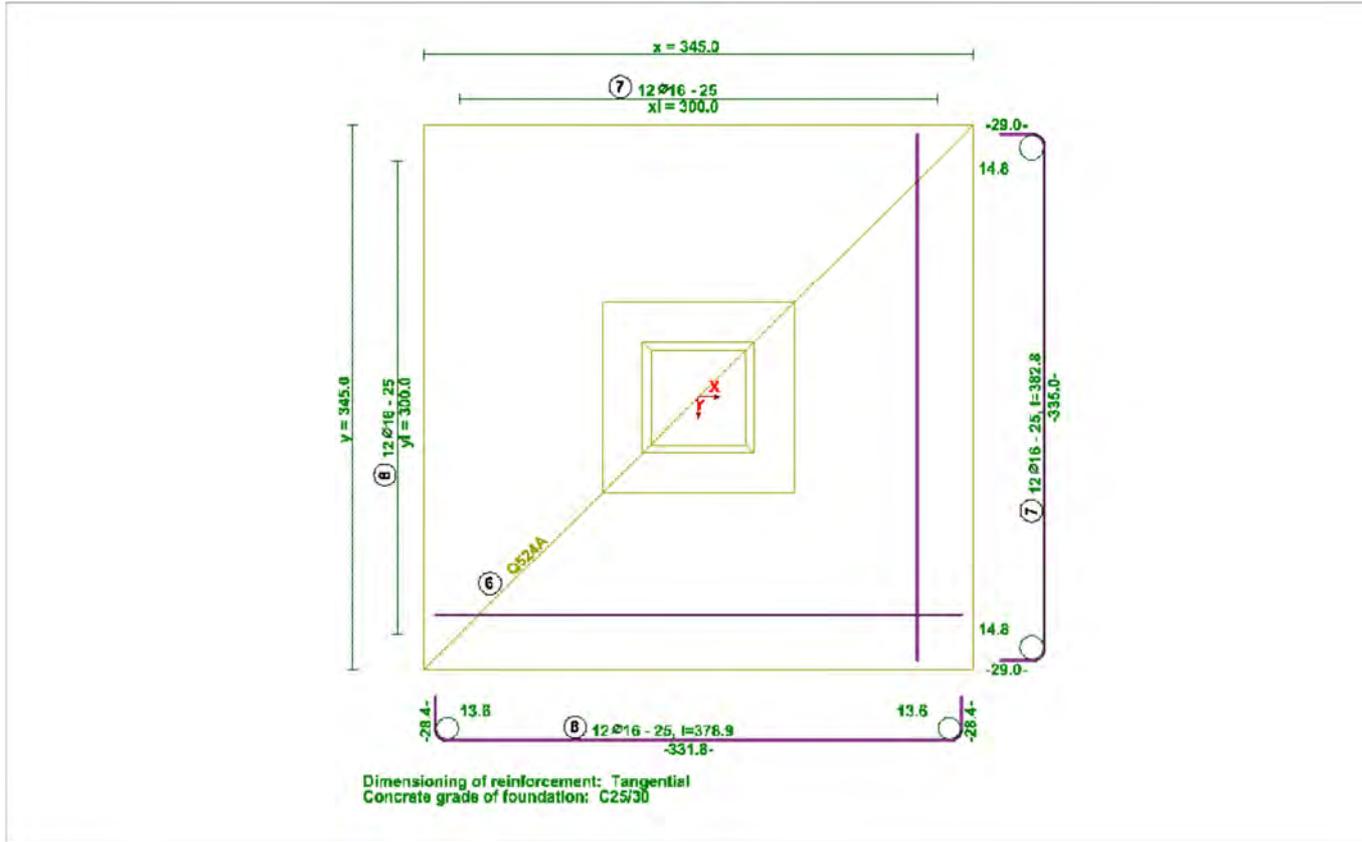
2.1 Geometry

Description	Symbol	Value	Unit	Message
Column				
Dimension in x-Direction	c_x	0.500	m	
Dimension in y-Direction	c_y	0.500	m	
Foundation plate				
Dimension in x-Direction	x	3.450	m	
Dimension in y-Direction	y	3.450	m	
Plate Thickness	t	1.060	m	
Bucket				
Bucket Height	h	1.200	m	
Column Embedment Depth	d	1.200	m	
Dimension in x-Direction				
Total Bucket Dimension	d_{tx}	1.200	m	
Bucket Wall Thickness Top	t_{tx}	0.250	m	
Column Allowance Top	a_{tx}	0.100	m	
Bucket Wall Thickness Bottom	t_{bx}	0.300	m	
Column Allowance Bottom	a_{bx}	0.050	m	
Bucket Inclination Inside	α_x	87.61	°	
Dimension in y-Direction				
Total Bucket Dimension	d_{ty}	1.200	m	
Bucket Wall Thickness Top	t_{ty}	0.250	m	
Column Allowance Top	a_{ty}	0.100	m	
Bucket Wall Thickness Bottom	t_{by}	0.300	m	
Column Allowance Bottom	a_{by}	0.050	m	
Bucket Inclination Inside	α_y	87.61	°	
Earth Covering				
Height of Earth Covering	c	1.200	m	

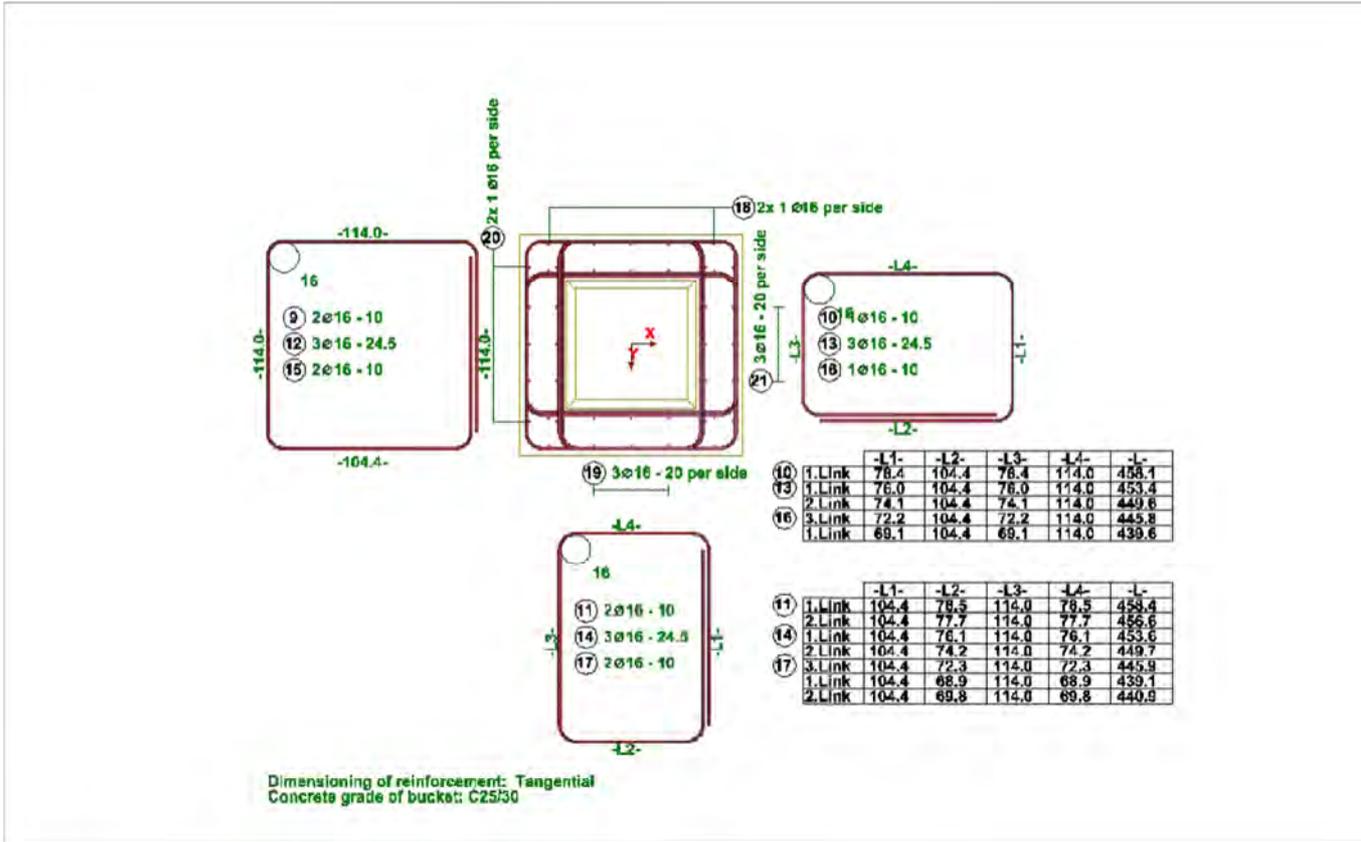
A-A: Top view of bottom plate reinforcement



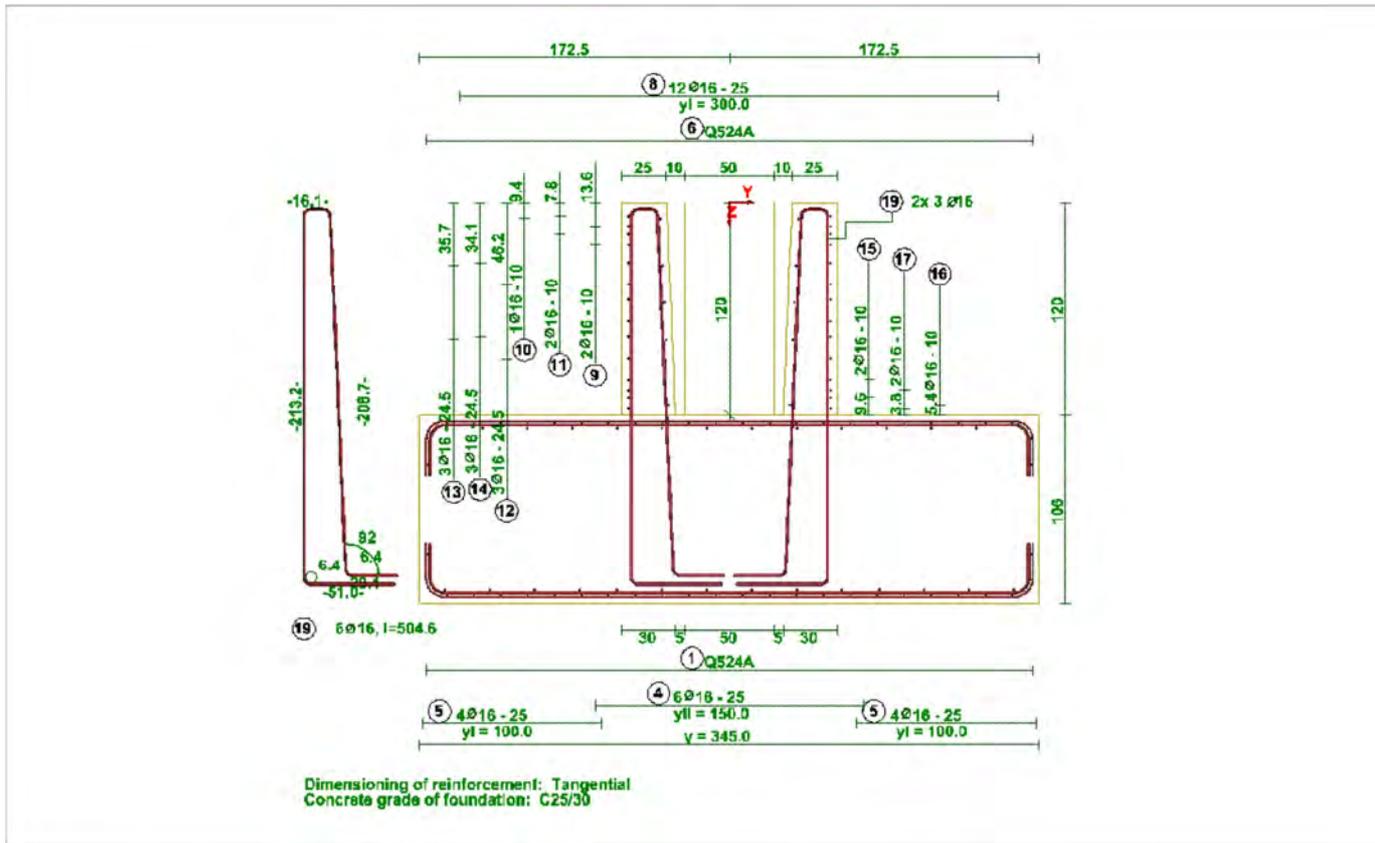
B-B: Top view of top plate reinforcement



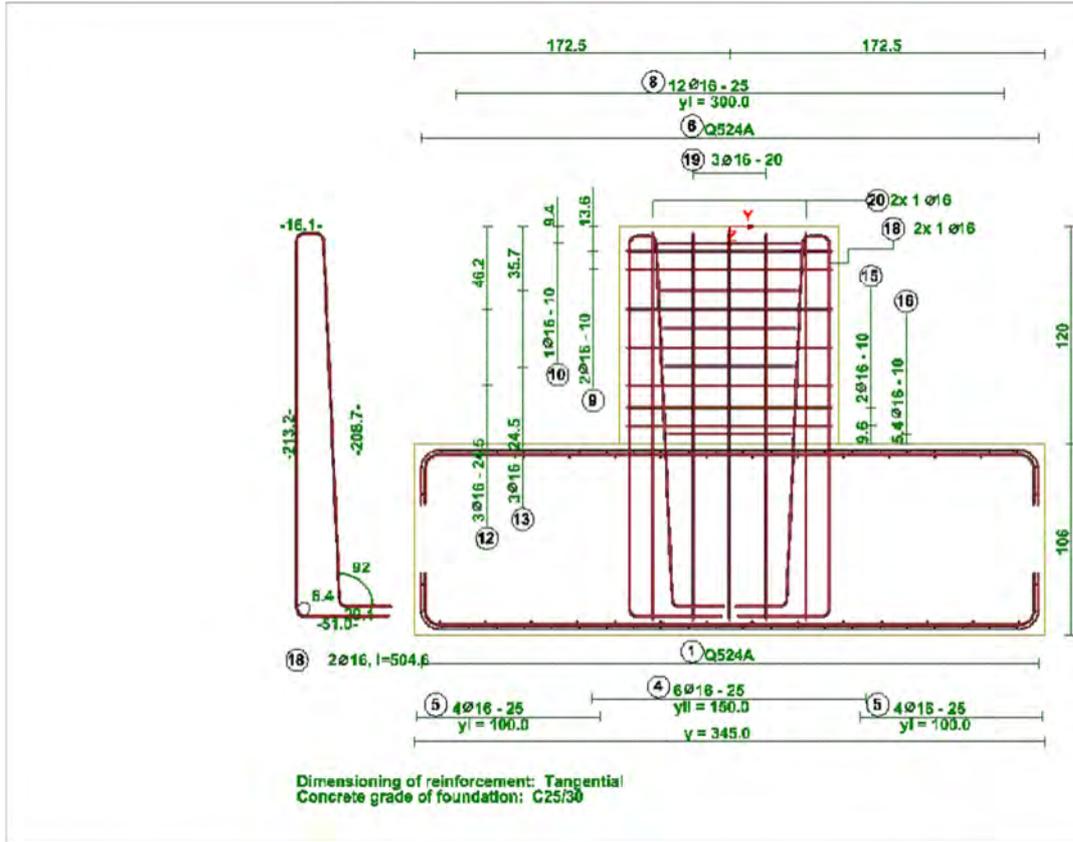
C-C: Top view of bucket reinforcement



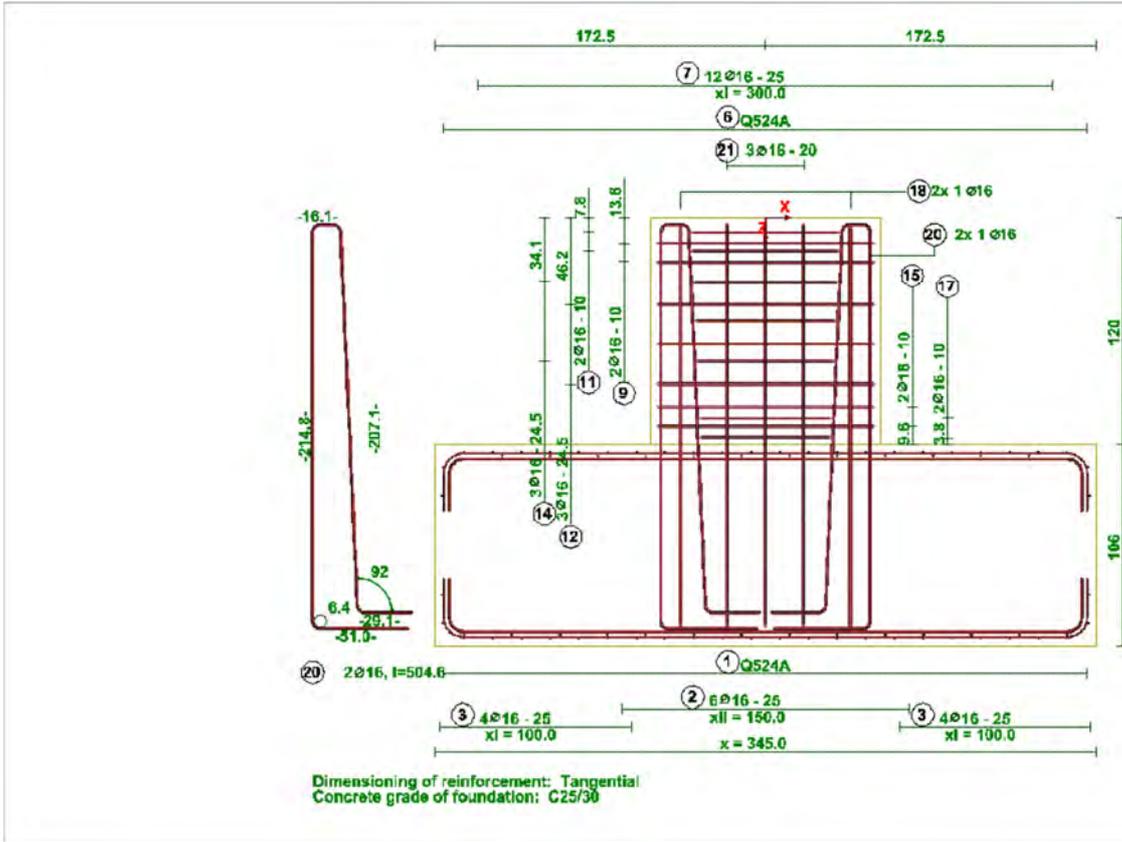
D-D: Section through column, view in x-direction



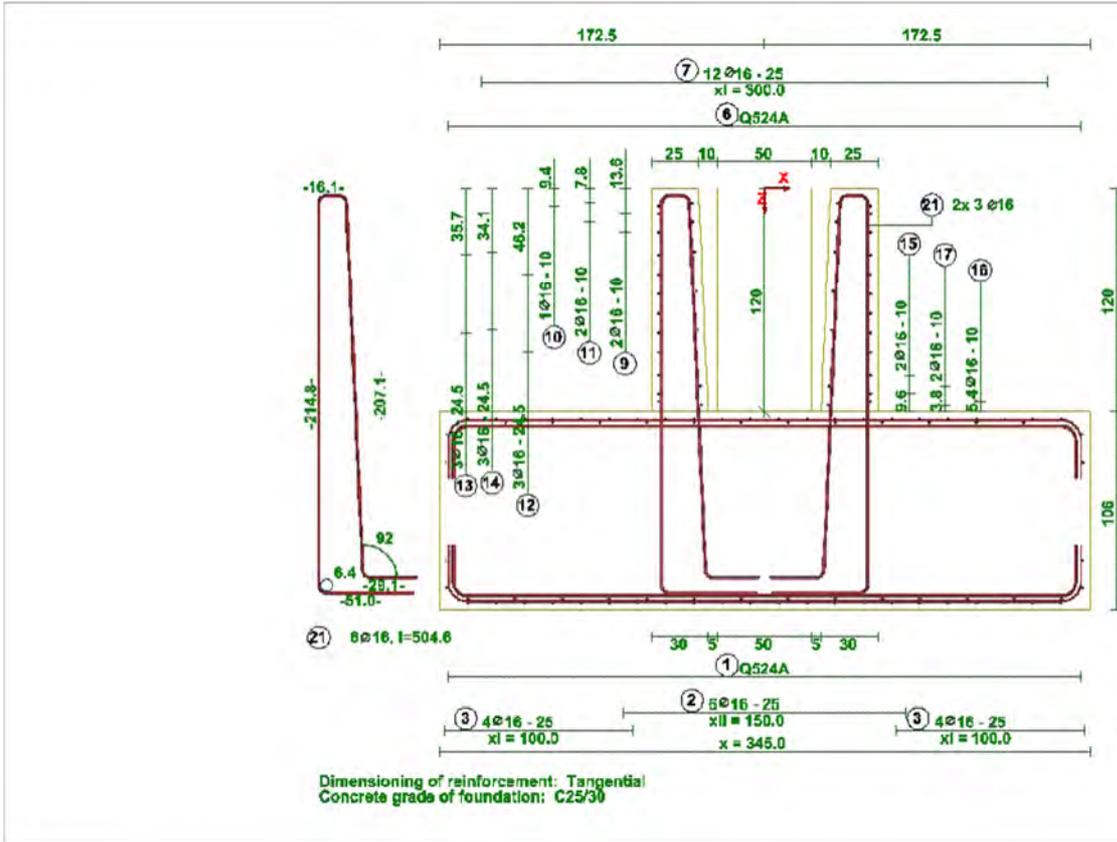
E-E: Section through bucket wall, view in x-direction



G-G: Section through bucket wall, view in y-direction



F-F: Section through column, view in y-direction



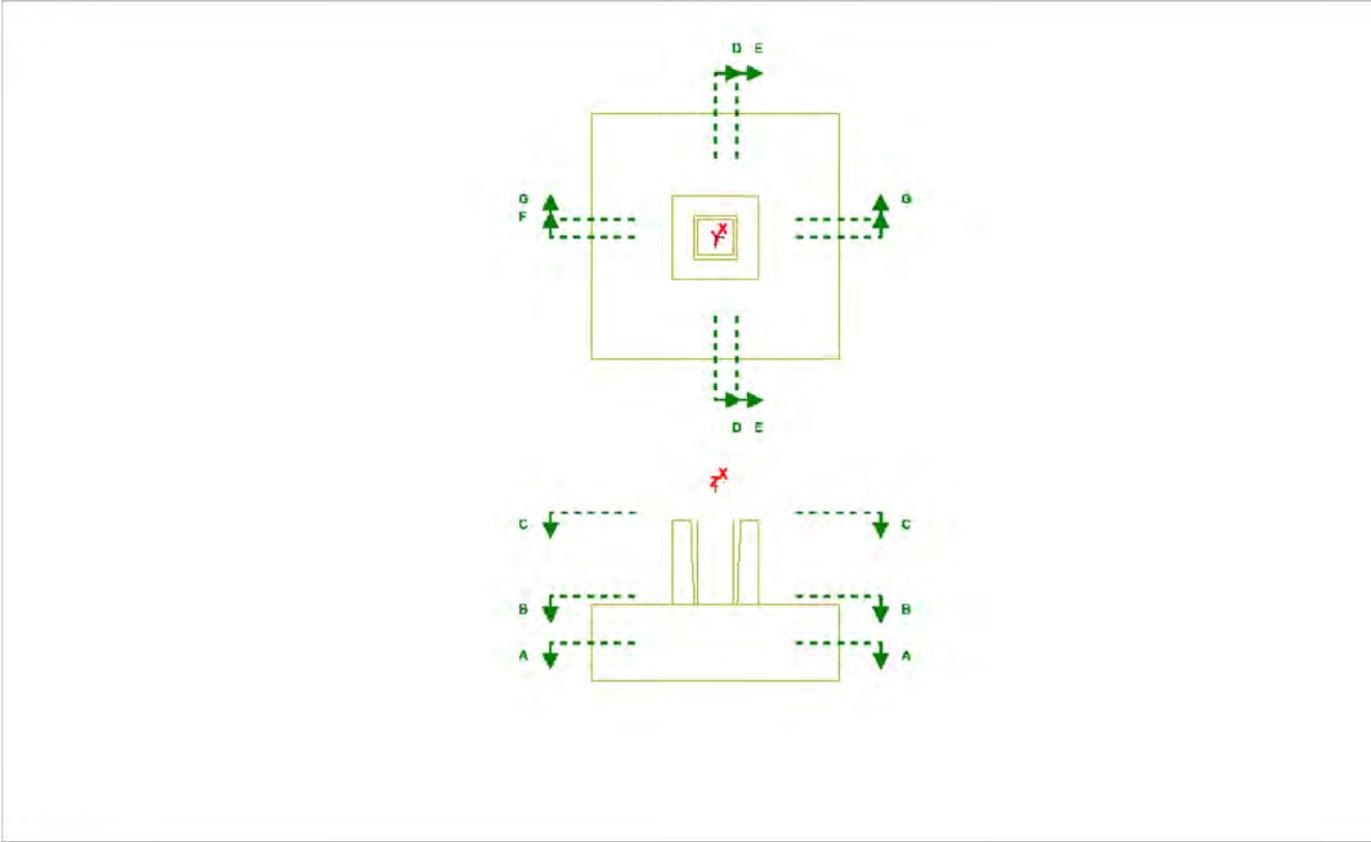
Steel Schedule

General						
Foundation No.: 1				Reinforcement steel: B 500 S (C)		
At nodes: 1,3,4,6,8,10,13,20,23						
Number of foundations: 9						
Description:						
Reinforcing Steel Mats Bottom and Top						
Position No.	Main Reinforcement Direction	Type of Mat	Weight [kg/m ²]	Area Without Lap [m ²]	Weight Per Foundation [kg]	Total Weight [kg]
1	y-Direction	Q524A	7.31	14.42	105.44	948.98
8	y-Direction	Q524A	7.31	14.42	105.44	948.98
Additional Rebar and Bucket Reinforcement						
Position No.	Number per Foundation	Total Number	∅ [mm]	Section Length [cm]	Total Length [m]	
					∅16	∅20
2	8	54	16	382.8	208.69	
3	8	72	16	382.8	275.59	
4	6	54	16	378.9	204.59	
5	8	72	16	378.9	272.79	
7	12	108	16	382.8	413.38	
8	12	108	16	378.9	408.19	
9	2	18	16	529.3	95.27	
10	1	9	16	458.1	41.23	
11	2	18	16	458.4	82.51	
12	3	27	16	529.3	142.91	
13	3	27	16	448.6	121.38	
14	3	27	16	448.7	121.43	
15	2	18	16	529.3	95.27	
16	1	9	16	435.6	39.58	
17	2	18	16	438.1	79.05	
18	4	36	16	501.4	180.5	
19	5	54	16	504.6	272.47	
20	4	36	16	504.8	181.85	
21	5	54	16	504.6	272.47	
Date:				running m	3507.93	
				kg/run. m	1.58	2.47
To plan No.:				kg	5538.69	
				Total Weight:	5536.69+1897.96 (Standard Mats) = 7434.65	

Concrete Cubage

Foundation No.: 1		Concrete grade of foundation: Hormigón C25/30	
At nodes: 1,3,4,6,8,10,13,20,23		Concrete grade of bucket: Hormigón C25/30	
Number of foundations: 9			
Description:			
	Volume Per Foundation [m ³]	Volume of all Foundations [m ³]	
Foundation plate	12.62	113.55	
Bucket	1.22	10.98	
Backfill Concrete	0.21	1.87	

Legend - Scheme of Sections



2.2.1 Equilibrium Limit State (EC 7, 2.4.7.2)

Node No.	LC CO	Design Criterion	Comment on Design
10	RC1:max M-X	0.231	
Design Value of Support Forces and Moments			
At Node	No.	10	
Load Case	LC	RC1:max M-X	
Design Situation	DS	PT	
Vertical Force	$P_{z,d}$	64.59 kN	
Horizontal Force in x-Direction	$P_{x,d}$	-3.73 kN	
Horizontal Force in y-Direction	$P_{y,d}$	48.05 kN	
Moment About x-Axis	$M_{x,d}$	136.03 kNm	
Moment About y-Axis	$M_{y,d}$	10.37 kNm	
Verification			
Stabilizing moment	$M_{stb,2}$	1058.00 kNm	
Destabilizing moment	$M_{dst,2}$	244.61 kNm	
Edge No. 2	Criterion ₂	0.231	

2.2.2 Uplift Limit State (EC 7, 2.4.7.4)

Node No.	LC CO	Design Criterion	Comment on Design
1	RC1:max P-X	0.000	
Design Value of Support Forces and Moments			
At Node	No.	1	
Load Case	LC	RC1:max P-X	
Design Situation	DS	PT	
Vertical Force	$P_{z,d}$	57.12 kN	

2.2.2 Uplift Limit State (EC 7, 2.4.7.4)

Node No.	LC CO	Design Criterion	Comment on Design	
			Horizontal Force in x-Direction	$P_{x,d}$ 23.05 kN
			Horizontal Force in y-Direction	$P_{y,d}$ 32.53 kN
			Moment About x-Axis	$M_{x,d}$ 42.15 kNm
			Moment About y-Axis	$M_{y,d}$ -78.05 kNm
			Verification	
			Design Value of Effective Pressure Vertical Force of Foundation Level	$V_{res,pos}$ 605.86 kN
			Design Value of Effective Pressure Vertical Force of Uplift	$V_{res,neg}$ 0.00 kN
			Design Criterion	Criterion 0.000

2.2.3 Ground Failure (EC 7, 6.5.2)

Node No.	LC CO	Design Criterion	Comment on Design	
10	RC1:max P-Y	0.990	Design Value of Support Forces and Moments	
			At Node	No. 10
			Load Case	LC RC1:max P-Y
			Design Situation	DS PT
			Vertical Force	$P_{z,d}$ 156.51 kN
			Horizontal Force in x-Direction	$P_{x,d}$ 9.21 kN
			Horizontal Force in y-Direction	$P_{y,d}$ -54.52 kN
			Moment About x-Axis	$M_{x,d}$ -99.07 kNm
			Moment About y-Axis	$M_{y,d}$ -51.51 kNm
			Verification	
			Design Value of Ground Failure Action	V'_d/A' 0.099 MN/m ²
			Design Value of Ground Failure Resistance	R_d/A' 0.100 MN/m ²
			Design Criterion	Criterion 0.990

2.2.4 Loads with Large Eccentricities (EC 7, 6.5.4)

Node No.	LC CO	Design Criterion	Comment on Design	
10	RC1:max M-X	0.315	Support Forces and Moments	
			At Node	No. 10
			Load Case	LC RC1:max M-X
			Vertical Force	P_z 64.59 kN
			Horizontal Force in x-Direction	P_x -3.73 kN
			Horizontal Force in y-Direction	P_y 48.05 kN
			Moment About Axis x	M_x 136.03 kNm
			Moment about Axis Y	M_y 10.37 kNm
			Verification	
			Existing Relative Load Eccentricity	prov e 0.363 m
			Allowable Relative Load Eccentricity	all e 1.150 m
			Design Criterion	Criterion 0.315

2.2.6 Sliding (EC 7, 6.5.3)

Node No.	LC CO	Design Criterion	Comment on Design	
10	RC1:min P-Y	0.148	Design Value of Support Forces and Moments	
			At Node	No. 10
			Load Case	LC RC1:min P-Y
			Design Situation	DS PT
			Vertical Force	$P_{z,d}$ 63.66 kN

2.2.6 Sliding (EC 7, 6.5.3)

Node No.	LC CO	Design Criterion	Comment on Design
			Horizontal Force in x-Direction $P_{x,d}$ -3.72 kN
			Horizontal Force in y-Direction $P_{y,d}$ 48.23 kN
			Moment About x-Axis $M_{x,d}$ 135.25 kNm
			Moment About y-Axis $M_{y,d}$ 10.36 kNm
			Verification
			In x-Direction
			Design Value of Maximum Horizontal Load in x-Direction $H_{x,d}$ 3.72 kN
			Design Value of the Sliding Resistance in x-Direction $R_{x,d}$ 325.49 kN
			Design Criterion Criterion 0.011
			In y-Direction
			Design Value of Maximum Horizontal Load in y-Direction $H_{y,d}$ 48.23 kN
			Design Value of the Sliding Resistance in y-Direction $R_{y,d}$ 325.49 kN
			Design Criterion Criterion 0.148

2.2.8 Bending Failure of the Plate (EC 2, 6.1)

Node No.	LC CO	Design Criterion	Comment on Design
3	RC1:max M-X	0.071	
			Bottom Reinforcement in x-Direction Criterion 0.048
			Design Value of Support Forces and Moments
			At Node No. 1
			Load Case LC RC1:min P-Z
			Design Situation DS PT
			Vertical Force $P_{z,d}$ 193.70 kN
			Horizontal Force in x-Direction $P_{x,d}$ -22.64 kN
			Horizontal Force in y-Direction $P_{y,d}$ 25.56 kN
			Moment About x-Axis $M_{x,d}$ 76.46 kNm
			Moment About y-Axis $M_{y,d}$ 54.86 kNm
			Verification
			Governing Safety Against Bending Failure $\gamma_{s,A}$ 20.627
			Required Safety Against Bending Failure req γ 1.00
			Design Criterion Criterion 0.048
			Bottom Reinforcement in y-Direction Criterion 0.071
			Design Value of Support Forces and Moments
			At Node No. 3
			Load Case LC RC1:max M-X
			Design Situation DS PT
			Vertical Force $P_{z,d}$ 165.13 kN
			Horizontal Force in x-Direction $P_{x,d}$ 2.08 kN
			Horizontal Force in y-Direction $P_{y,d}$ 47.06 kN
			Moment About x-Axis $M_{x,d}$ 155.27 kNm
			Moment About y-Axis $M_{y,d}$ -5.12 kNm
			Verification
			Governing Safety Against Bending Failure $\gamma_{s,A}$ 14.067
			Required Safety Against Bending Failure req γ 1.00
			Design Criterion Criterion 0.071
			Top Reinforcement in x-Direction Criterion 0.020
			Design Value of Support Forces and Moments
			At Node No. 4
			Load Case LC RC1:max P-X
			Design Situation DS PT
			Vertical Force $P_{z,d}$ 71.13 kN
			Horizontal Force in x-Direction $P_{x,d}$ 35.80 kN
			Horizontal Force in y-Direction $P_{y,d}$ -0.01 kN
			Moment About x-Axis $M_{x,d}$ -0.13 kNm

2.2.8 Bending Failure of the Plate (EC 2, 6.1)

Node No.	LC CO	Design Criterion	Comment on Design
			Moment About y-Axis $M_{y,d}$ -97.13 kNm
			Verification
			Provided Safety Against Bending Failure $prov \gamma$ 49.121
			Required Safety Against Bending Failure $req \gamma$ 1.00
			Design Criterion Criterion 0.020
			Top Reinforcement in y-Direction Criterion 0.033
			Design Value of Support Forces and Moments
			At Node No. 10
			Load Case LC RC1:min P-Y
			Design Situation DS PT
			Vertical Force $P_{z,d}$ 63.66 kN
			Horizontal Force in x-Direction $P_{x,d}$ -3.72 kN
			Horizontal Force in y-Direction $P_{y,d}$ 48.23 kN
			Moment About x-Axis $M_{x,d}$ 135.25 kNm
			Moment About y-Axis $M_{y,d}$ 10.36 kNm
			Verification
			Provided Safety Against Bending Failure $prov \gamma$ 30.524
			Required Safety Against Bending Failure $req \gamma$ 1.00
			Design Criterion Criterion 0.033

2.2.9 Punching (EC 2, 6.4)

Node No.	LC CO	Design Criterion	Comment on Design
3	RC1:max M-X	0.054	
			Design Value of Support Forces and Moments
			At Node No. 3
			Load Case LC RC1:max M-X
			Design Situation DS PT
			Vertical Force $P_{z,d}$ 165.13 kN
			Horizontal Force in x-Direction $P_{x,d}$ 2.08 kN
			Horizontal Force in y-Direction $P_{y,d}$ 47.06 kN
			Moment About x-Axis $M_{x,d}$ 155.27 kNm
			Moment About y-Axis $M_{y,d}$ -5.12 kNm
			Verification
			Design Shear Force V_{Ed} 0.119 MN/m ²
			Design Shear Resistance $V_{Rd,ct}$ 2.197 MN/m ²
			Check Criterion Criterion 0.054

2.2.10 Minimum embedment depth of column (EC 2, 10.9.6)

Node No.	LC CO	Design Criterion	Comment on Design
1	RC1:max P-X	0.500	
			Column
			Column Width in x-Direction c_x 0.500 m
			Column Width in y-Direction c_y 0.500 m
			Verification
			Provided Embedment Depth $prov d$ 1.200 m
			Required Embedment Depth $req d$ 0.600 m
			Design Criterion Criterion 0.500

2.2.11 Safety against bending failure of bucket wall

Node No.	LC CO	Design Criterion	Comment on Design	
3	RC1:max M-X	0.620		
Bucket Wall in y-Direction			Criterion	0.512
Design Value of Support Forces and Moments				
At Node		No.		4
Load Case		LC		RC1:max M-Y
Design Situation		DS		PT
Vertical Force		$P_{z,d}$		100.38 kN
Horizontal Force in x-Direction		$P_{x,d}$		35.79 kN
Horizontal Force in y-Direction		$P_{y,d}$		0.03 kN
Moment About x-Axis		$M_{x,d}$		0.17 kNm
Moment About y-Axis		$M_{y,d}$		-97.19 kNm
Verification				
Provided Safety Against Bending Failure		prov γ		1.951
Required Safety Against Bending Failure		req γ		1.00
Design Criterion		Criterion		0.512
Bucket Wall in x-Direction			Criterion	0.620
Design Value of Support Forces and Moments				
At Node		No.		3
Load Case		LC		RC1:max M-X
Design Situation		DS		PT
Vertical Force		$P_{z,d}$		165.13 kN
Horizontal Force in x-Direction		$P_{x,d}$		2.08 kN
Horizontal Force in y-Direction		$P_{y,d}$		47.06 kN
Moment About x-Axis		$M_{x,d}$		155.27 kNm
Moment About y-Axis		$M_{y,d}$		-5.12 kNm
Verification				
Provided Safety Against Bending Failure		prov γ		1.613
Required Safety Against Bending Failure		req γ		1.00
Design Criterion		Criterion		0.620

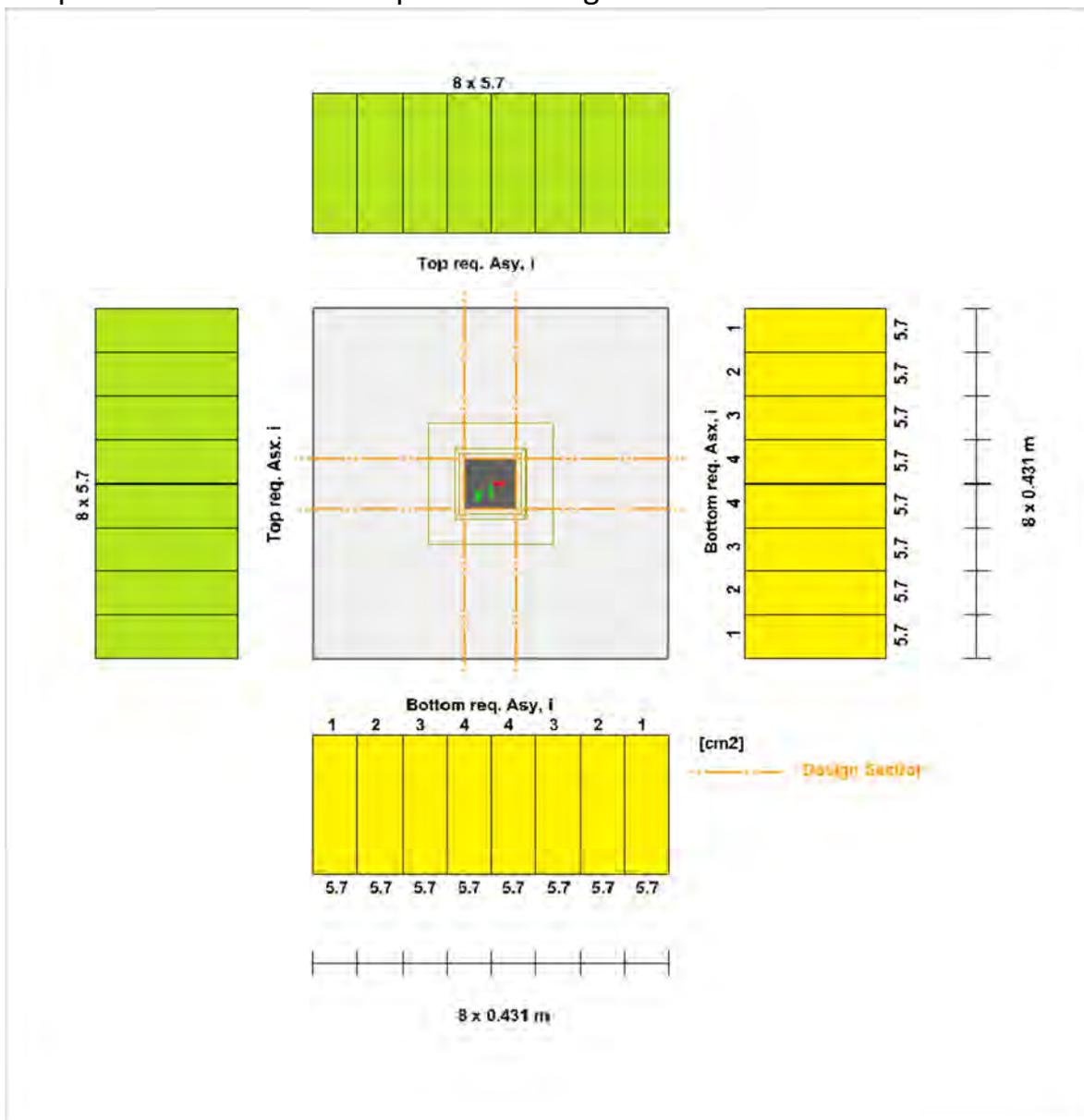
2.2.12 Concrete Stresses in Bucket Walls (EC 2, 10.9.6)

Node No.	LC CO	Design Criterion	Comment on Design	
3	RC1:max M-X	0.077		
Bucket Wall in x-Direction			Criterion	0.051
Design Value of Support Forces and Moments				
At Node		No.		4
Load Case		LC		RC1:max M-Y
Design Situation		DS		PT
Vertical Force		$P_{z,d}$		100.38 kN
Horizontal Force in x-Direction		$P_{x,d}$		35.79 kN
Horizontal Force in y-Direction		$P_{y,d}$		0.03 kN
Moment About x-Axis		$M_{x,d}$		0.17 kNm
Moment About y-Axis		$M_{y,d}$		-97.19 kNm
Verification				
Provided Concrete Stress		σ_{cx}		0.842 MN/m ²
Concrete Design Value		f_{cd}		16.667 MN/m ²
Design Criterion		Criterion		0.051
Bucket Wall in y-Direction			Criterion	0.077
Design Value of Support Forces and Moments				
At Node		No.		3
Load Case		LC		RC1:max M-X
Design Situation		DS		PT
Vertical Force		$P_{z,d}$		165.13 kN
Horizontal Force in x-Direction		$P_{x,d}$		2.08 kN

2.2.12 Concrete Stresses in Bucket Walls (EC 2, 10.9.6)

Node No.	LC CO	Design Criterion	Comment on Design	
		Horizontal Force in y-Direction	$P_{y,d}$	47.06 kN
		Moment About x-Axis	$M_{x,d}$	155.27 kNm
		Moment About y-Axis	$M_{y,d}$	-5.12 kNm
Verification				
		Provided Concrete Stress	σ_{cy}	1.278 MN/m ²
		Concrete Design Value	f_{cd}	16.667 MN/m ²
		Design Criterion	Criterion	0.077

Graphical schema of the required bending reinforcement



Overview of required bending reinforcement

Strip No. [-]	Strip Width [m]	Distribution factor [-]	$M_{Ed,i}$ [kNm]	req $a_{s,i}$ [cm ² /m]	req $A_{s,i}$ [cm ²]
Required Bottom Reinforcement in X-Direction					
1	0.431	0.125	13.29	0.64	0.28
2	0.431	0.125	13.29	0.64	0.28
3	0.431	0.125	13.29	0.64	0.28
4	0.431	0.125	13.29	0.64	0.28
Required Bottom Reinforcement in Y-Direction					
1	0.431	0.125	19.79	0.95	0.41
2	0.431	0.125	19.79	0.95	0.41
3	0.431	0.125	19.79	0.95	0.41
4	0.431	0.125	19.79	0.95	0.41
Required Top Reinforcement in X-Direction					
1 - 4	0.431	0.125	-5.58	0.27	0.12
Required Top Reinforcement in Y-Direction					
1 - 4	0.431	0.125	-9.12	0.44	0.19

Notes

Núm.	Descripción
300)	Governing minimum reinforcement for determining the required reinforcement
301)	Governing minimum reinforcement for determining the required reinforcement
302)	Governing minimum reinforcement for determining the required reinforcement
303)	Governing minimum reinforcement for determining the required reinforcement
304)	Governing minimum reinforcement for determining the required reinforcement
305)	Governing minimum reinforcement for determining the required reinforcement

12.5.UNIONES METÁLICAS

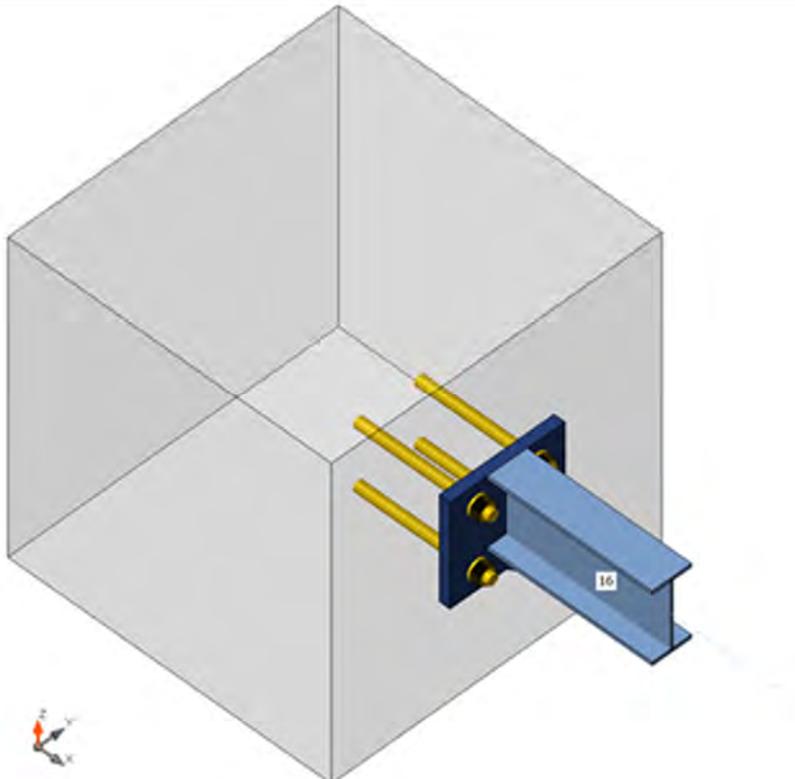
NUDO 1

Diseño

Nombre	NUDO 1
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transver sal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
16	6 - IPE140	0.0	0.0	0.0	0	0	70	Posición



Secciones

Nombre	Material
--------	----------

6 - IPE140	Acero S 275	EN 10025-2:2004-11
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Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm ²]
M20 10.9	M20 10.9	20	1000.0	314

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(1)	16	-11.2	-0.1	30.6	0.0	-25.3	0.0
RC1(2)	16	4.6	0.0	0.6	0.0	-0.5	0.0
RC1(25)	16	-1.0	0.0	30.6	0.0	-25.2	0.0
RC1(26)	16	-5.6	-0.1	0.6	0.0	-0.5	0.0
RC1(27)	16	-5.9	-0.1	0.6	0.0	-0.5	0.0
RC1(29)	16	-5.0	0.0	30.6	0.0	-25.2	0.0
RC1(18)	16	-10.8	-0.1	30.6	0.0	-25.3	0.0
RC1(9)	16	-6.9	0.0	30.6	0.0	-25.2	0.0
RC1(20)	16	-10.9	-0.1	30.6	0.0	-25.3	0.0
RC1(28)	16	4.3	0.0	0.6	0.0	-0.5	0.0

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	613 x 600	mm
Profundidad	600	mm
Anclaje	M20 10.9	
Longitud del anclaje	200	mm
Transferencia de la fuerza cortante	Anclajes	

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	0.9 < 5.0%	OK
Anclajes	75.2 < 100%	OK
Bloque de hormigón	56.3 < 100%	OK
Pandeo	No calculado	

Placas

Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{PI} [%]	σ_{CEd} [MPa]	Estado
--------	--------------	--------	---------------------	---------------------	----------------------	--------

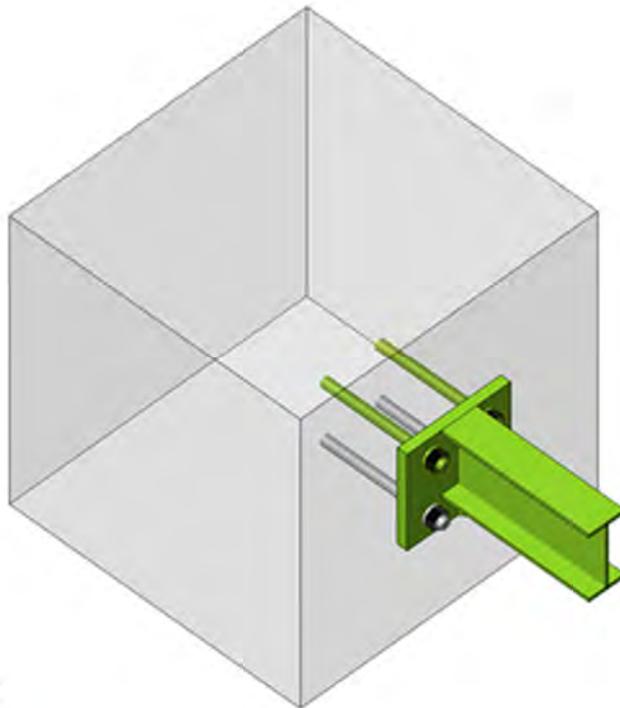
16-bfl 1	6.9	RC1(25)	276.8	0.9	0.0	OK
16-tfl 1	6.9	RC1(1)	276.0	0.5	0.0	OK
16-w 1	4.7	RC1(1)	275.8	0.4	0.0	OK
BP1	20.0	RC1(25)	275.4	0.2	0.0	OK
RIB1	4.7	RC1(1)	276.6	0.8	0.0	OK

Datos de diseño

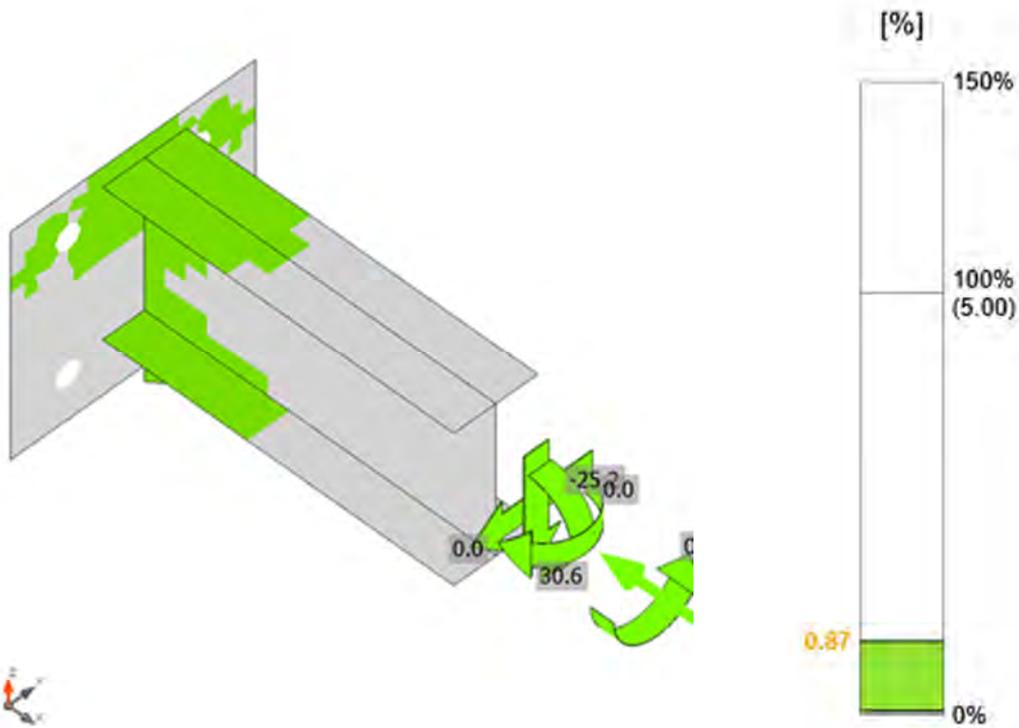
Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

Explicación del símbolo

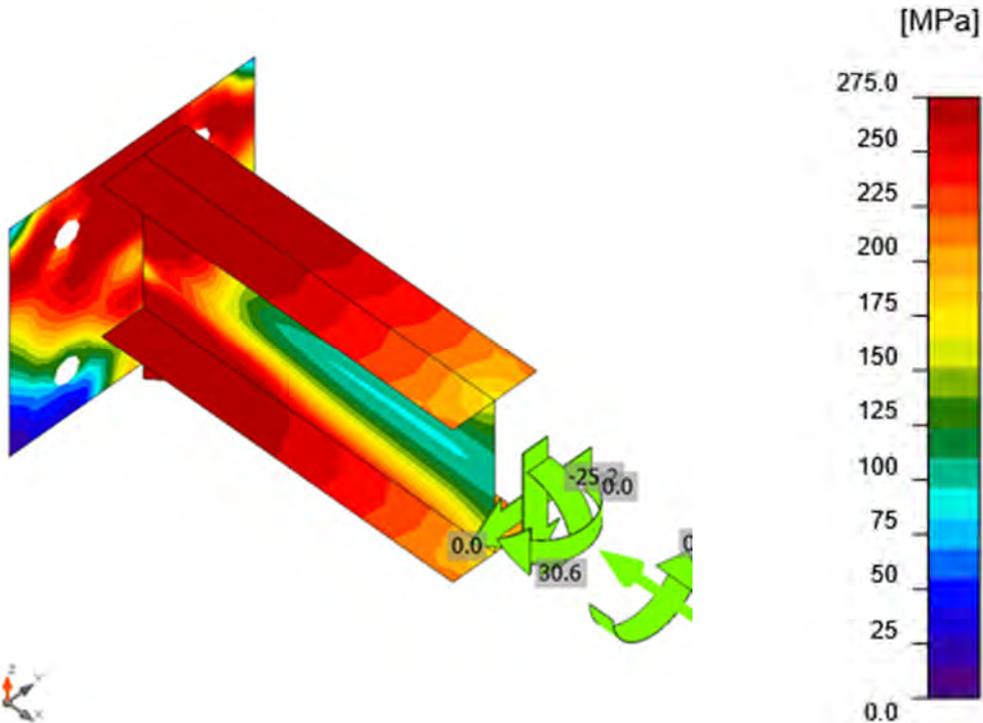
- ϵ_{Pl} Deformación
- σ_{Ed} Ec. tensión
- σ_{CEd} Contact stress
- f_y Límite elástico
- ϵ_{lim} Límite de la deformación plástica



Verificación general, RC1(25)

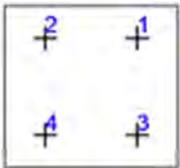


Verificación de deformación, RC1(25)



Tensión equivalente, RC1(25)

Anclajes

Forma	Ítem	Cargas	N_{Ed} [kN]	V_{Ed} [kN]	$V_{Rd,cp}$ [kN]	U_{t_t} [%]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Estado
	A1	RC1(25)	111.5	7.1	175.3	75.0	8.7	57.0	OK
	A2	RC1(25)	111.9	7.1	175.3	75.2	8.7	57.4	OK
	A3	RC1(25)	0.0	8.3	175.3	0.0	10.1	1.0	OK
	A4	RC1(1)	0.0	8.2	175.3	0.0	10.1	1.0	OK

Datos de diseño

Calidad	$N_{Rd,s}$ [kN]	$V_{Rd,s}$ [kN]
M20 10.9 - 1	148.8	81.7

Explicación del símbolo

- N_{Ed} Fuerza de tracción
- V_{Ed} Resultante de las fuerzas cortantes V_y , V_z en el tornillo.
- $V_{Rd,cp}$ Design resistance in case of concrete pryout failure - EN1992-4 - Cl. 7.2.2.4

- U_t Utilización a tracción
 U_s Utilización a cortante
 U_{ts} Utilización a tensión y cortante
 $N_{Rd,s}$ Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
 $V_{Rd,s}$ Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Soldaduras (Se ha usado el máximo valor. Se recomienda redistribución plástica)

Ítem	Borde	Espesor de g. [mm]	Longitud [mm]	Cargas	$\sigma_{w,Ed}$ [MPa]	σ_{\perp} [MPa]	τ_{\parallel} [MPa]	τ_{\perp} [MPa]	U_t [%]	Estado
BP1	16-bfl ₁	6.9	73	RC1(1)						OK
BP1	16-tfl ₁	6.9	73	RC1(1)						OK
BP1	16-w ₁	4.7	133	RC1(1)						OK
BP1	RIB1	4.7	60	RC1(1)						OK
16-tfl ₁	RIB1	4.7	95	RC1(1)						OK

Datos de diseño

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
Acero S 275 EN 10025-2:2004-11	0.85	404.7	309.6

Explicación del símbolo

- $\sigma_{w,Ed}$ Tensión equivalente
 $\sigma_{w,Rd}$ Resistencia a tensión equivalente
 σ_{\perp} Tensión perpendicular
 τ_{\parallel} Tensión cortante paralela al eje de la soldadura
 τ_{\perp} Tensión normal perpendicular al eje de la soldadura
 0.9σ Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
 β_w Factor de correlación EN 1993-1-8 tabla. 4.1
 U_t Utilización
 U_{tc} Utilización de la capacidad de la soldadura

Bloque de hormigón

Ítem	Cargas	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	U_t [%]	Estado
CB 1	RC1(25)	30	10006	22.6	3.00	40.2	56.3	OK

Explicación del símbolo

c	Anchura del área portante
A_{eff}	Área efectiva
σ	Tensión media en el hormigón
k_j	Factor de concentración
F_{jd}	Resistencia portante última del bloque de hormigón
Ut	Utilización

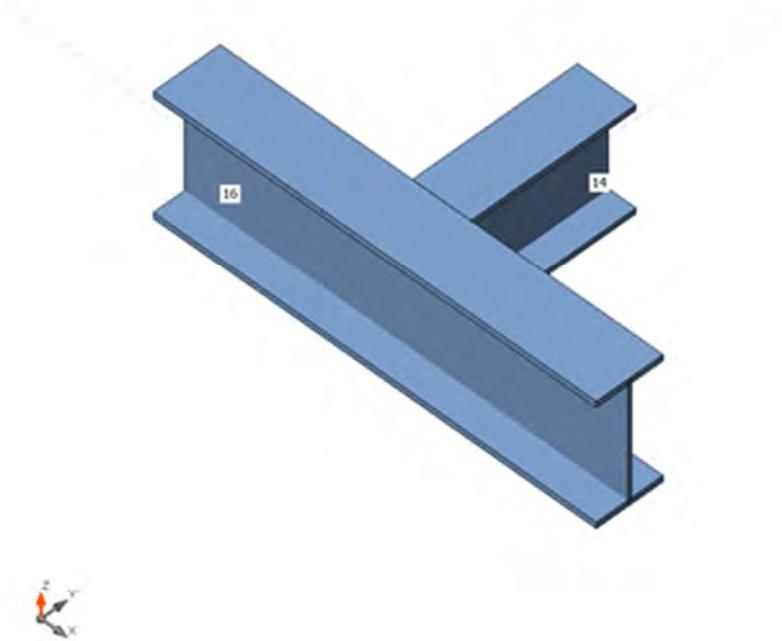
NUDO 2

Diseño

Nombre	NUDO 2
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
14	5 - IPE 120	0.0	0.0	0.0	0	0	60	Posición
16	1 - IPE 140	0.0	0.0	0.0	0	0	70	Posición



Secciones

Nombre	Material
5 - IPE 120	Acero S 275 EN 10025-2:2004-11
1 - IPE 140	Acero S 275 EN 10025-2:2004-11

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(25)	14	0.0	0.0	-0.5	0.0	0.0	0.0
	16	0.8	-0.1	-17.6	0.0	3.8	0.0
	16	-0.8	0.1	18.1	0.0	-3.8	0.0
RC1(26)	14	0.1	0.0	0.1	0.0	0.0	0.0
	16	5.6	0.1	-0.4	0.0	0.0	0.0
	16	-5.6	0.0	0.3	0.0	0.0	0.0
RC1(30)	14	0.0	0.0	-0.5	0.0	0.0	0.0
	16	0.5	-0.1	-17.6	0.0	3.8	0.0
	16	-0.5	0.1	18.1	0.0	-3.8	0.0
RC1(27)	14	0.1	0.0	0.1	0.0	0.0	0.0
	16	5.9	0.1	-0.4	0.0	0.0	0.0
	16	-5.9	0.0	0.3	0.0	0.0	0.0

RC1(31)	14	0.1	0.0	-0.5	0.0	0.0	0.0
	16	10.9	0.0	-17.7	0.0	3.8	0.0
	16	-10.9	0.1	18.3	0.0	-3.8	0.0
RC1(18)	14	0.1	0.0	-0.5	0.0	0.0	0.0
	16	10.6	0.0	-17.7	0.0	3.8	0.0
	16	-10.6	0.1	18.3	0.0	-3.8	0.0
RC1(21)	14	0.0	0.0	0.1	0.0	0.0	0.0
	16	-4.2	0.0	-0.4	0.0	0.0	0.0
	16	4.3	0.0	0.3	0.0	0.0	0.0
RC1(1)	14	0.1	0.0	-0.5	0.0	0.0	0.0
	16	11.0	0.0	-17.7	0.0	3.8	0.0
	16	-11.0	0.1	18.3	0.0	-3.8	0.0
RC1(20)	14	0.1	0.0	-0.5	0.0	0.0	0.0
	16	10.7	0.0	-17.7	0.0	3.8	0.0
	16	-10.7	0.1	18.3	0.0	-3.8	0.0
RC1(22)	14	0.0	0.0	0.1	0.0	0.0	0.0
	16	-4.2	0.0	-0.4	0.0	0.0	0.0
	16	4.3	0.0	0.3	0.0	0.0	0.0
RC1(10)	14	0.1	0.0	-0.5	0.0	0.0	0.0
	16	10.6	0.0	-17.7	0.0	3.8	0.0
	16	-10.6	0.1	18.3	0.0	-3.8	0.0
RC1(2)	14	0.0	0.0	0.1	0.0	0.0	0.0
	16	-4.6	0.0	-0.4	0.0	0.0	0.0
	16	4.6	0.0	0.3	0.0	0.0	0.0
RC1(29)	14	0.0	0.0	-0.5	0.0	0.0	0.0
	16	4.8	0.0	-17.7	0.0	3.8	0.0
	16	-4.7	0.1	18.2	0.0	-3.8	0.0
RC1(9)	14	0.0	0.0	-0.5	0.0	0.0	0.0
	16	6.7	0.0	-17.7	0.0	3.8	0.0
	16	-6.7	0.1	18.2	0.0	-3.8	0.0
RC1(28)	14	0.0	0.0	0.1	0.0	0.0	0.0
	16	-4.3	0.0	-0.4	0.0	0.0	0.0
	16	4.3	0.0	0.3	0.0	0.0	0.0

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	0.0 < 5.0%	OK
Pandeo	No calculado	

Placas

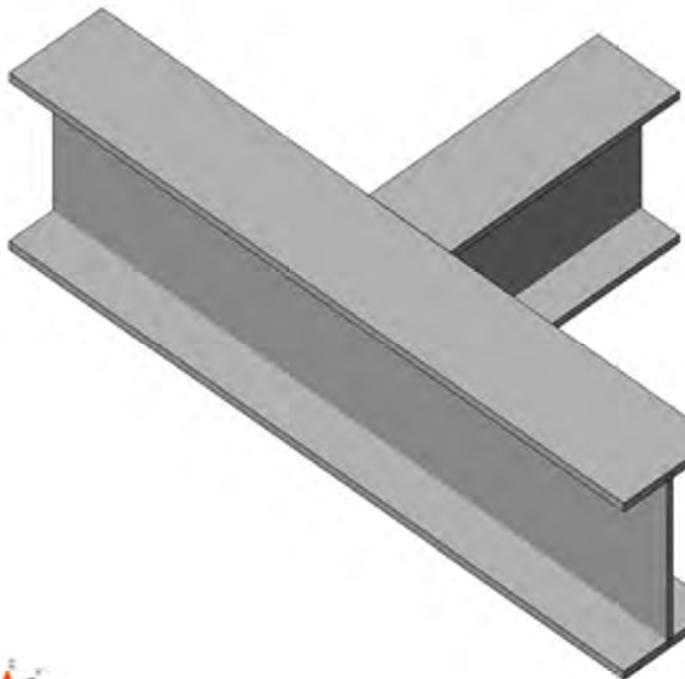
Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{Pl} [%]	σ_{CEd} [MPa]	Estado
14-bfl 1	6.3	RC1(30)	22.9	0.0	0.0	OK
14-tfl 1	6.3	RC1(1)	23.8	0.0	0.0	OK
14-w 1	4.4	RC1(1)	12.0	0.0	0.0	OK
16-bfl 1	6.9	RC1(30)	113.9	0.0	0.0	OK
16-tfl 1	6.9	RC1(1)	120.1	0.0	0.0	OK
16-w 1	4.7	RC1(1)	102.1	0.0	0.0	OK

Datos de diseño

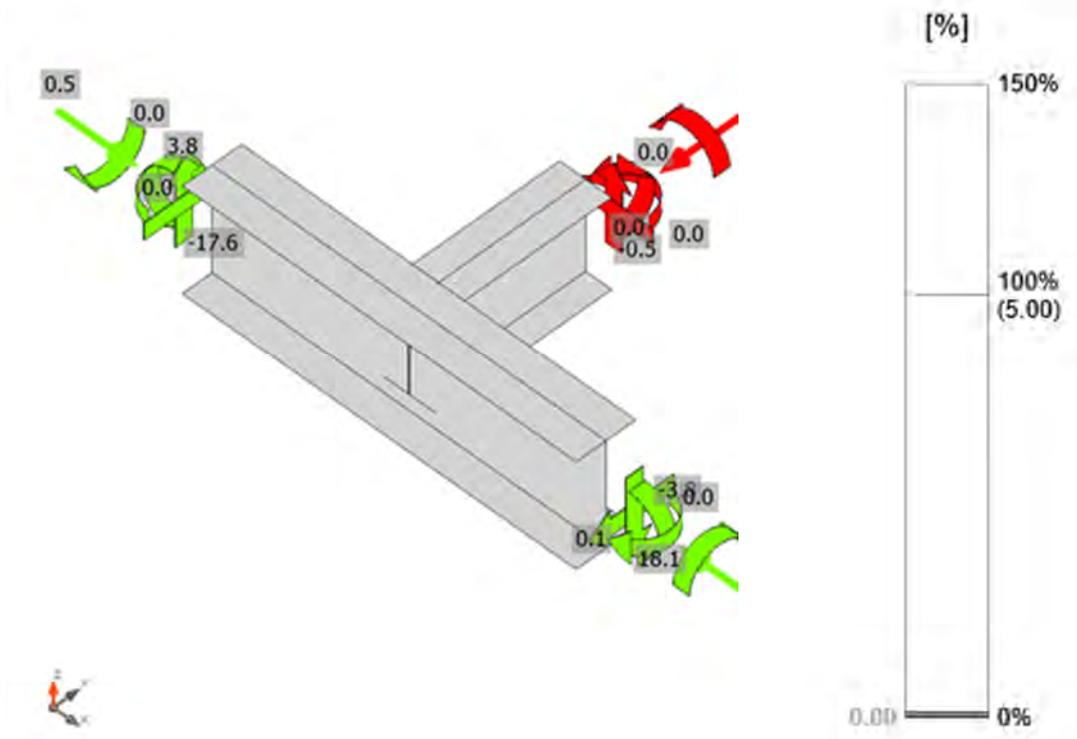
Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

Explicación del símbolo

- ϵ_{Pl} Deformación
- σ_{Ed} Ec. tensión
- σ_{CEd} Contact stress
- f_y Límite elástico
- ϵ_{lim} Límite de la deformación plástica



Verificación general, RC1(30)



Verificación de deformación, RC1(30)

σ_{\perp}	Tensión perpendicular
τ_{\parallel}	Tensión cortante paralela al eje de la soldadura
τ_{\perp}	Tensión normal perpendicular al eje de la soldadura
0.9σ	Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Factor de correlación EN 1993-1-8 tabla. 4.1
Ut	Utilización
Utc	Utilización de la capacidad de la soldadura

Resultado detallado para 16-bfl 1 14-bfl 1

Las soldaduras a tope se asumen como de penetración completa y no se comprueban. Su resistencia se asume igual a la del elemento soldado -EN 1993 - 1 - 8 - 4.7.1.

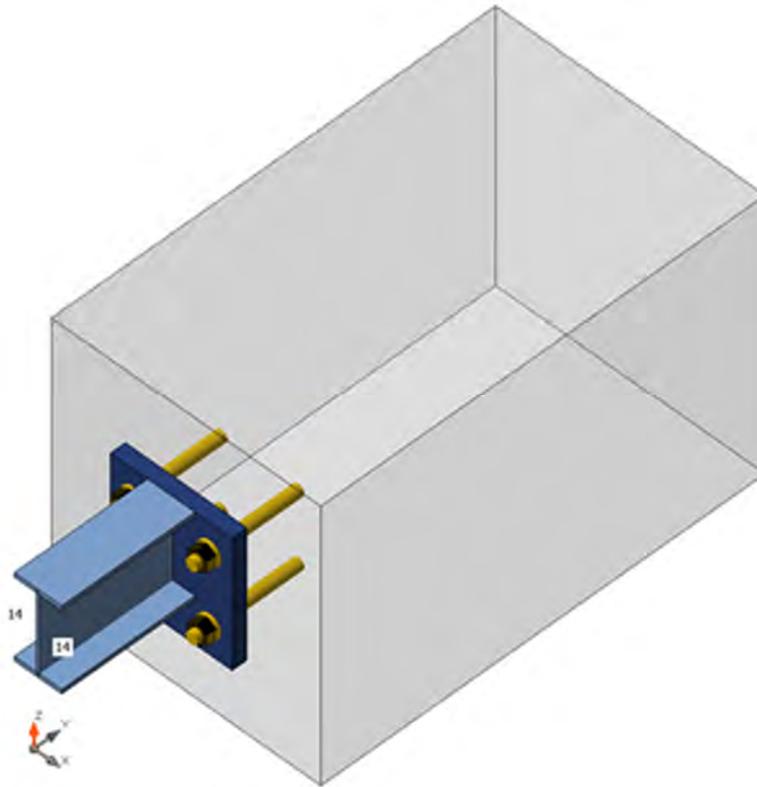
NUDO 3

Diseño

Nombre	NUDO 3
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
14	6 - IPE120	0.0	0.0	0.0	0	0	60	Posición



Secciones

Nombre	Material
6 - IPE120	Acero S 275 EN 10025-2:2004-11

Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm ²]
M16 10.9	M16 10.9	16	1000.0	201

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(25)	14	0.0	0.0	17.3	0.0	8.4	0.0
RC1(26)	14	-0.1	0.0	0.2	0.0	0.1	0.0
RC1(30)	14	0.0	0.0	17.3	0.0	8.4	0.0
RC1(27)	14	-0.1	0.0	0.2	0.0	0.1	0.0
RC1(31)	14	-0.1	0.0	17.3	0.0	8.4	0.0
RC1(18)	14	-0.1	0.0	17.3	0.0	8.4	0.0
RC1(21)	14	0.0	0.0	0.2	0.0	0.2	0.0
RC1(1)	14	-0.1	0.0	17.3	0.0	8.4	0.0

RC1(20)	14	-0.1	0.0	17.3	0.0	8.4	0.0
RC1(22)	14	0.0	0.0	0.2	0.0	0.2	0.0
RC1(10)	14	-0.1	0.0	17.3	0.0	8.4	0.0

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	364 x 380	mm
Profundidad	600	mm
Anclaje	M16 10.9	
Longitud del anclaje	100	mm
Transferencia de la fuerza cortante	Anclajes	

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	0.1 < 5.0%	OK
Anclajes	45.7 < 100%	OK
Bloque de hormigón	30.8 < 100%	OK
Pandeo	No calculado	

Placas

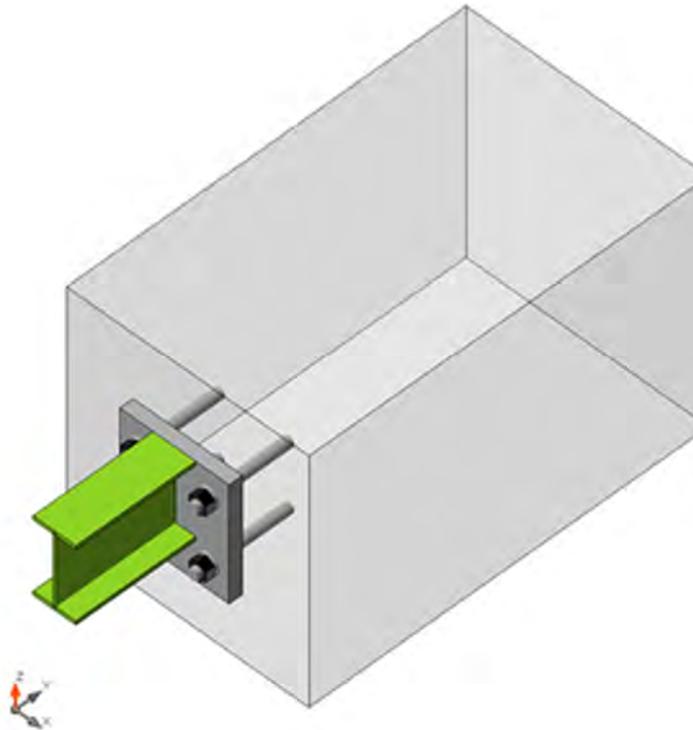
Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{Pl} [%]	σ_{CEd} [MPa]	Estado
14-bfl 1	6.3	RC1(30)	254.0	0.1	0.0	OK
14-tfl 1	6.3	RC1(30)	275.2	0.1	0.0	OK
14-w 1	4.4	RC1(30)	275.1	0.1	0.0	OK
BP1	20.0	RC1(30)	221.6	0.0	0.0	OK

Datos de diseño

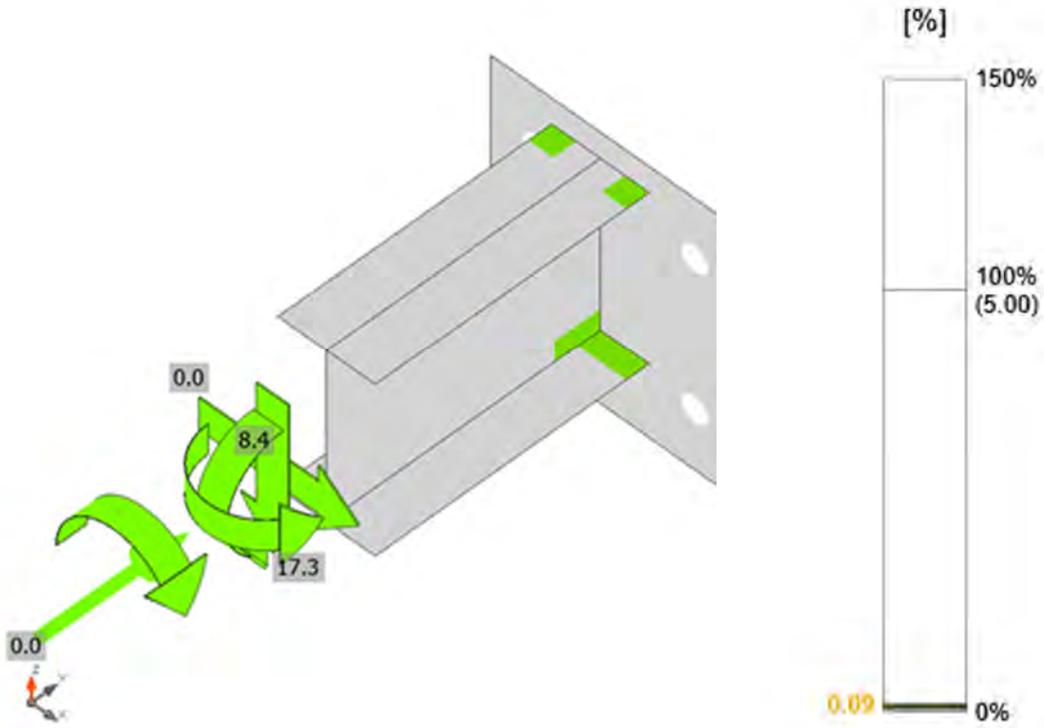
Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

Explicación del símbolo

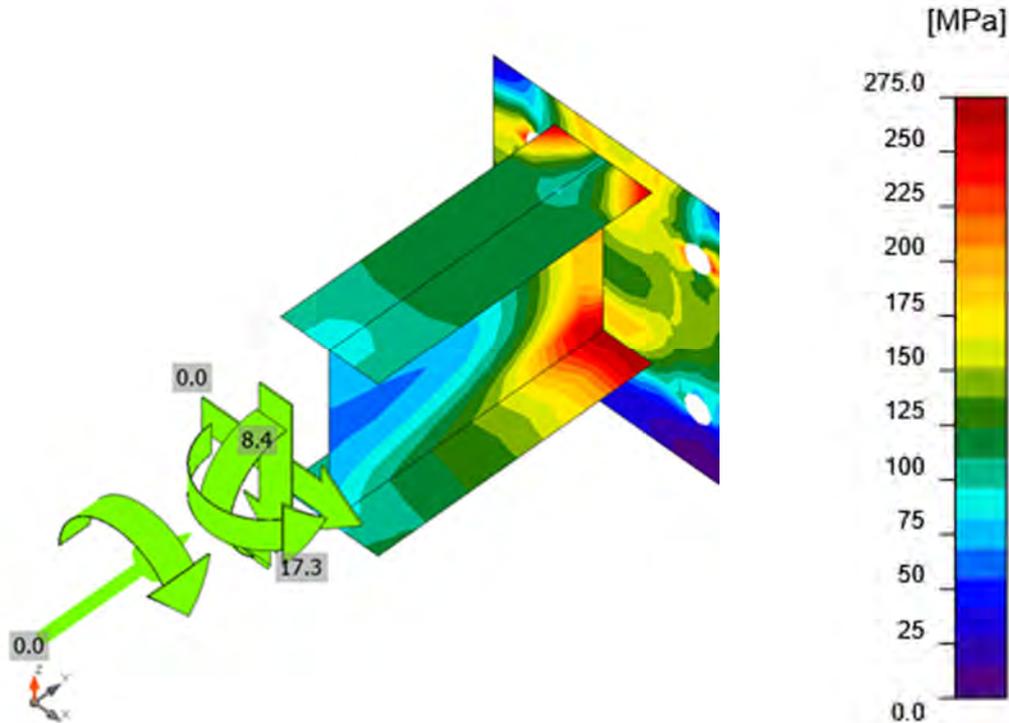
ϵ_{Pl}	Deformación
σ_{Ed}	Ec. tensión
σ_{CEd}	Contact stress
f_y	Límite elástico
ϵ_{lim}	Límite de la deformación plástica



Verificación general, RC1(30)

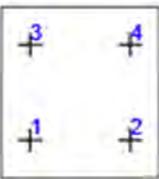


Verificación de deformación, RC1(30)



Tensión equivalente, RC1(30)

Anclajes

Forma	Ítem	Cargas	N_{Ed} [kN]	V_{Ed} [kN]	$V_{Rd,cp}$ [kN]	U_{t_t} [%]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Estado
	A1	RC1(30)	0.0	4.5	84.4	0.0	8.7	0.8	OK
	A2	RC1(18)	0.0	4.5	84.4	0.0	8.6	0.7	OK
	A3	RC1(18)	43.3	4.2	84.4	45.5	8.0	21.3	OK
	A4	RC1(30)	43.5	4.1	84.4	45.7	7.9	21.5	OK

Datos de diseño

Calidad	$N_{Rd,s}$ [kN]	$V_{Rd,s}$ [kN]
M16 10.9 - 1	95.3	52.3

Explicación del símbolo

- N_{Ed} Fuerza de tracción
- V_{Ed} Resultante de las fuerzas cortantes V_y , V_z en el tornillo.
- $V_{Rd,cp}$ Design resistance in case of concrete pryout failure - EN1992-4 - Cl. 7.2.2.4

U_t	Utilización a tracción
U_s	Utilización a cortante
U_{ts}	Utilización a tensión y cortante
$N_{Rd,s}$	Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
$V_{Rd,s}$	Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Resultado detallado para A4

Resistencia a tracción del anclaje (EN1992-4 - Cl. 7.2.1.3)

$$N_{Rd,s} = \frac{N_{tRk,s}}{\gamma_{Ms}} = 95.3 \text{ kN} \geq N_{Ed} = 43.5 \text{ kN}$$

$$N_{tRk,s} = c \cdot A_s \cdot f_{tk} = 133.5 \text{ kN}$$

Donde:

$$c = 0.85$$

– reduction factor for cut thread

$$A_s = 157 \text{ mm}^2$$

– Área a tracción

$$f_{tk} = 1000.0 \text{ MPa}$$

– resistencia a tracción última del tornillo

$$\gamma_{Ms} = 1.40$$

– safety factor for steel

$$\gamma_{Ms} = 1.2 \cdot \frac{f_{tk}}{f_{yk}} \geq 1.4$$

, donde:

$$f_{yk} =$$

900.0 MPa – resistencia mínima del tornillo

Resistencia a cortante (EN1992-4 - Cl.7.2.2.3.1)

$$V_{Rd,s} = \frac{V_{tRk,s}}{\gamma_{Vs}} = 52.3 \text{ kN} \geq V_{Ed} = 4.1 \text{ kN}$$

$$V_{tRk,s} = k_7 \cdot V_{Rk,s}^0 = 78.5 \text{ kN}$$

Donde:

$$k_7 = 1.00$$

– coefficient for anchor steel ductility

$$k_7 = \begin{cases} 0.8, & A < 0.08 \\ 1.0, & A \geq 0.08 \end{cases}$$

, donde:

$$A =$$

0.09 – bolt grade elongation at rupture

$$V_{Rk,s}^0 = 78.5 \text{ kN}$$

– the characteristic shear strength

$$V_{Rk,s}^0 = k_6 \cdot A_s \cdot f_{tk}$$

, donde:

$$k_6 =$$

0.50 – coefficient for anchor resistance in shear

$$A_s =$$

157 mm² – Área a tracción

$$f_{tk} =$$

1000.0 MPa – resistencia última específica para el acero del anclaje

$$\gamma_{M_2} = 1.50$$

– safety factor for steel

Interaction of tensile and shear forces in steel (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,s}}\right)^2 + \left(\frac{V_{Ed}}{V_{Rd,s}}\right)^2 = 0.21 \leq 1.0$$

Donde:

$$N_{Ed} = 43.5 \text{ kN} \quad \text{– fuerza de tracción de diseño}$$

$$N_{Rd,s} = 95.3 \text{ kN} \quad \text{– resistencia a tracción del anclaje}$$

$$V_{Ed} = 4.1 \text{ kN} \quad \text{– esfuerzo cortante de cálculo}$$

$$V_{Rd,s} = 52.3 \text{ kN} \quad \text{– resistencia a cortante del anclaje}$$

Interaction of tensile and shear forces in concrete (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,c}}\right)^{1.5} + \left(\frac{V_{Ed}}{V_{Rd,c}}\right)^{1.5} = 0.00 \leq 1.0$$

Donde:

$$\frac{N_{Ed}}{N_{Rd,c}} \quad \text{– the largest utilization value for tension failure modes}$$

$$\frac{V_{Ed}}{V_{Rd,c}} \quad \text{– the largest utilization value for shear failure modes}$$

Armado suplementario (EN 1992-4 - Cl. 7.2.1.9; EN 1992-4 - Cl. 7.2.2.6)
Supplementary reinforcement should resist force of 86.8 kN en tracción y 17.3 kN a cortante

Soldaduras (Se ha usado el máximo valor. Se recomienda redistribución plástica)

Ítem	Borde	Espesor de g. [mm]	Longitud [mm]	Cargas	$\sigma_{w,Ed}$ [MPa]	σ_{\perp} [MPa]	τ_{\parallel} [MPa]	τ_{\perp} [MPa]	Ut [%]	Estado
BP1	14-bfl 1	6.3	64	RC1(25)						OK
BP1	14-tfl 1	6.3	64	RC1(25)						OK
BP1	14-w 1	4.4	114	RC1(25)						OK

Datos de diseño

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
Acero S 275 EN 10025-2:2004-11	0.85	404.7	309.6

Explicación del símbolo

$\sigma_{w,Ed}$	Tensión equivalente
$\sigma_{w,Rd}$	Resistencia a tensión equivalente
σ_{\perp}	Tensión perpendicular
T_{\parallel}	Tensión cortante paralela al eje de la soldadura
T_{\perp}	Tensión normal perpendicular al eje de la soldadura
0.9σ	Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Factor de correlación EN 1993-1-8 tabla. 4.1
Ut	Utilización
Utc	Utilización de la capacidad de la soldadura

Resultado detallado para BP1 14-bfl 1

Las soldaduras a tope se asumen como de penetración completa y no se comprueban. Su resistencia se asume igual a la del elemento soldado -EN 1993 - 1 - 8 - 4.7.1.

Bloque de hormigón

Ítem	Cargas	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	Ut [%]	Estado
CB 1	RC1(30)	30	7049	12.4	3.00	40.2	30.8	OK

Explicación del símbolo

c	Anchura del área portante
A_{eff}	Área efectiva
σ	Tensión media en el hormigón
k_j	Factor de concentración
F_{jd}	Resistencia portante última del bloque de hormigón
Ut	Utilización

Resultado detallado para CB 1

Comprobación de la resistencia a compresión del bloque de hormigón (EN 1993-1-8 6.2.5)

$$\sigma = \frac{N}{A_{eff}} = 12.4 \text{ MPa}$$

$$F_{jd} = \alpha_{cc} \beta_j k_j f_{ck} / \gamma_c = 40.2 \text{ MPa}$$

Dónde:

$$N = 87.4 \text{ kN} \quad \text{– Fuerza axial de diseño}$$

$$A_{eff} = 7049 \text{ mm}^2 \quad \text{– Área efectiva, en la cual la fuerza de la columna}$$

$$\alpha_{cc} = 1.00 \quad \text{– Efectos a largo plazo sobre } F_{cd}$$

$$\beta_j = 0.87 \quad \text{– Coeficiente de unión } \beta_j$$

$$k_j = 3.00$$

– Factor de concentración

$$f_{ck} = 30.0 \text{ MPa}$$

– Resistencia característica a compresión del hormigón

$$\gamma_c = 1.50$$

– Factor de seguridad

Utilización de tensión

$$U_t = \frac{\sigma}{f_{td}} = 30.8 \%$$

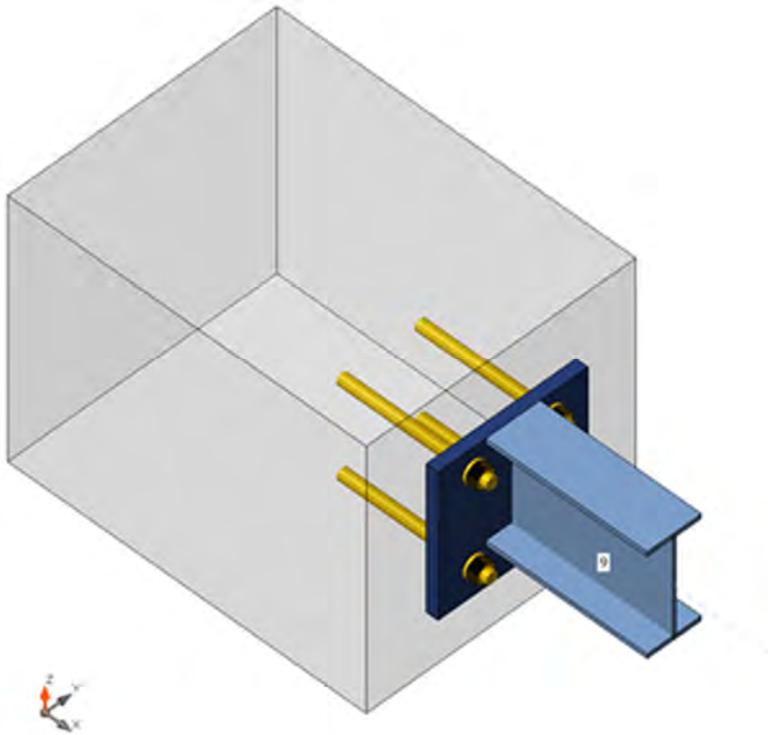
NUDO 4

Diseño

Nombre	NUDO 4
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
9	9 - IPE180	0.0	0.0	0.0	0	0	90	Posición



Secciones

Nombre	Material
9 - IPE180	Acero S 275 EN 10025-2:2004-11

Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm ²]
M20 10.9	M20 10.9	20	1000.0	314

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(12)	9	-27.4	0.0	30.3	0.0	-38.4	0.0
RC1(13)	9	32.4	0.0	0.9	0.0	-0.7	0.0
RC1(14)	9	-27.1	0.0	30.3	0.0	-38.4	0.0
RC1(18)	9	23.4	0.0	26.9	0.0	-32.9	0.0
RC1(15)	9	-27.1	0.0	30.3	0.0	-38.4	0.0
RC1(24)	9	-18.6	0.0	4.3	0.0	-5.6	0.0
RC1(10)	9	23.4	0.0	26.9	0.0	-32.9	0.0
RC1(23)	9	32.1	0.0	0.9	0.0	-0.7	0.0

RC1(17)	9	-27.4	0.0	30.3	0.0	-38.4	0.0
RC1(8)	9	22.6	0.0	30.2	0.0	-37.1	0.0
RC1(1)	9	22.7	0.0	30.2	0.0	-37.1	0.0
RC1(20)	9	22.3	0.0	30.2	0.0	-37.1	0.0
RC1(19)	9	-17.5	0.0	0.9	0.0	-1.4	0.0
RC1(2)	9	-17.5	0.0	0.9	0.0	-1.4	0.0

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	451 x 450	mm
Profundidad	600	mm
Anclaje	M20 10.9	
Longitud del anclaje	200	mm
Transferencia de la fuerza cortante	Anclajes	

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	1.2 < 5.0%	OK
Anclajes	91.9 < 100%	OK
Bloque de hormigón	69.5 < 100%	OK
Pandeo	No calculado	

Placas

Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{PI} [%]	σ_{CEd} [MPa]	Estado
9-bfl 1	8.0	RC1(8)	277.2	1.0	0.0	OK
9-tfl 1	8.0	RC1(12)	277.6	1.2	0.0	OK
9-w 1	5.3	RC1(12)	276.5	0.7	0.0	OK
BP1	20.0	RC1(8)	275.7	0.3	0.0	OK

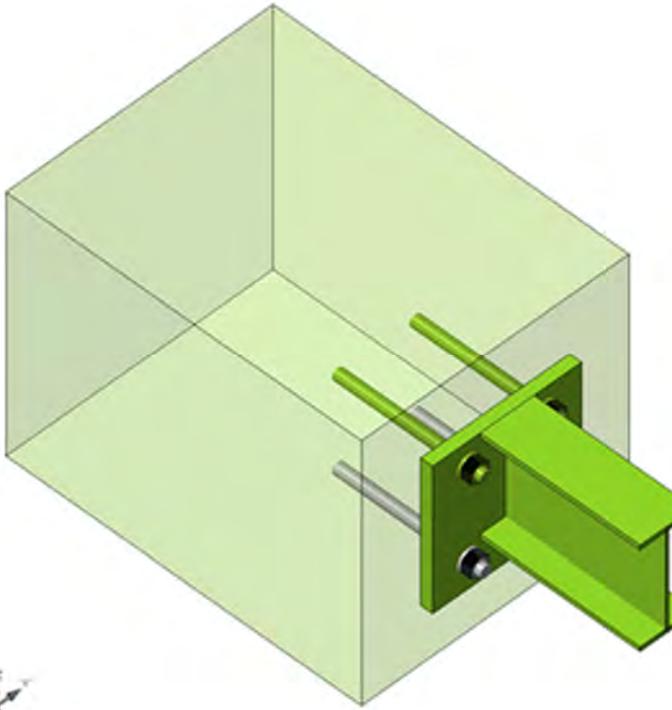
Datos de diseño

Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

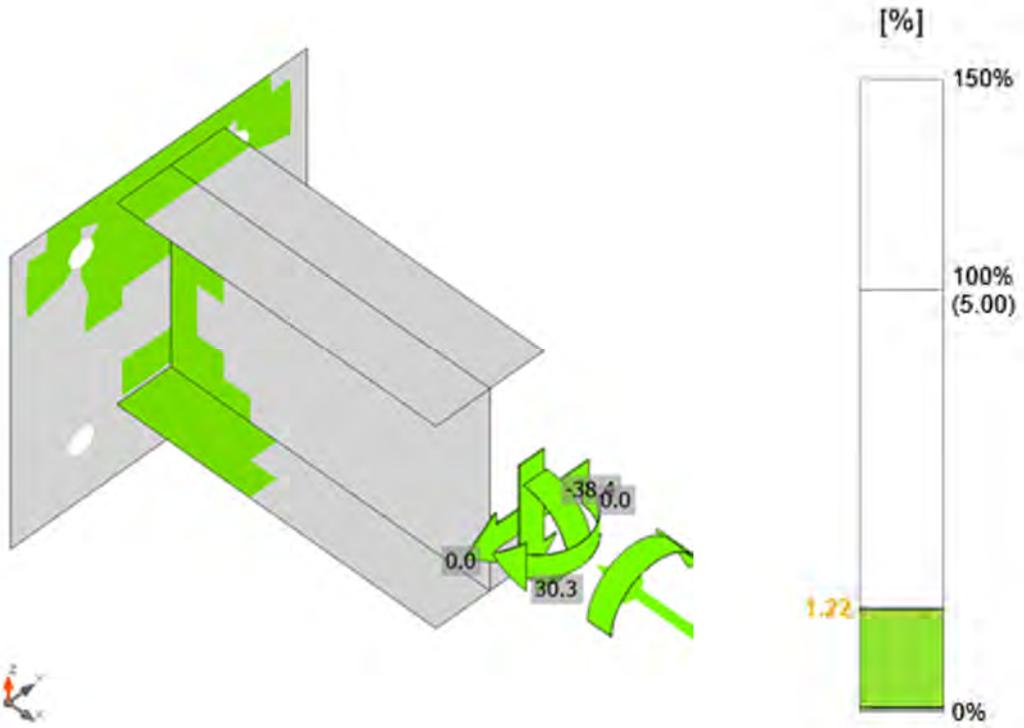
Explicación del símbolo

ϵ_{PI}	Deformación
σ_{Ed}	Ec. tensión
σ_{CEd}	Contact stress

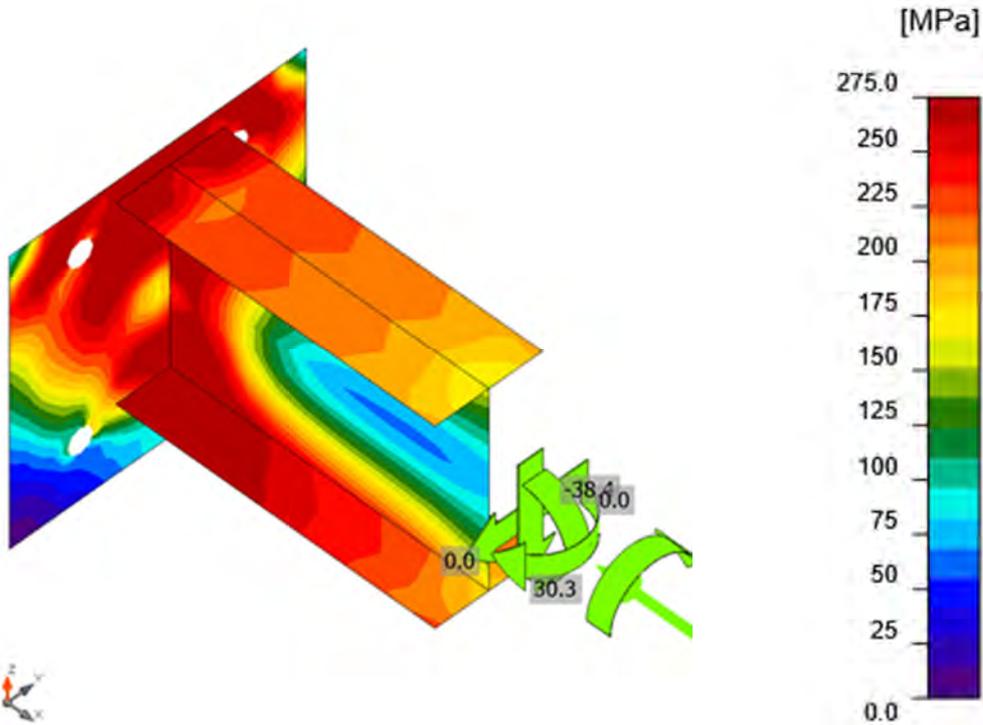
f_y Límite elástico
 ϵ_{lim} Límite de la deformación plástica



Verificación general, RC1(12)

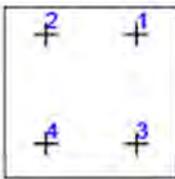


Verificación de deformación, RC1(12)



Tensión equivalente, RC1(12)

Anclajes

Forma	Ítem	Cargas	N_{Ed} [kN]	V_{Ed} [kN]	$V_{Rd,cp}$ [kN]	U_{t_t} [%]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Estado
	A1	RC1(1)	136.7	7.0	117.7	91.9	8.6	85.1	OK
	A2	RC1(1)	136.7	7.0	117.7	91.9	8.6	85.1	OK
	A3	RC1(8)	0.0	8.3	117.7	0.0	10.2	1.0	OK
	A4	RC1(8)	0.0	8.3	117.7	0.0	10.2	1.0	OK

Datos de diseño

Calidad	$N_{Rd,s}$ [kN]	$V_{Rd,s}$ [kN]
M20 10.9 - 1	148.8	81.7

Explicación del símbolo

- N_{Ed} Fuerza de tracción
- V_{Ed} Resultante de las fuerzas cortantes V_y , V_z en el tornillo.
- $V_{Rd,cp}$ Design resistance in case of concrete pryout failure - EN1992-4 - Cl. 7.2.2.4

U_t	Utilización a tracción
U_s	Utilización a cortante
U_{ts}	Utilización a tensión y cortante
$N_{Rd,s}$	Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
$V_{Rd,s}$	Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Resultado detallado para A2

Resistencia a tracción del anclaje (EN1992-4 - Cl. 7.2.1.3)

$$N_{Rd,s} = \frac{N_{tk,s}}{\gamma_{Ms}} = 148.8 \text{ kN} \geq N_{Ed} = 136.7 \text{ kN}$$

$$N_{Rk,s} = c \cdot A_s \cdot f_{tk} = 208.3 \text{ kN}$$

Donde:

$$c = 0.85$$

– reduction factor for cut thread

$$A_s = 245 \text{ mm}^2$$

– Área a tracción

$$f_{tk} = 1000.0 \text{ MPa}$$

– resistencia a tracción última del tornillo

$$\gamma_{Ms} = 1.40$$

– safety factor for steel

$$\gamma_{Ms} = 1.2 \cdot \frac{f_{tk}}{f_{yk}} \geq 1.4$$

, donde:

$$f_{yk} =$$

900.0 MPa – resistencia mínima del tornillo

Resistencia a cortante (EN1992-4 - Cl.7.2.2.3.1)

$$V_{Rd,s} = \frac{V_{tk,s}}{\gamma_{Vs}} = 81.7 \text{ kN} \geq V_{Ed} = 7.0 \text{ kN}$$

$$V_{Rk,s} = k_7 \cdot V_{Rk,s}^0 = 122.5 \text{ kN}$$

Donde:

$$k_7 = 1.00$$

– coefficient for anchor steel ductility

$$k_7 = \begin{cases} 0.8, & A < 0.08 \\ 1.0, & A \geq 0.08 \end{cases}$$

, donde:

$$A =$$

0.09 – bolt grade elongation at rupture

$$V_{Rk,s}^0 = 122.5 \text{ kN}$$

– the characteristic shear strength

$$V_{Rk,s}^0 = k_6 \cdot A_s \cdot f_{tk}$$

, donde:

$$k_6 =$$

0.50 – coefficient for anchor resistance in shear

$$A_s =$$

245 mm² – Área a tracción

$$f_{tk} =$$

1000.0 MPa – resistencia última específica para el acero del anclaje

$$\gamma_{M2} = 1.50$$

– safety factor for steel

Interaction of tensile and shear forces in steel (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,s}}\right)^2 + \left(\frac{V_{Ed}}{V_{Rd,s}}\right)^2 = 0.85 \leq 1.0$$

Donde:

$$N_{Ed} = 136.7 \text{ kN} \quad \text{– fuerza de tracción de diseño}$$

$$N_{Rd,s} = 148.8 \text{ kN} \quad \text{– resistencia a tracción del anclaje}$$

$$V_{Ed} = 7.0 \text{ kN} \quad \text{– esfuerzo cortante de cálculo}$$

$$V_{Rd,s} = 81.7 \text{ kN} \quad \text{– resistencia a cortante del anclaje}$$

Interaction of tensile and shear forces in concrete (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,t}}\right)^{1.5} + \left(\frac{V_{Ed}}{V_{Rd,t}}\right)^{1.5} = 0.00 \leq 1.0$$

Donde:

$$\frac{N_{Ed}}{N_{Rd,t}} \quad \text{– the largest utilization value for tension failure modes}$$

$$\frac{V_{Ed}}{V_{Rd,t}} \quad \text{– the largest utilization value for shear failure modes}$$

Armado suplementario (EN 1992-4 - Cl. 7.2.1.9; EN 1992-4 - Cl. 7.2.2.6)

Supplementary reinforcement should resist force of 273.3 kN en tracción y 30.2 kN a cortante

Soldaduras (Se ha usado el máximo valor. Se recomienda redistribución plástica)

Ítem	Borde	Espesor de g. [mm]	Longitud [mm]	Cargas	$\sigma_{w,Ed}$ [MPa]	σ_{\perp} [MPa]	τ_{\parallel} [MPa]	τ_{\perp} [MPa]	Ut [%]	Estado
BP1	9-bfl 1	8.0	91	RC1(12)						OK
BP1	9-tfl 1	8.0	91	RC1(12)						OK
BP1	9-w 1	5.3	172	RC1(12)						OK

Datos de diseño

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
Acero S 275 EN 10025-2:2004-11	0.85	404.7	309.6

Explicación del símbolo

$\sigma_{w,Ed}$	Tensión equivalente
$\sigma_{w,Rd}$	Resistencia a tensión equivalente
σ_{\perp}	Tensión perpendicular
T_{\parallel}	Tensión cortante paralela al eje de la soldadura
T_{\perp}	Tensión normal perpendicular al eje de la soldadura
0.9σ	Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Factor de correlación EN 1993-1-8 tabla. 4.1
Ut	Utilización
Utc	Utilización de la capacidad de la soldadura

Resultado detallado para BP1 9-bf1 1

Las soldaduras a tope se asumen como de penetración completa y no se comprueban. Su resistencia se asume igual a la del elemento soldado -EN 1993 - 1 - 8 - 4.7.1.

Bloque de hormigón

Ítem	Cargas	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	Ut [%]	Estado
CB 1	RC1(14)	30	10785	28.0	3.00	40.2	69.5	OK

Explicación del símbolo

c	Anchura del área portante
A_{eff}	Área efectiva
σ	Tensión media en el hormigón
k_j	Factor de concentración
F_{jd}	Resistencia portante última del bloque de hormigón
Ut	Utilización

Resultado detallado para CB 1

Comprobación de la resistencia a compresión del bloque de hormigón (EN 1993-1-8 6.2.5)

$$\sigma = \frac{N}{A_{eff}} = 28.0 \text{ MPa}$$

$$F_{jd} = \alpha_{cc} \beta_j k_j f_{ck} / \gamma_c = 40.2 \text{ MPa}$$

Dónde:

$$N = 301.5 \text{ kN} \quad \text{– Fuerza axial de diseño}$$

$$A_{eff} = 10785 \text{ mm}^2 \quad \text{– Área efectiva, en la cual la fuerza de la columna}$$

$$\alpha_{cc} = 1.00 \quad \text{– Efectos a largo plazo sobre } F_{cd}$$

$$\beta_j = 0.87 \quad \text{– Coeficiente de unión } \beta_j$$

$$k_j = 3.00$$

– Factor de concentración

$$f_{ck} = 30.0 \text{ MPa}$$

– Resistencia característica a compresión del hormigón

$$\gamma_c = 1.50$$

– Factor de seguridad

Utilización de tensión

$$U_t = \frac{\sigma}{f_{td}} = 69.5 \%$$

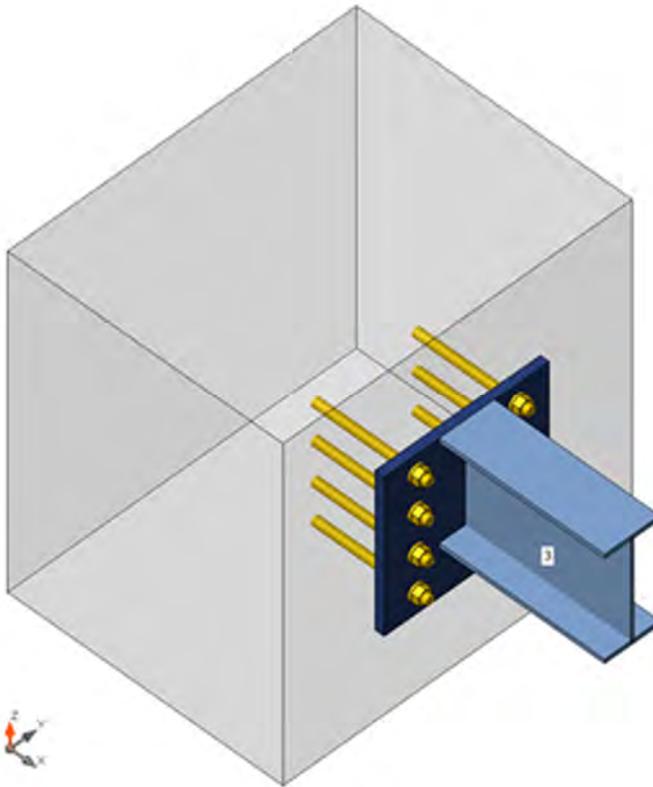
NUDO 5

Diseño

Nombre	NUDO 5
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
3	6 - IPE240	0.0	0.0	0.0	0	0	120	Posición



Secciones

Nombre	Material
6 - IPE240	Acero S 275 EN 10025-2:2004-11

Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm ²]
M20 10.9	M20 10.9	20	1000.0	314

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(12)	3	-46.0	0.0	38.7	0.0	-61.4	0.0
RC1(13)	3	50.0	0.0	1.9	0.0	-1.6	0.0
RC1(14)	3	-45.5	0.0	38.7	0.0	-61.3	0.0
RC1(18)	3	37.4	0.0	34.5	0.0	-51.8	0.0
RC1(19)	3	-31.9	0.0	1.9	0.0	-3.8	0.0
RC1(10)	3	37.3	0.0	34.5	0.0	-51.8	0.0
RC1(17)	3	-45.9	0.0	38.7	0.0	-61.3	0.0
RC1(15)	3	-45.4	0.0	38.7	0.0	-61.3	0.0

RC1(16)	3	49.5	0.0	1.9	0.0	-1.6	0.0
RC1(20)	3	35.8	0.0	38.7	0.0	-58.3	0.0
RC1(21)	3	-33.1	0.0	6.1	0.0	-10.3	0.0
RC1(22)	3	-33.0	0.0	6.1	0.0	-10.3	0.0
RC1(7)	3	35.7	0.0	38.7	0.0	-58.3	0.0
RC1(1)	3	36.3	0.0	38.7	0.0	-58.2	0.0
RC1(2)	3	-32.0	0.0	1.9	0.0	-3.8	0.0

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	760 x 750	mm
Profundidad	600	mm
Anclaje	M20 10.9	
Longitud del anclaje	200	mm
Transferencia de la fuerza cortante	Anclajes	

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	2.7 < 5.0%	OK
Anclajes	93.8 < 100%	OK
Bloque de hormigón	99.9 < 100%	OK
Pandeo	No calculado	

Placas

Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{Pl} [%]	σ_{CEd} [MPa]	Estado
3-bfl 1	9.8	RC1(1)	280.1	2.4	0.0	OK
3-tfl 1	9.8	RC1(1)	277.1	1.0	0.0	OK
3-w 1	6.2	RC1(1)	276.3	0.6	0.0	OK
BP1	20.0	RC1(1)	280.8	2.7	0.0	OK

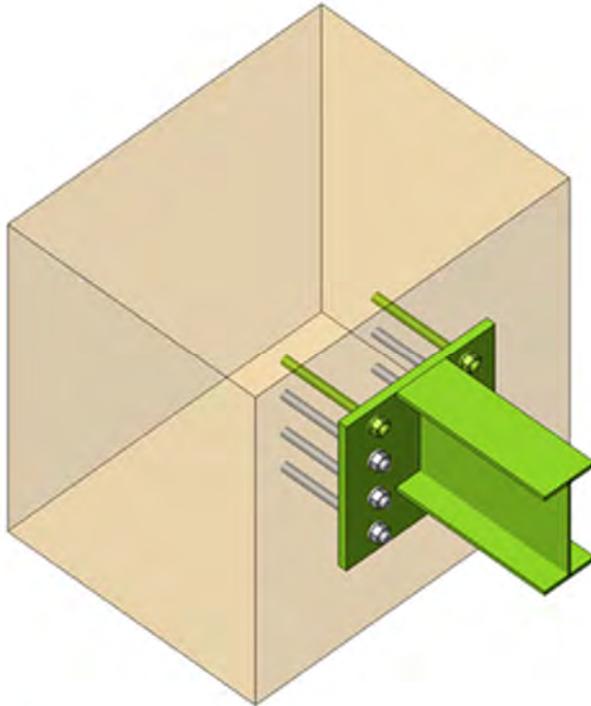
Datos de diseño

Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

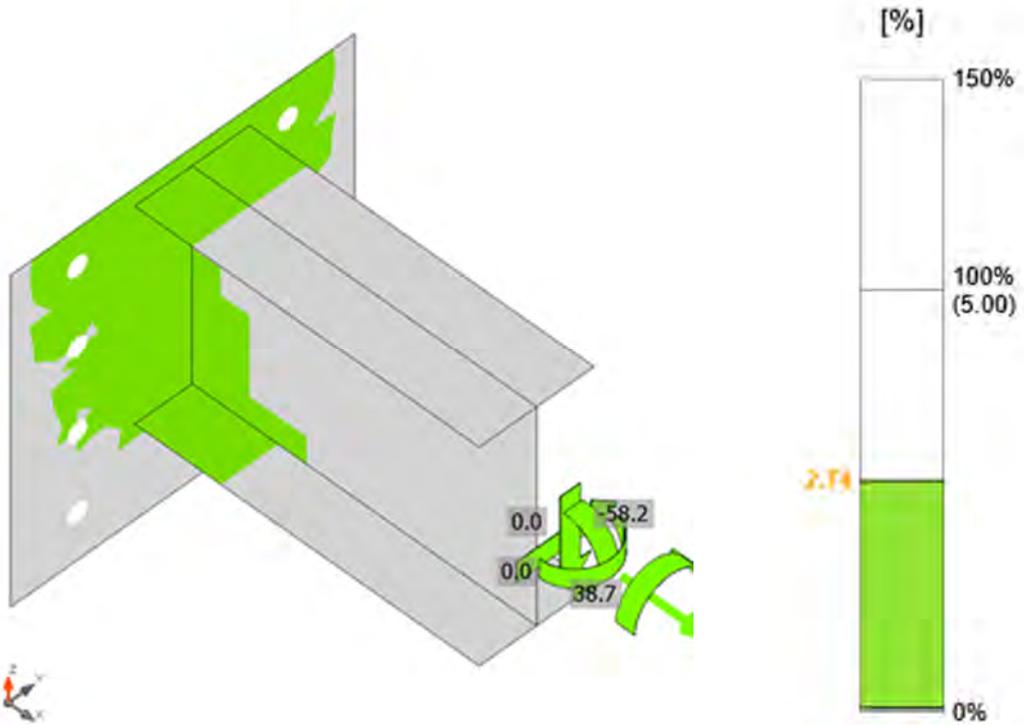
Explicación del símbolo

ϵ_{Pl} Deformación
 σ_{Ed} Ec. tensión

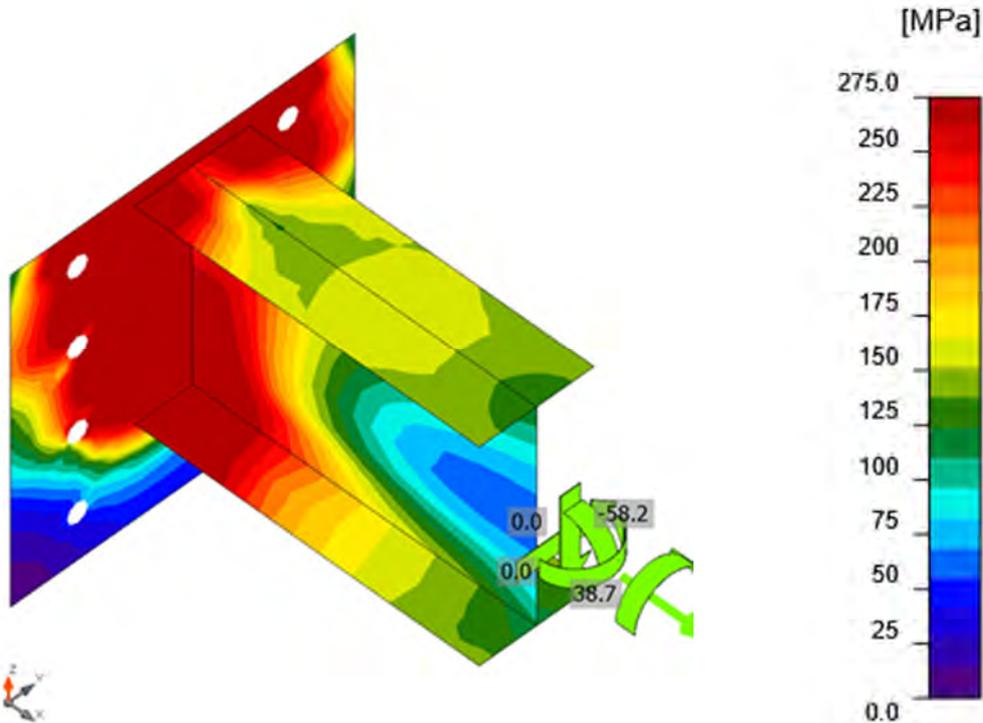
σ_{Ed} Contact stress
 f_y Límite elástico
 ϵ_{lim} Límite de la deformación plástica



Verificación general, RC1(1)

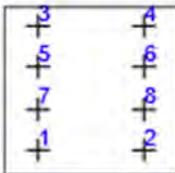


Verificación de deformación, RC1(1)



Tensión equivalente, RC1(1)

Anclajes

Forma	Ítem	Cargas	N_{Ed} [kN]	V_{Ed} [kN]	$V_{Rd,cp}$ [kN]	U_{t_t} [%]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Estado
	A1	RC1(1)	0.0	5.7	256.6	0.0	6.9	0.5	OK
	A2	RC1(1)	0.0	5.7	256.6	0.0	6.9	0.5	OK
	A3	RC1(1)	139.6	5.4	256.6	93.8	6.6	88.5	OK
	A4	RC1(1)	139.6	5.4	256.6	93.8	6.6	88.5	OK
	A5	RC1(1)	88.2	4.9	256.6	59.3	6.0	35.5	OK
	A6	RC1(1)	88.1	4.9	256.6	59.3	6.0	35.5	OK
	A7	RC1(1)	0.0	5.2	256.6	0.0	6.4	0.4	OK
	A8	RC1(1)	0.0	5.2	256.6	0.0	6.4	0.4	OK

Datos de diseño

Calidad	$N_{Rd,s}$ [kN]	$V_{Rd,s}$ [kN]
M20 10.9 - 1	148.8	81.7

Explicación del símbolo

N_{Ed} Fuerza de tracción

- V_{Ed} Resultante de las fuerzas cortantes V_y , V_z en el tornillo.
 $V_{Rd,cp}$ Design resistance in case of concrete pryout failure - EN1992-4 - Cl. 7.2.2.4
 U_t Utilización a tracción
 U_s Utilización a cortante
 U_{ts} Utilización a tensión y cortante
 $N_{Rd,s}$ Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
 $V_{Rd,s}$ Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Resultado detallado para A3

Resistencia a tracción del anclaje (EN1992-4 - Cl. 7.2.1.3)

$$N_{Rd,s} = \frac{N_{tks}}{\gamma_{M_s}} = 148.8 \text{ kN} \geq N_{Ed} = 139.6 \text{ kN}$$

$$N_{tks} = c \cdot A_s \cdot f_{tk} = 208.3 \text{ kN}$$

Donde:

$$c = 0.85$$

– reduction factor for cut thread

$$A_s = 245 \text{ mm}^2$$

– Área a tracción

$$f_{tk} = 1000.0 \text{ MPa}$$

– resistencia a tracción última del tornillo

$$\gamma_{M_s} = 1.40$$

– safety factor for steel

$$\gamma_{M_s} = 1.2 \cdot \frac{f_{yk}}{f_{yk}} \geq 1.4$$

, donde:

$$f_{yk} =$$

900.0 MPa – resistencia mínima del tornillo

Resistencia a cortante (EN1992-4 - Cl.7.2.2.3.1)

$$V_{Rd,s} = \frac{V_{tks}}{\gamma_{M_s}} = 81.7 \text{ kN} \geq V_{Ed} = 5.4 \text{ kN}$$

$$V_{tks} = k_7 \cdot V_{Rk,s}^0 = 122.5 \text{ kN}$$

Donde:

$$k_7 = 1.00$$

– coefficient for anchor steel ductility

$$k_7 = \begin{cases} 0.8, & A < 0.08 \\ 1.0, & A \geq 0.08 \end{cases}$$

, donde:

$$A =$$

0.09 – bolt grade elongation at rupture

$$V_{Rk,s}^0 = 122.5 \text{ kN}$$

– the characteristic shear strength

$$V_{Rk,s}^0 = k_6 \cdot A_s \cdot f_{tk}$$

, donde:

$$k_6 =$$

0.50 – coefficient for anchor resistance in shear

$$A_s =$$

245 mm² – Área a tracción

$f_{tk} =$

1000.0 MPa – resistencia última específica para el acero del anclaje

$\gamma_{Ms} = 1.50$

– safety factor for steel

Interaction of tensile and shear forces in steel (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,s}}\right)^2 + \left(\frac{V_{Ed}}{V_{Rd,s}}\right)^2 = 0.88 \leq 1.0$$

Donde:

$N_{Ed} = 139.6 \text{ kN}$ – fuerza de tracción de diseño

$N_{Rd,s} = 148.8 \text{ kN}$ – resistencia a tracción del anclaje

$V_{Ed} = 5.4 \text{ kN}$ – esfuerzo cortante de cálculo

$V_{Rd,s} = 81.7 \text{ kN}$ – resistencia a cortante del anclaje

Interaction of tensile and shear forces in concrete (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,t}}\right)^{1.5} + \left(\frac{V_{Ed}}{V_{Rd,t}}\right)^{1.5} = 0.00 \leq 1.0$$

Donde:

$\frac{N_{Ed}}{N_{Rd,t}}$ – the largest utilization value for tension failure modes

$\frac{V_{Ed}}{V_{Rd,t}}$ – the largest utilization value for shear failure modes

Armado suplementario (EN 1992-4 - Cl. 7.2.1.9; EN 1992-4 - Cl. 7.2.2.6)
Supplementary reinforcement should resist force of 455.5 kN en tracción y 38.7 kN a cortante

Soldaduras (Se ha usado el máximo valor. Se recomienda redistribución plástica)

Ítem	Borde	Espesor de g. [mm]	Longitud [mm]	Cargas	$\sigma_{w,Ed}$ [MPa]	σ_{\perp} [MPa]	T_{\parallel} [MPa]	T_{\perp} [MPa]	Ut [%]	Estado
BP1	3-bfl 1	9.8	120	RC1(12)						OK
BP1	3-tfl 1	9.8	120	RC1(12)						OK
BP1	3-w 1	6.2	230	RC1(12)						OK

Datos de diseño

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
Acero S 275 EN 10025-2:2004-11	0.85	404.7	309.6

Explicación del símbolo

$\sigma_{w,Ed}$	Tensión equivalente
$\sigma_{w,Rd}$	Resistencia a tensión equivalente
σ_{\perp}	Tensión perpendicular
T_{\parallel}	Tensión cortante paralela al eje de la soldadura
T_{\perp}	Tensión normal perpendicular al eje de la soldadura
0.9σ	Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Factor de correlación EN 1993-1-8 tabla. 4.1
Ut	Utilización
Utc	Utilización de la capacidad de la soldadura

Resultado detallado para BP1 3-bfl 1

Las soldaduras a tope se asumen como de penetración completa y no se comprueban. Su resistencia se asume igual a la del elemento soldado -EN 1993 - 1 - 8 - 4.7.1.

Bloque de hormigón

Ítem	Cargas	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	Ut [%]	Estado
CB 1	RC1(1)	30	10904	40.2	3.00	40.2	99.9	OK

Explicación del símbolo

c	Anchura del área portante
A_{eff}	Área efectiva
σ	Tensión media en el hormigón
k_j	Factor de concentración
F_{jd}	Resistencia portante última del bloque de hormigón
Ut	Utilización

Resultado detallado para CB 1

Comprobación de la resistencia a compresión del bloque de hormigón (EN 1993-1-8 6.2.5)

$$\sigma = \frac{N}{A_{eff}} = 40.2 \text{ MPa}$$

$$F_{jd} = \alpha_{cc} \beta_j k_j f_{ck} / \gamma_c = 40.2 \text{ MPa}$$

Dónde:

$$N = 438.0 \text{ kN} \quad \text{– Fuerza axial de diseño}$$

$$A_{eff} = 10904 \text{ mm}^2 \quad \text{– Área efectiva, en la cual la fuerza de la columna}$$

$$\alpha_{cc} = 1.00 \quad \text{– Efectos a largo plazo sobre } F_{cd}$$

$$\beta_j = 0.87 \quad \text{– Coeficiente de unión } \beta_j$$

$$k_j = 3.00$$

– Factor de concentración

$$f_{ck} = 30.0 \text{ MPa}$$

– Resistencia característica a compresión del hormigón

$$\gamma_c = 1.50$$

– Factor de seguridad

Utilización de tensión

$$U_t = \frac{\sigma}{f_{td}} = 99.9 \%$$

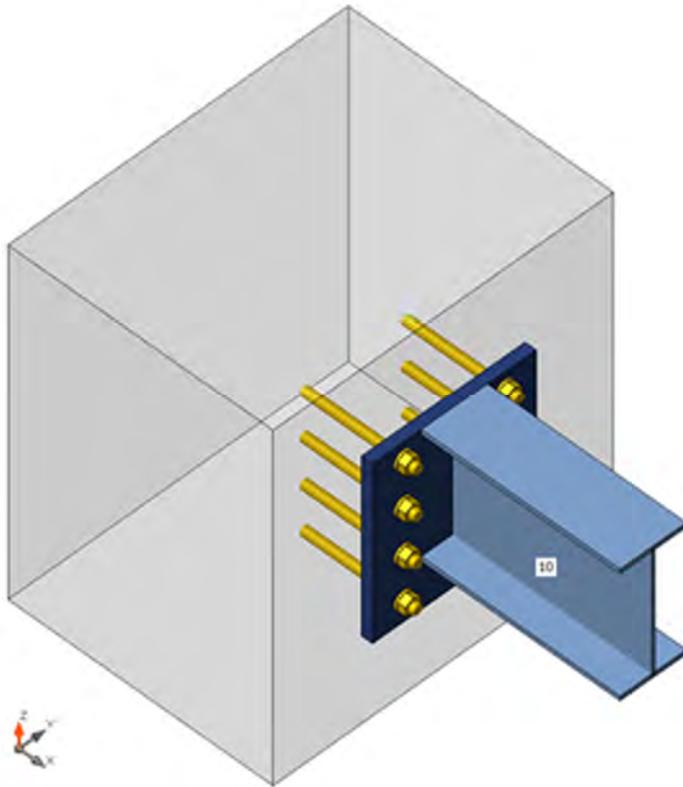
NUDO 6

Diseño

Nombre	NUDO 6
Descripción	
Análisis	Tensión, deformación/ Cargas en equilibrio

Elementos estructurales

Nom bre	Sección transve rsal	β – Direcc ión [°]	γ - Inclina ción [°]	α - Rotac ión [°]	Desplaza miento ex [mm]	Desplaza miento ey [mm]	Desplaza miento ez [mm]	Fuer zas en
10	10 - IPE300	0.0	0.0	0.0	0	0	150	Posic ión



Secciones

Nombre	Material
10 - IPE300	Acero S 275 EN 10025-2:2004-11

Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm ²]
M22 10.9	M22 10.9	22	1000.0	380

Cargas (Fuerzas en equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
RC1(12)	10	-34.0	0.0	49.8	0.0	-93.7	0.0
RC1(13)	10	31.8	0.0	3.2	0.0	-3.9	0.0
RC1(14)	10	-28.9	0.0	49.8	0.0	-93.6	0.0
RC1(18)	10	20.9	0.0	44.5	0.0	-79.9	0.0
RC1(10)	10	19.9	0.0	44.5	0.0	-80.0	0.0
RC1(15)	10	-27.9	0.0	49.8	0.0	-93.5	0.0
RC1(32)	10	-12.2	0.0	49.8	0.0	-91.8	0.0
RC1(1)	10	24.7	0.0	49.7	0.0	-89.5	0.0

RC1(2)	10	-26.8	0.0	3.2	0.0	-7.4	0.0
RC1(3)	10	24.3	0.0	8.5	0.0	-13.7	0.0

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	770 x 810	mm
Profundidad	600	mm
Anclaje	M22 10.9	
Longitud del anclaje	200	mm
Transferencia de la fuerza cortante	Anclajes	

Verificación

Resumen

Nombre	Valor	Estado
Análisis	100.0%	OK
Placas	0.5 < 5.0%	OK
Anclajes	91.1 < 100%	OK
Bloque de hormigón	57.2 < 100%	OK
Pandeo	No calculado	

Placas

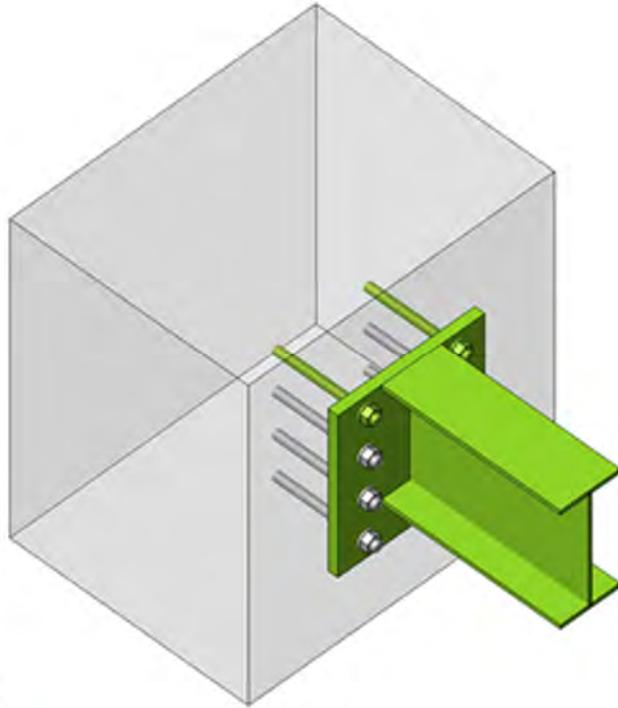
Nombre	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ϵ_{PI} [%]	σ_{CEd} [MPa]	Estado
10-bfl 1	10.7	RC1(1)	276.1	0.5	0.0	OK
10-tfl 1	10.7	RC1(12)	275.3	0.2	0.0	OK
10-w 1	7.1	RC1(15)	269.7	0.0	0.0	OK
BP1	25.0	RC1(1)	275.3	0.2	0.0	OK

Datos de diseño

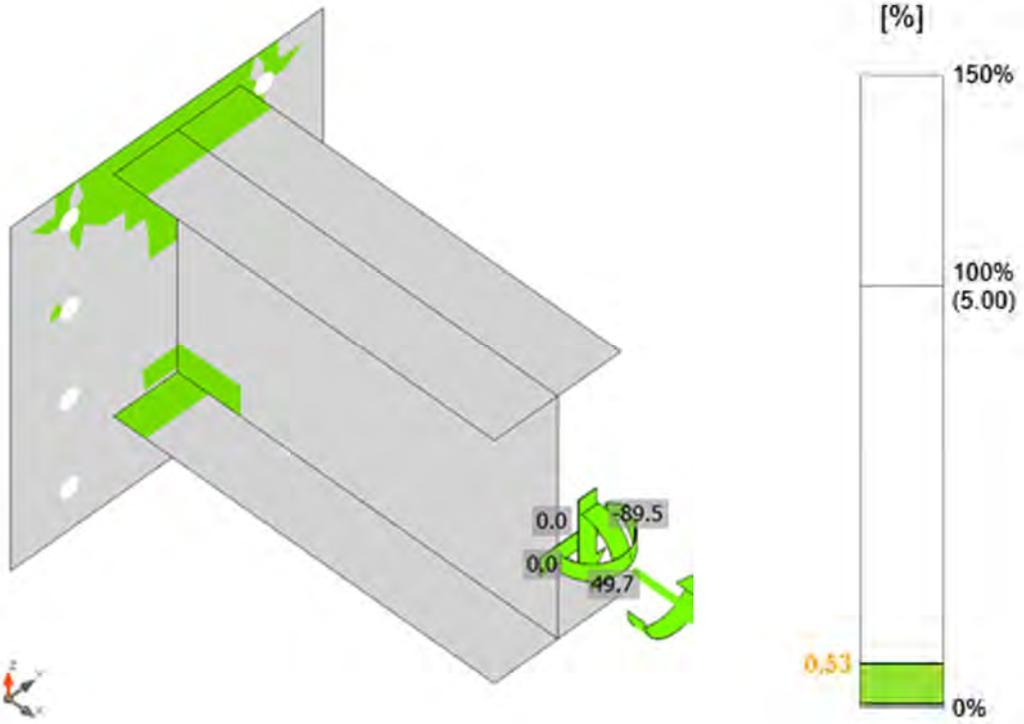
Material	f_y [MPa]	ϵ_{lim} [%]
Acero S 275 EN 10025-2:2004-11	275.0	5.0

Explicación del símbolo

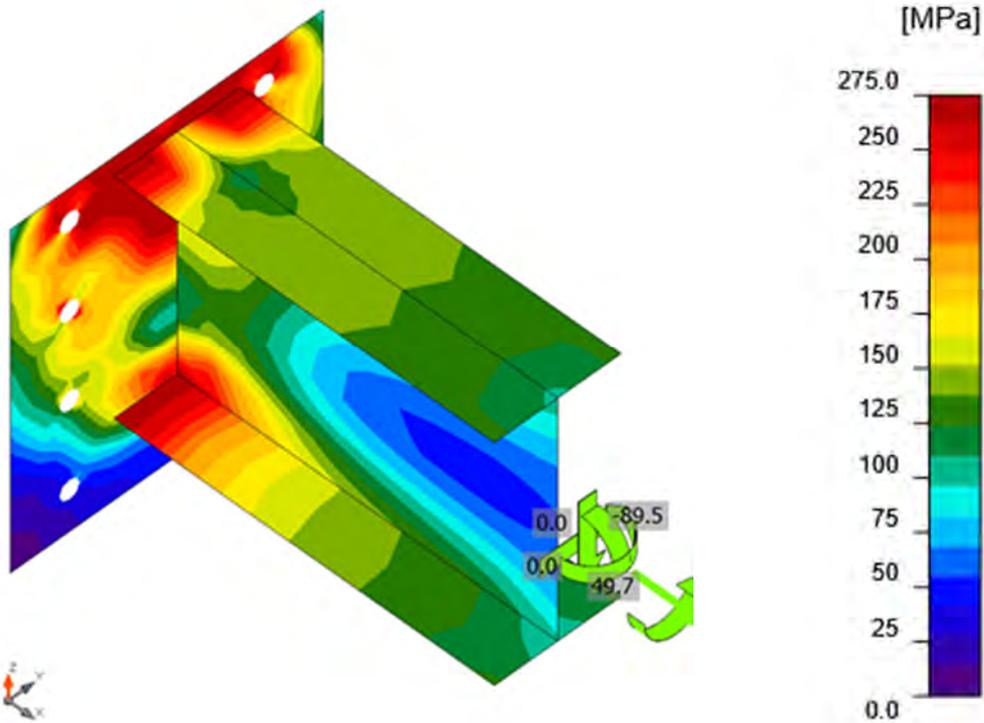
ϵ_{PI}	Deformación
σ_{Ed}	Ec. tensión
σ_{CEd}	Contact stress
f_y	Límite elástico
ϵ_{lim}	Límite de la deformación plástica



Verificación general, RC1(1)

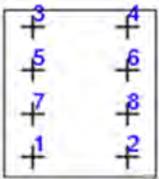


Verificación de deformación, RC1(1)



Tensión equivalente, RC1(1)

Anclajes

Forma	Ítem	Cargas	N_{Ed} [kN]	V_{Ed} [kN]	$V_{Rd,cp}$ [kN]	U_{t_t} [%]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Estado
	A1	RC1(1)	0.0	7.1	280.8	0.0	7.0	0.5	OK
	A2	RC1(1)	0.0	7.1	280.8	0.0	7.0	0.5	OK
	A3	RC1(1)	167.7	5.9	280.8	91.1	5.9	83.4	OK
	A4	RC1(1)	167.6	5.9	280.8	91.1	5.9	83.4	OK
	A5	RC1(1)	53.9	6.2	280.8	29.3	6.2	9.0	OK
	A6	RC1(1)	53.9	6.2	280.8	29.3	6.2	9.0	OK
	A7	RC1(1)	0.0	6.6	280.8	0.0	6.6	0.4	OK
	A8	RC1(1)	0.0	6.6	280.8	0.0	6.6	0.4	OK

Datos de diseño

Calidad	$N_{Rd,s}$ [kN]	$V_{Rd,s}$ [kN]
M22 10.9 - 1	184.0	101.0

Explicación del símbolo

N_{Ed} Fuerza de tracción

- V_{Ed} Resultante de las fuerzas cortantes V_y , V_z en el tornillo.
 $V_{Rd,cp}$ Design resistance in case of concrete pryout failure - EN1992-4 - Cl. 7.2.2.4
 U_t Utilización a tracción
 U_s Utilización a cortante
 U_{ts} Utilización a tensión y cortante
 $N_{Rd,s}$ Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
 $V_{Rd,s}$ Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Resultado detallado para A3

Resistencia a tracción del anclaje (EN1992-4 - Cl. 7.2.1.3)

$$N_{Rd,s} = \frac{N_{Rk,s}}{\gamma_{M_s}} = 184.0 \text{ kN} \geq N_{Ed} = 167.7 \text{ kN}$$

$$N_{Rk,s} = c \cdot A_s \cdot f_{uk} = 257.6 \text{ kN}$$

Donde:

$$c = 0.85$$

– reduction factor for cut thread

$$A_s = 303 \text{ mm}^2$$

– Área a tracción

$$f_{uk} = 1000.0 \text{ MPa}$$

– resistencia a tracción última del tornillo

$$\gamma_{M_s} = 1.40$$

– safety factor for steel

$$\gamma_{M_s} = 1.2 \cdot \frac{f_{yk}}{f_{yk}} \geq 1.4$$

, donde:

$$f_{yk} =$$

900.0 MPa – resistencia mínima del tornillo

Resistencia a cortante (EN1992-4 - Cl.7.2.2.3.1)

$$V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{M_s}} = 101.0 \text{ kN} \geq V_{Ed} = 5.9 \text{ kN}$$

$$V_{Rk,s} = k_7 \cdot V_{Rk,s}^0 = 151.5 \text{ kN}$$

Donde:

$$k_7 = 1.00$$

– coefficient for anchor steel ductility

$$k_7 = \begin{cases} 0.8, & A < 0.08 \\ 1.0, & A \geq 0.08 \end{cases}$$

, donde:

$$A =$$

0.09 – bolt grade elongation at rupture

$$V_{Rk,s}^0 = 151.5 \text{ kN}$$

– the characteristic shear strength

$$V_{Rk,s}^0 = k_6 \cdot A_s \cdot f_{uk}$$

, donde:

$$k_6 =$$

0.50 – coefficient for anchor resistance in shear

$$A_s =$$

303 mm² – Área a tracción

$f_{tk} =$

1000.0 MPa – resistencia última específica para el acero del anclaje

$\gamma_{Ms} = 1.50$

– safety factor for steel

Interaction of tensile and shear forces in steel (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,s}}\right)^2 + \left(\frac{V_{Ed}}{V_{Rd,s}}\right)^2 = 0.83 \leq 1.0$$

Donde:

$N_{Ed} = 167.7 \text{ kN}$ – fuerza de tracción de diseño

$N_{Rd,s} = 184.0 \text{ kN}$ – resistencia a tracción del anclaje

$V_{Ed} = 5.9 \text{ kN}$ – esfuerzo cortante de cálculo

$V_{Rd,s} = 101.0 \text{ kN}$ – resistencia a cortante del anclaje

Interaction of tensile and shear forces in concrete (EN 1992-4 - Table 7.3)

$$\left(\frac{N_{Ed}}{N_{Rd,t}}\right)^{1.5} + \left(\frac{V_{Ed}}{V_{Rd,t}}\right)^{1.5} = 0.00 \leq 1.0$$

Donde:

$\frac{N_{Ed}}{N_{Rd,t}}$ – the largest utilization value for tension failure modes

$\frac{V_{Ed}}{V_{Rd,t}}$ – the largest utilization value for shear failure modes

Armado suplementario (EN 1992-4 - Cl. 7.2.1.9; EN 1992-4 - Cl. 7.2.2.6)
Supplementary reinforcement should resist force of 443.1 kN en tracción y 49.7 kN a cortante

Soldaduras (Se ha usado el máximo valor. Se recomienda redistribución plástica)

Ítem	Borde	Espesor de g. [mm]	Longitud [mm]	Cargas	$\sigma_{w,Ed}$ [MPa]	σ_{\perp} [MPa]	T_{\parallel} [MPa]	T_{\perp} [MPa]	Ut [%]	Estado
BP1	10-bfl 1	10.7	150	RC1(12)						OK
BP1	10-tfl 1	10.7	150	RC1(12)						OK
BP1	10-w 1	7.1	289	RC1(12)						OK

Datos de diseño

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
Acero S 275 EN 10025-2:2004-11	0.85	404.7	309.6

Explicación del símbolo

$\sigma_{w,Ed}$	Tensión equivalente
$\sigma_{w,Rd}$	Resistencia a tensión equivalente
σ_{\perp}	Tensión perpendicular
T_{\parallel}	Tensión cortante paralela al eje de la soldadura
T_{\perp}	Tensión normal perpendicular al eje de la soldadura
0.9σ	Resistencia a tensión perpendicular - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Factor de correlación EN 1993-1-8 tabla. 4.1
Ut	Utilización
Utc	Utilización de la capacidad de la soldadura

Resultado detallado para BP1 10-bfl 1

Las soldaduras a tope se asumen como de penetración completa y no se comprueban. Su resistencia se asume igual a la del elemento soldado -EN 1993 - 1 - 8 - 4.7.1.

Bloque de hormigón

Ítem	Cargas	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	Ut [%]	Estado
CB 1	RC1(14)	38	20305	23.0	3.00	40.2	57.2	OK

Explicación del símbolo

c	Anchura del área portante
A_{eff}	Área efectiva
σ	Tensión media en el hormigón
k_j	Factor de concentración
F_{jd}	Resistencia portante última del bloque de hormigón
Ut	Utilización

Resultado detallado para CB 1

Comprobación de la resistencia a compresión del bloque de hormigón (EN 1993-1-8 6.2.5)

$$\sigma = \frac{N}{A_{eff}} = 23.0 \text{ MPa}$$

$$F_{jd} = \alpha_{cc} \beta_j k_j f_{ck} / \gamma_c = 40.2 \text{ MPa}$$

Dónde:

$$N = 466.8 \text{ kN} \quad \text{– Fuerza axial de diseño}$$

$$A_{eff} = 20305 \text{ mm}^2 \quad \text{– Área efectiva, en la cual la fuerza de la columna}$$

$$\alpha_{cc} = 1.00 \quad \text{– Efectos a largo plazo sobre } F_{cd}$$

$$\beta_j = 0.87 \quad \text{– Coeficiente de unión } \beta_j$$

$$k_j = 3.00$$

– Factor de concentración

$$f_{ck} = 30.0 \text{ MPa}$$

– Resistencia característica a compresión del hormigón

$$\gamma_c = 1.50$$

– Factor de seguridad

Utilización de tensión

$$U_t = \frac{\sigma}{f_{td}} = 57.2 \%$$

12.6. TABLESTACAS SIN ARRIOSTRAMIENTO

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1.- NORMA Y MATERIALES

Módulo de elasticidad: 210 GPa

Módulo de cortadura: 80.7692 GPa

Límite elástico (f_y): 0.355 GPa

2.- ACCIONES

Mayoración esfuerzos en construcción: 1.60

Mayoración esfuerzos en servicio: 1.60

Sin análisis sísmico

Sin considerar acciones térmicas en puntales

3.- DATOS GENERALES

Cota de la rasante: 0.00 m

Altura del muro sobre la rasante: 0.00 m

Tipología: Tablestacas metálicas. Catálogo 'ArcelorMittal'.

4.- DESCRIPCIÓN DEL TERRENO

Porcentaje del rozamiento interno entre el terreno y el trasdós del muro pantalla: 0.0 %

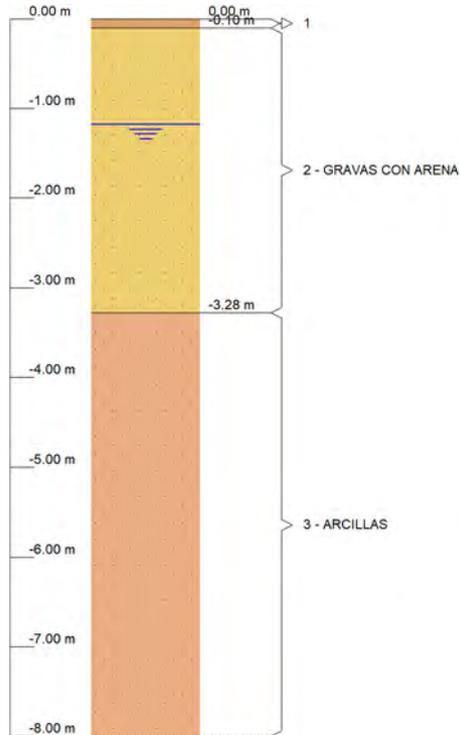
Porcentaje del rozamiento interno entre el terreno y el intradós del muro pantalla: 0.0 %

Profundidad del nivel freático: 1.18 m

ESTRATOS

Referencias	Cota superior	Descripción	Coefficientes de empuje
1	0.00 m	Densidad aparente: 18.0 kN/m ³ Densidad sumergida: 10.0 kN/m ³ Ángulo rozamiento interno: 30 grados Cohesión: 0.00 kN/m ² Módulo de balasto empuje activo: 10000.0 kN/m ³ Módulo de balasto empuje pasivo: 10000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.33 Reposo trasdós: 0.50 Pasivo trasdós: 3.00 Activo intradós: 0.33 Reposo intradós: 0.50 Pasivo intradós: 3.00
2 - GRAVAS CON ARENA	-0.10 m	Densidad aparente: 20.0 kN/m ³ Densidad sumergida: 11.0 kN/m ³ Ángulo rozamiento interno: 38 grados Cohesión: 0.00 kN/m ² Módulo de balasto empuje activo: 100000.0 kN/m ³ Módulo de balasto empuje pasivo: 100000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.24 Reposo trasdós: 0.38 Pasivo trasdós: 4.20 Activo intradós: 0.24 Reposo intradós: 0.38 Pasivo intradós: 4.20
3 - ARCILLAS	-3.28 m	Densidad aparente: 20.0 kN/m ³ Densidad sumergida: 9.0 kN/m ³ Ángulo rozamiento interno: 27 grados Cohesión: 30.00 kN/m ² Módulo de balasto empuje activo: 30000.0 kN/m ³ Módulo de balasto empuje pasivo: 30000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.38 Reposo trasdós: 0.55 Pasivo trasdós: 2.66 Activo intradós: 0.38 Reposo intradós: 0.55 Pasivo intradós: 2.66

5.- SECCIÓN VERTICAL DEL TERRENO



6.- GEOMETRÍA

Altura total: 7.40 m

Serie de tablestacas: AZ

Perfil: AZ 18-700



7.- COMPROBACIÓN DE LA GEOMETRÍA

Referencia: AZ (AZ 18-700)

Comprobación

Valores

Estado

Axil de agotamiento plástico de la sección transversal:

Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 4 (pag.41).

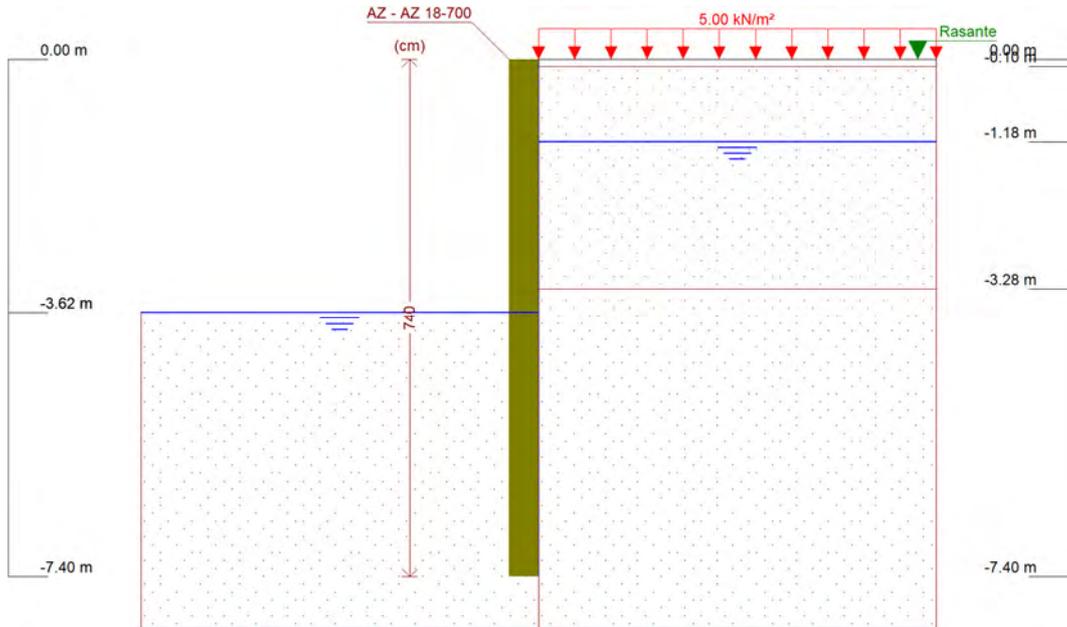
Npl,Rd: 4934.5 kN

Ned: 12.6 kN

Cumple

Referencia: AZ (AZ 18-700)		
Comprobación	Valores	Estado
<p>Cortante de agotamiento plástico de la sección transversal:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 4 (Fórmula 5.5) (pag.39).</i></p>	<p>Vpl,Rd: 1106.7 kN Ved: 87.5 kN</p>	Cumple
<p>Momento flector de agotamiento de la sección transversal:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 2 (pag.38).</i></p>	<p>Mc,Rd: 639 kN·m Med: 138.04 kN·m</p>	Cumple
<p>Resistencia al pandeo por esfuerzo cortante:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 7 (Fórmula 5.7) (pag.39).</i></p>	<p>Vb,Rd: 1098.9 kN Ved: 87.5 kN</p>	Cumple
<p>Momento flector resistido por la sección, reducido por la acción del esfuerzo cortante ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 9 (Fórmula 5.9/5.10) (pag.40).</i></p> <p>(1) No se ha superado el valor del esfuerzo cortante necesario para que haya una reducción del momento flector resistido por la sección.</p>		No procede
<p>Momento flector resistido por la sección, reducido por la acción de los esfuerzos cortante y axil ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 10, 11 (Fórmula 5.17, 5.18, 5.19, 5.20, 5.21, 5.22) (pag.45).</i></p> <p>(1) No se ha superado el valor del esfuerzo axil necesario para que haya una reducción del momento flector resistido por la sección.</p>		No procede
<p>Interacción flector, cortante y axil (comprobación con pandeo) ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 4 (Fórmula 5.13) (pag.41).</i></p> <p>(1) No se ha superado el valor del esfuerzo axil necesario para que sea necesaria la comprobación</p>		No procede
Se cumplen todas las comprobaciones		

8.- ESQUEMA DE LAS FASES



Referencias	Nombre	Descripción
Fase 1	Fase1 Excavación hasta cota - 3.62	Tipo de fase: Constructiva Cota de excavación: -3.62 m Con nivel freático trasdós hasta la cota: -1.18 m Con nivel freático intradós hasta la cota: -3.62 m

9.- CARGAS

CARGAS EN EL TRASDÓS

Tipo	Cota	Datos	Fase inicial	Fase final
Uniforme	En superficie	Valor: 5 kN/m ²	Fase1 Excavación hasta cota -3.62	Fase1 Excavación hasta cota -3.62

10.- RESULTADOS DE LAS FASES

Esfuerzos sin mayorar.

FASE 1: FASE1 ESCAVACIÓN HASTA COTA -3.62

BÁSICA

Cota (m)	Desplazamientos (mm)	Ley de axiles (kN/m)	Ley de cortantes (kN/m)	Ley de momento flector (kN·m/m)	Ley de empujes (kN/m ²)	Presión hidrostática (kN/m ²)
0.00	-17.34	0.00	0.21	0.00	1.67	0.00
-0.77	-14.61	0.82	1.72	0.70	4.78	0.00
-1.53	-11.88	1.64	6.50	4.26	7.67	3.44
-2.30	-9.18	2.46	17.44	14.40	9.68	10.95
-3.06	-6.56	3.28	35.66	36.64	11.68	18.46
-3.83	-4.19	4.10	54.69	74.09	-102.89	23.94
-4.59	-2.40	4.92	-3.88	85.29	-76.67	23.94
-5.36	-1.29	5.74	-35.68	64.68	-47.21	23.94
-6.12	-0.68	6.56	-43.08	31.87	-10.88	23.94
-6.89	-0.29	7.37	-26.83	6.14	12.33	23.94
Máximos	-0.05 Cota: -7.40 m	7.92 Cota: -7.40 m	54.69 Cota: -3.83 m	86.28 Cota: -4.34 m	26.97 Cota: -7.40 m	23.94 Cota: -4.08 m
Mínimos	-17.34 Cota: 0.00 m	0.00 Cota: 0.00 m	-43.88 Cota: -5.87 m	0.00 Cota: -7.40 m	-107.54 Cota: -4.08 m	0.00 Cota: 0.00 m

11.- COMPROBACIONES DE ESTABILIDAD (COEFICIENTES DE SEGURIDAD)

Referencia: Comprobaciones de estabilidad (Coeficientes de seguridad): canal de san José sin puntales		
Comprobación	Valores	Estado
<p>Relación entre el momento originado por los empujes pasivos en el intradós y el momento originado por los empujes activos en el trasdós:</p> <p>Hipótesis básica:</p> <p>- Fase1 Escavación hasta cota -3.62:</p> <p><i>Valor introducido por el usuario.</i></p>	<p>Mínimo: 2</p> <p>Calculado: 2.045</p>	Cumple
<p>Relación entre el empuje pasivo total en el intradós y el empuje realmente movilizado en el intradós:</p> <p>Hipótesis básica:</p> <p>- Fase1 Escavación hasta cota -3.62:</p> <p><i>Valor introducido por el usuario.</i></p>	<p>Mínimo: 1.5</p> <p>Calculado: 2.718</p>	Cumple
Se cumplen todas las comprobaciones		

12.- COMPROBACIONES DE ESTABILIDAD (CÍRCULO DE DESLIZAMIENTO PÉSIMO)

Referencia: Comprobaciones de estabilidad (Círculo de deslizamiento pésimo): canal de san José sin puntales		
Comprobación	Valores	Estado
<p>Círculo de deslizamiento pésimo:</p> <p>Combinaciones sin sismo:</p> <p>- Fase1 Escavación hasta cota -3.62: Coordenadas del centro del círculo (-1.29 m ; 2.18 m) - Radio: 9.68 m:</p> <p><i>Valor introducido por el usuario.</i></p>	<p>Mínimo: 1.5</p> <p>Calculado: 4.703</p>	Cumple
Se cumplen todas las comprobaciones		

12.7. TABLESTACAS CON ARRIOSTRAMIENTO

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1.- NORMA Y MATERIALES

Módulo de elasticidad: 210 GPa

Módulo de cortadura: 80.7692 GPa

Límite elástico (f_y): 0.355 GPa

2.- ACCIONES

Mayoración esfuerzos en construcción: 1.60

Mayoración esfuerzos en servicio: 1.60

Sin análisis sísmico

Sin considerar acciones térmicas en puntales

3.- DATOS GENERALES

Cota de la rasante: 0.00 m

Altura del muro sobre la rasante: 0.00 m

Tipología: Tablestacas metálicas. Catálogo 'ArcelorMittal'.

4.- DESCRIPCIÓN DEL TERRENO

Porcentaje del rozamiento interno entre el terreno y el trasdós del muro pantalla: 0.0 %

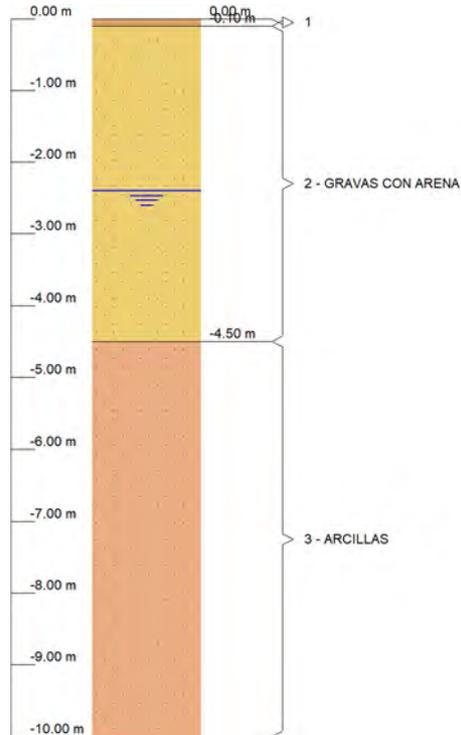
Porcentaje del rozamiento interno entre el terreno y el intradós del muro pantalla: 0.0 %

Profundidad del nivel freático: 2.40 m

ESTRATOS

Referencias	Cota superior	Descripción	Coefficientes de empuje
1	0.00 m	Densidad aparente: 18.0 kN/m ³ Densidad sumergida: 10.0 kN/m ³ Ángulo rozamiento interno: 30 grados Cohesión: 0.00 kN/m ² Módulo de balasto empuje activo: 10000.0 kN/m ³ Módulo de balasto empuje pasivo: 10000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.33 Reposo trasdós: 0.50 Pasivo trasdós: 3.00 Activo intradós: 0.33 Reposo intradós: 0.50 Pasivo intradós: 3.00
2 - GRAVAS CON ARENA	-0.10 m	Densidad aparente: 20.0 kN/m ³ Densidad sumergida: 11.0 kN/m ³ Ángulo rozamiento interno: 38 grados Cohesión: 0.00 kN/m ² Módulo de balasto empuje activo: 100000.0 kN/m ³ Módulo de balasto empuje pasivo: 100000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.24 Reposo trasdós: 0.38 Pasivo trasdós: 4.20 Activo intradós: 0.24 Reposo intradós: 0.38 Pasivo intradós: 4.20
3 - ARCILLAS	-4.50 m	Densidad aparente: 20.0 kN/m ³ Densidad sumergida: 9.0 kN/m ³ Ángulo rozamiento interno: 27 grados Cohesión: 30.00 kN/m ² Módulo de balasto empuje activo: 30000.0 kN/m ³ Módulo de balasto empuje pasivo: 30000.0 kN/m ³ Gradiente módulo de balasto: 0.0 kN/m ⁴	Activo trasdós: 0.38 Reposo trasdós: 0.55 Pasivo trasdós: 2.66 Activo intradós: 0.38 Reposo intradós: 0.55 Pasivo intradós: 2.66

5.- SECCIÓN VERTICAL DEL TERRENO



6.- GEOMETRÍA

Altura total: 9.50 m
 Serie de tablestacas: AZ
 Perfil: AZ 18-700

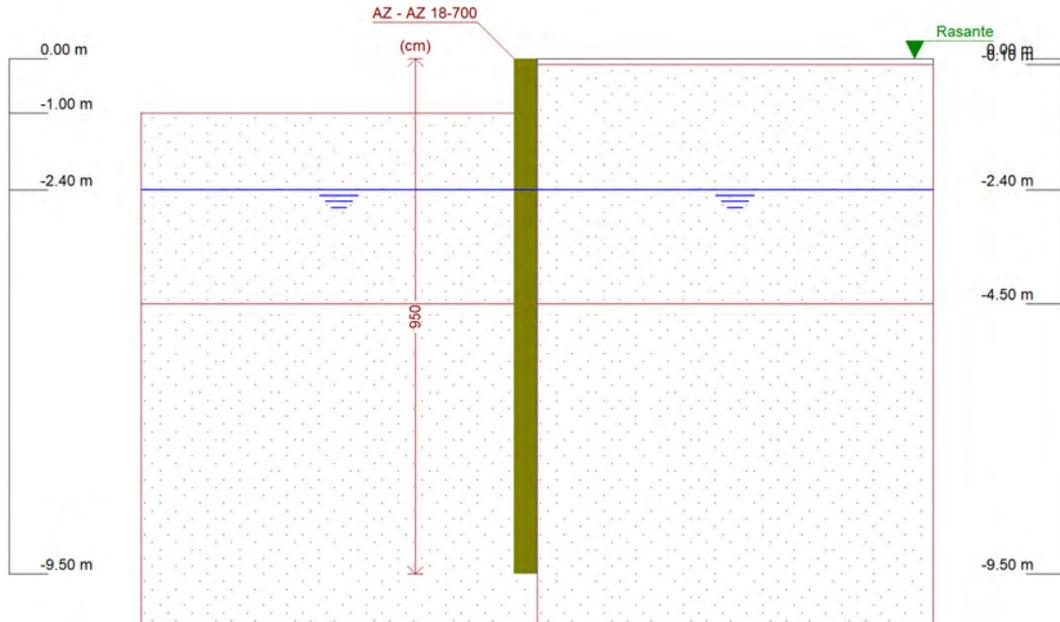


7.- COMPROBACIÓN DE LA GEOMETRÍA

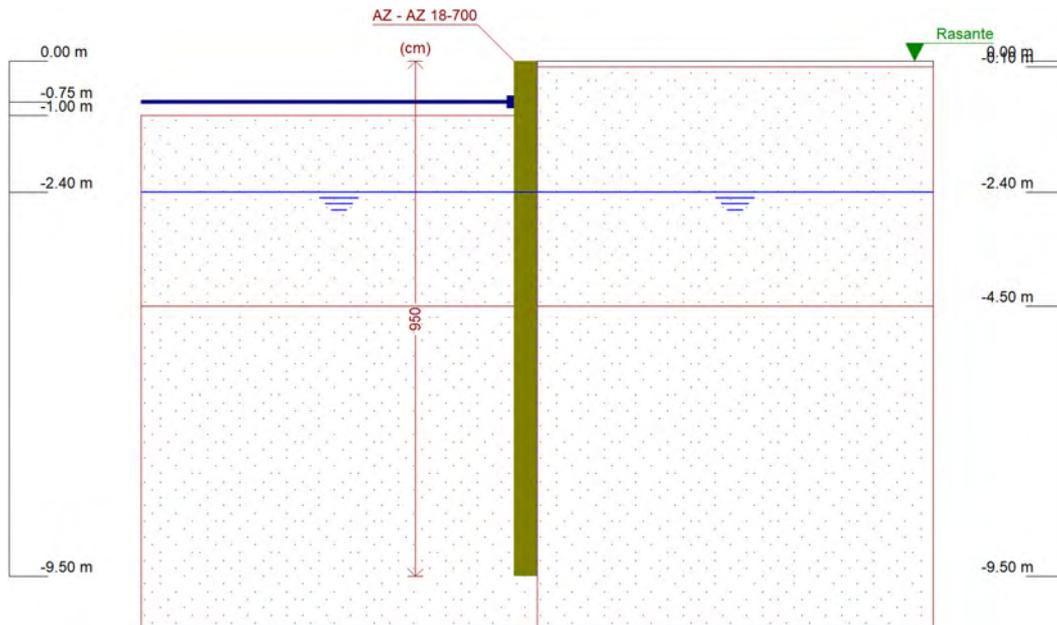
Referencia: AZ (AZ 18-700)		
Comprobación	Valores	Estado
Axil de agotamiento plástico de la sección transversal: <i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 4 (pag.41).</i>	Npl,Rd: 4934.5 kN Ned: 16.2 kN	Cumple

Referencia: AZ (AZ 18-700)		
Comprobación	Valores	Estado
<p>Cortante de agotamiento plástico de la sección transversal:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 4 (Fórmula 5.5) (pag.39).</i></p>	<p>Vpl,Rd: 1106.7 kN Ved: 135.1 kN</p>	Cumple
<p>Momento flector de agotamiento de la sección transversal:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 2 (pag.38).</i></p>	<p>Mc,Rd: 639 kN·m Med: 152.93 kN·m</p>	Cumple
<p>Resistencia al pandeo por esfuerzo cortante:</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 7 (Fórmula 5.7) (pag.39).</i></p>	<p>Vb,Rd: 1098.9 kN Ved: 135.1 kN</p>	Cumple
<p>Momento flector resistido por la sección, reducido por la acción del esfuerzo cortante ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.2, Apartado 9 (Fórmula 5.9/5.10) (pag.40).</i></p> <p>(1) No se ha superado el valor del esfuerzo cortante necesario para que haya una reducción del momento flector resistido por la sección.</p>		No procede
<p>Momento flector resistido por la sección, reducido por la acción de los esfuerzos cortante y axil ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 10, 11 (Fórmula 5.17, 5.18, 5.19, 5.20, 5.21, 5.22) (pag.45).</i></p> <p>(1) No se ha superado el valor del esfuerzo axil necesario para que haya una reducción del momento flector resistido por la sección.</p>		No procede
<p>Interacción flector, cortante y axil (comprobación con pandeo) ⁽¹⁾</p> <p><i>Eurocode 3: 'Design of steel structures'. Part 5: 'Piling'. English version. Stage 49, July 2004, CEN (European Committee for Standardisation). Artículo 5.2.3, Apartado 4 (Fórmula 5.13) (pag.41).</i></p> <p>(1) No se ha superado el valor del esfuerzo axil necesario para que sea necesaria la comprobación</p>		No procede
Se cumplen todas las comprobaciones		

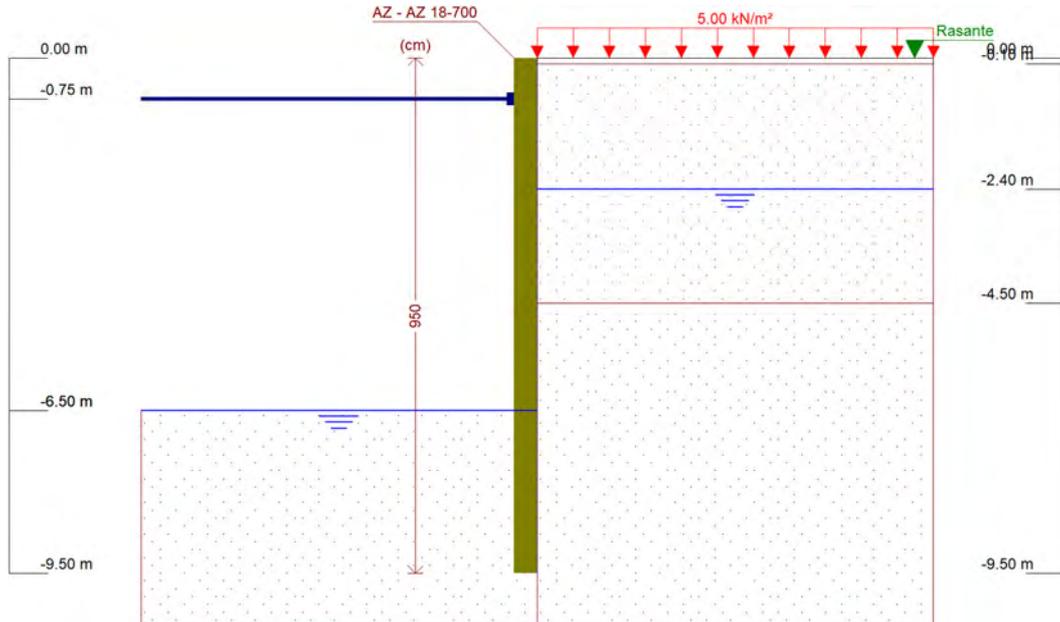
8.- ESQUEMA DE LAS FASES



Referencias	Nombre	Descripción
Fase 1	Fase1 Excavación hasta cota -1 m	Tipo de fase: Constructiva Cota de excavación: -1.00 m Con nivel freático trasdós hasta la cota: -2.40 m Con nivel freático intradós hasta la cota: -2.40 m



Referencias	Nombre	Descripción
Fase 2	Fase 2 Colocación del puntal a cota - 0.75 m	Tipo de fase: Constructiva Cota de excavación: -1.00 m Con nivel freático trasdós hasta la cota: -2.40 m Con nivel freático intradós hasta la cota: -2.40 m



Referencias	Nombre	Descripción
Fase 3	Fase 3 Excavación hasta cota - 6.60 m	Tipo de fase: Constructiva Cota de excavación: -6.50 m Con nivel freático trasdós hasta la cota: -2.40 m Con nivel freático intradós hasta la cota: -6.50 m

9.- CARGAS

CARGAS EN EL TRASDÓS

Tipo	Cota	Datos	Fase inicial	Fase final
Uniforme	En superficie	Valor: 5 kN/m ²	Fase 3 Excavación hasta cota -6.60 m	Fase 3 Excavación hasta cota -6.60 m

10.- ELEMENTOS DE APOYO

PUNTALES

Descripción	Fase inicial	Fase final
Cota: -0.75 m Rigidez axil: 9800 kN/m Separación: 5.0 m	Fase 2 Colocación del puntal a cota - 0.75 m	Fase 3 Excavación hasta cota - 6.60 m

11.- RESULTADOS DE LAS FASES

Esfuerzos sin mayorar.

FASE 1: FASE1 ESCAVACIÓN HASTA COTA -1 M

BÁSICA

Cota (m)	Desplazamientos (mm)	Ley de axiles (kN/m)	Ley de cortantes (kN/m)	Ley de momento flector (kN·m/m)	Ley de empujes (kN/m ²)	Presión hidrostática (kN/m ²)
0.00	-0.14	-0.00	0.00	-0.00	0.00	0.00
-0.75	-0.10	0.80	0.87	0.29	3.52	0.00
-1.50	-0.06	1.61	2.09	1.98	-2.97	0.00
-2.25	-0.04	2.41	0.26	2.54	-0.56	0.00
-3.00	-0.04	3.21	0.17	2.65	-0.07	0.00
-3.75	-0.06	4.01	-0.49	2.55	-3.40	0.00
-4.50	-0.09	4.82	-4.71	0.36	5.21	0.00
-5.25	-0.13	5.62	-1.45	-1.44	2.76	0.00
-6.00	-0.16	6.42	0.15	-1.65	1.08	0.00
-6.75	-0.18	7.23	0.69	-1.22	0.16	0.00
-7.50	-0.18	8.03	0.69	-0.69	-0.23	0.00
-8.25	-0.19	8.83	0.48	-0.27	-0.34	0.00
-9.00	-0.19	9.63	0.22	-0.04	-0.35	0.00
Máximos	-0.04 Cota: -2.75 m	10.17 Cota: -9.50 m	2.93 Cota: -1.25 m	2.68 Cota: -3.25 m	5.21 Cota: -4.50 m	0.00 Cota: 0.00 m
Mínimos	-0.19 Cota: -9.50 m	-0.00 Cota: 0.00 m	-4.71 Cota: -4.50 m	-1.69 Cota: -5.75 m	-8.03 Cota: -4.25 m	0.00 Cota: 0.00 m

FASE 2: FASE 2 COLOCACIÓN DEL PUNTAL A COTA -0.75 M

BÁSICA

Cota (m)	Desplazamientos (mm)	Ley de axiles (kN/m)	Ley de cortantes (kN/m)	Ley de momento flector (kN·m/m)	Ley de empujes (kN/m ²)	Presión hidrostática (kN/m ²)
0.00	-0.14	-0.00	0.00	0.00	0.00	0.00
-0.75	-0.10	0.80	0.87	0.29	3.52	0.00
-1.50	-0.06	1.61	2.09	1.98	-2.97	0.00
-2.25	-0.04	2.41	0.26	2.54	-0.56	0.00
-3.00	-0.04	3.21	0.17	2.65	-0.07	0.00
-3.75	-0.06	4.01	-0.49	2.55	-3.40	0.00
-4.50	-0.09	4.82	-4.71	0.36	5.21	0.00
-5.25	-0.13	5.62	-1.45	-1.44	2.76	0.00
-6.00	-0.16	6.42	0.15	-1.65	1.08	0.00
-6.75	-0.18	7.23	0.69	-1.22	0.16	0.00
-7.50	-0.18	8.03	0.69	-0.69	-0.23	0.00
-8.25	-0.19	8.83	0.48	-0.27	-0.34	0.00
-9.00	-0.19	9.63	0.22	-0.04	-0.35	0.00
Máximos	-0.04 Cota: -2.75 m	10.17 Cota: -9.50 m	2.93 Cota: -1.25 m	2.68 Cota: -3.25 m	5.21 Cota: -4.50 m	0.00 Cota: 0.00 m
Mínimos	-0.19 Cota: -9.50 m	-0.00 Cota: 0.00 m	-4.71 Cota: -4.50 m	-1.69 Cota: -5.75 m	-8.03 Cota: -4.25 m	0.00 Cota: 0.00 m

FASE 3: FASE 3 EXCAVACIÓN HASTA COTA -6.60 M

BÁSICA

Cota (m)	Desplazamientos (mm)	Ley de axiles (kN/m)	Ley de cortantes (kN/m)	Ley de momento flector (kN·m/m)	Ley de empujes (kN/m ²)	Presión hidrostática (kN/m ²)
0.00	-25.62	-0.00	0.21	0.00	1.67	0.00

Cota (m)	Desplazamientos (mm)	Ley de axiles (kN/m)	Ley de cortantes (kN/m)	Ley de momento flector (kN·m/m)	Ley de empujes (kN/m ²)	Presión hidrostática (kN/m ²)
-0.75	-25.33	0.80	1.67	0.67	4.71	0.00
-1.50	-25.09	1.61	-43.36	-33.11	8.28	0.00
-2.25	-24.60	2.41	-36.26	-62.23	11.85	0.00
-3.00	-23.66	3.21	-25.62	-84.42	14.13	5.89
-3.75	-22.11	4.01	-8.28	-95.35	16.09	13.24
-4.50	-19.85	4.82	16.05	-89.78	0.00	20.60
-5.25	-16.93	5.62	33.34	-69.40	0.00	27.96
-6.00	-13.50	6.42	56.15	-33.30	0.00	35.32
-6.75	-9.79	7.23	84.48	22.68	-103.90	40.22
-7.50	-6.27	8.03	32.53	60.74	-120.00	40.22
-8.25	-3.25	8.83	-31.04	53.97	-101.84	40.22
-9.00	-0.67	9.63	-54.97	14.80	10.87	40.22
Máximos	0.99 Cota: -9.50 m	10.17 Cota: -9.50 m	84.48 Cota: -6.75 m	63.89 Cota: -7.75 m	95.81 Cota: -9.50 m	40.22 Cota: -6.50 m
Mínimos	-25.62 Cota: 0.00 m	-0.00 Cota: 0.00 m	-55.25 Cota: -8.75 m	-95.59 Cota: -4.00 m	-129.78 Cota: -8.00 m	0.00 Cota: 0.00 m

12.- RESULTADOS PARA LOS ELEMENTOS DE APOYO

Esfuerzos sin mayorar.

Puntales

Cota: -0.75 m	
Fase	Resultado
Fase 2 Colocación del puntal a cota -0.75 m	Carga puntual: 0.00 kN Carga lineal: 0.00 kN/m
Fase 3 Excavación hasta cota -6.60 m	Carga puntual: 247.28 kN Carga lineal: 49.46 kN/m

13.- COMPROBACIONES DE ESTABILIDAD (COEFICIENTES DE SEGURIDAD)

Referencia: Comprobaciones de estabilidad (Coeficientes de seguridad): canal de san José sin puntales		
Comprobación	Valores	Estado
<p>Relación entre el momento originado por los empujes pasivos en el intradós y el momento originado por los empujes activos en el trasdós:</p> <p><i>Valor introducido por el usuario.</i></p> <p>Hipótesis básica:</p> <ul style="list-style-type: none"> - Fase1 Excavación hasta cota -1 m: - Fase 2 Colocación del puntal a cota -0.75 m: - Fase 3 Excavación hasta cota -6.60 m: 	<p>Mínimo: 2</p> <p>Calculado: 22.036</p> <p>Calculado: 74.872</p> <p>Calculado: 2.042</p>	<p>Cumple</p> <p>Cumple</p> <p>Cumple</p>
<p>Relación entre el empuje pasivo total en el intradós y el empuje realmente movilizado en el intradós:</p> <p><i>Valor introducido por el usuario.</i></p> <p>Hipótesis básica:</p> <ul style="list-style-type: none"> - Fase1 Excavación hasta cota -1 m: - Fase 2 Colocación del puntal a cota -0.75 m: - Fase 3 Excavación hasta cota -6.60 m: 	<p>Mínimo: 1.5</p> <p>Calculado: 6.709</p> <p>Calculado: 6.709</p> <p>Calculado: 1.575</p>	<p>Cumple</p> <p>Cumple</p> <p>Cumple</p>
Se cumplen todas las comprobaciones		

14.- COMPROBACIONES DE ESTABILIDAD (CÍRCULO DE DESLIZAMIENTO PÉSIMO)

Referencia: Comprobaciones de estabilidad (Círculo de deslizamiento pésimo): canal de san José sin puntales		
Comprobación	Valores	Estado
<p>Círculo de deslizamiento pésimo:</p> <p><i>Valor introducido por el usuario.</i></p> <p>Combinaciones sin sismo:</p> <ul style="list-style-type: none"> - Fase1 Excavación hasta cota -1 m: Coordenadas del centro del círculo (-0.81 m ; 2.76 m) - Radio: 12.76 m: 	<p>Mínimo: 1.5</p> <p>Calculado: 18.362</p>	<p>Cumple</p>

Referencia: Comprobaciones de estabilidad (Círculo de deslizamiento pésimo): canal de san josé sin puntales		
Comprobación	Valores	Estado
- Fase 2 Colocación del puntal a cota -0.75 m: Coordenadas del centro del círculo (-0.81 m ; 2.76 m) - Radio: 12.76 m:	Calculado: 18.362	Cumple
- Fase 3 Excavación hasta cota -6.60 m: Coordenadas del centro del círculo (-2.32 m ; 1.85 m) - Radio: 11.85 m:	Calculado: 2.986	Cumple
Se cumplen todas las comprobaciones		

En Madrid, a 17 de Diciembre de 2020



Fdo. Luis Hernández Blanco
ICCP – Colegiado nº 13.760

APENDICE 2: DIMENSIONAMIENTO DE EDIFICIO DE HORMIGÓN PREFABRICADO DE ESTACIÓN DE BOMBEO

MEMORIA DE CALCULO DE ESTRUCTURA

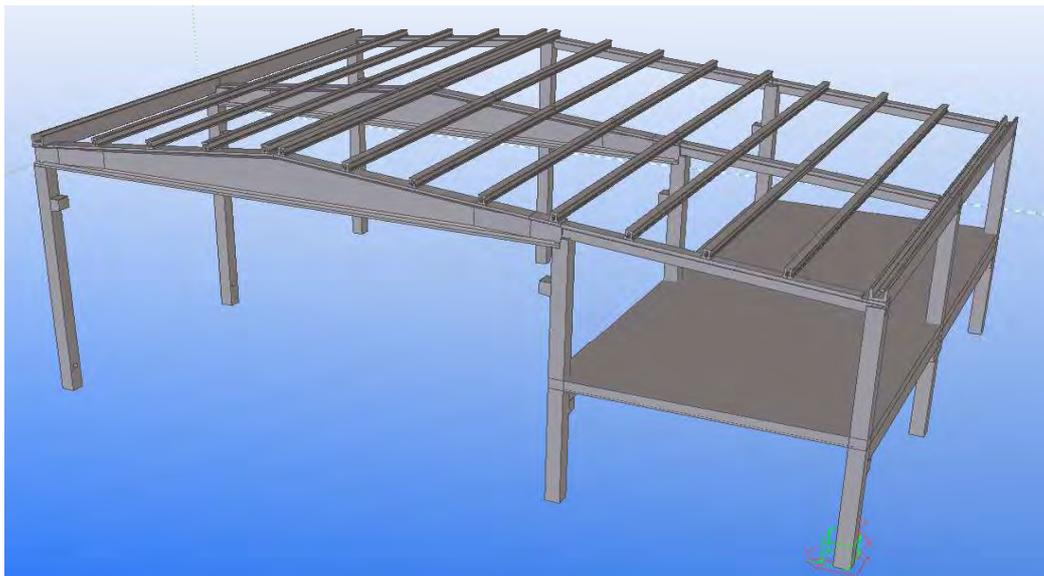
OBRA: ESTACION DE BOMBEO

LOCALIDAD: ZAMORA

PARA:

ING: ITACYL

R.B: 0026-06-20



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3.- DEFINICION

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5.- ACCIONES CONSIDERADAS

5.1.- ACCIONES CONSIDERADAS

5.2.- ACCIONES GRAVITATORIAS

5.3.- ACCIONES DEL VIENTO

5.3.1- PRESION DE VIENTO VERTICAL

5.3.2- PRESION DE VIENTO HORIZONTAL

5.4.- PUENTE GRUA

5.5.-ACCIONES TERMICAS Y REOLOGICAS.

5.6.- ACCIONES SISMICAS.-

6.- CALCULO ESTRUCTURAL

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6.2.- VIGAS

6.3.- PILARES.

6.4.- CIMENTACION.

7.- NORMATIVA UTILIZADA

8.- CARACTERISTICAS DE LOS MATERIALES

8.1.- HORMIGON

8.2.- ARMADURAS

8.3.- CONTROL DE EJECUCION

8.4.- COEFICIENTES DE SIMULTANEIDAD

1.- INTRODUCCION

Se redacta la presente Memoria de Cálculo con objeto de definir y justificar los elementos estructurales de la

ESTACION DE BOMBEO

de acuerdo con lo dispuesto en la Instrucción de Hormigón Estructural (EHE-08) y en el Código Técnico de la edificación.

2.- DATOS

OBRA: ESTACION DE BOMBEO
LOCALIDAD: ZAMORA
PARA:
ING: ITACYL
R.B: 0026-06-20

3.- DEFINICION

La presente memoria tiene por objeto la descripción de las hipótesis adoptadas en la estructura de la obra citada. La nave se distribuye de la siguiente forma:

LARGO DE LA NAVE (en el sentido de las Correas)	17.05	m
ANCHO DE LA NAVE (Longitud del Hastial)	23.07	m
ALTURA DE FACHADA	9.50	m

4.- ORGANIZACIÓN ESTRUCTURAL

La estructura se ha organizado mediante pórticos transversales formados:

- pilares prefabricados de hormigón armado tipo R
- vigas prefabricadas de hormigón pretensado tipo RNI
- vigas prefabricadas de hormigón armado FL

arriostrados por

- correas prefabricadas de hormigón pretensado de canto 25.

Se consigue de esta forma una estructura resistente y estable, frente a las acciones verticales, y frente a las acciones internas y horizontales externas.

La geometría de los pórticos es la siguiente:

Luz de Viga / Pórtico	15.58	m
Pendiente de la Cubierta	10.00	%
Separacion de Vigas / Pórticos	8.81	m
Número de Aguas de la Viga / Pórtico	2	
Altura libre de Pilares	7.78	m
Canto de la Solera	0.00	m
Canto de enchado sobre zapata	0.00	m

5.3.- ACCIONES DEL VIENTO

De acuerdo con lo recogido en la norma CTE SE-AE, el cálculo de la presión estática de viento, q_e , que actúa sobre un elemento se obtiene según la ecuación:

$$q_e = q_b \cdot c_e \cdot c_p$$

- q_e : Presión estática del viento (kN/m²)
- q_b : Presión dinámica del viento (kN/m²)
- c_e : Coeficiente de exposición.
- c_p : Coeficiente eólico o de presión.

5.3.1- PRESION DE VIENTO VERTICAL

Coeficiente de Presión Dinámica del viento

El cálculo de la presión dinámica del viento se realiza según lo recogido en el anejo D de la citada norma:

$$q_b = 0,5 \cdot d \cdot (v_b)^2$$

En el cálculo de la presión dinámica del viento que actúa sobre la estructura objeto de este anejo se han considerado los siguientes datos:

El valor básico de la velocidad del viento se deduce a partir de las zonas de la figura D1, y es afectado por un factor de corrección que depende de la vida útil considerada para la estructura.



Figura D.1 Valor básico de la velocidad del viento, v_b

Tabla D.1 Corrección de la velocidad básica en función del periodo de servicio

Periodo de retorno (años)	1	2	5	10	20	50	200
Coefficiente corrector	0,41	0,78	0,85	0,90	0,95	1,00	1,08

Zona de Viento	ZONA A	
Densidad del Aire	1.25	kp/m3
Velocidad Básica del viento	26	m/s
Periodo de vida Util de la estructura	50	años
Coefficiente Corrector	1	
Presión Dinámica	42.25	kp/m2

Coefficiente de Exposición

El coeficiente de exposición tiene en cuenta los efectos de las turbulencias originadas por el relieve y la topografía del terreno. Su valor se puede tomar de la tabla 3.3, siendo la altura del punto considerado la medida respecto a la rasante media de la fachada a barlovento. Para alturas superiores a 30 m los valores deben obtenerse de las expresiones generales que se recogen en el Anejo A.

En el caso de edificios situados en las cercanías de acantilados o escarpas de pendiente mayor de 40°, la altura se medirá desde la base de dichos accidentes topográficos. Este Documento Básico sólo es de aplicación para alturas de acantilado o escarpa inferiores a 50 m.

El cálculo del coeficiente de exposición se realiza según lo recogido en el anejo D de la citada norma, y para alturas sobre el terreno, z, no mayores de 200 m se calcula según las siguientes expresiones:

$$ce = F \cdot (F+7 \cdot k) \quad (D.2)$$

$$F = k \cdot \ln(\max(z, Z) / L) \quad (D.3)$$

Los factores k, L y Z dependen del tipo de entorno considerado, según la tabla D.2. En el cálculo del coeficiente de exposición que actúa sobre la estructura objeto de este anejo se han tenido en cuenta los siguientes datos:

Grado de Aspereza del entorno	GRADO IV
k	0.22
L	0.30
z	5.00
Z	9.50
Coefficiente de Exposición	1.748

Tabla D.2 Coeficientes para tipo de entorno

Grado de aspereza del entorno	Parámetro		
	k	L (m)	Z (m)
I Borde del mar o de un lago, con una superficie de agua en la dirección del viento de al menos 5 km de longitud	0,15	0,003	1,0
II Terreno rural llano sin obstáculos ni arbolado de importancia	0,17	0,01	1,0
III Zona rural accidentada o llana con algunos obstáculos aislados, como árboles o construcciones pequeñas	0,19	0,05	2,0
IV Zona urbana en general, industrial o forestal	0,22	0,3	5,0
V Centro de negocios de grandes ciudades, con profusión de edificios en altura	0,24	1,0	10,0

Coefficiente de Presión Exterior

El cálculo del coeficiente de presión exterior se realiza según lo recogido en el anejo D de la citada norma. Así, se tendrá en cuenta la forma y orientación de la superficie respecto al viento y, en su caso, de la situación del punto respecto a los bordes de esa superficie. Un valor negativo del coeficiente de presión exterior indica la existencia de succión. Los valores de los coeficientes se determinan en 3.3.4 y 3.3.5.

La estructura objeto de cálculo consiste en una nave, habiéndose aplicado las cargas repercutidas en los pilares así como en los elementos de cubierta con el valor correspondiente a la superficie tributante que le corresponde.

Coefficiente Eólico o de Presión	0.158
Coefficiente Eólico o de Presión	-0.579

Así la presión estática del viento, alcanza los siguientes valores

Máxima PRESION ESTATICA DEL VIENTO	11.67	kp/m2
Máxima SUCCION ESTATICA DEL VIENTO	-42.77	kp/m2

5.3.2- PRESION DE VIENTO HORIZONTAL

Coefficiente de Presión Dinámica del viento

El cálculo de la presión dinámica del viento se realiza según lo recogido en el anejo D de la citada norma:

$$q_b = 0,5 \cdot d \cdot (v_b)^2$$

En el cálculo de la presión dinámica del viento que actúa sobre la estructura objeto de este anejo se han considerado los siguientes datos:

El valor básico de la velocidad del viento se deduce a partir de las zonas de la figura D1, y es afectado por un factor de corrección que depende de la vida útil considerada para la estructura.

Zona de Viento	ZONA A	
Densidad del Aire	1.25	kp/m3
Velocidad Básica del viento	26	m/s
Periodo de vida Util de la estructura	50	años
Coefficiente Corrector	1	
Presión Dinámica	42.25	kp/m2

Coefficiente de Exposición

El coeficiente de exposición tiene en cuenta los efectos de las turbulencias originadas por el relieve y la topografía del terreno. Su valor se puede tomar de la tabla 3.3, siendo la altura del punto considerado la medida respecto a la rasante media de la fachada a barlovento. Para alturas superiores a 30 m los valores deben obtenerse de las expresiones generales que se recogen en el Anejo A.

En el caso de edificios situados en las cercanías de acantilados o escarpas de pendiente mayor de 40°, la altura se medirá desde la base de dichos accidentes topográficos. Este Documento Básico sólo es de aplicación para alturas de acantilado o escarpa inferiores a 50 m.

El cálculo del coeficiente de exposición se realiza según lo recogido en el anejo D de la citada norma, y para alturas sobre el terreno, z, no mayores de 200 m se calcula según las siguientes expresiones:

$$ce = F \cdot (F+7 \cdot k) \quad (D.2)$$

$$F = k \cdot \ln(\max(z, Z) / L) \quad (D.3)$$

Los factores k, L y Z dependen del tipo de entorno considerado, según la tabla D.2. En el cálculo del coeficiente de exposición que actúa sobre la estructura objeto de este anejo se han tenido en cuenta los siguientes datos:

Grado de Aspareza del entorno	GRADO IV
k	0.22
L	0.3
z	5
Z	9.50
Coefficiente de Exposición	1.748

Coefficiente de Presión Exterior

El cálculo del coeficiente de presión exterior se realiza según lo recogido en el anejo D de la citada norma. Así, se tendrá en cuenta la forma y orientación de la superficie respecto al viento y, en su caso, de la situación del punto respecto a los bordes de esa superficie. Un valor negativo del coeficiente de presión exterior indica la existencia de succión. Los valores de los coeficientes se determinan en 3.3.4 y 3.3.5.

La estructura objeto de cálculo consiste en una nave, habiéndose aplicado las cargas repercutidas en los pilares así como en los elementos de cubierta con el valor correspondiente a la superficie tributante que le corresponde.

Coefficiente Eólico o de Presión	0.80
----------------------------------	------

Así la presión estática del viento, alcanza los siguientes valores

Presión Estática de Viento para Pilares	59.10	kp/m ²
-----------------------------------------	-------	-------------------

5.4.- PUENTE GRUA

Sobrecarga de Uso (kp)	6300	kp
Peso Propio Puente Grúa (kp)	1800	kp
Peso Propio del Carro (kp)	400	kp
Altura del Puente Grúa	6.77	m

5.5.-ACCIONES TERMICAS Y REOLOGICAS.

No es necesario tenerlas presentes, de acuerdo con la normativa vigente, CODIGO TECNICO DE LA EDIFICACION (C.T.E.), DB SE-AE Acciones en la Edificación.

5.6.- ACCIONES SISMICAS.-

De acuerdo con la Normativa vigente NCSE-02, la estructura se clasifica como construcción de normal importancia. No es obligatoria la aplicación de esta norma en construcciones de normal importancia cuando la aceleración sísmica básica sea inferior a 0.04 g.

Según el Mapa de peligrosidad Sísmica, del Capítulo 2, de la norma NCSE-02, nos encontramos que la aceleración sísmica básica es inferior a 0.04 g, por lo que no es obligatoria la aplicación de dicha norma.

6.- CALCULO ESTRUCTURAL

6.1.- MODELO DE CALCULO

El tipo estructural adoptado en la superestructura corresponde al de pórticos espaciales formados por barras definidas como elementos unidimensionales. Se establece la compatibilidad de deformaciones en todos los nudos.

La estructura se discretiza en elementos tipo barra con sus condiciones de rigidez determinadas por la posición de los nudos inicial y final, sus condiciones de contorno, las propiedades de los materiales y de las secciones que se les asignan.

El análisis de las solicitaciones se realiza mediante un cálculo espacial en 3D, por métodos matriciales de rigidez, formando todos los elementos que definen la estructura: pilares, muros, vigas y correas.

Para todos los estados de carga se realiza un cálculo estático y se supone un comportamiento lineal de los materiales y, por tanto, un cálculo de primer orden con unas características mecánicas calculadas con las secciones brutas de los materiales y su módulo de elasticidad secante, de cara a la obtención de desplazamientos y esfuerzos.

6.2.- VIGAS

De acuerdo con las cargas obtenidas en el apartado 4, se han obtenido las solicitaciones en los diferentes puntos, considerando los principios de la Mecánica y las teorías clásicas de Resistencia de Materiales y Elasticidad. Obtenidos éstos esfuerzos se han dimensionado las vigas de acuerdo a la Norma EHE-08.

6.3.- PILARES.

De acuerdo con las cargas obtenidas en el apartado 4, se han obtenido las solicitaciones en los diferentes puntos, considerando los principios de la Mecánica y las teorías clásicas de Resistencia de Materiales y Elasticidad. Obtenidos estos esfuerzos se han dimensionado los pilares de acuerdo a la Norma EHE-08.

6.4.- CIMENTACION.

La cimentación se ha estudiado mediante zapatas centradas aisladas.

Según indicaciones de la obra se ha considerado una tensión máxima admisible del terreno de 0,21 N/mm², comprobando que las cargas transmitidas al terreno no superen en ningún punto dicha tensión.

7.- NORMATIVA UTILIZADA

Cementos. Todos los cementos a utilizar en la obra, en función de su situación, tipo de ambiente, serán definidos de acuerdo a su adecuación a la norma vigente para la Recepción de Cementos RC.

Hormigón Armado. El diseño, cálculo y armado de los elementos de hormigón de la estructura y cimentación, se ajustarán en todo momento a lo indicado en la norma EHE ejecutándose de acuerdo a lo señalado en las indicadas instrucciones.

Hormigón Pretensado. El diseño y cálculo de los elementos de hormigón pretensado, se harán de acuerdo a lo especificado en la instrucción EHE-08 , ajustándose su construcción a lo indicado en la misma.

Código Técnico de la Edificación (C.T.E.). Dentro del C.T.E. se aplicarán los siguientes Documentos Básicos:

El DB-SE constituye la base para los Documentos Básicos siguientes y se utilizará conjuntamente con ellos:

DB-SE	Seguridad estructural:	Procede
DB-SE-AE	Acciones en la edificación	Procede
DB-SE-C	Cimentaciones	Procede
DB-SE-A	Estructuras de acero	No Procede
DB-SE-F	Estructuras de fábrica	No Procede
DB-SE-M	Estructuras de madera	No Procede

8.- CARACTERISTICAS DE LOS MATERIALES

Las características de los materiales empleados en el cálculo de la estructura y el nivel de control considerado, son los siguientes:

8.1.- HORMIGON

ELEMENTO	Resistencia Característica (N/mm ²)	Nivel de Control	Coef. De Ponderación
VIGAS RNI	HP-35/F/12/IIa	100x100	1.50
VIGA FL	HA-35/F/12/IIa	100x100	1.50
CORREAS	HP-40/P/12/IIa	100x100	1.50
PILARES	HA-35/F/12/IIa	100x100	1.50
CIMENTACION	HA-25/B/20/IIa	Estadístico	1.50

8.2.- ARMADURAS

ELEMENTO	Resistencia Característica (N/mm ²)	Nivel de Control	Coef. De Ponderación
VIGAS RNI	Y 1860 S7	Normal	1.15
VIGA FL	B-500-S	Normal	1.15
CORREAS	Y 1860 S7	Normal	1.15
PILARES	B-500-S	Normal	1.15
CIMENTACION	B-500-S	Normal	1.15

8.3.- CONTROL DE EJECUCION

El control de ejecución de la obra será normal para los elementos armados in situ y para la cimentación, mientras que en los elementos prefabricados el control es intenso. Para garantizar la durabilidad del hormigón deberá realizarse un adecuado control del recubrimiento mediante la adecuada disposición de separadores conforme a lo prescrito en la EHE-08.

Según la EHE-08, la abertura máxima de fisuras para la clase de exposición IIa será $w_{max} = 0.3$ mm.

Según la EHE-08 es preciso realizar un control sobre las especificaciones relativas a la durabilidad del hormigón. Este control se llevará a cabo mediante el procedimiento de control estadístico, debiéndose satisfacer los requisitos recogidos en la EHE-08 para este tipo de control.

TIPO DE ACCION	SITUACION	
	DESFAVORABLE	FAVORABLE
Permanente	1.35	0.80
Variable	1.50	0.00

8.4.- COEFICIENTES DE SIMULTANEIDAD

Definidos los estados de carga según su origen, se procede a calcular las combinaciones posibles con los coeficientes de mayoración y minoración correspondientes de acuerdo a los coeficientes de seguridad definidos en el art. 12º de la norma EHE y las combinaciones de hipótesis básicas definidas en el Art. 4º del CTE DB-SE

COMBINACIONES DE ACCIONES	CHI 0	CHI 1	CHI 2
MANTENIMIENTO	0	0	0
NIEVE	0.5	0.2	0
VIENTO	0.6	0.5	0

DATOS DE LA OBRA E HIPÓTESIS DE CÁLCULO

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1.- DATOS GENERALES DE LA ESTRUCTURA

Proyecto: R.B:0026-06-20 NAVE EN ZAMORA

Clave: 0026-06-20 V1

2.- NORMAS CONSIDERADAS

Hormigón: EHE-08

Aceros conformados: CTE DB SE-A

Aceros laminados y armados: CTE DB SE-A

Categoría de uso: A. Zonas residenciales

3.- ACCIONES CONSIDERADAS

3.1.- Gravitatorias

Planta	S.C.U (t/m ²)	Cargas muertas (t/m ²)
ENTREPLANTA	0.50	0.10
PILARES	0.00	0.00
Cimentación	0.00	0.00

3.2.- Viento

Se ha tenido en cuenta la acción del viento mediante cargas aplicadas en las siguientes hipótesis: 'V 1', 'V 2', 'V 3' y 'V 4'.

3.3.- Sismo

Sin acción de sismo

3.4.- Hipótesis de carga

Automáticas	Carga permanente Sobrecarga de uso		
Adicionales	Referencia	Descripción	Naturaleza
	Q 1	PG1_1	Sobrecarga de uso
	Q 2	PG1_2	Sobrecarga de uso
	Q 3	PG2_1	Sobrecarga de uso
	Q 4	PG2_2	Sobrecarga de uso
	Q 5	PG3_1	Sobrecarga de uso
	Q 6	PG3_2	Sobrecarga de uso
	V 1	+X	Viento
	V 2	-X	Viento
	V 3	+Y	Viento
	V 4	-Y	Viento
	N 1	N	Nieve

3.5.- Listado de cargas

Cargas especiales introducidas (en Tm, Tm/m y Tm/m²)



Listado de datos de la obra

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Grupo	Hipótesis	Tipo	Valor	Coordenadas
0	Carga permanente	Puntual	25.00	(0.20, 22.88)
	Carga permanente	Puntual	25.00	(8.28, 22.88)
	Carga permanente	Puntual	25.00	(16.85, 22.90)
	Carga permanente	Puntual	25.00	(16.85, 15.27)
	Carga permanente	Puntual	25.00	(16.85, 7.46)
	Carga permanente	Puntual	25.00	(16.85, 0.23)
	Carga permanente	Puntual	25.00	(8.21, 0.16)
	Carga permanente	Puntual	25.00	(0.17, 0.18)
	Carga permanente	Puntual	25.00	(0.18, 7.51)

4.- ESTADOS LÍMITE

E.L.U. de rotura. Hormigón	CTE
E.L.U. de rotura. Hormigón en cimentaciones	Cota de nieve: Altitud inferior o igual a 1000 m
E.L.U. de rotura. Acero laminado	
Tensiones sobre el terreno	Acciones características
Desplazamientos	

5.- SITUACIONES DE PROYECTO

Para las distintas situaciones de proyecto, las combinaciones de acciones se definirán de acuerdo con los siguientes criterios:

- Con coeficientes de combinación

- Sin coeficientes de combinación

- Donde:

G_k Acción permanente

Q_k Acción variable

γ_G Coeficiente parcial de seguridad de las acciones permanentes

$\gamma_{Q,1}$ Coeficiente parcial de seguridad de la acción variable principal

$\gamma_{Q,i}$ Coeficiente parcial de seguridad de las acciones variables de acompañamiento

$\psi_{p,1}$ Coeficiente de combinación de la acción variable principal

$\psi_{a,i}$ Coeficiente de combinación de las acciones variables de acompañamiento

5.1.- Coeficientes parciales de seguridad (γ) y coeficientes de combinación (ψ)

Para cada situación de proyecto y estado límite los coeficientes a utilizar serán:

E.L.U. de rotura. Hormigón: EHE-08

	Persistente o transitoria			
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Carga permanente (G)	1.000	1.350	-	-
Sobrecarga (Q)	0.000	1.500	1.000	0.700



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Persistente o transitoria				
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Viento (Q)	0.000	1.500	1.000	0.600
Nieve (Q)	0.000	1.500	1.000	0.500

E.L.U. de rotura. Hormigón en cimentaciones: EHE-08 / CTE DB-SE C

Persistente o transitoria				
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Carga permanente (G)	1.000	1.600	-	-
Sobrecarga (Q)	0.000	1.600	1.000	0.700
Viento (Q)	0.000	1.600	1.000	0.600
Nieve (Q)	0.000	1.600	1.000	0.500

E.L.U. de rotura. Acero laminado: CTE DB SE-A

Persistente o transitoria				
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Carga permanente (G)	0.800	1.350	-	-
Sobrecarga (Q)	0.000	1.500	1.000	0.700
Viento (Q)	0.000	1.500	1.000	0.600
Nieve (Q)	0.000	1.500	1.000	0.500

Tensiones sobre el terreno

Característica				
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Carga permanente (G)	1.000	1.000	-	-
Sobrecarga (Q)	0.000	1.000	1.000	1.000
Viento (Q)	0.000	1.000	1.000	1.000
Nieve (Q)	0.000	1.000	1.000	1.000

Desplazamientos

Característica				
	Coeficientes parciales de seguridad (γ)		Coeficientes de combinación (ψ)	
	Favorable	Desfavorable	Principal (ψ_p)	Acompañamiento (ψ_a)
Carga permanente (G)	1.000	1.000	-	-
Sobrecarga (Q)	0.000	1.000	1.000	1.000
Viento (Q)	0.000	1.000	1.000	1.000
Nieve (Q)	0.000	1.000	1.000	1.000



Listado de datos de la obra

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Fecha: 11/01/21

5.2.- Combinaciones

■ Nombres de las hipótesis

G Carga permanente

Qa Sobrecarga de uso

Q 1 PG1_1

Q 2 PG1_2

Q 3 PG2_1

Q 4 PG2_2

Q 5 PG3_1

Q 6 PG3_2

V 1 +X

V 2 -X

V 3 +Y

V 4 -Y

N 1 N

■ E.L.U. de rotura. Hormigón

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
1	1.000												
2	1.350												
3	1.000	1.500											
4	1.350	1.500											
5	1.000		1.500										
6	1.350		1.500										
7	1.000	1.500	1.500										
8	1.350	1.500	1.500										
9	1.000			1.500									
10	1.350			1.500									
11	1.000		1.500	1.500									
12	1.350		1.500	1.500									
13	1.000				1.500								
14	1.350				1.500								
15	1.000			1.500	1.500								
16	1.350			1.500	1.500								
17	1.000					1.500							
18	1.350					1.500							
19	1.000				1.500	1.500							
20	1.350				1.500	1.500							
21	1.000						1.500						
22	1.350						1.500						
23	1.000					1.500	1.500						
24	1.350					1.500	1.500						
25	1.000							1.500					
26	1.350							1.500					
27	1.000		1.500					1.500					
28	1.350		1.500					1.500					
29	1.000						1.500	1.500					
30	1.350						1.500	1.500					
31	1.000								1.500				
32	1.350								1.500				
33	1.000	1.050							1.500				
34	1.350	1.050							1.500				
35	1.000		1.050						1.500				
36	1.350		1.050						1.500				



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
37	1.000	1.050	1.050						1.500				
38	1.350	1.050	1.050						1.500				
39	1.000			1.050					1.500				
40	1.350			1.050					1.500				
41	1.000		1.050	1.050					1.500				
42	1.350		1.050	1.050					1.500				
43	1.000				1.050				1.500				
44	1.350				1.050				1.500				
45	1.000			1.050	1.050				1.500				
46	1.350			1.050	1.050				1.500				
47	1.000					1.050			1.500				
48	1.350					1.050			1.500				
49	1.000				1.050	1.050			1.500				
50	1.350				1.050	1.050			1.500				
51	1.000						1.050		1.500				
52	1.350						1.050		1.500				
53	1.000					1.050	1.050		1.500				
54	1.350					1.050	1.050		1.500				
55	1.000							1.050	1.500				
56	1.350							1.050	1.500				
57	1.000		1.050					1.050	1.500				
58	1.350		1.050					1.050	1.500				
59	1.000						1.050	1.050	1.500				
60	1.350						1.050	1.050	1.500				
61	1.000	1.500							0.900				
62	1.350	1.500							0.900				
63	1.000		1.500						0.900				
64	1.350		1.500						0.900				
65	1.000	1.500	1.500						0.900				
66	1.350	1.500	1.500						0.900				
67	1.000			1.500					0.900				
68	1.350			1.500					0.900				
69	1.000		1.500	1.500					0.900				
70	1.350		1.500	1.500					0.900				
71	1.000				1.500				0.900				
72	1.350				1.500				0.900				
73	1.000			1.500	1.500				0.900				
74	1.350			1.500	1.500				0.900				
75	1.000					1.500			0.900				
76	1.350					1.500			0.900				
77	1.000				1.500	1.500			0.900				
78	1.350				1.500	1.500			0.900				
79	1.000						1.500		0.900				
80	1.350						1.500		0.900				
81	1.000					1.500	1.500		0.900				
82	1.350					1.500	1.500		0.900				
83	1.000							1.500	0.900				
84	1.350							1.500	0.900				
85	1.000		1.500					1.500	0.900				
86	1.350		1.500					1.500	0.900				
87	1.000						1.500	1.500	0.900				
88	1.350						1.500	1.500	0.900				
89	1.000									1.500			
90	1.350									1.500			
91	1.000	1.050								1.500			
92	1.350	1.050								1.500			
93	1.000		1.050							1.500			
94	1.350		1.050							1.500			

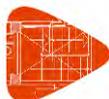


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
95	1.000	1.050	1.050							1.500			
96	1.350	1.050	1.050							1.500			
97	1.000			1.050						1.500			
98	1.350			1.050						1.500			
99	1.000		1.050	1.050						1.500			
100	1.350		1.050	1.050						1.500			
101	1.000				1.050					1.500			
102	1.350				1.050					1.500			
103	1.000			1.050	1.050					1.500			
104	1.350			1.050	1.050					1.500			
105	1.000					1.050				1.500			
106	1.350					1.050				1.500			
107	1.000				1.050	1.050				1.500			
108	1.350				1.050	1.050				1.500			
109	1.000						1.050			1.500			
110	1.350						1.050			1.500			
111	1.000					1.050	1.050			1.500			
112	1.350					1.050	1.050			1.500			
113	1.000							1.050		1.500			
114	1.350							1.050		1.500			
115	1.000		1.050					1.050		1.500			
116	1.350		1.050					1.050		1.500			
117	1.000						1.050	1.050		1.500			
118	1.350						1.050	1.050		1.500			
119	1.000	1.500								0.900			
120	1.350	1.500								0.900			
121	1.000		1.500							0.900			
122	1.350		1.500							0.900			
123	1.000	1.500	1.500							0.900			
124	1.350	1.500	1.500							0.900			
125	1.000			1.500						0.900			
126	1.350			1.500						0.900			
127	1.000		1.500	1.500						0.900			
128	1.350		1.500	1.500						0.900			
129	1.000				1.500					0.900			
130	1.350				1.500					0.900			
131	1.000			1.500	1.500					0.900			
132	1.350			1.500	1.500					0.900			
133	1.000					1.500				0.900			
134	1.350					1.500				0.900			
135	1.000				1.500	1.500				0.900			
136	1.350				1.500	1.500				0.900			
137	1.000						1.500			0.900			
138	1.350						1.500			0.900			
139	1.000					1.500	1.500			0.900			
140	1.350					1.500	1.500			0.900			
141	1.000							1.500		0.900			
142	1.350							1.500		0.900			
143	1.000		1.500					1.500		0.900			
144	1.350		1.500					1.500		0.900			
145	1.000						1.500	1.500		0.900			
146	1.350						1.500	1.500		0.900			
147	1.000										1.500		
148	1.350										1.500		
149	1.000	1.050									1.500		
150	1.350	1.050									1.500		
151	1.000		1.050								1.500		
152	1.350		1.050								1.500		

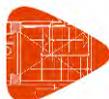


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
153	1.000	1.050	1.050								1.500		
154	1.350	1.050	1.050								1.500		
155	1.000			1.050							1.500		
156	1.350			1.050							1.500		
157	1.000		1.050	1.050							1.500		
158	1.350		1.050	1.050							1.500		
159	1.000				1.050						1.500		
160	1.350				1.050						1.500		
161	1.000			1.050	1.050						1.500		
162	1.350			1.050	1.050						1.500		
163	1.000					1.050					1.500		
164	1.350					1.050					1.500		
165	1.000				1.050	1.050					1.500		
166	1.350				1.050	1.050					1.500		
167	1.000						1.050				1.500		
168	1.350						1.050				1.500		
169	1.000					1.050	1.050				1.500		
170	1.350					1.050	1.050				1.500		
171	1.000							1.050			1.500		
172	1.350							1.050			1.500		
173	1.000		1.050					1.050			1.500		
174	1.350		1.050					1.050			1.500		
175	1.000						1.050	1.050			1.500		
176	1.350						1.050	1.050			1.500		
177	1.000	1.500									0.900		
178	1.350	1.500									0.900		
179	1.000		1.500								0.900		
180	1.350		1.500								0.900		
181	1.000	1.500	1.500								0.900		
182	1.350	1.500	1.500								0.900		
183	1.000			1.500							0.900		
184	1.350			1.500							0.900		
185	1.000		1.500	1.500							0.900		
186	1.350		1.500	1.500							0.900		
187	1.000				1.500						0.900		
188	1.350				1.500						0.900		
189	1.000			1.500	1.500						0.900		
190	1.350			1.500	1.500						0.900		
191	1.000					1.500					0.900		
192	1.350					1.500					0.900		
193	1.000				1.500	1.500					0.900		
194	1.350				1.500	1.500					0.900		
195	1.000						1.500				0.900		
196	1.350						1.500				0.900		
197	1.000					1.500	1.500				0.900		
198	1.350					1.500	1.500				0.900		
199	1.000							1.500			0.900		
200	1.350							1.500			0.900		
201	1.000		1.500					1.500			0.900		
202	1.350		1.500					1.500			0.900		
203	1.000						1.500	1.500			0.900		
204	1.350						1.500	1.500			0.900		
205	1.000											1.500	
206	1.350											1.500	
207	1.000	1.050										1.500	
208	1.350	1.050										1.500	
209	1.000		1.050									1.500	
210	1.350		1.050									1.500	



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
211	1.000	1.050	1.050									1.500	
212	1.350	1.050	1.050									1.500	
213	1.000			1.050								1.500	
214	1.350			1.050								1.500	
215	1.000		1.050	1.050								1.500	
216	1.350		1.050	1.050								1.500	
217	1.000				1.050							1.500	
218	1.350				1.050							1.500	
219	1.000			1.050	1.050							1.500	
220	1.350			1.050	1.050							1.500	
221	1.000					1.050						1.500	
222	1.350					1.050						1.500	
223	1.000				1.050	1.050						1.500	
224	1.350				1.050	1.050						1.500	
225	1.000						1.050					1.500	
226	1.350						1.050					1.500	
227	1.000					1.050	1.050					1.500	
228	1.350					1.050	1.050					1.500	
229	1.000							1.050				1.500	
230	1.350							1.050				1.500	
231	1.000		1.050					1.050				1.500	
232	1.350		1.050					1.050				1.500	
233	1.000						1.050	1.050				1.500	
234	1.350						1.050	1.050				1.500	
235	1.000	1.500										0.900	
236	1.350	1.500										0.900	
237	1.000		1.500									0.900	
238	1.350		1.500									0.900	
239	1.000	1.500	1.500									0.900	
240	1.350	1.500	1.500									0.900	
241	1.000			1.500								0.900	
242	1.350			1.500								0.900	
243	1.000		1.500	1.500								0.900	
244	1.350		1.500	1.500								0.900	
245	1.000				1.500							0.900	
246	1.350				1.500							0.900	
247	1.000			1.500	1.500							0.900	
248	1.350			1.500	1.500							0.900	
249	1.000					1.500						0.900	
250	1.350					1.500						0.900	
251	1.000				1.500	1.500						0.900	
252	1.350				1.500	1.500						0.900	
253	1.000						1.500					0.900	
254	1.350						1.500					0.900	
255	1.000					1.500	1.500					0.900	
256	1.350					1.500	1.500					0.900	
257	1.000							1.500				0.900	
258	1.350							1.500				0.900	
259	1.000		1.500					1.500				0.900	
260	1.350		1.500					1.500				0.900	
261	1.000						1.500	1.500				0.900	
262	1.350						1.500	1.500				0.900	
263	1.000											1.500	
264	1.350											1.500	
265	1.000	1.050										1.500	
266	1.350	1.050										1.500	
267	1.000		1.050									1.500	
268	1.350		1.050									1.500	



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
269	1.000	1.050	1.050										1.500
270	1.350	1.050	1.050										1.500
271	1.000			1.050									1.500
272	1.350			1.050									1.500
273	1.000		1.050	1.050									1.500
274	1.350		1.050	1.050									1.500
275	1.000				1.050								1.500
276	1.350				1.050								1.500
277	1.000			1.050	1.050								1.500
278	1.350			1.050	1.050								1.500
279	1.000					1.050							1.500
280	1.350					1.050							1.500
281	1.000				1.050	1.050							1.500
282	1.350				1.050	1.050							1.500
283	1.000						1.050						1.500
284	1.350						1.050						1.500
285	1.000					1.050	1.050						1.500
286	1.350					1.050	1.050						1.500
287	1.000							1.050					1.500
288	1.350							1.050					1.500
289	1.000		1.050					1.050					1.500
290	1.350		1.050					1.050					1.500
291	1.000						1.050	1.050					1.500
292	1.350						1.050	1.050					1.500
293	1.000								0.900				1.500
294	1.350								0.900				1.500
295	1.000	1.050							0.900				1.500
296	1.350	1.050							0.900				1.500
297	1.000		1.050						0.900				1.500
298	1.350		1.050						0.900				1.500
299	1.000	1.050	1.050						0.900				1.500
300	1.350	1.050	1.050						0.900				1.500
301	1.000			1.050					0.900				1.500
302	1.350			1.050					0.900				1.500
303	1.000		1.050	1.050					0.900				1.500
304	1.350		1.050	1.050					0.900				1.500
305	1.000				1.050				0.900				1.500
306	1.350				1.050				0.900				1.500
307	1.000			1.050	1.050				0.900				1.500
308	1.350			1.050	1.050				0.900				1.500
309	1.000					1.050			0.900				1.500
310	1.350					1.050			0.900				1.500
311	1.000				1.050	1.050			0.900				1.500
312	1.350				1.050	1.050			0.900				1.500
313	1.000						1.050		0.900				1.500
314	1.350						1.050		0.900				1.500
315	1.000					1.050	1.050		0.900				1.500
316	1.350					1.050	1.050		0.900				1.500
317	1.000							1.050	0.900				1.500
318	1.350							1.050	0.900				1.500
319	1.000		1.050					1.050	0.900				1.500
320	1.350		1.050					1.050	0.900				1.500
321	1.000						1.050	1.050	0.900				1.500
322	1.350						1.050	1.050	0.900				1.500
323	1.000									0.900			1.500
324	1.350									0.900			1.500
325	1.000	1.050								0.900			1.500
326	1.350	1.050								0.900			1.500

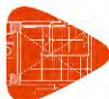


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
327	1.000		1.050							0.900			1.500
328	1.350		1.050							0.900			1.500
329	1.000	1.050	1.050							0.900			1.500
330	1.350	1.050	1.050							0.900			1.500
331	1.000			1.050						0.900			1.500
332	1.350			1.050						0.900			1.500
333	1.000		1.050	1.050						0.900			1.500
334	1.350		1.050	1.050						0.900			1.500
335	1.000				1.050					0.900			1.500
336	1.350				1.050					0.900			1.500
337	1.000			1.050	1.050					0.900			1.500
338	1.350			1.050	1.050					0.900			1.500
339	1.000					1.050				0.900			1.500
340	1.350					1.050				0.900			1.500
341	1.000				1.050	1.050				0.900			1.500
342	1.350				1.050	1.050				0.900			1.500
343	1.000						1.050			0.900			1.500
344	1.350						1.050			0.900			1.500
345	1.000					1.050	1.050			0.900			1.500
346	1.350					1.050	1.050			0.900			1.500
347	1.000							1.050		0.900			1.500
348	1.350							1.050		0.900			1.500
349	1.000		1.050					1.050		0.900			1.500
350	1.350		1.050					1.050		0.900			1.500
351	1.000						1.050	1.050		0.900			1.500
352	1.350						1.050	1.050		0.900			1.500
353	1.000										0.900		1.500
354	1.350										0.900		1.500
355	1.000	1.050									0.900		1.500
356	1.350	1.050									0.900		1.500
357	1.000		1.050								0.900		1.500
358	1.350		1.050								0.900		1.500
359	1.000	1.050	1.050								0.900		1.500
360	1.350	1.050	1.050								0.900		1.500
361	1.000			1.050							0.900		1.500
362	1.350			1.050							0.900		1.500
363	1.000		1.050	1.050							0.900		1.500
364	1.350		1.050	1.050							0.900		1.500
365	1.000				1.050						0.900		1.500
366	1.350				1.050						0.900		1.500
367	1.000			1.050	1.050						0.900		1.500
368	1.350			1.050	1.050						0.900		1.500
369	1.000					1.050					0.900		1.500
370	1.350					1.050					0.900		1.500
371	1.000				1.050	1.050					0.900		1.500
372	1.350				1.050	1.050					0.900		1.500
373	1.000						1.050				0.900		1.500
374	1.350						1.050				0.900		1.500
375	1.000					1.050	1.050				0.900		1.500
376	1.350					1.050	1.050				0.900		1.500
377	1.000							1.050			0.900		1.500
378	1.350							1.050			0.900		1.500
379	1.000		1.050					1.050			0.900		1.500
380	1.350		1.050					1.050			0.900		1.500
381	1.000						1.050	1.050			0.900		1.500
382	1.350						1.050	1.050			0.900		1.500
383	1.000											0.900	1.500
384	1.350											0.900	1.500



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
385	1.000	1.050										0.900	1.500
386	1.350	1.050										0.900	1.500
387	1.000		1.050									0.900	1.500
388	1.350		1.050									0.900	1.500
389	1.000	1.050	1.050									0.900	1.500
390	1.350	1.050	1.050									0.900	1.500
391	1.000			1.050								0.900	1.500
392	1.350			1.050								0.900	1.500
393	1.000		1.050	1.050								0.900	1.500
394	1.350		1.050	1.050								0.900	1.500
395	1.000				1.050							0.900	1.500
396	1.350				1.050							0.900	1.500
397	1.000			1.050	1.050							0.900	1.500
398	1.350			1.050	1.050							0.900	1.500
399	1.000					1.050						0.900	1.500
400	1.350					1.050						0.900	1.500
401	1.000				1.050	1.050						0.900	1.500
402	1.350				1.050	1.050						0.900	1.500
403	1.000						1.050					0.900	1.500
404	1.350						1.050					0.900	1.500
405	1.000					1.050	1.050					0.900	1.500
406	1.350					1.050	1.050					0.900	1.500
407	1.000							1.050				0.900	1.500
408	1.350							1.050				0.900	1.500
409	1.000		1.050					1.050				0.900	1.500
410	1.350		1.050					1.050				0.900	1.500
411	1.000						1.050	1.050				0.900	1.500
412	1.350						1.050	1.050				0.900	1.500
413	1.000	1.500											0.750
414	1.350	1.500											0.750
415	1.000		1.500										0.750
416	1.350		1.500										0.750
417	1.000	1.500	1.500										0.750
418	1.350	1.500	1.500										0.750
419	1.000			1.500									0.750
420	1.350			1.500									0.750
421	1.000		1.500	1.500									0.750
422	1.350		1.500	1.500									0.750
423	1.000				1.500								0.750
424	1.350				1.500								0.750
425	1.000			1.500	1.500								0.750
426	1.350			1.500	1.500								0.750
427	1.000					1.500							0.750
428	1.350					1.500							0.750
429	1.000				1.500	1.500							0.750
430	1.350				1.500	1.500							0.750
431	1.000						1.500						0.750
432	1.350						1.500						0.750
433	1.000					1.500	1.500						0.750
434	1.350					1.500	1.500						0.750
435	1.000							1.500					0.750
436	1.350							1.500					0.750
437	1.000		1.500					1.500					0.750
438	1.350		1.500					1.500					0.750
439	1.000						1.500	1.500					0.750
440	1.350						1.500	1.500					0.750
441	1.000								1.500				0.750
442	1.350								1.500				0.750

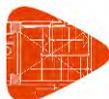


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
443	1.000	1.050							1.500				0.750
444	1.350	1.050							1.500				0.750
445	1.000		1.050						1.500				0.750
446	1.350		1.050						1.500				0.750
447	1.000	1.050	1.050						1.500				0.750
448	1.350	1.050	1.050						1.500				0.750
449	1.000			1.050					1.500				0.750
450	1.350			1.050					1.500				0.750
451	1.000		1.050	1.050					1.500				0.750
452	1.350		1.050	1.050					1.500				0.750
453	1.000				1.050				1.500				0.750
454	1.350				1.050				1.500				0.750
455	1.000			1.050	1.050				1.500				0.750
456	1.350			1.050	1.050				1.500				0.750
457	1.000					1.050			1.500				0.750
458	1.350					1.050			1.500				0.750
459	1.000				1.050	1.050			1.500				0.750
460	1.350				1.050	1.050			1.500				0.750
461	1.000						1.050		1.500				0.750
462	1.350						1.050		1.500				0.750
463	1.000					1.050	1.050		1.500				0.750
464	1.350					1.050	1.050		1.500				0.750
465	1.000							1.050	1.500				0.750
466	1.350							1.050	1.500				0.750
467	1.000		1.050					1.050	1.500				0.750
468	1.350		1.050					1.050	1.500				0.750
469	1.000						1.050	1.050	1.500				0.750
470	1.350						1.050	1.050	1.500				0.750
471	1.000	1.500							0.900				0.750
472	1.350	1.500							0.900				0.750
473	1.000		1.500						0.900				0.750
474	1.350		1.500						0.900				0.750
475	1.000	1.500	1.500						0.900				0.750
476	1.350	1.500	1.500						0.900				0.750
477	1.000			1.500					0.900				0.750
478	1.350			1.500					0.900				0.750
479	1.000		1.500	1.500					0.900				0.750
480	1.350		1.500	1.500					0.900				0.750
481	1.000				1.500				0.900				0.750
482	1.350				1.500				0.900				0.750
483	1.000			1.500	1.500				0.900				0.750
484	1.350			1.500	1.500				0.900				0.750
485	1.000					1.500			0.900				0.750
486	1.350					1.500			0.900				0.750
487	1.000				1.500	1.500			0.900				0.750
488	1.350				1.500	1.500			0.900				0.750
489	1.000						1.500		0.900				0.750
490	1.350						1.500		0.900				0.750
491	1.000					1.500	1.500		0.900				0.750
492	1.350					1.500	1.500		0.900				0.750
493	1.000							1.500	0.900				0.750
494	1.350							1.500	0.900				0.750
495	1.000		1.500					1.500	0.900				0.750
496	1.350		1.500					1.500	0.900				0.750
497	1.000						1.500	1.500	0.900				0.750
498	1.350						1.500	1.500	0.900				0.750
499	1.000									1.500			0.750
500	1.350									1.500			0.750



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
501	1.000	1.050								1.500			0.750
502	1.350	1.050								1.500			0.750
503	1.000		1.050							1.500			0.750
504	1.350		1.050							1.500			0.750
505	1.000	1.050	1.050							1.500			0.750
506	1.350	1.050	1.050							1.500			0.750
507	1.000			1.050						1.500			0.750
508	1.350			1.050						1.500			0.750
509	1.000		1.050	1.050						1.500			0.750
510	1.350		1.050	1.050						1.500			0.750
511	1.000				1.050					1.500			0.750
512	1.350				1.050					1.500			0.750
513	1.000			1.050	1.050					1.500			0.750
514	1.350			1.050	1.050					1.500			0.750
515	1.000					1.050				1.500			0.750
516	1.350					1.050				1.500			0.750
517	1.000				1.050	1.050				1.500			0.750
518	1.350				1.050	1.050				1.500			0.750
519	1.000						1.050			1.500			0.750
520	1.350						1.050			1.500			0.750
521	1.000					1.050	1.050			1.500			0.750
522	1.350					1.050	1.050			1.500			0.750
523	1.000							1.050		1.500			0.750
524	1.350							1.050		1.500			0.750
525	1.000		1.050					1.050		1.500			0.750
526	1.350		1.050					1.050		1.500			0.750
527	1.000						1.050	1.050		1.500			0.750
528	1.350						1.050	1.050		1.500			0.750
529	1.000	1.500								0.900			0.750
530	1.350	1.500								0.900			0.750
531	1.000		1.500							0.900			0.750
532	1.350		1.500							0.900			0.750
533	1.000	1.500	1.500							0.900			0.750
534	1.350	1.500	1.500							0.900			0.750
535	1.000			1.500						0.900			0.750
536	1.350			1.500						0.900			0.750
537	1.000		1.500	1.500						0.900			0.750
538	1.350		1.500	1.500						0.900			0.750
539	1.000				1.500					0.900			0.750
540	1.350				1.500					0.900			0.750
541	1.000			1.500	1.500					0.900			0.750
542	1.350			1.500	1.500					0.900			0.750
543	1.000					1.500				0.900			0.750
544	1.350					1.500				0.900			0.750
545	1.000				1.500	1.500				0.900			0.750
546	1.350				1.500	1.500				0.900			0.750
547	1.000						1.500			0.900			0.750
548	1.350						1.500			0.900			0.750
549	1.000					1.500	1.500			0.900			0.750
550	1.350					1.500	1.500			0.900			0.750
551	1.000							1.500		0.900			0.750
552	1.350							1.500		0.900			0.750
553	1.000		1.500					1.500		0.900			0.750
554	1.350		1.500					1.500		0.900			0.750
555	1.000						1.500	1.500		0.900			0.750
556	1.350						1.500	1.500		0.900			0.750
557	1.000										1.500		0.750
558	1.350										1.500		0.750



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
559	1.000	1.050									1.500		0.750
560	1.350	1.050									1.500		0.750
561	1.000		1.050								1.500		0.750
562	1.350		1.050								1.500		0.750
563	1.000	1.050	1.050								1.500		0.750
564	1.350	1.050	1.050								1.500		0.750
565	1.000			1.050							1.500		0.750
566	1.350			1.050							1.500		0.750
567	1.000		1.050	1.050							1.500		0.750
568	1.350		1.050	1.050							1.500		0.750
569	1.000				1.050						1.500		0.750
570	1.350				1.050						1.500		0.750
571	1.000			1.050	1.050						1.500		0.750
572	1.350			1.050	1.050						1.500		0.750
573	1.000					1.050					1.500		0.750
574	1.350					1.050					1.500		0.750
575	1.000				1.050	1.050					1.500		0.750
576	1.350				1.050	1.050					1.500		0.750
577	1.000						1.050				1.500		0.750
578	1.350						1.050				1.500		0.750
579	1.000					1.050	1.050				1.500		0.750
580	1.350					1.050	1.050				1.500		0.750
581	1.000							1.050			1.500		0.750
582	1.350							1.050			1.500		0.750
583	1.000		1.050					1.050			1.500		0.750
584	1.350		1.050					1.050			1.500		0.750
585	1.000						1.050	1.050			1.500		0.750
586	1.350						1.050	1.050			1.500		0.750
587	1.000	1.500									0.900		0.750
588	1.350	1.500									0.900		0.750
589	1.000		1.500								0.900		0.750
590	1.350		1.500								0.900		0.750
591	1.000	1.500	1.500								0.900		0.750
592	1.350	1.500	1.500								0.900		0.750
593	1.000			1.500							0.900		0.750
594	1.350			1.500							0.900		0.750
595	1.000		1.500	1.500							0.900		0.750
596	1.350		1.500	1.500							0.900		0.750
597	1.000				1.500						0.900		0.750
598	1.350				1.500						0.900		0.750
599	1.000			1.500	1.500						0.900		0.750
600	1.350			1.500	1.500						0.900		0.750
601	1.000					1.500					0.900		0.750
602	1.350					1.500					0.900		0.750
603	1.000				1.500	1.500					0.900		0.750
604	1.350				1.500	1.500					0.900		0.750
605	1.000						1.500				0.900		0.750
606	1.350						1.500				0.900		0.750
607	1.000					1.500	1.500				0.900		0.750
608	1.350					1.500	1.500				0.900		0.750
609	1.000							1.500			0.900		0.750
610	1.350							1.500			0.900		0.750
611	1.000		1.500					1.500			0.900		0.750
612	1.350		1.500					1.500			0.900		0.750
613	1.000						1.500	1.500			0.900		0.750
614	1.350						1.500	1.500			0.900		0.750
615	1.000										1.500	0.750	
616	1.350										1.500	0.750	



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
617	1.000	1.050										1.500	0.750
618	1.350	1.050										1.500	0.750
619	1.000		1.050									1.500	0.750
620	1.350		1.050									1.500	0.750
621	1.000	1.050	1.050									1.500	0.750
622	1.350	1.050	1.050									1.500	0.750
623	1.000			1.050								1.500	0.750
624	1.350			1.050								1.500	0.750
625	1.000		1.050	1.050								1.500	0.750
626	1.350		1.050	1.050								1.500	0.750
627	1.000				1.050							1.500	0.750
628	1.350				1.050							1.500	0.750
629	1.000			1.050	1.050							1.500	0.750
630	1.350			1.050	1.050							1.500	0.750
631	1.000					1.050						1.500	0.750
632	1.350					1.050						1.500	0.750
633	1.000				1.050	1.050						1.500	0.750
634	1.350				1.050	1.050						1.500	0.750
635	1.000						1.050					1.500	0.750
636	1.350						1.050					1.500	0.750
637	1.000					1.050	1.050					1.500	0.750
638	1.350					1.050	1.050					1.500	0.750
639	1.000							1.050				1.500	0.750
640	1.350							1.050				1.500	0.750
641	1.000		1.050					1.050				1.500	0.750
642	1.350		1.050					1.050				1.500	0.750
643	1.000						1.050	1.050				1.500	0.750
644	1.350						1.050	1.050				1.500	0.750
645	1.000	1.500										0.900	0.750
646	1.350	1.500										0.900	0.750
647	1.000		1.500									0.900	0.750
648	1.350		1.500									0.900	0.750
649	1.000	1.500	1.500									0.900	0.750
650	1.350	1.500	1.500									0.900	0.750
651	1.000			1.500								0.900	0.750
652	1.350			1.500								0.900	0.750
653	1.000		1.500	1.500								0.900	0.750
654	1.350		1.500	1.500								0.900	0.750
655	1.000				1.500							0.900	0.750
656	1.350				1.500							0.900	0.750
657	1.000			1.500	1.500							0.900	0.750
658	1.350			1.500	1.500							0.900	0.750
659	1.000					1.500						0.900	0.750
660	1.350					1.500						0.900	0.750
661	1.000				1.500	1.500						0.900	0.750
662	1.350				1.500	1.500						0.900	0.750
663	1.000						1.500					0.900	0.750
664	1.350						1.500					0.900	0.750
665	1.000					1.500	1.500					0.900	0.750
666	1.350					1.500	1.500					0.900	0.750
667	1.000							1.500				0.900	0.750
668	1.350							1.500				0.900	0.750
669	1.000		1.500					1.500				0.900	0.750
670	1.350		1.500					1.500				0.900	0.750
671	1.000						1.500	1.500				0.900	0.750
672	1.350						1.500	1.500				0.900	0.750



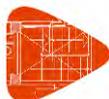
Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

■ E.L.U. de rotura. Hormigón en cimentaciones

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
1	1.000												
2	1.600												
3	1.000	1.600											
4	1.600	1.600											
5	1.000		1.600										
6	1.600		1.600										
7	1.000	1.600	1.600										
8	1.600	1.600	1.600										
9	1.000			1.600									
10	1.600			1.600									
11	1.000		1.600	1.600									
12	1.600		1.600	1.600									
13	1.000				1.600								
14	1.600				1.600								
15	1.000			1.600	1.600								
16	1.600			1.600	1.600								
17	1.000					1.600							
18	1.600					1.600							
19	1.000				1.600	1.600							
20	1.600				1.600	1.600							
21	1.000						1.600						
22	1.600						1.600						
23	1.000					1.600	1.600						
24	1.600					1.600	1.600						
25	1.000							1.600					
26	1.600							1.600					
27	1.000		1.600					1.600					
28	1.600		1.600					1.600					
29	1.000						1.600	1.600					
30	1.600						1.600	1.600					
31	1.000								1.600				
32	1.600								1.600				
33	1.000	1.120							1.600				
34	1.600	1.120							1.600				
35	1.000		1.120						1.600				
36	1.600		1.120						1.600				
37	1.000	1.120	1.120						1.600				
38	1.600	1.120	1.120						1.600				
39	1.000			1.120					1.600				
40	1.600			1.120					1.600				
41	1.000		1.120	1.120					1.600				
42	1.600		1.120	1.120					1.600				
43	1.000				1.120				1.600				
44	1.600				1.120				1.600				
45	1.000			1.120	1.120				1.600				
46	1.600			1.120	1.120				1.600				
47	1.000					1.120			1.600				
48	1.600					1.120			1.600				
49	1.000				1.120	1.120			1.600				
50	1.600				1.120	1.120			1.600				
51	1.000						1.120		1.600				
52	1.600						1.120		1.600				
53	1.000					1.120	1.120		1.600				
54	1.600					1.120	1.120		1.600				
55	1.000							1.120	1.600				

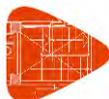


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
56	1.600							1.120	1.600				
57	1.000		1.120					1.120	1.600				
58	1.600		1.120					1.120	1.600				
59	1.000						1.120	1.120	1.600				
60	1.600						1.120	1.120	1.600				
61	1.000	1.600							0.960				
62	1.600	1.600							0.960				
63	1.000		1.600						0.960				
64	1.600		1.600						0.960				
65	1.000	1.600	1.600						0.960				
66	1.600	1.600	1.600						0.960				
67	1.000			1.600					0.960				
68	1.600			1.600					0.960				
69	1.000		1.600	1.600					0.960				
70	1.600		1.600	1.600					0.960				
71	1.000				1.600				0.960				
72	1.600				1.600				0.960				
73	1.000			1.600	1.600				0.960				
74	1.600			1.600	1.600				0.960				
75	1.000					1.600			0.960				
76	1.600					1.600			0.960				
77	1.000				1.600	1.600			0.960				
78	1.600				1.600	1.600			0.960				
79	1.000						1.600		0.960				
80	1.600						1.600		0.960				
81	1.000					1.600	1.600		0.960				
82	1.600					1.600	1.600		0.960				
83	1.000							1.600	0.960				
84	1.600							1.600	0.960				
85	1.000		1.600					1.600	0.960				
86	1.600		1.600					1.600	0.960				
87	1.000						1.600	1.600	0.960				
88	1.600						1.600	1.600	0.960				
89	1.000									1.600			
90	1.600									1.600			
91	1.000	1.120								1.600			
92	1.600	1.120								1.600			
93	1.000		1.120							1.600			
94	1.600		1.120							1.600			
95	1.000	1.120	1.120							1.600			
96	1.600	1.120	1.120							1.600			
97	1.000			1.120						1.600			
98	1.600			1.120						1.600			
99	1.000		1.120	1.120						1.600			
100	1.600		1.120	1.120						1.600			
101	1.000				1.120					1.600			
102	1.600				1.120					1.600			
103	1.000			1.120	1.120					1.600			
104	1.600			1.120	1.120					1.600			
105	1.000					1.120				1.600			
106	1.600					1.120				1.600			
107	1.000				1.120	1.120				1.600			
108	1.600				1.120	1.120				1.600			
109	1.000						1.120			1.600			
110	1.600						1.120			1.600			
111	1.000					1.120	1.120			1.600			
112	1.600					1.120	1.120			1.600			
113	1.000							1.120		1.600			



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
114	1.600							1.120		1.600			
115	1.000		1.120					1.120		1.600			
116	1.600		1.120					1.120		1.600			
117	1.000						1.120	1.120		1.600			
118	1.600						1.120	1.120		1.600			
119	1.000	1.600								0.960			
120	1.600	1.600								0.960			
121	1.000		1.600							0.960			
122	1.600		1.600							0.960			
123	1.000	1.600	1.600							0.960			
124	1.600	1.600	1.600							0.960			
125	1.000			1.600						0.960			
126	1.600			1.600						0.960			
127	1.000		1.600	1.600						0.960			
128	1.600		1.600	1.600						0.960			
129	1.000				1.600					0.960			
130	1.600				1.600					0.960			
131	1.000			1.600	1.600					0.960			
132	1.600			1.600	1.600					0.960			
133	1.000					1.600				0.960			
134	1.600					1.600				0.960			
135	1.000				1.600	1.600				0.960			
136	1.600				1.600	1.600				0.960			
137	1.000						1.600			0.960			
138	1.600						1.600			0.960			
139	1.000					1.600	1.600			0.960			
140	1.600					1.600	1.600			0.960			
141	1.000							1.600		0.960			
142	1.600							1.600		0.960			
143	1.000		1.600					1.600		0.960			
144	1.600		1.600					1.600		0.960			
145	1.000						1.600	1.600		0.960			
146	1.600						1.600	1.600		0.960			
147	1.000										1.600		
148	1.600										1.600		
149	1.000	1.120									1.600		
150	1.600	1.120									1.600		
151	1.000		1.120								1.600		
152	1.600		1.120								1.600		
153	1.000	1.120	1.120								1.600		
154	1.600	1.120	1.120								1.600		
155	1.000			1.120							1.600		
156	1.600			1.120							1.600		
157	1.000		1.120	1.120							1.600		
158	1.600		1.120	1.120							1.600		
159	1.000				1.120						1.600		
160	1.600				1.120						1.600		
161	1.000			1.120	1.120						1.600		
162	1.600			1.120	1.120						1.600		
163	1.000					1.120					1.600		
164	1.600					1.120					1.600		
165	1.000				1.120	1.120					1.600		
166	1.600				1.120	1.120					1.600		
167	1.000						1.120				1.600		
168	1.600						1.120				1.600		
169	1.000					1.120	1.120				1.600		
170	1.600					1.120	1.120				1.600		
171	1.000							1.120			1.600		

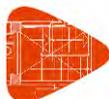


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
172	1.600							1.120			1.600		
173	1.000		1.120					1.120			1.600		
174	1.600		1.120					1.120			1.600		
175	1.000						1.120	1.120			1.600		
176	1.600						1.120	1.120			1.600		
177	1.000	1.600									0.960		
178	1.600	1.600									0.960		
179	1.000		1.600								0.960		
180	1.600		1.600								0.960		
181	1.000	1.600	1.600								0.960		
182	1.600	1.600	1.600								0.960		
183	1.000			1.600							0.960		
184	1.600			1.600							0.960		
185	1.000		1.600	1.600							0.960		
186	1.600		1.600	1.600							0.960		
187	1.000				1.600						0.960		
188	1.600				1.600						0.960		
189	1.000			1.600	1.600						0.960		
190	1.600			1.600	1.600						0.960		
191	1.000					1.600					0.960		
192	1.600					1.600					0.960		
193	1.000				1.600	1.600					0.960		
194	1.600				1.600	1.600					0.960		
195	1.000						1.600				0.960		
196	1.600						1.600				0.960		
197	1.000					1.600	1.600				0.960		
198	1.600					1.600	1.600				0.960		
199	1.000							1.600			0.960		
200	1.600							1.600			0.960		
201	1.000		1.600					1.600			0.960		
202	1.600		1.600					1.600			0.960		
203	1.000						1.600	1.600			0.960		
204	1.600						1.600	1.600			0.960		
205	1.000											1.600	
206	1.600											1.600	
207	1.000	1.120										1.600	
208	1.600	1.120										1.600	
209	1.000		1.120									1.600	
210	1.600		1.120									1.600	
211	1.000	1.120	1.120									1.600	
212	1.600	1.120	1.120									1.600	
213	1.000			1.120								1.600	
214	1.600			1.120								1.600	
215	1.000		1.120	1.120								1.600	
216	1.600		1.120	1.120								1.600	
217	1.000				1.120							1.600	
218	1.600				1.120							1.600	
219	1.000			1.120	1.120							1.600	
220	1.600			1.120	1.120							1.600	
221	1.000					1.120						1.600	
222	1.600					1.120						1.600	
223	1.000				1.120	1.120						1.600	
224	1.600				1.120	1.120						1.600	
225	1.000						1.120					1.600	
226	1.600						1.120					1.600	
227	1.000					1.120	1.120					1.600	
228	1.600					1.120	1.120					1.600	
229	1.000							1.120				1.600	

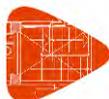


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
230	1.600							1.120				1.600	
231	1.000		1.120					1.120				1.600	
232	1.600		1.120					1.120				1.600	
233	1.000						1.120	1.120				1.600	
234	1.600						1.120	1.120				1.600	
235	1.000	1.600										0.960	
236	1.600	1.600										0.960	
237	1.000		1.600									0.960	
238	1.600		1.600									0.960	
239	1.000	1.600	1.600									0.960	
240	1.600	1.600	1.600									0.960	
241	1.000			1.600								0.960	
242	1.600			1.600								0.960	
243	1.000		1.600	1.600								0.960	
244	1.600		1.600	1.600								0.960	
245	1.000				1.600							0.960	
246	1.600				1.600							0.960	
247	1.000			1.600	1.600							0.960	
248	1.600			1.600	1.600							0.960	
249	1.000					1.600						0.960	
250	1.600					1.600						0.960	
251	1.000				1.600	1.600						0.960	
252	1.600				1.600	1.600						0.960	
253	1.000						1.600					0.960	
254	1.600						1.600					0.960	
255	1.000					1.600	1.600					0.960	
256	1.600					1.600	1.600					0.960	
257	1.000							1.600				0.960	
258	1.600							1.600				0.960	
259	1.000		1.600					1.600				0.960	
260	1.600		1.600					1.600				0.960	
261	1.000						1.600	1.600				0.960	
262	1.600						1.600	1.600				0.960	
263	1.000												1.600
264	1.600												1.600
265	1.000	1.120											1.600
266	1.600	1.120											1.600
267	1.000		1.120										1.600
268	1.600		1.120										1.600
269	1.000	1.120	1.120										1.600
270	1.600	1.120	1.120										1.600
271	1.000			1.120									1.600
272	1.600			1.120									1.600
273	1.000		1.120	1.120									1.600
274	1.600		1.120	1.120									1.600
275	1.000				1.120								1.600
276	1.600				1.120								1.600
277	1.000			1.120	1.120								1.600
278	1.600			1.120	1.120								1.600
279	1.000					1.120							1.600
280	1.600					1.120							1.600
281	1.000				1.120	1.120							1.600
282	1.600				1.120	1.120							1.600
283	1.000						1.120						1.600
284	1.600						1.120						1.600
285	1.000					1.120	1.120						1.600
286	1.600					1.120	1.120						1.600
287	1.000							1.120					1.600



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
288	1.600							1.120					1.600
289	1.000		1.120					1.120					1.600
290	1.600		1.120					1.120					1.600
291	1.000						1.120	1.120					1.600
292	1.600						1.120	1.120					1.600
293	1.000								0.960				1.600
294	1.600								0.960				1.600
295	1.000	1.120							0.960				1.600
296	1.600	1.120							0.960				1.600
297	1.000		1.120						0.960				1.600
298	1.600		1.120						0.960				1.600
299	1.000	1.120	1.120						0.960				1.600
300	1.600	1.120	1.120						0.960				1.600
301	1.000			1.120					0.960				1.600
302	1.600			1.120					0.960				1.600
303	1.000		1.120	1.120					0.960				1.600
304	1.600		1.120	1.120					0.960				1.600
305	1.000				1.120				0.960				1.600
306	1.600				1.120				0.960				1.600
307	1.000			1.120	1.120				0.960				1.600
308	1.600			1.120	1.120				0.960				1.600
309	1.000					1.120			0.960				1.600
310	1.600					1.120			0.960				1.600
311	1.000				1.120	1.120			0.960				1.600
312	1.600				1.120	1.120			0.960				1.600
313	1.000						1.120		0.960				1.600
314	1.600						1.120		0.960				1.600
315	1.000					1.120	1.120		0.960				1.600
316	1.600					1.120	1.120		0.960				1.600
317	1.000							1.120	0.960				1.600
318	1.600							1.120	0.960				1.600
319	1.000		1.120					1.120	0.960				1.600
320	1.600		1.120					1.120	0.960				1.600
321	1.000						1.120	1.120	0.960				1.600
322	1.600						1.120	1.120	0.960				1.600
323	1.000									0.960			1.600
324	1.600									0.960			1.600
325	1.000	1.120								0.960			1.600
326	1.600	1.120								0.960			1.600
327	1.000		1.120							0.960			1.600
328	1.600		1.120							0.960			1.600
329	1.000	1.120	1.120							0.960			1.600
330	1.600	1.120	1.120							0.960			1.600
331	1.000			1.120						0.960			1.600
332	1.600			1.120						0.960			1.600
333	1.000		1.120	1.120						0.960			1.600
334	1.600		1.120	1.120						0.960			1.600
335	1.000				1.120					0.960			1.600
336	1.600				1.120					0.960			1.600
337	1.000			1.120	1.120					0.960			1.600
338	1.600			1.120	1.120					0.960			1.600
339	1.000					1.120				0.960			1.600
340	1.600					1.120				0.960			1.600
341	1.000				1.120	1.120				0.960			1.600
342	1.600				1.120	1.120				0.960			1.600
343	1.000						1.120			0.960			1.600
344	1.600						1.120			0.960			1.600
345	1.000					1.120	1.120			0.960			1.600



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
346	1.600					1.120	1.120			0.960			1.600
347	1.000							1.120		0.960			1.600
348	1.600							1.120		0.960			1.600
349	1.000		1.120					1.120		0.960			1.600
350	1.600		1.120					1.120		0.960			1.600
351	1.000						1.120	1.120		0.960			1.600
352	1.600						1.120	1.120		0.960			1.600
353	1.000										0.960		1.600
354	1.600										0.960		1.600
355	1.000	1.120									0.960		1.600
356	1.600	1.120									0.960		1.600
357	1.000		1.120								0.960		1.600
358	1.600		1.120								0.960		1.600
359	1.000	1.120	1.120								0.960		1.600
360	1.600	1.120	1.120								0.960		1.600
361	1.000			1.120							0.960		1.600
362	1.600			1.120							0.960		1.600
363	1.000		1.120	1.120							0.960		1.600
364	1.600		1.120	1.120							0.960		1.600
365	1.000				1.120						0.960		1.600
366	1.600				1.120						0.960		1.600
367	1.000			1.120	1.120						0.960		1.600
368	1.600			1.120	1.120						0.960		1.600
369	1.000					1.120					0.960		1.600
370	1.600					1.120					0.960		1.600
371	1.000				1.120	1.120					0.960		1.600
372	1.600				1.120	1.120					0.960		1.600
373	1.000						1.120				0.960		1.600
374	1.600						1.120				0.960		1.600
375	1.000					1.120	1.120				0.960		1.600
376	1.600					1.120	1.120				0.960		1.600
377	1.000							1.120			0.960		1.600
378	1.600							1.120			0.960		1.600
379	1.000		1.120					1.120			0.960		1.600
380	1.600		1.120					1.120			0.960		1.600
381	1.000						1.120	1.120			0.960		1.600
382	1.600						1.120	1.120			0.960		1.600
383	1.000											0.960	1.600
384	1.600											0.960	1.600
385	1.000	1.120										0.960	1.600
386	1.600	1.120										0.960	1.600
387	1.000		1.120									0.960	1.600
388	1.600		1.120									0.960	1.600
389	1.000	1.120	1.120									0.960	1.600
390	1.600	1.120	1.120									0.960	1.600
391	1.000			1.120								0.960	1.600
392	1.600			1.120								0.960	1.600
393	1.000		1.120	1.120								0.960	1.600
394	1.600		1.120	1.120								0.960	1.600
395	1.000				1.120							0.960	1.600
396	1.600				1.120							0.960	1.600
397	1.000			1.120	1.120							0.960	1.600
398	1.600			1.120	1.120							0.960	1.600
399	1.000					1.120						0.960	1.600
400	1.600					1.120						0.960	1.600
401	1.000				1.120	1.120						0.960	1.600
402	1.600				1.120	1.120						0.960	1.600
403	1.000						1.120					0.960	1.600

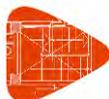


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
404	1.600						1.120					0.960	1.600
405	1.000					1.120	1.120					0.960	1.600
406	1.600					1.120	1.120					0.960	1.600
407	1.000							1.120				0.960	1.600
408	1.600							1.120				0.960	1.600
409	1.000		1.120					1.120				0.960	1.600
410	1.600		1.120					1.120				0.960	1.600
411	1.000						1.120	1.120				0.960	1.600
412	1.600						1.120	1.120				0.960	1.600
413	1.000	1.600											0.800
414	1.600	1.600											0.800
415	1.000		1.600										0.800
416	1.600		1.600										0.800
417	1.000	1.600	1.600										0.800
418	1.600	1.600	1.600										0.800
419	1.000			1.600									0.800
420	1.600			1.600									0.800
421	1.000		1.600	1.600									0.800
422	1.600		1.600	1.600									0.800
423	1.000				1.600								0.800
424	1.600				1.600								0.800
425	1.000			1.600	1.600								0.800
426	1.600			1.600	1.600								0.800
427	1.000					1.600							0.800
428	1.600					1.600							0.800
429	1.000				1.600	1.600							0.800
430	1.600				1.600	1.600							0.800
431	1.000						1.600						0.800
432	1.600						1.600						0.800
433	1.000					1.600	1.600						0.800
434	1.600					1.600	1.600						0.800
435	1.000							1.600					0.800
436	1.600							1.600					0.800
437	1.000		1.600					1.600					0.800
438	1.600		1.600					1.600					0.800
439	1.000						1.600	1.600					0.800
440	1.600						1.600	1.600					0.800
441	1.000								1.600				0.800
442	1.600								1.600				0.800
443	1.000	1.120							1.600				0.800
444	1.600	1.120							1.600				0.800
445	1.000		1.120						1.600				0.800
446	1.600		1.120						1.600				0.800
447	1.000	1.120	1.120						1.600				0.800
448	1.600	1.120	1.120						1.600				0.800
449	1.000			1.120					1.600				0.800
450	1.600			1.120					1.600				0.800
451	1.000		1.120	1.120					1.600				0.800
452	1.600		1.120	1.120					1.600				0.800
453	1.000				1.120				1.600				0.800
454	1.600				1.120				1.600				0.800
455	1.000			1.120	1.120				1.600				0.800
456	1.600			1.120	1.120				1.600				0.800
457	1.000					1.120			1.600				0.800
458	1.600					1.120			1.600				0.800
459	1.000				1.120	1.120			1.600				0.800
460	1.600				1.120	1.120			1.600				0.800
461	1.000						1.120		1.600				0.800

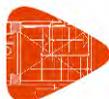


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
462	1.600						1.120		1.600				0.800
463	1.000					1.120	1.120		1.600				0.800
464	1.600					1.120	1.120		1.600				0.800
465	1.000							1.120	1.600				0.800
466	1.600							1.120	1.600				0.800
467	1.000		1.120					1.120	1.600				0.800
468	1.600		1.120					1.120	1.600				0.800
469	1.000						1.120	1.120	1.600				0.800
470	1.600						1.120	1.120	1.600				0.800
471	1.000	1.600							0.960				0.800
472	1.600	1.600							0.960				0.800
473	1.000		1.600						0.960				0.800
474	1.600		1.600						0.960				0.800
475	1.000	1.600	1.600						0.960				0.800
476	1.600	1.600	1.600						0.960				0.800
477	1.000			1.600					0.960				0.800
478	1.600			1.600					0.960				0.800
479	1.000		1.600	1.600					0.960				0.800
480	1.600		1.600	1.600					0.960				0.800
481	1.000				1.600				0.960				0.800
482	1.600				1.600				0.960				0.800
483	1.000			1.600	1.600				0.960				0.800
484	1.600			1.600	1.600				0.960				0.800
485	1.000					1.600			0.960				0.800
486	1.600					1.600			0.960				0.800
487	1.000				1.600	1.600			0.960				0.800
488	1.600				1.600	1.600			0.960				0.800
489	1.000						1.600		0.960				0.800
490	1.600						1.600		0.960				0.800
491	1.000					1.600	1.600		0.960				0.800
492	1.600					1.600	1.600		0.960				0.800
493	1.000							1.600	0.960				0.800
494	1.600							1.600	0.960				0.800
495	1.000		1.600					1.600	0.960				0.800
496	1.600		1.600					1.600	0.960				0.800
497	1.000						1.600	1.600	0.960				0.800
498	1.600						1.600	1.600	0.960				0.800
499	1.000									1.600			0.800
500	1.600									1.600			0.800
501	1.000	1.120								1.600			0.800
502	1.600	1.120								1.600			0.800
503	1.000		1.120							1.600			0.800
504	1.600		1.120							1.600			0.800
505	1.000	1.120	1.120							1.600			0.800
506	1.600	1.120	1.120							1.600			0.800
507	1.000			1.120						1.600			0.800
508	1.600			1.120						1.600			0.800
509	1.000		1.120	1.120						1.600			0.800
510	1.600		1.120	1.120						1.600			0.800
511	1.000				1.120					1.600			0.800
512	1.600				1.120					1.600			0.800
513	1.000			1.120	1.120					1.600			0.800
514	1.600			1.120	1.120					1.600			0.800
515	1.000					1.120				1.600			0.800
516	1.600					1.120				1.600			0.800
517	1.000				1.120	1.120				1.600			0.800
518	1.600				1.120	1.120				1.600			0.800
519	1.000						1.120			1.600			0.800

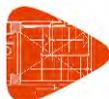


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
520	1.600						1.120			1.600			0.800
521	1.000					1.120	1.120			1.600			0.800
522	1.600					1.120	1.120			1.600			0.800
523	1.000							1.120		1.600			0.800
524	1.600							1.120		1.600			0.800
525	1.000		1.120					1.120		1.600			0.800
526	1.600		1.120					1.120		1.600			0.800
527	1.000						1.120	1.120		1.600			0.800
528	1.600						1.120	1.120		1.600			0.800
529	1.000	1.600								0.960			0.800
530	1.600	1.600								0.960			0.800
531	1.000		1.600							0.960			0.800
532	1.600		1.600							0.960			0.800
533	1.000	1.600	1.600							0.960			0.800
534	1.600	1.600	1.600							0.960			0.800
535	1.000			1.600						0.960			0.800
536	1.600			1.600						0.960			0.800
537	1.000		1.600	1.600						0.960			0.800
538	1.600		1.600	1.600						0.960			0.800
539	1.000				1.600					0.960			0.800
540	1.600				1.600					0.960			0.800
541	1.000			1.600	1.600					0.960			0.800
542	1.600			1.600	1.600					0.960			0.800
543	1.000					1.600				0.960			0.800
544	1.600					1.600				0.960			0.800
545	1.000				1.600	1.600				0.960			0.800
546	1.600				1.600	1.600				0.960			0.800
547	1.000						1.600			0.960			0.800
548	1.600						1.600			0.960			0.800
549	1.000					1.600	1.600			0.960			0.800
550	1.600					1.600	1.600			0.960			0.800
551	1.000							1.600		0.960			0.800
552	1.600							1.600		0.960			0.800
553	1.000		1.600					1.600		0.960			0.800
554	1.600		1.600					1.600		0.960			0.800
555	1.000						1.600	1.600		0.960			0.800
556	1.600						1.600	1.600		0.960			0.800
557	1.000										1.600		0.800
558	1.600										1.600		0.800
559	1.000	1.120									1.600		0.800
560	1.600	1.120									1.600		0.800
561	1.000		1.120								1.600		0.800
562	1.600		1.120								1.600		0.800
563	1.000	1.120	1.120								1.600		0.800
564	1.600	1.120	1.120								1.600		0.800
565	1.000			1.120							1.600		0.800
566	1.600			1.120							1.600		0.800
567	1.000		1.120	1.120							1.600		0.800
568	1.600		1.120	1.120							1.600		0.800
569	1.000				1.120						1.600		0.800
570	1.600				1.120						1.600		0.800
571	1.000			1.120	1.120						1.600		0.800
572	1.600			1.120	1.120						1.600		0.800
573	1.000					1.120					1.600		0.800
574	1.600					1.120					1.600		0.800
575	1.000				1.120	1.120					1.600		0.800
576	1.600				1.120	1.120					1.600		0.800
577	1.000						1.120				1.600		0.800



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
578	1.600						1.120				1.600		0.800
579	1.000					1.120	1.120				1.600		0.800
580	1.600					1.120	1.120				1.600		0.800
581	1.000							1.120			1.600		0.800
582	1.600							1.120			1.600		0.800
583	1.000		1.120					1.120			1.600		0.800
584	1.600		1.120					1.120			1.600		0.800
585	1.000						1.120	1.120			1.600		0.800
586	1.600						1.120	1.120			1.600		0.800
587	1.000	1.600									0.960		0.800
588	1.600	1.600									0.960		0.800
589	1.000		1.600								0.960		0.800
590	1.600		1.600								0.960		0.800
591	1.000	1.600	1.600								0.960		0.800
592	1.600	1.600	1.600								0.960		0.800
593	1.000			1.600							0.960		0.800
594	1.600			1.600							0.960		0.800
595	1.000		1.600	1.600							0.960		0.800
596	1.600		1.600	1.600							0.960		0.800
597	1.000				1.600						0.960		0.800
598	1.600				1.600						0.960		0.800
599	1.000			1.600	1.600						0.960		0.800
600	1.600			1.600	1.600						0.960		0.800
601	1.000					1.600					0.960		0.800
602	1.600					1.600					0.960		0.800
603	1.000				1.600	1.600					0.960		0.800
604	1.600				1.600	1.600					0.960		0.800
605	1.000						1.600				0.960		0.800
606	1.600						1.600				0.960		0.800
607	1.000					1.600	1.600				0.960		0.800
608	1.600					1.600	1.600				0.960		0.800
609	1.000							1.600			0.960		0.800
610	1.600							1.600			0.960		0.800
611	1.000		1.600					1.600			0.960		0.800
612	1.600		1.600					1.600			0.960		0.800
613	1.000						1.600	1.600			0.960		0.800
614	1.600						1.600	1.600			0.960		0.800
615	1.000											1.600	0.800
616	1.600											1.600	0.800
617	1.000	1.120										1.600	0.800
618	1.600	1.120										1.600	0.800
619	1.000		1.120									1.600	0.800
620	1.600		1.120									1.600	0.800
621	1.000	1.120	1.120									1.600	0.800
622	1.600	1.120	1.120									1.600	0.800
623	1.000			1.120								1.600	0.800
624	1.600			1.120								1.600	0.800
625	1.000		1.120	1.120								1.600	0.800
626	1.600		1.120	1.120								1.600	0.800
627	1.000				1.120							1.600	0.800
628	1.600				1.120							1.600	0.800
629	1.000			1.120	1.120							1.600	0.800
630	1.600			1.120	1.120							1.600	0.800
631	1.000					1.120						1.600	0.800
632	1.600					1.120						1.600	0.800
633	1.000				1.120	1.120						1.600	0.800
634	1.600				1.120	1.120						1.600	0.800
635	1.000						1.120					1.600	0.800



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
636	1.600						1.120					1.600	0.800
637	1.000					1.120	1.120					1.600	0.800
638	1.600					1.120	1.120					1.600	0.800
639	1.000							1.120				1.600	0.800
640	1.600							1.120				1.600	0.800
641	1.000		1.120					1.120				1.600	0.800
642	1.600		1.120					1.120				1.600	0.800
643	1.000						1.120	1.120				1.600	0.800
644	1.600						1.120	1.120				1.600	0.800
645	1.000	1.600										0.960	0.800
646	1.600	1.600										0.960	0.800
647	1.000		1.600									0.960	0.800
648	1.600		1.600									0.960	0.800
649	1.000	1.600	1.600									0.960	0.800
650	1.600	1.600	1.600									0.960	0.800
651	1.000			1.600								0.960	0.800
652	1.600			1.600								0.960	0.800
653	1.000		1.600	1.600								0.960	0.800
654	1.600		1.600	1.600								0.960	0.800
655	1.000				1.600							0.960	0.800
656	1.600				1.600							0.960	0.800
657	1.000			1.600	1.600							0.960	0.800
658	1.600			1.600	1.600							0.960	0.800
659	1.000					1.600						0.960	0.800
660	1.600					1.600						0.960	0.800
661	1.000				1.600	1.600						0.960	0.800
662	1.600				1.600	1.600						0.960	0.800
663	1.000						1.600					0.960	0.800
664	1.600						1.600					0.960	0.800
665	1.000					1.600	1.600					0.960	0.800
666	1.600					1.600	1.600					0.960	0.800
667	1.000							1.600				0.960	0.800
668	1.600							1.600				0.960	0.800
669	1.000		1.600					1.600				0.960	0.800
670	1.600		1.600					1.600				0.960	0.800
671	1.000						1.600	1.600				0.960	0.800
672	1.600						1.600	1.600				0.960	0.800

■ E.L.U. de rotura. Acero laminado

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
1	0.800												
2	1.350												
3	0.800	1.500											
4	1.350	1.500											
5	0.800		1.500										
6	1.350		1.500										
7	0.800	1.500	1.500										
8	1.350	1.500	1.500										
9	0.800			1.500									
10	1.350			1.500									
11	0.800		1.500	1.500									
12	1.350		1.500	1.500									
13	0.800				1.500								
14	1.350				1.500								
15	0.800			1.500	1.500								
16	1.350			1.500	1.500								



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
17	0.800					1.500							
18	1.350					1.500							
19	0.800				1.500	1.500							
20	1.350				1.500	1.500							
21	0.800						1.500						
22	1.350						1.500						
23	0.800					1.500	1.500						
24	1.350					1.500	1.500						
25	0.800							1.500					
26	1.350							1.500					
27	0.800		1.500					1.500					
28	1.350		1.500					1.500					
29	0.800						1.500	1.500					
30	1.350						1.500	1.500					
31	0.800								1.500				
32	1.350								1.500				
33	0.800	1.050								1.500			
34	1.350	1.050								1.500			
35	0.800		1.050							1.500			
36	1.350		1.050							1.500			
37	0.800	1.050	1.050							1.500			
38	1.350	1.050	1.050							1.500			
39	0.800			1.050						1.500			
40	1.350			1.050						1.500			
41	0.800		1.050	1.050						1.500			
42	1.350		1.050	1.050						1.500			
43	0.800				1.050					1.500			
44	1.350				1.050					1.500			
45	0.800			1.050	1.050					1.500			
46	1.350			1.050	1.050					1.500			
47	0.800					1.050				1.500			
48	1.350					1.050				1.500			
49	0.800				1.050	1.050				1.500			
50	1.350				1.050	1.050				1.500			
51	0.800						1.050		1.500				
52	1.350						1.050		1.500				
53	0.800					1.050	1.050		1.500				
54	1.350					1.050	1.050		1.500				
55	0.800							1.050	1.500				
56	1.350							1.050	1.500				
57	0.800		1.050					1.050	1.500				
58	1.350		1.050					1.050	1.500				
59	0.800						1.050	1.050	1.500				
60	1.350						1.050	1.050	1.500				
61	0.800	1.500								0.900			
62	1.350	1.500								0.900			
63	0.800		1.500							0.900			
64	1.350		1.500							0.900			
65	0.800	1.500	1.500							0.900			
66	1.350	1.500	1.500							0.900			
67	0.800			1.500						0.900			
68	1.350			1.500						0.900			
69	0.800		1.500	1.500						0.900			
70	1.350		1.500	1.500						0.900			
71	0.800				1.500					0.900			
72	1.350				1.500					0.900			
73	0.800			1.500	1.500					0.900			
74	1.350			1.500	1.500					0.900			



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
75	0.800					1.500			0.900				
76	1.350					1.500			0.900				
77	0.800				1.500	1.500			0.900				
78	1.350				1.500	1.500			0.900				
79	0.800						1.500		0.900				
80	1.350						1.500		0.900				
81	0.800					1.500	1.500		0.900				
82	1.350					1.500	1.500		0.900				
83	0.800							1.500	0.900				
84	1.350							1.500	0.900				
85	0.800		1.500					1.500	0.900				
86	1.350		1.500					1.500	0.900				
87	0.800						1.500	1.500	0.900				
88	1.350						1.500	1.500	0.900				
89	0.800									1.500			
90	1.350									1.500			
91	0.800	1.050								1.500			
92	1.350	1.050								1.500			
93	0.800		1.050							1.500			
94	1.350		1.050							1.500			
95	0.800	1.050	1.050							1.500			
96	1.350	1.050	1.050							1.500			
97	0.800			1.050						1.500			
98	1.350			1.050						1.500			
99	0.800		1.050	1.050						1.500			
100	1.350		1.050	1.050						1.500			
101	0.800				1.050					1.500			
102	1.350				1.050					1.500			
103	0.800			1.050	1.050					1.500			
104	1.350			1.050	1.050					1.500			
105	0.800					1.050				1.500			
106	1.350					1.050				1.500			
107	0.800				1.050	1.050				1.500			
108	1.350				1.050	1.050				1.500			
109	0.800						1.050			1.500			
110	1.350						1.050			1.500			
111	0.800					1.050	1.050			1.500			
112	1.350					1.050	1.050			1.500			
113	0.800							1.050		1.500			
114	1.350							1.050		1.500			
115	0.800		1.050					1.050		1.500			
116	1.350		1.050					1.050		1.500			
117	0.800						1.050	1.050		1.500			
118	1.350						1.050	1.050		1.500			
119	0.800	1.500								0.900			
120	1.350	1.500								0.900			
121	0.800		1.500							0.900			
122	1.350		1.500							0.900			
123	0.800	1.500	1.500							0.900			
124	1.350	1.500	1.500							0.900			
125	0.800			1.500						0.900			
126	1.350			1.500						0.900			
127	0.800		1.500	1.500						0.900			
128	1.350		1.500	1.500						0.900			
129	0.800				1.500					0.900			
130	1.350				1.500					0.900			
131	0.800			1.500	1.500					0.900			
132	1.350			1.500	1.500					0.900			



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
133	0.800					1.500				0.900			
134	1.350					1.500				0.900			
135	0.800				1.500	1.500				0.900			
136	1.350				1.500	1.500				0.900			
137	0.800						1.500			0.900			
138	1.350						1.500			0.900			
139	0.800					1.500	1.500			0.900			
140	1.350					1.500	1.500			0.900			
141	0.800							1.500		0.900			
142	1.350							1.500		0.900			
143	0.800		1.500					1.500		0.900			
144	1.350		1.500					1.500		0.900			
145	0.800						1.500	1.500		0.900			
146	1.350						1.500	1.500		0.900			
147	0.800										1.500		
148	1.350										1.500		
149	0.800	1.050									1.500		
150	1.350	1.050									1.500		
151	0.800		1.050								1.500		
152	1.350		1.050								1.500		
153	0.800	1.050	1.050								1.500		
154	1.350	1.050	1.050								1.500		
155	0.800			1.050							1.500		
156	1.350			1.050							1.500		
157	0.800		1.050	1.050							1.500		
158	1.350		1.050	1.050							1.500		
159	0.800				1.050						1.500		
160	1.350				1.050						1.500		
161	0.800			1.050	1.050						1.500		
162	1.350			1.050	1.050						1.500		
163	0.800					1.050					1.500		
164	1.350					1.050					1.500		
165	0.800				1.050	1.050					1.500		
166	1.350				1.050	1.050					1.500		
167	0.800						1.050				1.500		
168	1.350						1.050				1.500		
169	0.800					1.050	1.050				1.500		
170	1.350					1.050	1.050				1.500		
171	0.800							1.050			1.500		
172	1.350							1.050			1.500		
173	0.800		1.050					1.050			1.500		
174	1.350		1.050					1.050			1.500		
175	0.800						1.050	1.050			1.500		
176	1.350						1.050	1.050			1.500		
177	0.800	1.500									0.900		
178	1.350	1.500									0.900		
179	0.800		1.500								0.900		
180	1.350		1.500								0.900		
181	0.800	1.500	1.500								0.900		
182	1.350	1.500	1.500								0.900		
183	0.800			1.500							0.900		
184	1.350			1.500							0.900		
185	0.800		1.500	1.500							0.900		
186	1.350		1.500	1.500							0.900		
187	0.800				1.500						0.900		
188	1.350				1.500						0.900		
189	0.800			1.500	1.500						0.900		
190	1.350			1.500	1.500						0.900		

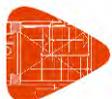


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
191	0.800					1.500					0.900		
192	1.350					1.500					0.900		
193	0.800				1.500	1.500					0.900		
194	1.350				1.500	1.500					0.900		
195	0.800						1.500				0.900		
196	1.350						1.500				0.900		
197	0.800					1.500	1.500				0.900		
198	1.350					1.500	1.500				0.900		
199	0.800							1.500			0.900		
200	1.350							1.500			0.900		
201	0.800		1.500					1.500			0.900		
202	1.350		1.500					1.500			0.900		
203	0.800						1.500	1.500			0.900		
204	1.350						1.500	1.500			0.900		
205	0.800											1.500	
206	1.350											1.500	
207	0.800	1.050											1.500
208	1.350	1.050											1.500
209	0.800		1.050										1.500
210	1.350		1.050										1.500
211	0.800	1.050	1.050										1.500
212	1.350	1.050	1.050										1.500
213	0.800			1.050									1.500
214	1.350			1.050									1.500
215	0.800		1.050	1.050									1.500
216	1.350		1.050	1.050									1.500
217	0.800				1.050								1.500
218	1.350				1.050								1.500
219	0.800			1.050	1.050								1.500
220	1.350			1.050	1.050								1.500
221	0.800					1.050							1.500
222	1.350					1.050							1.500
223	0.800				1.050	1.050							1.500
224	1.350				1.050	1.050							1.500
225	0.800						1.050						1.500
226	1.350						1.050						1.500
227	0.800					1.050	1.050						1.500
228	1.350					1.050	1.050						1.500
229	0.800							1.050					1.500
230	1.350							1.050					1.500
231	0.800		1.050					1.050					1.500
232	1.350		1.050					1.050					1.500
233	0.800						1.050	1.050					1.500
234	1.350						1.050	1.050					1.500
235	0.800	1.500										0.900	
236	1.350	1.500										0.900	
237	0.800		1.500									0.900	
238	1.350		1.500									0.900	
239	0.800	1.500	1.500									0.900	
240	1.350	1.500	1.500									0.900	
241	0.800			1.500								0.900	
242	1.350			1.500								0.900	
243	0.800		1.500	1.500								0.900	
244	1.350		1.500	1.500								0.900	
245	0.800				1.500							0.900	
246	1.350				1.500							0.900	
247	0.800			1.500	1.500							0.900	
248	1.350			1.500	1.500							0.900	

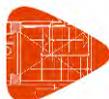


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
249	0.800					1.500						0.900	
250	1.350					1.500						0.900	
251	0.800				1.500	1.500						0.900	
252	1.350				1.500	1.500						0.900	
253	0.800						1.500					0.900	
254	1.350						1.500					0.900	
255	0.800					1.500	1.500					0.900	
256	1.350					1.500	1.500					0.900	
257	0.800							1.500				0.900	
258	1.350							1.500				0.900	
259	0.800		1.500					1.500				0.900	
260	1.350		1.500					1.500				0.900	
261	0.800						1.500	1.500				0.900	
262	1.350						1.500	1.500				0.900	
263	0.800												1.500
264	1.350												1.500
265	0.800	1.050											1.500
266	1.350	1.050											1.500
267	0.800		1.050										1.500
268	1.350		1.050										1.500
269	0.800	1.050	1.050										1.500
270	1.350	1.050	1.050										1.500
271	0.800			1.050									1.500
272	1.350			1.050									1.500
273	0.800		1.050	1.050									1.500
274	1.350		1.050	1.050									1.500
275	0.800				1.050								1.500
276	1.350				1.050								1.500
277	0.800			1.050	1.050								1.500
278	1.350			1.050	1.050								1.500
279	0.800					1.050							1.500
280	1.350					1.050							1.500
281	0.800				1.050	1.050							1.500
282	1.350				1.050	1.050							1.500
283	0.800						1.050						1.500
284	1.350						1.050						1.500
285	0.800					1.050	1.050						1.500
286	1.350					1.050	1.050						1.500
287	0.800							1.050					1.500
288	1.350							1.050					1.500
289	0.800		1.050					1.050					1.500
290	1.350		1.050					1.050					1.500
291	0.800						1.050	1.050					1.500
292	1.350						1.050	1.050					1.500
293	0.800								0.900				1.500
294	1.350								0.900				1.500
295	0.800	1.050							0.900				1.500
296	1.350	1.050							0.900				1.500
297	0.800		1.050						0.900				1.500
298	1.350		1.050						0.900				1.500
299	0.800	1.050	1.050						0.900				1.500
300	1.350	1.050	1.050						0.900				1.500
301	0.800			1.050					0.900				1.500
302	1.350			1.050					0.900				1.500
303	0.800		1.050	1.050					0.900				1.500
304	1.350		1.050	1.050					0.900				1.500
305	0.800				1.050				0.900				1.500
306	1.350				1.050				0.900				1.500



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
307	0.800			1.050	1.050				0.900				1.500
308	1.350			1.050	1.050				0.900				1.500
309	0.800					1.050			0.900				1.500
310	1.350					1.050			0.900				1.500
311	0.800				1.050	1.050			0.900				1.500
312	1.350				1.050	1.050			0.900				1.500
313	0.800						1.050		0.900				1.500
314	1.350						1.050		0.900				1.500
315	0.800					1.050	1.050		0.900				1.500
316	1.350					1.050	1.050		0.900				1.500
317	0.800							1.050	0.900				1.500
318	1.350							1.050	0.900				1.500
319	0.800		1.050					1.050	0.900				1.500
320	1.350		1.050					1.050	0.900				1.500
321	0.800						1.050	1.050	0.900				1.500
322	1.350						1.050	1.050	0.900				1.500
323	0.800									0.900			1.500
324	1.350									0.900			1.500
325	0.800	1.050								0.900			1.500
326	1.350	1.050								0.900			1.500
327	0.800		1.050							0.900			1.500
328	1.350		1.050							0.900			1.500
329	0.800	1.050	1.050							0.900			1.500
330	1.350	1.050	1.050							0.900			1.500
331	0.800			1.050						0.900			1.500
332	1.350			1.050						0.900			1.500
333	0.800		1.050	1.050						0.900			1.500
334	1.350		1.050	1.050						0.900			1.500
335	0.800				1.050					0.900			1.500
336	1.350				1.050					0.900			1.500
337	0.800			1.050	1.050					0.900			1.500
338	1.350			1.050	1.050					0.900			1.500
339	0.800					1.050				0.900			1.500
340	1.350					1.050				0.900			1.500
341	0.800				1.050	1.050				0.900			1.500
342	1.350				1.050	1.050				0.900			1.500
343	0.800						1.050			0.900			1.500
344	1.350						1.050			0.900			1.500
345	0.800					1.050	1.050			0.900			1.500
346	1.350					1.050	1.050			0.900			1.500
347	0.800							1.050		0.900			1.500
348	1.350							1.050		0.900			1.500
349	0.800		1.050					1.050		0.900			1.500
350	1.350		1.050					1.050		0.900			1.500
351	0.800						1.050	1.050		0.900			1.500
352	1.350						1.050	1.050		0.900			1.500
353	0.800										0.900		1.500
354	1.350										0.900		1.500
355	0.800	1.050									0.900		1.500
356	1.350	1.050									0.900		1.500
357	0.800		1.050								0.900		1.500
358	1.350		1.050								0.900		1.500
359	0.800	1.050	1.050								0.900		1.500
360	1.350	1.050	1.050								0.900		1.500
361	0.800			1.050							0.900		1.500
362	1.350			1.050							0.900		1.500
363	0.800		1.050	1.050							0.900		1.500
364	1.350		1.050	1.050							0.900		1.500



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
365	0.800				1.050						0.900		1.500
366	1.350				1.050						0.900		1.500
367	0.800			1.050	1.050						0.900		1.500
368	1.350			1.050	1.050						0.900		1.500
369	0.800					1.050					0.900		1.500
370	1.350					1.050					0.900		1.500
371	0.800				1.050	1.050					0.900		1.500
372	1.350				1.050	1.050					0.900		1.500
373	0.800						1.050				0.900		1.500
374	1.350						1.050				0.900		1.500
375	0.800					1.050	1.050				0.900		1.500
376	1.350					1.050	1.050				0.900		1.500
377	0.800							1.050			0.900		1.500
378	1.350							1.050			0.900		1.500
379	0.800		1.050					1.050			0.900		1.500
380	1.350		1.050					1.050			0.900		1.500
381	0.800						1.050	1.050			0.900		1.500
382	1.350						1.050	1.050			0.900		1.500
383	0.800											0.900	1.500
384	1.350											0.900	1.500
385	0.800	1.050										0.900	1.500
386	1.350	1.050										0.900	1.500
387	0.800		1.050									0.900	1.500
388	1.350		1.050									0.900	1.500
389	0.800	1.050	1.050									0.900	1.500
390	1.350	1.050	1.050									0.900	1.500
391	0.800			1.050								0.900	1.500
392	1.350			1.050								0.900	1.500
393	0.800		1.050	1.050								0.900	1.500
394	1.350		1.050	1.050								0.900	1.500
395	0.800				1.050							0.900	1.500
396	1.350				1.050							0.900	1.500
397	0.800			1.050	1.050							0.900	1.500
398	1.350			1.050	1.050							0.900	1.500
399	0.800					1.050						0.900	1.500
400	1.350					1.050						0.900	1.500
401	0.800				1.050	1.050						0.900	1.500
402	1.350				1.050	1.050						0.900	1.500
403	0.800						1.050					0.900	1.500
404	1.350						1.050					0.900	1.500
405	0.800					1.050	1.050					0.900	1.500
406	1.350					1.050	1.050					0.900	1.500
407	0.800							1.050				0.900	1.500
408	1.350							1.050				0.900	1.500
409	0.800		1.050					1.050				0.900	1.500
410	1.350		1.050					1.050				0.900	1.500
411	0.800						1.050	1.050				0.900	1.500
412	1.350						1.050	1.050				0.900	1.500
413	0.800	1.500											0.750
414	1.350	1.500											0.750
415	0.800		1.500										0.750
416	1.350		1.500										0.750
417	0.800	1.500	1.500										0.750
418	1.350	1.500	1.500										0.750
419	0.800			1.500									0.750
420	1.350			1.500									0.750
421	0.800		1.500	1.500									0.750
422	1.350		1.500	1.500									0.750

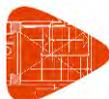


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
423	0.800				1.500								0.750
424	1.350				1.500								0.750
425	0.800			1.500	1.500								0.750
426	1.350			1.500	1.500								0.750
427	0.800					1.500							0.750
428	1.350					1.500							0.750
429	0.800				1.500	1.500							0.750
430	1.350				1.500	1.500							0.750
431	0.800						1.500						0.750
432	1.350						1.500						0.750
433	0.800					1.500	1.500						0.750
434	1.350					1.500	1.500						0.750
435	0.800							1.500					0.750
436	1.350							1.500					0.750
437	0.800		1.500					1.500					0.750
438	1.350		1.500					1.500					0.750
439	0.800						1.500	1.500					0.750
440	1.350						1.500	1.500					0.750
441	0.800								1.500				0.750
442	1.350								1.500				0.750
443	0.800	1.050							1.500				0.750
444	1.350	1.050							1.500				0.750
445	0.800		1.050						1.500				0.750
446	1.350		1.050						1.500				0.750
447	0.800	1.050	1.050						1.500				0.750
448	1.350	1.050	1.050						1.500				0.750
449	0.800			1.050					1.500				0.750
450	1.350			1.050					1.500				0.750
451	0.800		1.050	1.050					1.500				0.750
452	1.350		1.050	1.050					1.500				0.750
453	0.800				1.050				1.500				0.750
454	1.350				1.050				1.500				0.750
455	0.800			1.050	1.050				1.500				0.750
456	1.350			1.050	1.050				1.500				0.750
457	0.800					1.050			1.500				0.750
458	1.350					1.050			1.500				0.750
459	0.800				1.050	1.050			1.500				0.750
460	1.350				1.050	1.050			1.500				0.750
461	0.800						1.050		1.500				0.750
462	1.350						1.050		1.500				0.750
463	0.800					1.050	1.050		1.500				0.750
464	1.350					1.050	1.050		1.500				0.750
465	0.800							1.050	1.500				0.750
466	1.350							1.050	1.500				0.750
467	0.800		1.050					1.050	1.500				0.750
468	1.350		1.050					1.050	1.500				0.750
469	0.800						1.050	1.050	1.500				0.750
470	1.350						1.050	1.050	1.500				0.750
471	0.800	1.500							0.900				0.750
472	1.350	1.500							0.900				0.750
473	0.800		1.500						0.900				0.750
474	1.350		1.500						0.900				0.750
475	0.800	1.500	1.500						0.900				0.750
476	1.350	1.500	1.500						0.900				0.750
477	0.800			1.500					0.900				0.750
478	1.350			1.500					0.900				0.750
479	0.800		1.500	1.500					0.900				0.750
480	1.350		1.500	1.500					0.900				0.750



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
481	0.800				1.500				0.900				0.750
482	1.350				1.500				0.900				0.750
483	0.800			1.500	1.500				0.900				0.750
484	1.350			1.500	1.500				0.900				0.750
485	0.800					1.500			0.900				0.750
486	1.350					1.500			0.900				0.750
487	0.800				1.500	1.500			0.900				0.750
488	1.350				1.500	1.500			0.900				0.750
489	0.800						1.500		0.900				0.750
490	1.350						1.500		0.900				0.750
491	0.800					1.500	1.500		0.900				0.750
492	1.350					1.500	1.500		0.900				0.750
493	0.800							1.500	0.900				0.750
494	1.350							1.500	0.900				0.750
495	0.800		1.500					1.500	0.900				0.750
496	1.350		1.500					1.500	0.900				0.750
497	0.800						1.500	1.500	0.900				0.750
498	1.350						1.500	1.500	0.900				0.750
499	0.800									1.500			0.750
500	1.350									1.500			0.750
501	0.800	1.050								1.500			0.750
502	1.350	1.050								1.500			0.750
503	0.800		1.050							1.500			0.750
504	1.350		1.050							1.500			0.750
505	0.800	1.050	1.050							1.500			0.750
506	1.350	1.050	1.050							1.500			0.750
507	0.800			1.050						1.500			0.750
508	1.350			1.050						1.500			0.750
509	0.800		1.050	1.050						1.500			0.750
510	1.350		1.050	1.050						1.500			0.750
511	0.800				1.050					1.500			0.750
512	1.350				1.050					1.500			0.750
513	0.800			1.050	1.050					1.500			0.750
514	1.350			1.050	1.050					1.500			0.750
515	0.800					1.050				1.500			0.750
516	1.350					1.050				1.500			0.750
517	0.800				1.050	1.050				1.500			0.750
518	1.350				1.050	1.050				1.500			0.750
519	0.800						1.050			1.500			0.750
520	1.350						1.050			1.500			0.750
521	0.800					1.050	1.050			1.500			0.750
522	1.350					1.050	1.050			1.500			0.750
523	0.800							1.050		1.500			0.750
524	1.350							1.050		1.500			0.750
525	0.800		1.050					1.050		1.500			0.750
526	1.350		1.050					1.050		1.500			0.750
527	0.800						1.050	1.050		1.500			0.750
528	1.350						1.050	1.050		1.500			0.750
529	0.800	1.500								0.900			0.750
530	1.350	1.500								0.900			0.750
531	0.800		1.500							0.900			0.750
532	1.350		1.500							0.900			0.750
533	0.800	1.500	1.500							0.900			0.750
534	1.350	1.500	1.500							0.900			0.750
535	0.800			1.500						0.900			0.750
536	1.350			1.500						0.900			0.750
537	0.800		1.500	1.500						0.900			0.750
538	1.350		1.500	1.500						0.900			0.750

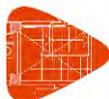


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
539	0.800				1.500					0.900			0.750
540	1.350				1.500					0.900			0.750
541	0.800			1.500	1.500					0.900			0.750
542	1.350			1.500	1.500					0.900			0.750
543	0.800					1.500				0.900			0.750
544	1.350					1.500				0.900			0.750
545	0.800				1.500	1.500				0.900			0.750
546	1.350				1.500	1.500				0.900			0.750
547	0.800						1.500			0.900			0.750
548	1.350						1.500			0.900			0.750
549	0.800					1.500	1.500			0.900			0.750
550	1.350					1.500	1.500			0.900			0.750
551	0.800							1.500		0.900			0.750
552	1.350							1.500		0.900			0.750
553	0.800		1.500					1.500		0.900			0.750
554	1.350		1.500					1.500		0.900			0.750
555	0.800						1.500	1.500		0.900			0.750
556	1.350						1.500	1.500		0.900			0.750
557	0.800										1.500		0.750
558	1.350										1.500		0.750
559	0.800	1.050									1.500		0.750
560	1.350	1.050									1.500		0.750
561	0.800		1.050								1.500		0.750
562	1.350		1.050								1.500		0.750
563	0.800	1.050	1.050								1.500		0.750
564	1.350	1.050	1.050								1.500		0.750
565	0.800			1.050							1.500		0.750
566	1.350			1.050							1.500		0.750
567	0.800		1.050	1.050							1.500		0.750
568	1.350		1.050	1.050							1.500		0.750
569	0.800				1.050						1.500		0.750
570	1.350				1.050						1.500		0.750
571	0.800			1.050	1.050						1.500		0.750
572	1.350			1.050	1.050						1.500		0.750
573	0.800					1.050					1.500		0.750
574	1.350					1.050					1.500		0.750
575	0.800				1.050	1.050					1.500		0.750
576	1.350				1.050	1.050					1.500		0.750
577	0.800						1.050				1.500		0.750
578	1.350						1.050				1.500		0.750
579	0.800					1.050	1.050				1.500		0.750
580	1.350					1.050	1.050				1.500		0.750
581	0.800							1.050			1.500		0.750
582	1.350							1.050			1.500		0.750
583	0.800		1.050					1.050			1.500		0.750
584	1.350		1.050					1.050			1.500		0.750
585	0.800						1.050	1.050			1.500		0.750
586	1.350						1.050	1.050			1.500		0.750
587	0.800	1.500									0.900		0.750
588	1.350	1.500									0.900		0.750
589	0.800		1.500								0.900		0.750
590	1.350		1.500								0.900		0.750
591	0.800	1.500	1.500								0.900		0.750
592	1.350	1.500	1.500								0.900		0.750
593	0.800			1.500							0.900		0.750
594	1.350			1.500							0.900		0.750
595	0.800		1.500	1.500							0.900		0.750
596	1.350		1.500	1.500							0.900		0.750



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
597	0.800				1.500						0.900		0.750
598	1.350				1.500						0.900		0.750
599	0.800			1.500	1.500						0.900		0.750
600	1.350			1.500	1.500						0.900		0.750
601	0.800					1.500					0.900		0.750
602	1.350					1.500					0.900		0.750
603	0.800				1.500	1.500					0.900		0.750
604	1.350				1.500	1.500					0.900		0.750
605	0.800						1.500				0.900		0.750
606	1.350						1.500				0.900		0.750
607	0.800					1.500	1.500				0.900		0.750
608	1.350					1.500	1.500				0.900		0.750
609	0.800							1.500			0.900		0.750
610	1.350							1.500			0.900		0.750
611	0.800		1.500					1.500			0.900		0.750
612	1.350		1.500					1.500			0.900		0.750
613	0.800						1.500	1.500			0.900		0.750
614	1.350						1.500	1.500			0.900		0.750
615	0.800											1.500	0.750
616	1.350											1.500	0.750
617	0.800	1.050										1.500	0.750
618	1.350	1.050										1.500	0.750
619	0.800		1.050									1.500	0.750
620	1.350		1.050									1.500	0.750
621	0.800	1.050	1.050									1.500	0.750
622	1.350	1.050	1.050									1.500	0.750
623	0.800			1.050								1.500	0.750
624	1.350			1.050								1.500	0.750
625	0.800		1.050	1.050								1.500	0.750
626	1.350		1.050	1.050								1.500	0.750
627	0.800				1.050							1.500	0.750
628	1.350				1.050							1.500	0.750
629	0.800			1.050	1.050							1.500	0.750
630	1.350			1.050	1.050							1.500	0.750
631	0.800					1.050						1.500	0.750
632	1.350					1.050						1.500	0.750
633	0.800				1.050	1.050						1.500	0.750
634	1.350				1.050	1.050						1.500	0.750
635	0.800						1.050					1.500	0.750
636	1.350						1.050					1.500	0.750
637	0.800					1.050	1.050					1.500	0.750
638	1.350					1.050	1.050					1.500	0.750
639	0.800							1.050				1.500	0.750
640	1.350							1.050				1.500	0.750
641	0.800		1.050					1.050				1.500	0.750
642	1.350		1.050					1.050				1.500	0.750
643	0.800						1.050	1.050				1.500	0.750
644	1.350						1.050	1.050				1.500	0.750
645	0.800	1.500										0.900	0.750
646	1.350	1.500										0.900	0.750
647	0.800		1.500									0.900	0.750
648	1.350		1.500									0.900	0.750
649	0.800	1.500	1.500									0.900	0.750
650	1.350	1.500	1.500									0.900	0.750
651	0.800			1.500								0.900	0.750
652	1.350			1.500								0.900	0.750
653	0.800		1.500	1.500								0.900	0.750
654	1.350		1.500	1.500								0.900	0.750



Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

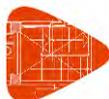
Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
655	0.800				1.500							0.900	0.750
656	1.350				1.500							0.900	0.750
657	0.800			1.500	1.500							0.900	0.750
658	1.350			1.500	1.500							0.900	0.750
659	0.800					1.500						0.900	0.750
660	1.350					1.500						0.900	0.750
661	0.800				1.500	1.500						0.900	0.750
662	1.350				1.500	1.500						0.900	0.750
663	0.800						1.500					0.900	0.750
664	1.350						1.500					0.900	0.750
665	0.800					1.500	1.500					0.900	0.750
666	1.350					1.500	1.500					0.900	0.750
667	0.800							1.500				0.900	0.750
668	1.350							1.500				0.900	0.750
669	0.800		1.500					1.500				0.900	0.750
670	1.350		1.500					1.500				0.900	0.750
671	0.800						1.500	1.500				0.900	0.750
672	1.350						1.500	1.500				0.900	0.750

■ Tensiones sobre el terreno

■ Desplazamientos

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
1	1.000												
2	1.000	1.000											
3	1.000		1.000										
4	1.000	1.000	1.000										
5	1.000			1.000									
6	1.000		1.000	1.000									
7	1.000				1.000								
8	1.000			1.000	1.000								
9	1.000					1.000							
10	1.000				1.000	1.000							
11	1.000						1.000						
12	1.000					1.000	1.000						
13	1.000							1.000					
14	1.000		1.000					1.000					
15	1.000						1.000	1.000					
16	1.000								1.000				
17	1.000	1.000								1.000			
18	1.000		1.000								1.000		
19	1.000	1.000	1.000								1.000		
20	1.000			1.000								1.000	
21	1.000		1.000	1.000								1.000	
22	1.000				1.000							1.000	
23	1.000			1.000	1.000							1.000	
24	1.000					1.000						1.000	
25	1.000				1.000	1.000						1.000	
26	1.000						1.000					1.000	
27	1.000					1.000	1.000					1.000	
28	1.000							1.000				1.000	
29	1.000		1.000						1.000			1.000	
30	1.000						1.000	1.000	1.000				
31	1.000									1.000			
32	1.000	1.000									1.000		
33	1.000		1.000									1.000	
34	1.000	1.000	1.000								1.000		

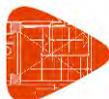


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
35	1.000			1.000						1.000			
36	1.000		1.000	1.000						1.000			
37	1.000				1.000					1.000			
38	1.000			1.000	1.000					1.000			
39	1.000					1.000				1.000			
40	1.000				1.000	1.000				1.000			
41	1.000						1.000			1.000			
42	1.000					1.000	1.000			1.000			
43	1.000							1.000		1.000			
44	1.000		1.000					1.000		1.000			
45	1.000						1.000	1.000		1.000			
46	1.000										1.000		
47	1.000	1.000									1.000		
48	1.000		1.000								1.000		
49	1.000	1.000	1.000								1.000		
50	1.000			1.000							1.000		
51	1.000		1.000	1.000							1.000		
52	1.000				1.000						1.000		
53	1.000			1.000	1.000						1.000		
54	1.000					1.000					1.000		
55	1.000				1.000	1.000					1.000		
56	1.000						1.000				1.000		
57	1.000					1.000	1.000				1.000		
58	1.000							1.000			1.000		
59	1.000		1.000					1.000			1.000		
60	1.000						1.000	1.000			1.000		
61	1.000											1.000	
62	1.000	1.000										1.000	
63	1.000		1.000									1.000	
64	1.000	1.000	1.000									1.000	
65	1.000			1.000								1.000	
66	1.000		1.000	1.000								1.000	
67	1.000				1.000							1.000	
68	1.000			1.000	1.000							1.000	
69	1.000					1.000						1.000	
70	1.000				1.000	1.000						1.000	
71	1.000						1.000					1.000	
72	1.000					1.000	1.000					1.000	
73	1.000							1.000				1.000	
74	1.000		1.000					1.000				1.000	
75	1.000						1.000	1.000				1.000	
76	1.000												1.000
77	1.000	1.000											1.000
78	1.000		1.000										1.000
79	1.000	1.000	1.000										1.000
80	1.000			1.000									1.000
81	1.000		1.000	1.000									1.000
82	1.000				1.000								1.000
83	1.000			1.000	1.000								1.000
84	1.000					1.000							1.000
85	1.000				1.000	1.000							1.000
86	1.000						1.000						1.000
87	1.000					1.000	1.000						1.000
88	1.000							1.000					1.000
89	1.000		1.000					1.000					1.000
90	1.000						1.000	1.000					1.000
91	1.000								1.000				1.000
92	1.000	1.000							1.000				1.000

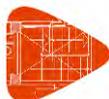


Listado de datos de la obra

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha: 11/01/21

Comb.	G	Qa	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	V 1	V 2	V 3	V 4	N 1
93	1.000		1.000						1.000				1.000
94	1.000	1.000	1.000						1.000				1.000
95	1.000			1.000					1.000				1.000
96	1.000		1.000	1.000					1.000				1.000
97	1.000				1.000				1.000				1.000
98	1.000			1.000	1.000				1.000				1.000
99	1.000					1.000			1.000				1.000
100	1.000				1.000	1.000			1.000				1.000
101	1.000						1.000		1.000				1.000
102	1.000					1.000	1.000		1.000				1.000
103	1.000							1.000	1.000				1.000
104	1.000		1.000					1.000	1.000				1.000
105	1.000						1.000	1.000	1.000				1.000
106	1.000									1.000			1.000
107	1.000	1.000								1.000			1.000
108	1.000		1.000							1.000			1.000
109	1.000	1.000	1.000							1.000			1.000
110	1.000			1.000						1.000			1.000
111	1.000		1.000	1.000						1.000			1.000
112	1.000				1.000					1.000			1.000
113	1.000			1.000	1.000					1.000			1.000
114	1.000					1.000				1.000			1.000
115	1.000				1.000	1.000				1.000			1.000
116	1.000						1.000			1.000			1.000
117	1.000					1.000	1.000			1.000			1.000
118	1.000							1.000		1.000			1.000
119	1.000		1.000					1.000		1.000			1.000
120	1.000						1.000	1.000		1.000			1.000
121	1.000										1.000		1.000
122	1.000	1.000									1.000		1.000
123	1.000		1.000								1.000		1.000
124	1.000	1.000	1.000								1.000		1.000
125	1.000			1.000							1.000		1.000
126	1.000		1.000	1.000							1.000		1.000
127	1.000				1.000						1.000		1.000
128	1.000			1.000	1.000						1.000		1.000
129	1.000					1.000					1.000		1.000
130	1.000				1.000	1.000					1.000		1.000
131	1.000						1.000				1.000		1.000
132	1.000					1.000	1.000				1.000		1.000
133	1.000							1.000			1.000		1.000
134	1.000		1.000					1.000			1.000		1.000
135	1.000						1.000	1.000			1.000		1.000
136	1.000											1.000	1.000
137	1.000	1.000										1.000	1.000
138	1.000		1.000									1.000	1.000
139	1.000	1.000	1.000									1.000	1.000
140	1.000			1.000								1.000	1.000
141	1.000		1.000	1.000								1.000	1.000
142	1.000				1.000							1.000	1.000
143	1.000			1.000	1.000							1.000	1.000
144	1.000					1.000						1.000	1.000
145	1.000				1.000	1.000						1.000	1.000
146	1.000						1.000					1.000	1.000
147	1.000					1.000	1.000					1.000	1.000
148	1.000							1.000				1.000	1.000
149	1.000		1.000					1.000				1.000	1.000
150	1.000						1.000	1.000				1.000	1.000



Listado de datos de la obra

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6.- DATOS GEOMÉTRICOS DE GRUPOS Y PLANTAS

Grupo	Nombre del grupo	Planta	Nombre planta	Altura	Cota
2	ENTREPLANTA	2	ENTREPLANTA	3.45	3.55
1	PILARES	1	PILARES	0.10	0.10
0	Cimentación				0.00

7.- DATOS GEOMÉTRICOS DE PILARES, PANTALLAS Y MUROS

7.1.- Pilares

GI: grupo inicial

GF: grupo final

Ang: ángulo del pilar en grados sexagesimales

Datos de los pilares

Referencia	Coord(P.Fijo)	GI- GF	Vinculación exterior	Ang.	Punto fijo	Canto de apoyo
P1	(0.00, 0.00)	0-2	Con vinculación exterior	0.0	Esq. inf. izq.	0.60
P2	(8.24, 0.00)	0-2	Con vinculación exterior	0.0	Mitad inferior	0.60
P3	(17.05, -0.00)	0-2	Con vinculación exterior	0.0	Esq. inf. der.	0.60
P4	(0.00, 7.49)	0-2	Con vinculación exterior	0.0	Mitad izquierda	0.60
P5	(8.24, 7.49)	0-2	Con vinculación exterior	0.0	Centro	0.40
P6	(17.05, 7.49)	0-2	Con vinculación exterior	0.0	Mitad derecha	0.60
P7	(0.00, 23.07)	0-2	Con vinculación exterior	0.0	Esq. sup. izq.	0.70
P8	(8.24, 23.07)	0-2	Con vinculación exterior	0.0	Mitad superior	0.70
P9	(17.05, 23.07)	0-2	Con vinculación exterior	0.0	Esq. sup. der.	0.70
P10	(17.05, 15.28)	0-2	Con vinculación exterior	0.0	Mitad derecha	0.70

8.- DIMENSIONES, COEFICIENTES DE EMPOTRAMIENTO Y COEFICIENTES DE PANDEO PARA CADA PLANTA

Referencia pilar	Planta	Dimensiones	Coefs. empotramiento		Coefs. pandeo	
			Cabeza	Pie	Pandeo x	Pandeo Y
Para todos los pilares	2	0.40x0.40	0.30	1.00	1.00	1.00
	1	0.40x0.40	1.00	1.00	1.00	1.00

9.- MATERIALES UTILIZADOS

9.1.- Hormigones

Elemento	Hormigón	f_{ck} (kp/cm ²)	γ_c
Vigas y losas de cimentación	HA-25	255	1.50
Elementos de cimentación	HA-25	255	1.50
Forjados	HA-25	255	1.50
Pilares y pantallas	HA-35	357	1.50
Muros	HA-25	255	1.50



Listado de datos de la obra

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9.2. - Aceros por elemento y posición

9.2.1. - Aceros en barras

Para todos los elementos estructurales de la obra: B 500 S; $f_{yk} = 5097 \text{ kp/cm}^2$; $\gamma_s = 1.15$

9.2.2. - Aceros en perfiles

Tipo de acero para perfiles	Acero	Límite elástico (kp/cm ²)	Módulo de elasticidad (kp/cm ²)
Aceros conformados	S235	2396	2140673
Aceros laminados	S275	2803	2140673

CÁLCULO DE ESFUERZOS Y ARMADOS

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Esfuerzos y armados de pilares, pantallas y muros

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1.- MATERIALES

1.1.- Hormigones

Elemento	Hormigón	f_{ck} (kp/cm ²)	γ_c
Pilares y pantallas	HA-35	357	1.50
Muros	HA-25	255	1.50

1.2.- Aceros por elemento y posición

1.2.1.- Aceros en barras

Para todos los elementos estructurales de la obra: B 500 S; $f_{yk} = 5097$ kp/cm²; $\gamma_s = 1.15$

1.2.2.- Aceros en perfiles

Tipo de acero para perfiles	Acero	Límite elástico (kp/cm ²)	Módulo de elasticidad (kp/cm ²)
Aceros conformados	S235	2396	2140673
Aceros laminados	S275	2803	2140673

2.- ARMADO DE PILARES Y PANTALLAS

2.1.- Pilares



Esfuerzos y armados de pilares, pantallas y muros

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Armado de pilares											
Hormigón: HA-35, Yc=1.5											
Pilar	Geometría			Armaduras						Aprov. (%)	Estado
	Planta	Dimensiones (cm)	Tramo (m)	Barras			Estribos				
				Esquina	Cara X	Cara Y	Cuantía (%)	Perimetral	Separación (cm)		
P1	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	42.5	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	54.9	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	54.9	Cumple
P2	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	4.3	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	43.3	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	43.3	Cumple
P3	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	47.4	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	60.4	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	60.4	Cumple
P4	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	42.8	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	60.1	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	60.1	Cumple
P5	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	4.3	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	36.7	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	36.7	Cumple
P6	ENTREPLANTA	40x40	2.75/3.25				1.01	1e06	24	47.5	Cumple
			0.10/2.35						24		
	PILARES	40x40	0.00/0.10	4Ø16	2Ø16	2Ø16	1.01	1e06	24	65.8	Cumple
	Cimentación	-	-	4Ø16	2Ø16	2Ø16	1.01	1e06	-	65.8	Cumple
P7	ENTREPLANTA	40x40	0.10/3.55	4Ø20	2Ø16	2Ø16	1.29	1e06	24	78.6	Cumple
	PILARES	40x40	0.00/0.10						24		
	Cimentación	-	-						-		
P8	ENTREPLANTA	40x40	0.10/3.55	4Ø20	2Ø16	2Ø16	1.29	1e06	24	71.3	Cumple
	PILARES	40x40	0.00/0.10						24		
	Cimentación	-	-						-		
P9	ENTREPLANTA	40x40	0.10/3.55	4Ø20	2Ø16	2Ø16	1.29	1e06	24	65.6	Cumple
	PILARES	40x40	0.00/0.10						24		
	Cimentación	-	-						-		
P10	ENTREPLANTA	40x40	0.10/3.55	4Ø20	2Ø16	2Ø16	1.29	1e06	24	75.6	Cumple
	PILARES	40x40	0.00/0.10						24		
	Cimentación	-	-						-		

3.- ESFUERZOS DE PILARES, PANTALLAS Y MUROS POR HIPÓTESIS

- Tramo: Nivel inicial / nivel final del tramo entre plantas.
- Nota:
Los esfuerzos están referidos a ejes locales del pilar.



Esfuerzos y armados de pilares, pantallas y muros

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Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza						
					N (t)	Mx (t-m)	My (t-m)	Qx (t)	Qy (t)	T (t-m)	N (t)	Mx (t-m)	My (t-m)	Qx (t)	Qy (t)	T (t-m)	
P1	ENTREPLANTA	40x40	2.75/3.25	Carga permanente	1.11	1.35	-0.11	1.69	0.07	-0.00	0.91	0.51	-0.14	1.69	0.07	-0.00	
				Sobrecarga de uso	0.69	0.81	-0.09	1.01	0.06	-0.00	0.69	0.30	-0.12	1.01	0.06	-0.00	
				Q 1	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	
				Q 2	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	
				Q 3	-0.00	-0.01	0.00	-0.01	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.01	0.00	
				Q 4	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	
				Q 5	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Q 6	0.00	0.01	-0.01	0.01	-0.01	-0.00	0.00	0.00	-0.00	0.01	-0.01	-0.00	
				V 1	0.00	0.01	-0.00	0.02	-0.00	0.00	0.00	0.00	-0.00	0.02	-0.00	0.00	
				V 2	-0.00	-0.02	0.01	-0.03	0.01	-0.00	-0.00	-0.01	0.01	-0.03	0.01	-0.00	
				V 3	0.00	-0.01	0.00	-0.02	0.01	-0.00	0.00	-0.00	0.00	-0.02	0.01	-0.00	
				V 4	0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	
				N 1													
							0.10/2.35	Carga permanente	14.77	1.42	0.07	1.69	0.07	-0.00	13.87	-2.38	-0.08
					Sobrecarga de uso	8.20	0.86	0.06	1.01	0.06	-0.00	8.20	-1.42	-0.07	1.01	0.06	-0.00
					Q 1	0.00	0.00	0.01	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	
					Q 2	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00		
					Q 3	-0.00	-0.03	0.02	-0.01	0.00	-0.00	-0.01	0.01	-0.01	0.00		
					Q 4	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00			
					Q 5	-0.00	0.00	0.01	0.00	0.00	-0.00	0.00	0.00	0.00			
					Q 6	0.00	0.04	-0.04	0.01	-0.01	-0.00	0.00	0.01	-0.01			
					V 1	0.00	0.05	-0.01	0.02	-0.00	0.00	0.00	0.02	-0.00			
					V 2	-0.00	-0.10	0.05	-0.03	0.01	-0.00	-0.04	0.02	-0.03			
					V 3	0.00	-0.05	0.02	-0.02	0.01	-0.00	-0.02	0.01	-0.02			
					V 4	0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00				
					N 1												
		PILARES	40x40	0.00/0.10	Carga permanente	22.47	1.54	0.15	1.69	0.08	0.00	22.43	1.38	0.14	1.69	0.08	0.00
					Sobrecarga de uso	8.20	0.92	0.05	1.00	0.05	0.00	8.20	0.82	0.05	1.00	0.05	0.00
	Q 1				0.00	-0.14	0.01	-0.02	-0.01	0.01	0.00	-0.13	0.01	-0.02	-0.01		
	Q 2				-0.00	-0.03	-0.01	0.02	0.01	0.02	-0.00	-0.03	-0.01	0.02	0.01		
	Q 3				-0.00	-0.05	-0.12	0.00	-0.02	0.02	-0.00	-0.05	-0.12	0.00	-0.02		
	Q 4				-0.04	0.08	-1.26	0.14	-0.07	0.10	-0.04	0.07	-1.25	0.14	-0.07		
	Q 5				-0.01	-0.54	-0.68	-0.08	-0.10	0.03	-0.01	-0.53	-0.67	-0.08	-0.10		
	Q 6				0.00	-0.85	-0.34	-0.16	-0.08	-0.03	0.00	-0.83	-0.34	-0.16	-0.08		
	Q 6				-0.07	-5.66	0.52	-1.47	0.80	0.06	-0.07	-5.51	0.44	-1.47	0.80		
	V 1				-0.06	4.59	1.83	0.84	1.10	-0.12	-0.06	4.51	1.72	0.84	1.10		
	V 2				0.01	1.54	-4.70	0.91	-1.34	0.07	0.01	1.45	-4.56	0.91	-1.34		
	V 3				0.04	0.86	3.60	0.63	0.66	0.01	0.04	0.79	3.53	0.63	0.66		
	V 4				0.81	0.00	0.02	0.00	0.00	-0.00	0.81	0.00	0.02	0.00	0.00		
	N 1																
P2	ENTREPLANTA	40x40	2.75/3.25	Carga permanente	1.11	0.14	-0.11	0.14	0.07	0.00	0.91	0.07	-0.14	0.14	0.07	0.00	
				Sobrecarga de uso	0.69	0.10	-0.09	0.09	0.06	-0.00	0.69	0.05	-0.12	0.09	0.06	-0.00	
				Q 1	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00		
				Q 2	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00		
				Q 3	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00		
				Q 4	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00		
				Q 5	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00		
				Q 6	0.00	0.00	-0.03	0.00	-0.03	-0.00	0.00	0.00	-0.01	0.00	-0.03		
				V 1	0.00	-0.00	-0.02	-0.00	-0.03	0.00	0.00	-0.00	-0.01	-0.00	-0.03		
				V 2	-0.00	0.00	0.02	0.00	0.02	0.00	-0.00	0.00	0.01	0.00	0.02		
				V 3	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00		
				V 4	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00		
				N 1													



Esfuerzos y armados de pilares, pantallas y muros

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Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza					
					N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)	N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)
			0.10/2.35	Carga permanente	28.31	0.15	0.07	0.14	0.07	0.00	27.41	-0.18	-0.08	0.14	0.07	0.00
				Sobrecarga de uso	16.27	0.10	0.06	0.09	0.06	-0.00	16.27	-0.11	-0.07	0.09	0.06	-0.00
				Q 1	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00
				Q 2	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00
				Q 3	-0.00	0.01	-0.01	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00
				Q 4	-0.00	0.00	-0.01	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00
				Q 5	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
				Q 6	0.00	0.00	-0.11	0.00	-0.03	-0.00	0.00	0.00	-0.04	0.00	-0.03	-0.00
				V 1	0.00	-0.00	-0.10	-0.00	-0.03	0.00	0.00	-0.00	-0.03	-0.00	-0.03	0.00
				V 2	-0.00	0.00	0.09	0.00	0.02	0.00	-0.00	0.00	0.03	0.00	0.02	0.00
				V 3	0.00	0.01	0.07	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.02	0.00
				V 4	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.00
				N 1												
	PILARES	40x40	0.00/0.10	Carga permanente	39.35	0.16	0.11	0.14	0.07	-0.00	39.31	0.14	0.10	0.14	0.07	-0.00
				Sobrecarga de uso	16.27	0.10	0.05	0.09	0.05	0.00	16.27	0.09	0.04	0.09	0.05	0.00
				Q 1	-0.00	-0.18	0.12	-0.04	0.03	-0.00	-0.00	-0.18	0.11	-0.04	0.03	-0.00
				Q 2	0.00	-0.10	0.05	-0.01	-0.01	0.01	0.00	-0.10	0.05	-0.01	-0.01	0.01
				Q 3	-0.00	-0.01	0.10	0.02	0.03	0.02	-0.00	-0.02	0.10	0.02	0.03	0.02
				Q 4	-0.01	-0.37	-0.50	-0.07	-0.03	0.06	-0.01	-0.37	-0.49	-0.07	-0.03	0.06
				Q 5	-0.05	-0.61	-0.38	-0.11	0.17	0.02	-0.05	-0.60	-0.40	-0.11	0.17	0.02
				Q 6	-0.01	-0.87	-0.43	-0.17	-0.04	-0.03	-0.01	-0.85	-0.43	-0.17	-0.04	-0.03
				V 1	-0.13	-5.16	2.20	-0.99	1.85	0.11	-0.13	-5.06	2.02	-0.99	1.85	0.11
				V 2	-0.12	5.20	2.11	0.99	1.80	-0.10	-0.12	5.10	1.93	0.99	1.80	-0.10
				V 3	0.02	0.36	-5.09	0.10	-1.75	-0.00	0.02	0.35	-4.92	0.10	-1.75	-0.00
				V 4	0.08	0.12	2.88	0.02	0.42	-0.04	0.08	0.12	2.83	0.02	0.42	-0.04
				N 1	1.69	-0.00	0.01	-0.00	-0.00	-0.00	1.69	-0.00	0.01	-0.00	-0.00	-0.00
P3	ENTREPLANTA	40x40	2.75/3.25	Carga permanente	0.32	-1.47	0.00	-1.84	0.00	0.00	0.12	-0.55	0.00	-1.84	0.00	0.00
				Sobrecarga de uso	0.00	-0.88	0.00	-1.10	0.00	0.00	0.00	-0.33	0.00	-1.10	0.00	0.00
				Q 1	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00
				Q 2	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
				Q 3	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00
				Q 4	0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	-0.00
				Q 5	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
				Q 6	0.00	-0.01	-0.00	-0.02	-0.00	-0.00	0.00	-0.01	-0.00	-0.02	-0.00	-0.00
				V 1	-0.00	-0.01	-0.01	-0.02	-0.01	0.00	-0.00	-0.00	-0.00	-0.02	-0.01	0.00
				V 2	0.00	0.03	0.01	0.04	0.01	0.00	0.00	0.01	0.00	0.04	0.01	0.00
				V 3	-0.00	0.02	-0.00	0.03	-0.00	0.00	-0.00	0.01	-0.00	0.03	-0.00	0.00
				V 4	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00
				N 1												
			0.10/2.35	Carga permanente	15.23	-1.48	0.00	-1.84	0.00	0.00	14.33	2.65	0.00	-1.84	0.00	0.00
				Sobrecarga de uso	8.34	-0.89	0.00	-1.10	0.00	0.00	8.34	1.60	0.00	-1.10	0.00	0.00
				Q 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
				Q 2	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
				Q 3	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00
				Q 4	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00
				Q 5	0.00	0.03	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
				Q 6	-0.00	-0.06	-0.01	-0.02	-0.00	-0.00	-0.00	-0.02	-0.00	-0.02	-0.00	-0.00
				V 1	0.00	-0.05	-0.04	-0.02	-0.01	0.00	0.00	-0.02	-0.02	-0.02	-0.01	0.00
				V 2	0.00	0.13	0.04	0.04	0.01	0.00	0.00	0.04	0.01	0.04	0.01	0.00
				V 3	0.00	0.09	-0.00	0.03	-0.00	0.00	0.00	0.03	-0.00	0.03	-0.00	0.00
				V 4	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
				N 1												



Esfuerzos y armados de pilares, pantallas y muros

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha:
11/01/21

Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza									
					N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)	N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)				
PILARES	40x40	0.00/0.10	Carga permanente Sobrecarga de uso	Q 1	23.09	-1.65	0.03	-1.84	0.01	-0.01	23.05	-1.46	0.03	-1.84	0.01	-0.01				
				Q 2	8.35	-0.95	-0.01	-1.09	-0.00	-0.00	8.35	-0.84	-0.01	-1.09	-0.00	-0.00				
				Q 3	0.00	-0.12	0.14	-0.01	0.02	0.01	0.00	-0.12	0.14	-0.01	-0.01	0.02	0.01			
				Q 4	0.00	-0.14	0.24	-0.03	0.05	0.01	0.00	-0.13	0.23	-0.03	0.05	0.01	0.01			
				Q 5	0.00	-0.03	0.25	0.01	0.04	0.02	0.00	-0.03	0.25	0.01	0.04	0.02	0.02			
				Q 6	-0.00	-0.29	-0.08	-0.03	0.01	0.08	-0.00	-0.29	-0.08	-0.03	0.01	0.08	0.01	0.08		
				V 1	-0.01	-0.60	-0.33	-0.11	-0.00	0.02	-0.01	-0.59	-0.33	-0.11	-0.00	0.02	0.02			
				V 2	-0.04	-1.21	-0.88	-0.32	0.02	-0.05	-0.04	-1.18	-0.89	-0.32	0.02	-0.05	-0.05	-0.05		
				V 3	-0.07	-4.51	1.92	-0.81	1.18	0.12	-0.07	-4.43	1.80	-0.81	1.18	0.12	1.18	0.12		
				V 4	-0.07	5.79	0.65	1.51	0.85	-0.06	-0.07	5.64	0.57	1.51	0.85	-0.06	-0.06			
				N 1	0.02	-1.04	-4.50	-0.81	-1.36	-0.05	0.02	-0.96	-4.37	-0.81	-1.36	-0.05	-0.05			
				N 1	0.02	-0.76	3.47	-0.65	0.72	-0.05	0.02	-0.70	3.40	-0.65	0.72	-0.05	-0.05			
				N 1	0.87	-0.01	0.01	-0.00	0.00	-0.00	0.87	-0.01	0.01	-0.00	0.00	-0.00	0.00	-0.00		
				P4	ENTREPLANTA	40x40	Carga permanente Sobrecarga de uso	Q 1	1.11	1.35	0.11	1.69	-0.07	0.00	0.91	0.51	0.14	1.69	-0.07	0.00
								Q 2	0.69	0.81	0.09	1.01	-0.06	0.00	0.69	0.30	0.12	1.01	-0.06	0.00
								Q 3	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
								Q 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
Q 5	0.00	-0.00	-0.00					-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00				
Q 6	0.00	0.00	-0.01					0.00	-0.01	-0.00	0.00	0.00	-0.00	0.00	-0.01	-0.00				
V 1	0.00	-0.01	0.01					-0.01	0.01	-0.00	0.00	-0.01	0.01	-0.01	0.01	-0.00				
V 2	0.00	-0.00	0.00					-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00				
V 3	-0.00	0.03	0.01					0.04	0.02	-0.00	-0.00	0.01	0.01	0.04	0.02	-0.00				
V 4	-0.00	0.00	0.01					0.00	0.01	0.00	-0.00	0.00	0.00	0.01	0.00	0.01				
N 1	0.00	-0.06	-0.01					-0.07	-0.01	-0.00	0.00	-0.02	-0.00	-0.07	-0.01	-0.00				
N 1	-0.00	-0.04	-0.01					-0.05	-0.01	-0.00	-0.01	-0.00	-0.05	-0.01	-0.05	-0.01				
N 1	-0.00	0.00	-0.00					0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00				
N 1	14.77	1.43	-0.07					1.69	-0.07	0.00	13.87	-2.38	0.08	1.69	-0.07	0.00				
N 1	8.20	0.86	-0.06					1.01	-0.06	0.00	8.20	-1.41	0.07	1.01	-0.06	0.00				
N 1	-0.00	-0.00	-0.00					-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00				
N 1	0.00	0.00	0.00					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00				
N 1	0.00	0.00	-0.04	0.00	-0.01	-0.00	0.00	0.00	-0.01	0.00	-0.01	-0.00								
N 1	0.00	-0.02	0.03	-0.01	0.01	-0.00	0.00	-0.01	0.01	-0.01	0.01	-0.00								
N 1	0.00	-0.01	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00								
N 1	-0.00	0.14	0.06	0.04	0.02	-0.00	-0.00	0.05	0.02	0.04	0.02	-0.00								
N 1	-0.00	0.01	0.03	0.00	0.01	0.00	-0.00	0.00	0.01	0.00	0.01	0.00								
N 1	0.00	-0.25	-0.04	-0.07	-0.01	-0.00	0.00	-0.09	-0.01	-0.07	-0.01	-0.00								
N 1	-0.00	-0.16	-0.03	-0.05	-0.01	-0.00	-0.00	-0.05	-0.01	-0.05	-0.01	-0.00								
N 1	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00								
PILARES	40x40	0.00/0.10	Carga permanente Sobrecarga de uso	Q 1	29.08	1.53	0.04	1.68	-0.03	-0.00	29.04	1.36	0.04	1.68	-0.03	-0.00				
				Q 2	8.20	0.92	-0.06	1.00	-0.05	-0.00	8.20	0.82	-0.05	1.00	-0.05	-0.00				
				Q 3	0.93	-0.13	0.11	0.01	0.03	0.02	0.93	-0.13	0.10	0.01	0.03	0.02				
				Q 4	0.00	-0.19	-0.03	-0.02	-0.00	0.02	0.00	-0.19	-0.03	-0.02	-0.00	0.02				
				Q 5	0.00	-0.20	-0.11	-0.02	-0.02	0.03	0.00	-0.20	-0.11	-0.02	-0.02	0.03				
				Q 6	7.39	-0.80	-0.62	-0.14	0.12	0.07	7.39	-0.78	-0.63	-0.14	0.12	0.07				
				V 1	0.01	-0.45	-1.05	0.02	-0.28	0.01	0.01	-0.45	-1.02	0.02	-0.28	0.01				
				V 2	-0.00	-0.53	-0.29	-0.05	-0.06	-0.03	-0.00	-0.53	-0.29	-0.05	-0.06	-0.03				
				V 3	0.07	-7.54	-0.69	-2.71	-0.12	0.07	0.07	-7.27	-0.68	-2.71	-0.12	0.07				
				V 4	0.06	5.82	1.39	1.45	0.54	-0.10	0.06	5.68	1.34	1.45	0.54	-0.10				
				N 1	-0.01	3.25	-3.71	2.39	-0.72	0.07	-0.01	3.01	-3.64	2.39	-0.72	0.07				
				N 1	-0.04	2.21	4.14	1.87	0.88	0.05	-0.04	2.02	4.05	1.87	0.88	0.05				
				N 1	2.51	-0.00	0.02	-0.00	0.01	-0.00	2.51	-0.00	0.02	-0.00	0.01	-0.00				



Esfuerzos y armados de pilares, pantallas y muros

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha:
11/01/21

Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza									
					N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)	N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)				
P5	ENTREPLANTA	40x40	2.75/3.25	Carga permanente	1.11	0.14	0.11	0.14	-0.07	0.00	0.91	0.07	0.14	0.14	-0.07	0.00				
				Sobrecarga de uso	0.69	0.10	0.09	0.09	-0.06	0.00	0.69	0.05	0.12	0.09	-0.06	0.00				
				Q 1	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00				
				Q 2	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00				
				Q 3	0.00	0.01	0.01	0.01	0.01	-0.00	0.00	0.00	0.00	0.01	0.01	0.01				
				Q 4	0.00	-0.00	-0.01	-0.00	-0.01	-0.00	0.00	-0.00	-0.00	-0.00	-0.01	-0.01				
				Q 5	0.00	-0.01	0.01	-0.01	0.01	0.00	0.00	-0.00	0.00	0.00	-0.01	0.01				
				Q 6	-0.00	-0.02	0.01	-0.02	0.02	-0.00	-0.01	0.00	-0.02	0.02	-0.02	0.02				
				V 1	-0.00	0.02	0.01	0.02	0.01	0.00	-0.00	0.01	0.00	0.02	0.01	0.00				
				V 2	0.00	0.00	-0.02	0.00	-0.02	-0.00	0.00	0.00	-0.01	0.00	-0.02	-0.00				
				V 3	-0.00	0.00	-0.01	0.00	-0.01	-0.00	-0.00	0.00	-0.00	0.00	-0.01	-0.00				
				V 4	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	0.00				
				N 1																
							0.10/2.35	Carga permanente	28.31	0.14	-0.07	0.14	-0.07	0.00	27.41	-0.18	0.08	0.14	-0.07	0.00
								Sobrecarga de uso	16.27	0.10	-0.06	0.09	-0.06	0.00	16.27	-0.11	0.07	0.09	-0.06	0.00
								Q 1	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	
								Q 2	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00	
								Q 3	0.00	0.02	0.03	0.01	0.01	-0.00	0.00	0.01	0.01	0.01	0.01	
					Q 4	0.00	-0.00	-0.04	-0.00	-0.01	-0.00	0.00	-0.00	-0.01	-0.00	-0.01				
					Q 5	0.00	-0.03	0.03	-0.01	0.01	0.00	0.00	-0.01	0.01	-0.01	0.01				
					Q 6	-0.00	-0.07	0.05	-0.02	0.02	-0.00	-0.03	0.02	-0.02	0.02					
					V 1	-0.00	0.07	0.05	0.02	0.01	0.00	-0.00	0.02	0.02	0.02					
					V 2	0.00	0.02	-0.08	0.00	-0.02	-0.00	0.00	0.01	-0.03	0.00					
					V 3	-0.00	0.01	-0.03	0.00	-0.01	-0.00	-0.00	0.00	-0.01	-0.01					
					V 4	-0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.00					
					N 1															
		PILARES	40x40	0.00/0.10	Carga permanente	48.16	0.20	0.02	0.15	-0.04	-0.00	48.12	0.19	0.03	0.15	-0.04	-0.00			
					Sobrecarga de uso	16.27	0.10	-0.05	0.09	-0.05	-0.00	16.27	0.09	-0.04	0.09	-0.05	-0.00			
				Q 1	0.00	-0.14	0.08	-0.00	0.02	0.01	0.00	-0.14	0.08	-0.00	0.02					
				Q 2	0.93	-0.18	0.12	-0.02	0.02	0.02	0.93	-0.18	0.11	-0.02	0.02					
				Q 3	0.00	-0.22	0.07	-0.03	0.01	0.03	0.00	-0.21	0.06	-0.03	0.01					
				Q 4	0.01	-1.03	-0.91	-0.27	-0.23	0.08	0.01	-1.01	-0.89	-0.27	-0.23					
				Q 5	7.40	-0.65	-0.12	-0.09	0.21	0.02	7.40	-0.64	-0.14	-0.09	0.21					
				Q 6	0.01	-0.25	-0.77	0.10	-0.20	-0.04	0.01	-0.26	-0.75	0.10	-0.20					
				V 1	0.13	-5.10	0.28	-0.76	0.23	0.10	0.13	-5.02	0.26	-0.76						
				V 2	0.12	5.07	0.39	0.71	0.27	-0.11	0.12	5.00	0.37	0.71						
				V 3	-0.02	0.17	-3.21	0.07	-0.44	0.04	-0.02	0.17	-3.17	0.07						
				V 4	-0.08	0.35	3.98	0.14	0.77	0.01	-0.08	0.33	3.90	0.14						
				N 1	5.20	0.01	0.01	0.00	-0.00	-0.00	5.20	0.01	0.01	0.00						
P6	ENTREPLANTA	40x40	2.75/3.25	Carga permanente	0.32	-1.47	-0.00	-1.84	-0.00	0.00	0.12	-0.55	-0.00	-1.84	-0.00					
				Sobrecarga de uso	0.00	-0.88	-0.00	-1.10	-0.00	-0.00	0.00	-0.33	-0.00	-1.10	-0.00					
				Q 1	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00					
				Q 2	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00					
				Q 3	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00					
				Q 4	0.00	0.00	0.01	0.01	0.01	-0.00	0.00	0.00	0.00	0.01	0.01					
				Q 5	0.00	-0.00	-0.01	-0.00	-0.01	0.00	0.00	-0.00	-0.00	-0.01	-0.01					
				Q 6	-0.00	-0.01	0.01	-0.01	0.01	-0.00	-0.00	-0.00	0.00	-0.01	0.01					
				V 1	0.00	-0.02	0.02	-0.02	0.02	0.00	-0.01	0.01	-0.02	0.02	0.00					
				V 2	-0.00	0.05	-0.01	0.06	-0.02	-0.00	-0.00	0.02	-0.00	0.06	-0.02					
				V 3	0.00	0.02	-0.01	0.03	-0.01	-0.00	0.00	0.01	-0.00	0.03	-0.01					
				V 4	0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00					
				N 1																



Esfuerzos y armados de pilares, pantallas y muros

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha:
11/01/21

Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza					
					N (t)	Mx (t-m)	My (t-m)	Qx (t)	Qy (t)	T (t-m)	N (t)	Mx (t-m)	My (t-m)	Qx (t)	Qy (t)	T (t-m)
			0.10/2.35	Carga permanente	15.23	-1.49	-0.00	-1.84	-0.00	0.00	14.33	2.64	-0.00	-1.84	-0.00	0.00
				Sobrecarga de uso	8.34	-0.89	-0.00	-1.10	-0.00	-0.00	8.34	1.60	-0.00	-1.10	-0.00	-0.00
				Q 1	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00
				Q 2	0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	-0.00
				Q 3	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00
				Q 4	0.00	0.02	0.03	0.01	0.01	-0.00	0.00	0.01	0.01	0.01	0.01	-0.00
				Q 5	-0.00	-0.00	-0.04	-0.00	-0.01	0.00	-0.00	-0.00	-0.02	-0.00	-0.01	0.00
				Q 6	0.00	-0.05	0.05	-0.01	0.01	-0.00	0.00	-0.02	0.02	-0.01	0.01	-0.00
				V 1	-0.00	-0.08	0.07	-0.02	0.02	0.00	-0.00	-0.03	0.02	-0.02	0.02	0.00
				V 2	-0.00	0.21	-0.05	0.06	-0.02	-0.00	-0.00	0.07	-0.02	0.06	-0.02	-0.00
				V 3	-0.00	0.11	-0.03	0.03	-0.01	-0.00	-0.00	0.04	-0.01	0.03	-0.01	-0.00
				V 4	0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	0.00
				N 1												
	PILARES	40x40	0.00/0.10	Carga permanente	26.19	-1.58	0.08	-1.81	0.03	-0.00	26.15	-1.40	0.07	-1.81	0.03	-0.00
				Sobrecarga de uso	8.34	-0.95	0.01	-1.09	0.00	0.00	8.34	-0.84	0.01	-1.09	0.00	0.00
				Q 1	-0.00	-0.15	0.13	-0.01	0.02	0.02	-0.00	-0.15	0.13	-0.01	0.02	0.02
				Q 2	0.94	-0.22	0.33	-0.03	0.08	0.04	0.94	-0.22	0.33	-0.03	0.08	0.04
				Q 3	-0.00	-0.81	-0.06	-0.15	0.01	0.06	-0.00	-0.80	-0.06	-0.15	0.01	0.06
				Q 4	0.01	-0.93	-0.70	-0.23	-0.18	0.02	0.01	-0.91	-0.69	-0.23	-0.18	0.02
				Q 5	7.42	-0.61	-0.22	-0.07	0.23	-0.03	7.42	-0.60	-0.24	-0.07	0.23	-0.03
				Q 6	-0.02	-5.35	1.26	-1.11	0.49	0.09	-0.02	-5.24	1.21	-1.11	0.49	0.09
				V 1	-0.00	6.76	-0.60	2.04	-0.10	-0.10	-0.00	6.56	-0.59	2.04	-0.10	-0.10
				V 2	-0.01	-2.06	-3.46	-1.57	-0.68	0.05	-0.01	-1.90	-3.39	-1.57	-0.68	0.05
				V 3	-0.01	-0.80	3.83	-0.96	0.83	0.02	-0.01	-0.71	3.74	-0.96	0.83	0.02
				V 4	1.78	0.01	0.01	0.00	0.01	-0.00	1.78	0.01	0.01	0.00	0.01	-0.00
				N 1												
P7	ENTREPLANTA	40x40	0.10/3.55	Carga permanente	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00
				Sobrecarga de uso	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00
				Q 1	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00
				Q 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Q 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Q 4	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00
				Q 5	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00
				Q 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				V 1	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00
				V 2	-0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00
				V 3	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
				V 4	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	-0.00
				N 1												
	PILARES	40x40	0.00/0.10	Carga permanente	11.36	-0.00	-0.18	0.00	-0.04	0.00	11.32	-0.00	-0.18	0.00	-0.04	0.00
				Sobrecarga de uso	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
				Q 1	7.35	-1.16	-1.66	-0.20	-0.64	0.05	7.35	-1.14	-1.59	-0.20	-0.64	0.05
				Q 2	0.00	-1.14	-0.04	-0.19	-0.01	0.04	0.00	-1.12	-0.04	-0.19	-0.01	0.04
				Q 3	0.00	-1.15	-0.08	-0.19	-0.01	0.05	0.00	-1.13	-0.08	-0.19	-0.01	0.05
				Q 4	0.93	-0.35	-1.47	-0.04	-0.22	0.01	0.93	-0.35	-1.45	-0.04	-0.22	0.01
				Q 5	0.00	-0.18	-0.54	-0.01	-0.07	-0.04	0.00	-0.18	-0.53	-0.01	-0.07	-0.04
				Q 6	-0.00	-0.05	-0.19	-0.00	-0.02	-0.05	-0.00	-0.05	-0.19	-0.00	-0.02	-0.05
				V 1	-0.00	-7.03	-2.69	-2.14	-1.29	0.07	-0.00	-6.81	-2.57	-2.14	-1.29	0.07
				V 2	0.00	5.98	-1.98	1.38	-1.21	0.08	0.00	5.85	-1.86	1.38	-1.21	0.08
				V 3	0.00	2.46	-3.56	1.63	-0.80	-0.37	0.00	2.29	-3.48	1.63	-0.80	-0.37
				V 4	-0.00	2.50	4.65	1.63	1.39	-0.35	-0.00	2.34	4.51	1.63	1.39	-0.35
				N 1	1.71	0.00	-0.03	0.00	-0.00	-0.00	1.71	0.00	-0.03	0.00	-0.00	-0.00



Esfuerzos y armados de pilares, pantallas y muros

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha:
11/01/21

Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza							
					N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)	N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)		
P8	ENTREPLANTA	40x40	0.10/3.55	Carga permanente	1.38	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	
				Sobrecarga de uso	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00
				Q 1	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Q 2	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00
				Q 3	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
				Q 4	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00
				Q 5	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00
				Q 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				V 1	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00
				V 2	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00
				V 3	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00
				V 4	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00
				N 1														
		PILARES	40x40	0.00/0.10	Carga permanente	13.90	0.02	-0.28	-0.00	-0.06	0.01	13.86	0.02	-0.27	-0.00	-0.06	0.01	
	Sobrecarga de uso				0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	
	Q 1				-0.00	-1.13	0.05	-0.19	0.00	0.05	-0.00	-1.11	0.05	-0.19	0.00	0.00	0.05	
	Q 2				7.35	-1.14	-1.60	-0.19	-0.63	0.04	7.35	-1.12	-1.54	-0.19	-0.63	0.04		
	Q 3				-0.00	-1.15	0.04	-0.19	0.00	0.04	-0.00	-1.14	0.04	-0.19	0.00	0.04		
	Q 4				0.00	-0.36	-0.50	-0.04	-0.06	0.02	0.00	-0.35	-0.49	-0.04	-0.06			
Q 5	0.93	-0.19	-1.07	-0.02	-0.17	-0.02	0.93	-0.19	-1.05	-0.02	-0.17	-0.02						
Q 6	0.00	-0.04	-0.42	0.00	-0.05	-0.06	0.00	-0.04	-0.41	0.00	-0.05	-0.06						
V 1	-0.00	-5.20	-4.74	-0.76	-2.57	-0.09	-0.00	-5.13	-4.48	-0.76	-2.57	-0.09						
V 2	-0.00	5.13	-4.72	0.73	-2.57	0.16	-0.00	5.06	-4.46	0.73	-2.57	0.16						
V 3	-0.00	0.40	-4.69	0.11	-1.34	-0.12	-0.00	0.39	-4.56	0.11	-1.34	-0.12						
V 4	0.00	0.47	6.65	0.12	2.49	-0.14	0.00	0.45	6.41	0.12	2.49	-0.14						
N 1	3.55	0.00	-0.07	-0.00	-0.01	0.00	3.55	0.00	-0.07	-0.00	-0.01	0.00						
P9	ENTREPLANTA	40x40	0.10/3.55	Carga permanente	1.38	0.00	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00		
				Sobrecarga de uso	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	
				Q 1	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00		
				Q 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00		
				Q 3	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00		
				Q 4	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00		
				Q 5	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00		
				Q 6	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00		
				V 1	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00		
				V 2	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00		
				V 3	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00		
				V 4	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00		
				N 1														
		PILARES	40x40	0.00/0.10	Carga permanente	7.79	-0.01	-0.05	-0.00	-0.02	0.01	7.75	-0.01	-0.05	-0.00	-0.02	0.01	
	Sobrecarga de uso				0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	
	Q 1				0.00	-1.12	0.10	-0.18	0.01	0.06	0.00	-1.11	0.10	-0.18	0.01	0.06		
	Q 2				-0.00	-1.16	0.14	-0.19	0.02	0.06	-0.00	-1.14	0.13	-0.19	0.02	0.06		
	Q 3				7.36	-1.20	-1.48	-0.20	-0.62	0.05	7.36	-1.18	-1.42	-0.20	-0.62	0.05		
	Q 4				-0.00	-0.34	-0.12	-0.03	-0.02	-0.01	-0.00	-0.33	-0.12	-0.03	-0.02	-0.01		
Q 5	0.00	-0.19	-0.38	-0.02	-0.05	-0.02	0.00	-0.19	-0.38	-0.02	-0.05	-0.02						
Q 6	0.95	-0.04	-1.26	0.00	-0.19	-0.07	0.95	-0.04	-1.25	0.00	-0.19	-0.07						
V 1	-0.09	-5.56	-2.15	-1.05	-1.30	-0.06	-0.09	-5.45	-2.02	-1.05	-1.30	-0.06						
V 2	-0.07	5.99	-2.77	1.39	-1.37	0.12	-0.07	5.85	-2.63	1.39	-1.37	0.12						
V 3	-0.01	-0.60	-3.42	-0.63	-0.82	-0.08	-0.01	-0.54	-3.34	-0.63	-0.82	-0.08						
V 4	0.04	-0.52	4.46	-0.62	1.41	-0.12	0.04	-0.46	4.32	-0.62	1.41	-0.12						
N 1	0.90	-0.00	0.00	-0.00	-0.00	0.00	0.90	-0.00	0.00	-0.00	-0.00	0.00						



Esfuerzos y armados de pilares, pantallas y muros

R.B: 0026-06-20 NAVE EN ZAMORA

Fecha:
11/01/21

Soporte	Planta	Dimensión (cm)	Tramo (m)	Hipótesis	Base						Cabeza											
					N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)	N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)						
P10	ENTREPLANTA	40x40	0.10/3.55	Carga permanente	1.38	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00					
				Sobrecarga de uso	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00				
				Q 1	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
				Q 2	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
				Q 3	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00				
				Q 4	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00				
				Q 5	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00				
				Q 6	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00				
				V 1	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00				
				V 2	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00				
				V 3	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00				
				V 4	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00				
				N 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
					PILARES	40x40	0.00/0.10	Carga permanente	10.47	0.00	-0.01	0.00	0.00	0.00	10.43	0.00	-0.01	0.00	0.00	0.00		
								Sobrecarga de uso	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
								Q 1	-0.00	-0.49	0.08	-0.06	0.01	0.09	-0.00	-0.49	0.08	-0.06	0.01	0.09		
								Q 2	0.00	-0.51	0.12	-0.06	0.01	0.10	0.00	-0.51	0.11	-0.06	0.01	0.10		
Q 3	-0.03	-0.53	0.17					-0.06	0.02	0.10	-0.03	-0.53	0.16	-0.06	0.02	0.10						
Q 4	0.00	-0.50	-0.10					-0.06	-0.01	-0.04	0.00	-0.49	-0.10	-0.06	-0.01	-0.04						
Q 5	-0.00	-0.41	-0.31					-0.05	-0.03	-0.05	-0.00	-0.40	-0.31	-0.05	-0.03	-0.05						
Q 6	-0.06	-0.32	-0.92					-0.04	-0.10	-0.06	-0.06	-0.31	-0.91	-0.04	-0.10	-0.06						
Q 6	0.18	-6.20	0.10					-1.41	0.01	0.02	0.18	-6.06	0.09	-1.41	0.01	0.02						
V 1	0.14	8.63	-0.44					2.57	-0.05	-0.02	0.14	8.38	-0.44	2.57	-0.05	-0.02						
V 2	-0.01	-4.48	-2.11					-2.21	-0.23	-0.00	-0.01	-4.26	-2.08	-2.21	-0.23	-0.00						
V 3	-0.05	-4.42	2.13					-2.20	0.23	-0.00	-0.05	-4.20	2.11	-2.20	0.23	-0.00						
V 4	1.85	0.00	-0.00					0.00	0.00	0.00	1.85	0.00	-0.00	0.00	0.00	0.00						
N 1																						

4.- ARRANQUES DE PILARES, PANTALLAS Y MUROS POR HIPÓTESIS

■ Nota:

Los esfuerzos están referidos a ejes locales del pilar.

Soporte	Hipótesis	Esfuerzos en arranques					
		N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)
P1	Carga permanente	22.47	1.54	0.15	1.69	0.08	0.00
	Sobrecarga de uso	8.20	0.92	0.05	1.00	0.05	0.00
	Q 1	0.00	-0.14	0.01	-0.02	-0.01	0.01
	Q 2	-0.00	-0.03	-0.01	0.02	0.01	0.02
	Q 3	-0.00	-0.05	-0.12	0.00	-0.02	0.02
	Q 4	-0.04	0.08	-1.26	0.14	-0.07	0.10
	Q 5	-0.01	-0.54	-0.68	-0.08	-0.10	0.03
	Q 6	0.00	-0.85	-0.34	-0.16	-0.08	-0.03
	V 1	-0.07	-5.66	0.52	-1.47	0.80	0.06
	V 2	-0.06	4.59	1.83	0.84	1.10	-0.12
	V 3	0.01	1.54	-4.70	0.91	-1.34	0.07
V 4	0.04	0.86	3.60	0.63	0.66	0.01	
N 1	0.81	0.00	0.02	0.00	0.00	-0.00	



Esfuerzos y armados de pilares, pantallas y muros

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Soporte	Hipótesis	Esfuerzos en arranques					
		N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)
P2	Carga permanente	39.35	0.16	0.11	0.14	0.07	-0.00
	Sobrecarga de uso	16.27	0.10	0.05	0.09	0.05	0.00
	Q 1	-0.00	-0.18	0.12	-0.04	0.03	-0.00
	Q 2	0.00	-0.10	0.05	-0.01	-0.01	0.01
	Q 3	-0.00	-0.01	0.10	0.02	0.03	0.02
	Q 4	-0.01	-0.37	-0.50	-0.07	-0.03	0.06
	Q 5	-0.05	-0.61	-0.38	-0.11	0.17	0.02
	Q 6	-0.01	-0.87	-0.43	-0.17	-0.04	-0.03
	V 1	-0.13	-5.16	2.20	-0.99	1.85	0.11
	V 2	-0.12	5.20	2.11	0.99	1.80	-0.10
	V 3	0.02	0.36	-5.09	0.10	-1.75	-0.00
	V 4	0.08	0.12	2.88	0.02	0.42	-0.04
	N 1	1.69	-0.00	0.01	-0.00	-0.00	-0.00
	P3	Carga permanente	23.09	-1.65	0.03	-1.84	0.01
Sobrecarga de uso		8.35	-0.95	-0.01	-1.09	-0.00	-0.00
Q 1		0.00	-0.12	0.14	-0.01	0.02	0.01
Q 2		0.00	-0.14	0.24	-0.03	0.05	0.01
Q 3		0.00	-0.03	0.25	0.01	0.04	0.02
Q 4		-0.00	-0.29	-0.08	-0.03	0.01	0.08
Q 5		-0.01	-0.60	-0.33	-0.11	-0.00	0.02
Q 6		-0.04	-1.21	-0.88	-0.32	0.02	-0.05
V 1		-0.07	-4.51	1.92	-0.81	1.18	0.12
V 2		-0.07	5.79	0.65	1.51	0.85	-0.06
V 3		0.02	-1.04	-4.50	-0.81	-1.36	-0.05
V 4		0.02	-0.76	3.47	-0.65	0.72	-0.05
N 1		0.87	-0.01	0.01	-0.00	0.00	-0.00
P4		Carga permanente	29.08	1.53	0.04	1.68	-0.03
	Sobrecarga de uso	8.20	0.92	-0.06	1.00	-0.05	-0.00
	Q 1	0.93	-0.13	0.11	0.01	0.03	0.02
	Q 2	0.00	-0.19	-0.03	-0.02	-0.00	0.02
	Q 3	0.00	-0.20	-0.11	-0.02	-0.02	0.03
	Q 4	7.39	-0.80	-0.62	-0.14	0.12	0.07
	Q 5	0.01	-0.45	-1.05	0.02	-0.28	0.01
	Q 6	-0.00	-0.53	-0.29	-0.05	-0.06	-0.03
	V 1	0.07	-7.54	-0.69	-2.71	-0.12	0.07
	V 2	0.06	5.82	1.39	1.45	0.54	-0.10
	V 3	-0.01	3.25	-3.71	2.39	-0.72	0.07
	V 4	-0.04	2.21	4.14	1.87	0.88	0.05
	N 1	2.51	-0.00	0.02	-0.00	0.01	-0.00
	P5	Carga permanente	48.16	0.20	0.02	0.15	-0.04
Sobrecarga de uso		16.27	0.10	-0.05	0.09	-0.05	-0.00
Q 1		0.00	-0.14	0.08	-0.00	0.02	0.01
Q 2		0.93	-0.18	0.12	-0.02	0.02	0.02
Q 3		0.00	-0.22	0.07	-0.03	0.01	0.03
Q 4		0.01	-1.03	-0.91	-0.27	-0.23	0.08
Q 5		7.40	-0.65	-0.12	-0.09	0.21	0.02
Q 6		0.01	-0.25	-0.77	0.10	-0.20	-0.04
V 1		0.13	-5.10	0.28	-0.76	0.23	0.10
V 2		0.12	5.07	0.39	0.71	0.27	-0.11
V 3		-0.02	0.17	-3.21	0.07	-0.44	0.04
V 4		-0.08	0.35	3.98	0.14	0.77	0.01
N 1		5.20	0.01	0.01	0.00	-0.00	-0.00



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Soporte	Hipótesis	Esfuerzos en arranques					
		N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)
P6	Carga permanente	26.19	-1.58	0.08	-1.81	0.03	-0.00
	Sobrecarga de uso	8.34	-0.95	0.01	-1.09	0.00	0.00
	Q 1	-0.00	-0.15	0.13	-0.01	0.02	0.02
	Q 2	-0.00	-0.15	0.20	-0.00	0.04	0.03
	Q 3	0.94	-0.22	0.33	-0.03	0.08	0.04
	Q 4	-0.00	-0.81	-0.06	-0.15	0.01	0.06
	Q 5	0.01	-0.93	-0.70	-0.23	-0.18	0.02
	Q 6	7.42	-0.61	-0.22	-0.07	0.23	-0.03
	V 1	-0.02	-5.35	1.26	-1.11	0.49	0.09
	V 2	-0.00	6.76	-0.60	2.04	-0.10	-0.10
	V 3	-0.01	-2.06	-3.46	-1.57	-0.68	0.05
	V 4	-0.01	-0.80	3.83	-0.96	0.83	0.02
	N 1	1.78	0.01	0.01	0.00	0.01	-0.00
	P7	Carga permanente	11.36	-0.00	-0.18	0.00	-0.04
Sobrecarga de uso		-0.00	0.00	-0.00	0.00	-0.00	0.00
Q 1		7.35	-1.16	-1.66	-0.20	-0.64	0.05
Q 2		0.00	-1.14	-0.04	-0.19	-0.01	0.04
Q 3		0.00	-1.15	-0.08	-0.19	-0.01	0.05
Q 4		0.93	-0.35	-1.47	-0.04	-0.22	0.01
Q 5		0.00	-0.18	-0.54	-0.01	-0.07	-0.04
Q 6		-0.00	-0.05	-0.19	-0.00	-0.02	-0.05
V 1		-0.00	-7.03	-2.69	-2.14	-1.29	0.07
V 2		0.00	5.98	-1.98	1.38	-1.21	0.08
V 3		0.00	2.46	-3.56	1.63	-0.80	-0.37
V 4		-0.00	2.50	4.65	1.63	1.39	-0.35
N 1		1.71	0.00	-0.03	0.00	-0.00	-0.00
P8		Carga permanente	13.90	0.02	-0.28	-0.00	-0.06
	Sobrecarga de uso	0.00	0.00	-0.00	0.00	-0.00	0.00
	Q 1	-0.00	-1.13	0.05	-0.19	0.00	0.05
	Q 2	7.35	-1.14	-1.60	-0.19	-0.63	0.04
	Q 3	-0.00	-1.15	0.04	-0.19	0.00	0.04
	Q 4	0.00	-0.36	-0.50	-0.04	-0.06	0.02
	Q 5	0.93	-0.19	-1.07	-0.02	-0.17	-0.02
	Q 6	0.00	-0.04	-0.42	0.00	-0.05	-0.06
	V 1	-0.00	-5.20	-4.74	-0.76	-2.57	-0.09
	V 2	-0.00	5.13	-4.72	0.73	-2.57	0.16
	V 3	-0.00	0.40	-4.69	0.11	-1.34	-0.12
	V 4	0.00	0.47	6.65	0.12	2.49	-0.14
	N 1	3.55	0.00	-0.07	-0.00	-0.01	0.00
	P9	Carga permanente	7.79	-0.01	-0.05	-0.00	-0.02
Sobrecarga de uso		0.00	0.00	-0.00	0.00	-0.00	0.00
Q 1		0.00	-1.12	0.10	-0.18	0.01	0.06
Q 2		-0.00	-1.16	0.14	-0.19	0.02	0.06
Q 3		7.36	-1.20	-1.48	-0.20	-0.62	0.05
Q 4		-0.00	-0.34	-0.12	-0.03	-0.02	-0.01
Q 5		0.00	-0.19	-0.38	-0.02	-0.05	-0.02
Q 6		0.95	-0.04	-1.26	0.00	-0.19	-0.07
V 1		-0.09	-5.56	-2.15	-1.05	-1.30	-0.06
V 2		-0.07	5.99	-2.77	1.39	-1.37	0.12
V 3		-0.01	-0.60	-3.42	-0.63	-0.82	-0.08
V 4		0.04	-0.52	4.46	-0.62	1.41	-0.12
N 1		0.90	-0.00	0.00	-0.00	-0.00	0.00



Esfuerzos y armados de pilares, pantallas y muros

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Soporte	Hipótesis	Esfuerzos en arranques					
		N (t)	Mx (t·m)	My (t·m)	Qx (t)	Qy (t)	T (t·m)
P10	Carga permanente	10.47	0.00	-0.01	0.00	0.00	0.00
	Sobrecarga de uso	-0.00	0.00	-0.00	0.00	-0.00	0.00
	Q 1	-0.00	-0.49	0.08	-0.06	0.01	0.09
	Q 2	0.00	-0.51	0.12	-0.06	0.01	0.10
	Q 3	-0.03	-0.53	0.17	-0.06	0.02	0.10
	Q 4	0.00	-0.50	-0.10	-0.06	-0.01	-0.04
	Q 5	-0.00	-0.41	-0.31	-0.05	-0.03	-0.05
	Q 6	-0.06	-0.32	-0.92	-0.04	-0.10	-0.06
	V 1	0.18	-6.20	0.10	-1.41	0.01	0.02
	V 2	0.14	8.63	-0.44	2.57	-0.05	-0.02
	V 3	-0.01	-4.48	-2.11	-2.21	-0.23	-0.00
	V 4	-0.05	-4.42	2.13	-2.20	0.23	-0.00
	N 1	1.85	0.00	-0.00	0.00	0.00	0.00

5.- PÉSIMOS DE PILARES, PANTALLAS Y MUROS

5.1.- Pilares

Resumen de las comprobaciones													
Pilares	Planta	Tramo (m)	Dimensión	Posición	Esfuerzos pésimos					Pésima	Aprov. (%)	Estado	
					Naturaleza	N (t)	Mxx (t·m)	Myy (t·m)	Qx (t)				Qy (t)
P1	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, V	2.54	0.28	-3.05	-3.81	0.17	Q	42.4	Cumple
				Cabeza	G, Q, V	2.27	0.37	-1.14	-3.81	0.17	Q	42.5	Cumple
	PILARES	0.00/2.75	40x40	Pie	G, Q, V	22.44	8.94	-3.38	-3.11	-2.11	N,M	54.9	Cumple
				Cabeza	G, Q, V	38.90	6.61	-4.90	-4.70	-1.84	N,M	38.8	Cumple
				Cimentación	-0.21/0.00	40x40	Pie	G, Q, V	22.44	8.94	-3.38	-3.11	-2.11
P2	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, V	2.54	0.30	-0.34	-0.34	0.14	Q	4.0	Cumple
				Cabeza	G, Q, V, N	2.26	0.36	-0.18	-0.34	0.20	Q	4.3	Cumple
	PILARES	0.00/2.75	40x40	Pie	G, Q, V	39.10	-2.56	9.14	1.64	2.98	N,M	43.3	Cumple
				Cabeza	G, Q, V	39.06	-2.26	8.98	1.64	2.98	N,M	41.6	Cumple
				Cimentación	-0.21/0.00	40x40	Pie	G, Q, V	39.10	-2.56	9.14	1.64	2.98
P3	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, V	0.43	0.00	3.32	4.15	0.00	Q	47.2	Cumple
				Cabeza	G, Q, V	0.16	0.00	1.24	4.15	0.00	Q	47.4	Cumple
	PILARES	0.00/2.75	40x40	Pie	G, Q, V	22.94	-1.63	10.31	3.50	1.79	N,M	60.4	Cumple
				Cabeza	G, Q, V	39.91	6.37	4.42	4.85	-2.00	Q	40.0	Cumple
				Cimentación	-0.21/0.00	40x40	Pie	G, Q, V	22.94	-1.63	10.31	3.50	1.79
P4	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, V, N	2.54	-0.29	-3.07	-3.84	-0.16	Q	42.6	Cumple
				Cabeza	G, Q, V, N	2.27	-0.37	-1.15	-3.84	-0.16	Q	42.8	Cumple
	PILARES	0.00/2.75	40x40	Pie	G, Q, V	29.18	2.40	10.81	2.42	-0.57	N,M	60.1	Cumple
				Cabeza	G, Q, V	47.79	5.45	-7.21	-6.90	-1.18	Q	50.0	Cumple
				Cimentación	-0.21/0.00	40x40	Pie	G, Q, V	29.18	2.40	10.81	2.42	-0.57
P5	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, V	2.54	-0.29	-0.36	-0.35	-0.16	Q	4.3	Cumple
				Cabeza	G, Q, V	2.27	-0.36	-0.18	-0.34	-0.19	Q	4.3	Cumple
	PILARES	0.00/2.75	40x40	Pie	G, Q, V, N	76.89	0.63	9.13	1.31	0.27	N,M	36.7	Cumple
				Cabeza	G, Q, V	48.31	0.22	-7.41	-1.32	0.16	N,M	28.2	Cumple
				Cimentación	-0.21/0.00	40x40	Pie	G, Q, V, N	76.89	0.63	9.13	1.31	0.27
P6	ENTREPLANTA	2.75/3.55	40x40	Pie	G, Q, N	0.43	0.00	3.31	4.13	0.00	Q	47.1	Cumple
				Cabeza	G, Q, V, N	0.16	0.00	1.25	4.15	0.02	Q	47.5	Cumple



Esfuerzos y armados de pilares, pantallas y muros

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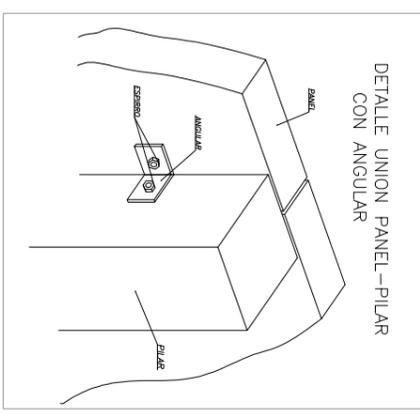
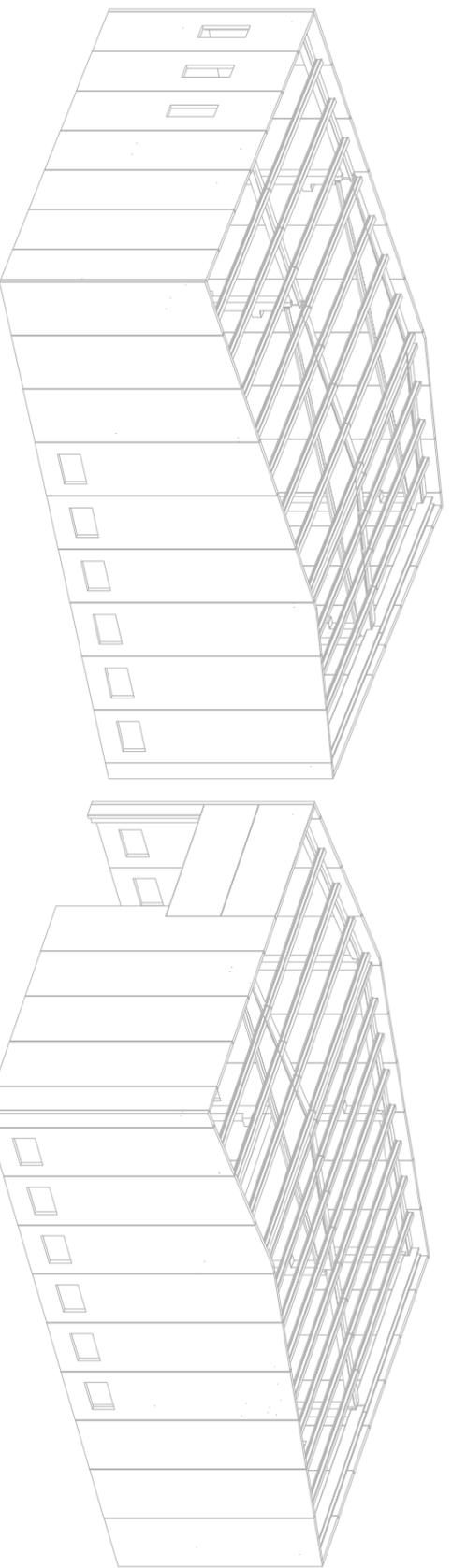
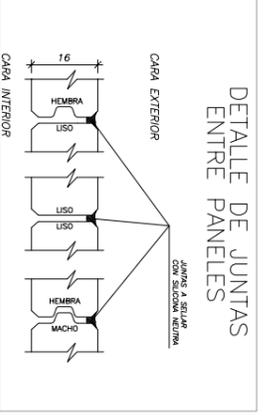
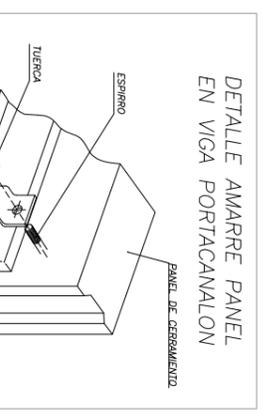
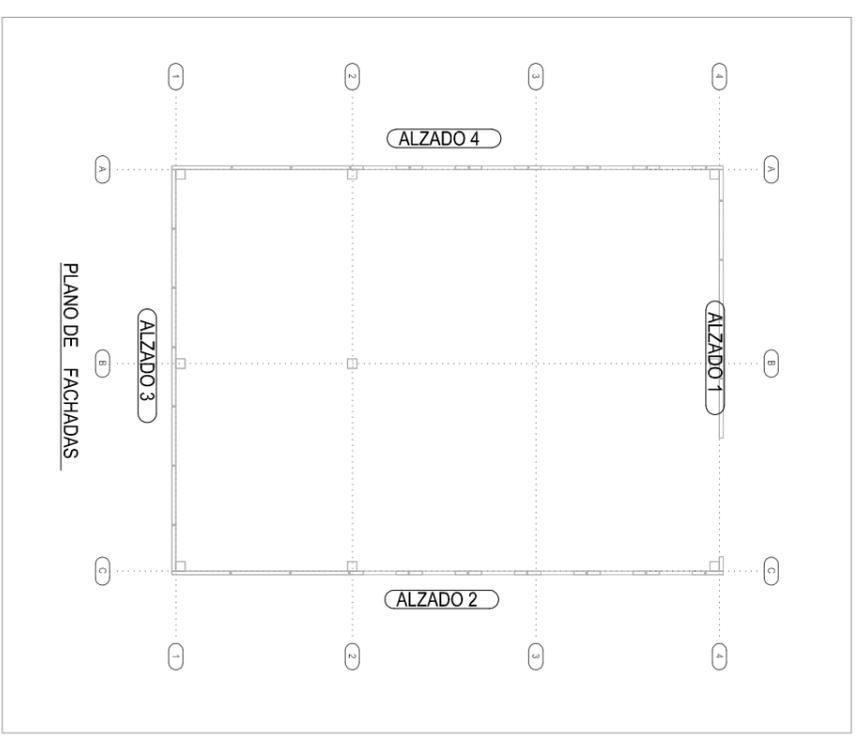
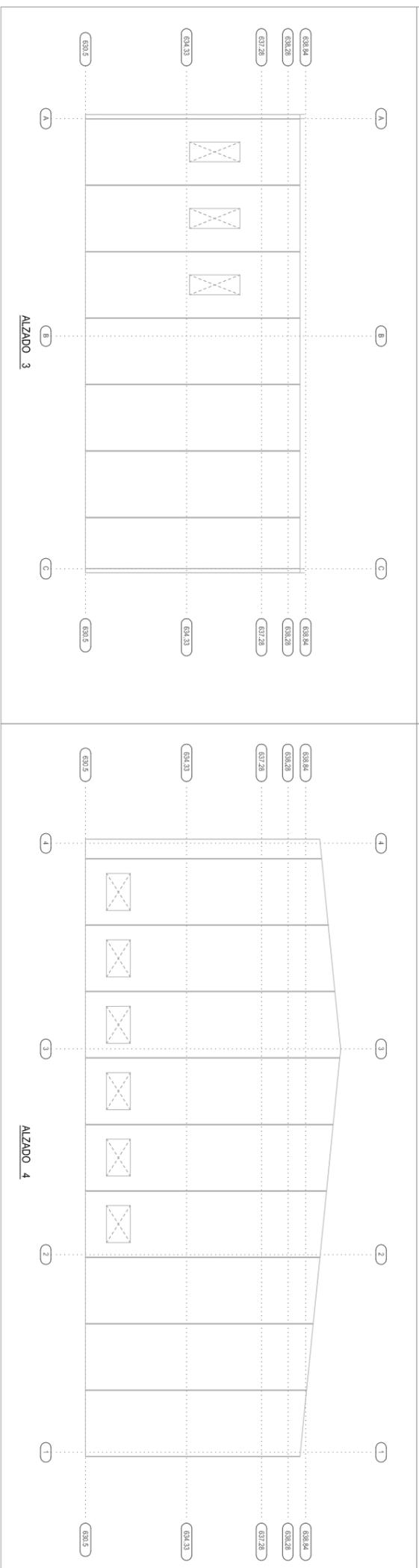
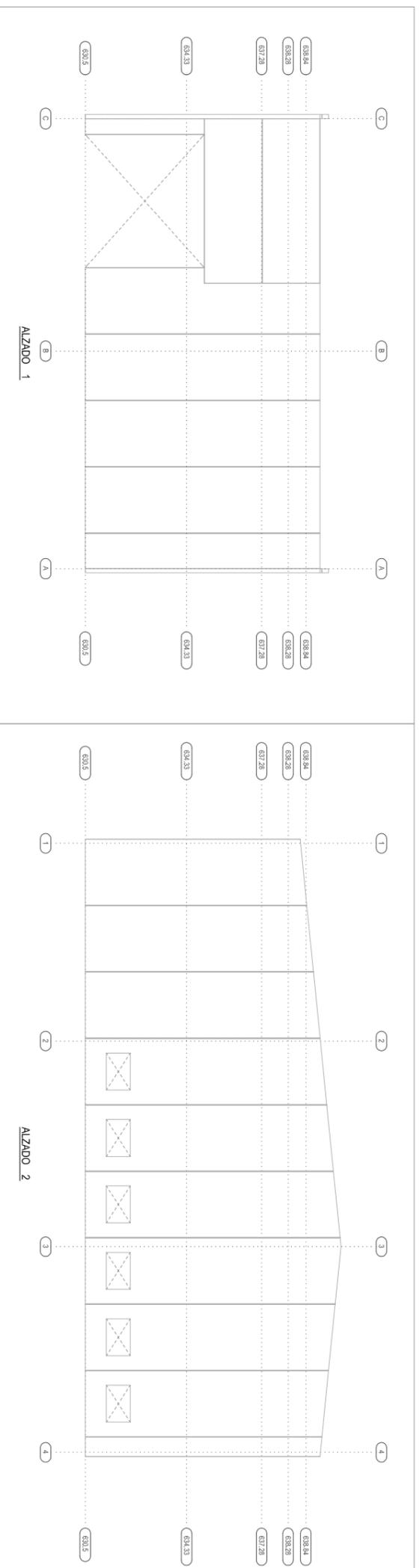
Resumen de las comprobaciones													
Pilares	Planta	Tramo (m)	Dimensión	Posición	Naturaleza	Esfuerzos pésimos					Pésima	Aprov. (%)	Estado
						N (t)	Mxx (t·m)	Myy (t·m)	Ox (t)	Oy (t)			
		0.00/2.75	40x40	Pie	G, Q, V	26.16	-1.16	11.44	3.88	0.59	N,M	65.8	Cumple
	PILARES			Cabeza	G, Q, V	44.05	4.85	5.78	5.95	-0.95	Q	44.4	Cumple
	Cimentación	-0.28/0.00	40x40	Pie	G, Q, V	26.16	-1.16	11.44	3.88	0.59	N,M	65.8	Cumple
P7	ENTREPLANTA	0.00/3.55	40x40	Pie	G, Q, V	11.36	4.35	12.94	3.60	-2.00	N,M	78.6	Cumple
	PILARES			Cabeza	G, Q, V	19.04	5.74	12.60	3.61	-2.66	N,M	74.3	Cumple
	Cimentación	-0.28/0.00	40x40	Pie	G, Q, V	11.36	4.35	12.94	3.60	-2.00	N,M	78.6	Cumple
P8	ENTREPLANTA	0.00/3.55	40x40	Pie	G, Q, V	21.61	9.02	10.20	1.55	-4.58	N,M	71.3	Cumple
	PILARES			Cabeza	G, Q, V	21.57	8.56	10.04	1.55	-4.58	N,M	68.8	Cumple
	Cimentación	-0.36/0.00	40x40	Pie	G, Q, V	21.61	9.02	10.20	1.55	-4.58	N,M	71.3	Cumple
P9	ENTREPLANTA	0.00/3.55	40x40	Pie	G, Q, V	7.65	3.03	10.75	1.97	-1.95	N,M	65.6	Cumple
	PILARES			Cabeza	G, Q, V	8.64	5.70	-8.52	-2.07	-2.33	N,M	58.1	Cumple
	Cimentación	-0.21/0.00	40x40	Pie	G, Q, V	7.65	3.03	10.75	1.97	-1.95	N,M	65.6	Cumple
P10	ENTREPLANTA	0.00/3.55	40x40	Pie	G, Q, V	10.69	0.68	-12.95	-3.85	-0.07	N,M	75.6	Cumple
	PILARES			Cabeza	G, Q, V	10.65	0.67	-12.57	-3.85	-0.07	N,M	73.1	Cumple
	Cimentación	-0.28/0.00	40x40	Pie	G, Q, V	10.69	0.68	-12.95	-3.85	-0.07	N,M	75.6	Cumple

Notas:

N,M: Estado límite de agotamiento frente a solicitaciones normales (combinaciones no sísmicas)

Q: Estado límite de agotamiento frente a cortante (combinaciones no sísmicas)

PLANOS



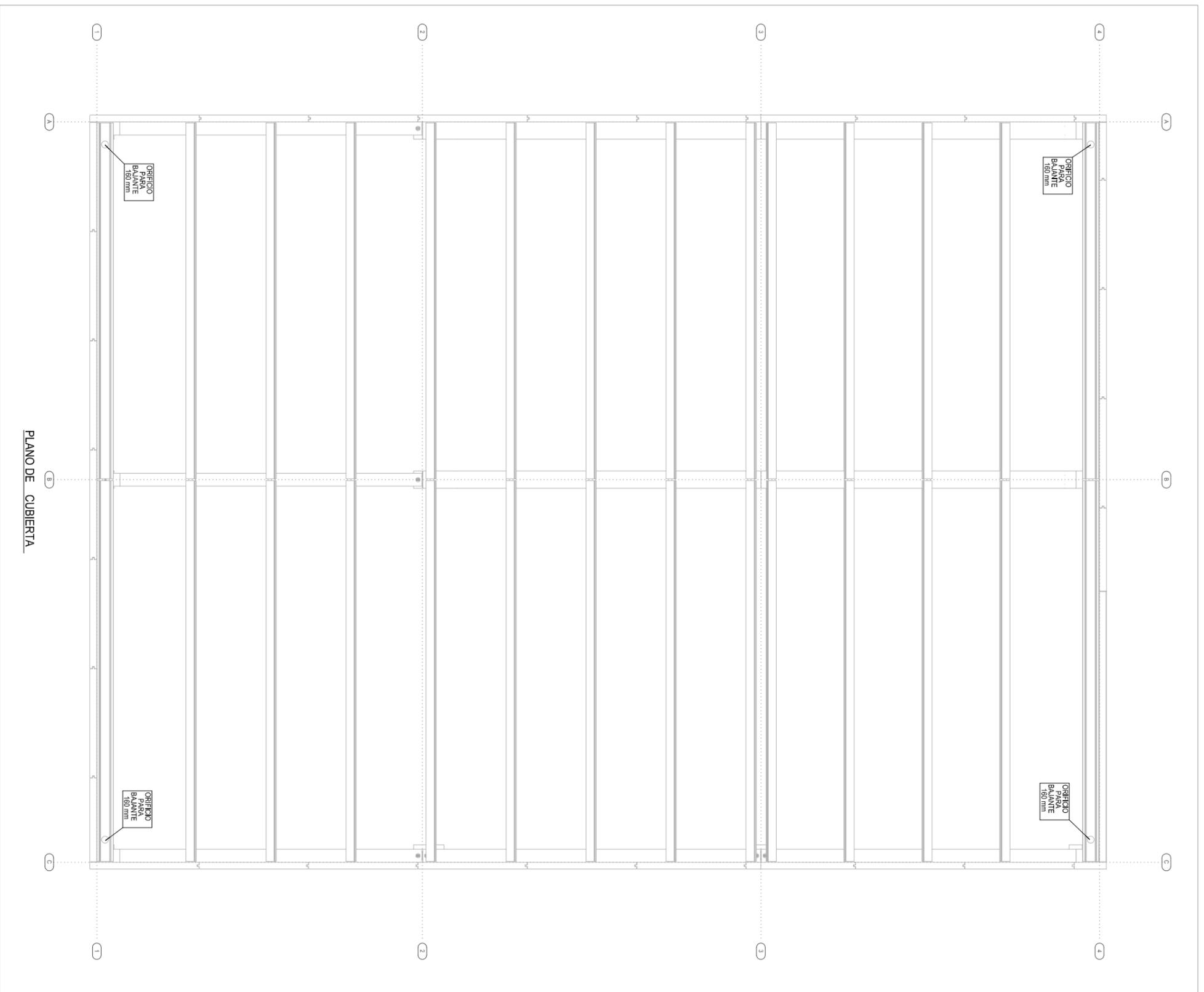
NOTAS IMPORTANTES:

- LOS PANELES SE APOYARAN EN VIGA RIOSTRA SEGUN PLANO DE CIMENTACION. DICHA RIOSTRA ESTARA PERFECTAMENTE NIVELADA ANTES DEL MONTAJE DE LOS PANELES.
- LAS DIMENSIONES DE LOS PANELES SON LAS INDICADAS EN ESTOS PLANOS, Y ESTAN REFLIJADAS LAS HOLLIGURAS.
- LA CARA EXTERIOR DE LA ESTRUCTURA DEBE QUEDAR EN UN MISMO PLANO PARA AMARRAR BIEN LOS PANELES.
- EN LA BASE DE LOS PANELES DE CERRAMIENTO CONTRA LA CIMENTACION SOBRE LA QUE SE APOYAN, SERA NECESARIO RETACAR CON MORTERO INMEDIATAMENTE DESPUES DEL MONTAJE DE LOS PANELES DE CERRAMIENTO, PARA EVITAR CONCENTRACION DE TENSIONES.

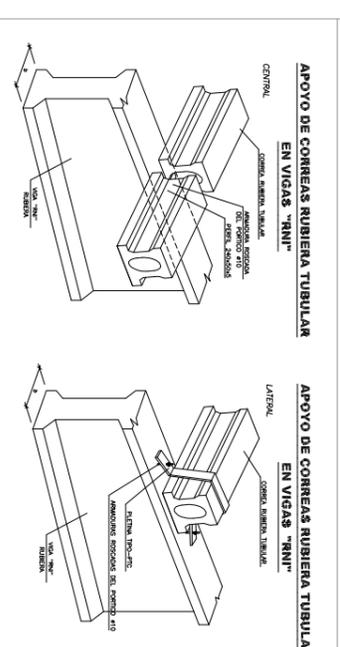
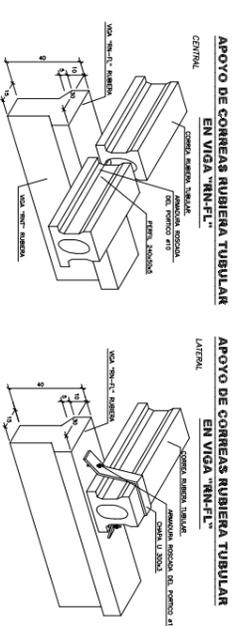
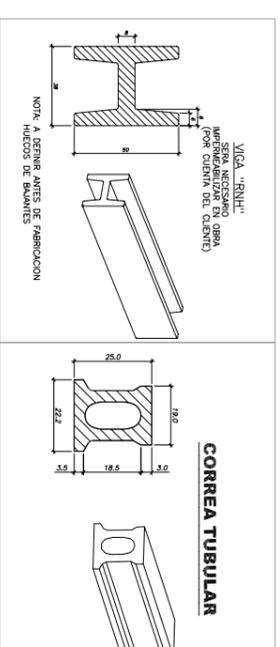
ACABADOS DE PANEL				
ACABADOS	ELEMENTO	ESPESOR	INTERIOR	ACABADO
CARA VISTA	PANEL CERRAMIENTO	16 cm	MACHO	ARIDO VISTO
CARA OPUESTA	PANEL CERRAMIENTO	16 cm	MACHO	COLOR GRIS SEGUN COLORELA DEL HORMIGON

CUADRO DE CARACTERISTICAS SEGUN EHE-08				
MATERIAL	ELEMENTO	HORMIGON	CERTIFICANTE	
		NIVEL DE CONTROL	δ_0 δ_1 δ_2	
HORMIGON	PANEL CERRAMIENTO	HA-25	100x100	1,50
ARMADURAS	PANEL CERRAMIENTO	AP-400-S	NORMAL	1,15
CONTROL EJECUCION	NORMAL	C.PERMANENTES	C.VARIABLES	1,35
		C.ACCIDENTALES		1,50
				1,00

		PLANO: FACHADAS		FECHA: 23.12.2020	
R.B.: 0026-06-20					
PROYECTA DE SOLUCION	ESTACION DE BOMBEO				
SITUACION	ZAMORA				
PARA	ITACVL				
ARQUINO.	ARQUINO.				



PLANO DE CUBIERTA



CUADRO DE CARACTERISTICAS SEGUN EHE-08			
MATERIAL	ELEMENTO	HORMIGON NIVEL DE CONTROL	CORRIENTE POSICION δ_0 δ_1 δ_2
HORMIGON	CORREA	HP-40	1.50
HORMIGON	PILAR	HA-35 - F12/IIa	1.50
HORMIGON	VIGA	HA-35 - F12/IIa	1.50
HORMIGON	VIGA	HP-35	1.50
ARMADURAS	CORREA	AP-500-S	1.15
ARMADURAS	PILAR	AP-500-S	1.15
ARMADURAS	VIGA	AP-500-S	1.15
CONTROL EJECUCION	NORMAL	C. PERMANENTES C.VARIABLES C.ACCIDENTALES	1.35 1.50 1.00

PLANO: CUBIERTA

FECHA: 23.12.2020

R.B.: 0026-06-20

PROPOSTA DE SOLUCION: ESTACION DE BOMBEO

SITUACION: ZAMORA

PARA: ITACYL

AROJING.

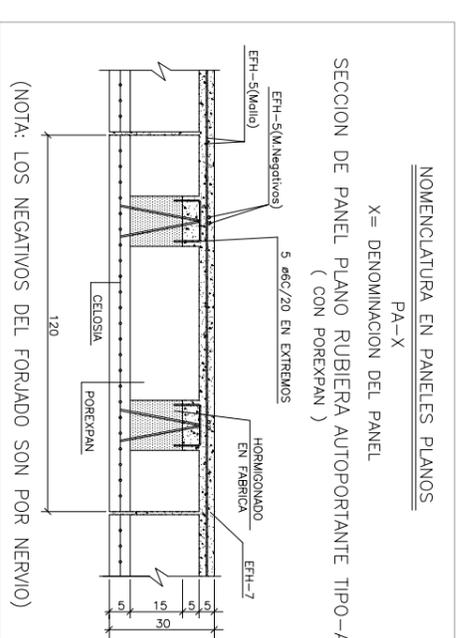
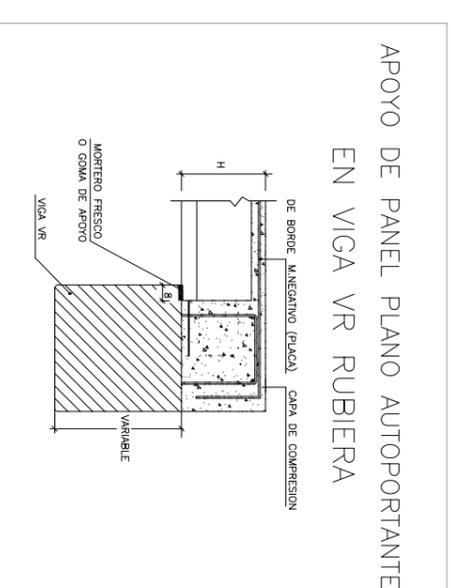
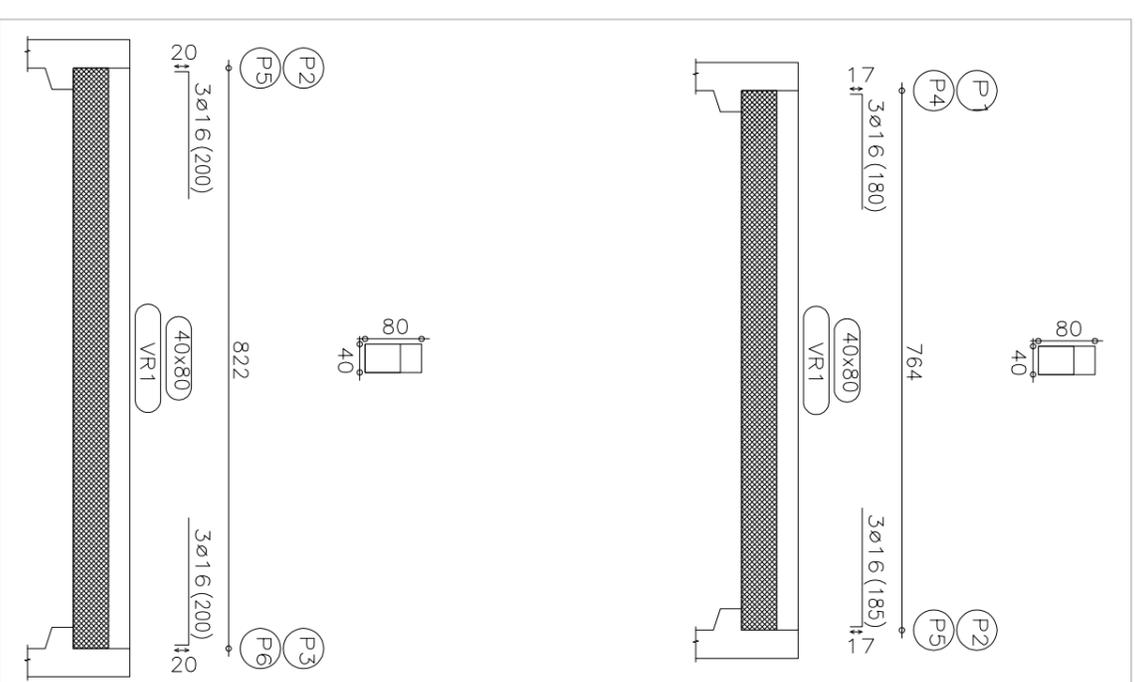
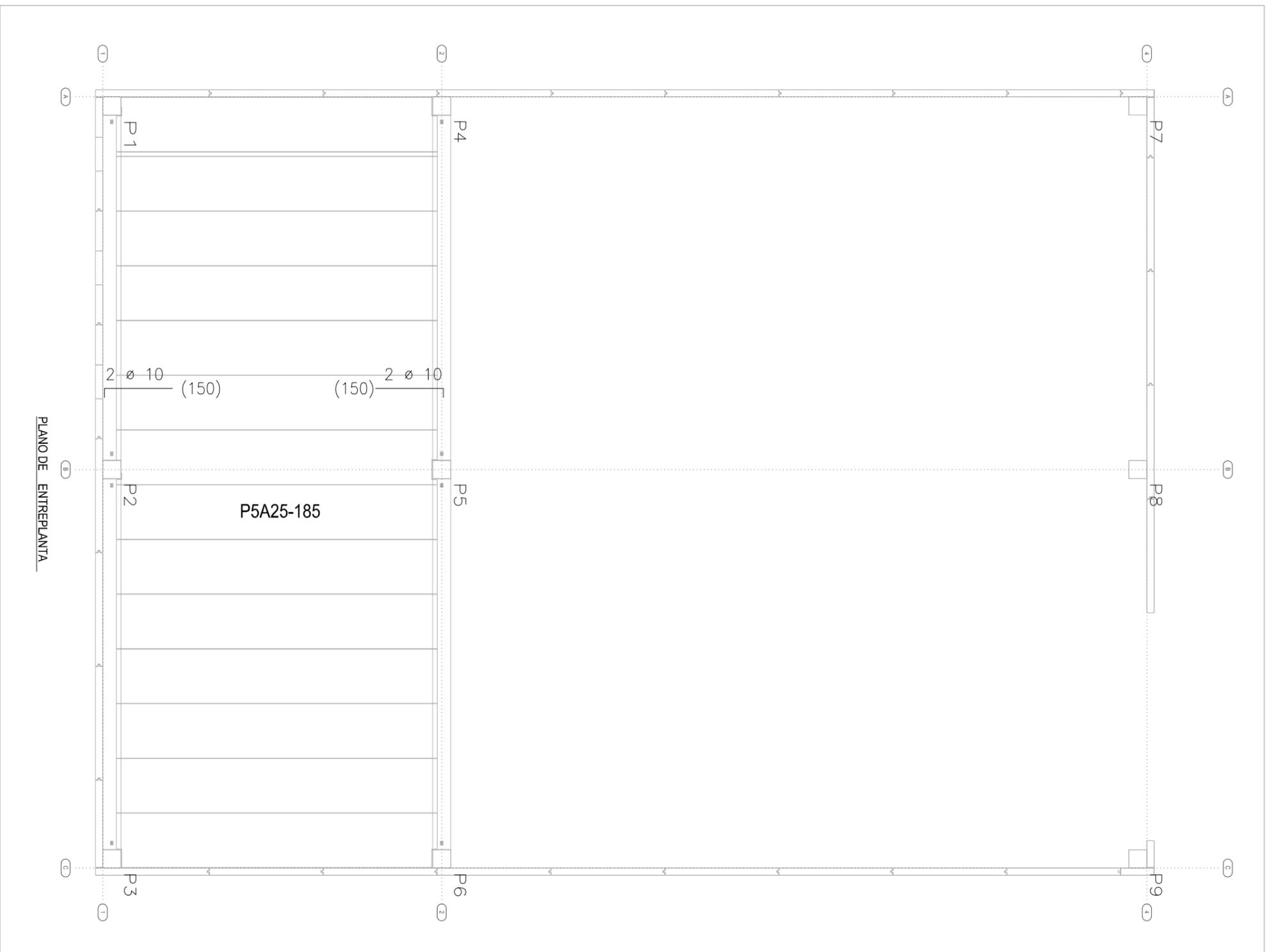
PROYECTO DE INGENIERIA

ESTACION DE BOMBEO

ZAMORA

ITACYL

AROJING.



CUADRO DE CARGAS DE FORJADO

PLANTA	SEPARACION	CANTO	MAILLA	S. USO	C. PERM.	Q. TOTAL
CUBIERTA	120	29x5	20x30/5x5	5,00 $\frac{KN}{M^2}$	1,00 $\frac{KN}{M^2}$	9,22 $\frac{KN}{M^2}$

CUADRO DE CARACTERISTICAS SEGUN EHE-08

MATERIAL	ELEMENTO	HORMIGON	NIVEL DE CONTROL	COEFICIENTE DE FLEXION	δ_1	δ_2
HORMIGON	FORJADO	HA-25 -B/20/1a	100x100	1,50		
HORMIGON	PLAR	HA-35 -F/12/1a	100x100	1,50		
HORMIGON	PLACA ALVEOLAR	HP-35	100x100	1,50		
HORMIGON	VIGA	HP-35 -F/12/1a	100x100	1,50		
ARMADURAS	FORJADO	AP-500-S	NORMAL	1,15		
ARMADURAS	PLAR	AP-500-S	NORMAL	1,15		
ARMADURAS	PLACA ALVEOLAR	AP-500-S	NORMAL	1,15		
ARMADURAS	VIGA	AP-500-S	NORMAL	1,15		
CONTROL EJECUCION	NORMAL	C.PERMANENTES C.VARIABLES C.ACCIDENTALES			1,35	1,50
						1,00

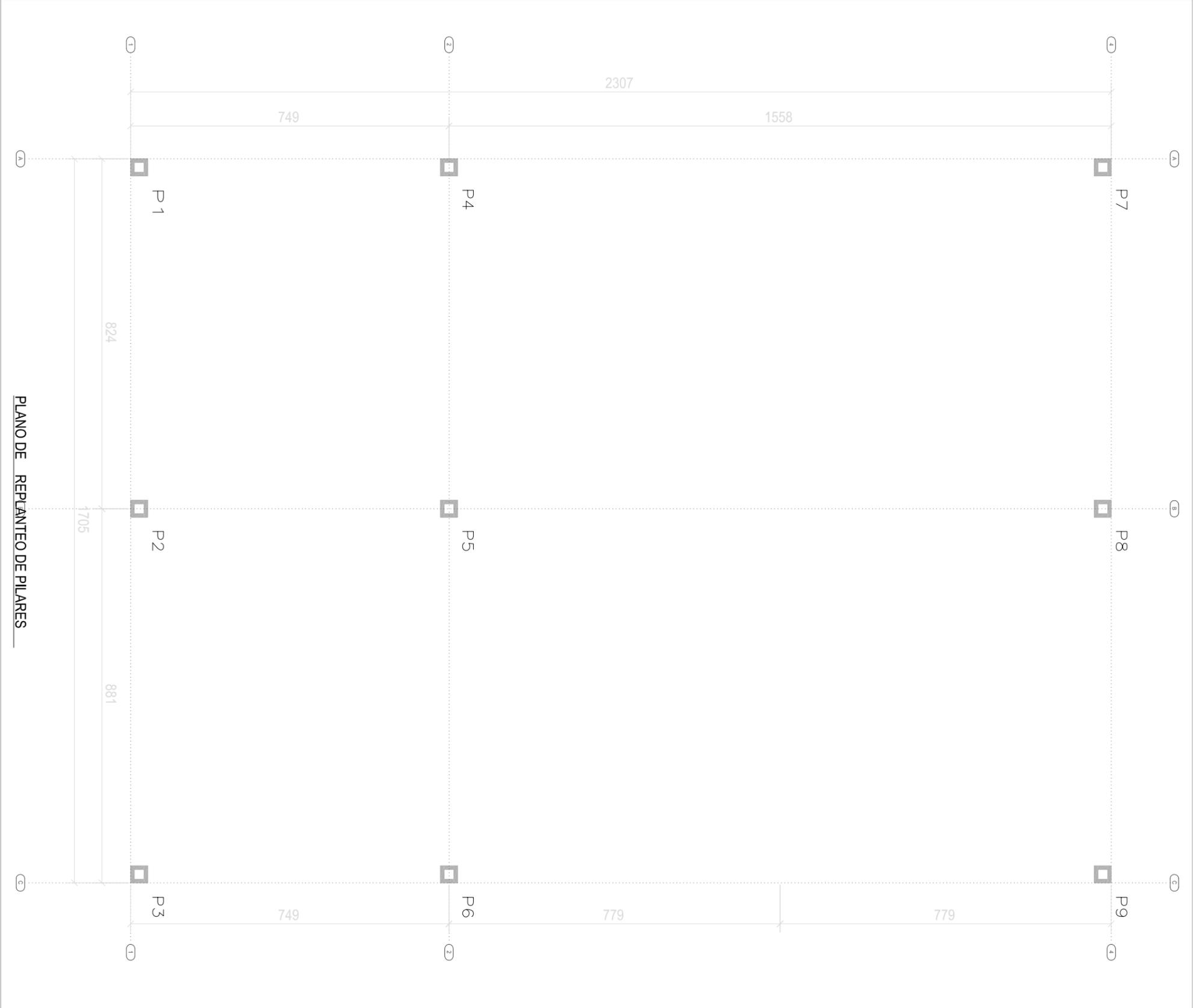
RUBIERA S.A.

PLANO: ENTREPANTALLA

FECHA: 23.12.2020

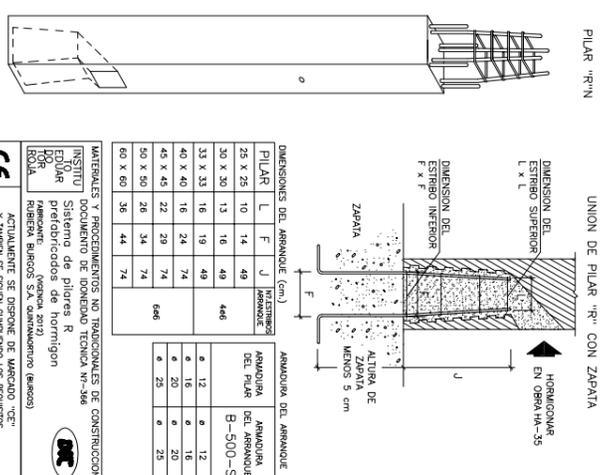
R.B.: 0026-06-20

PROPIEDAD DE SOLUCION	ESTACION DE BOMBEO
SITUACION	ZAMORA
PARA	ITACVL
ARQUINO.	



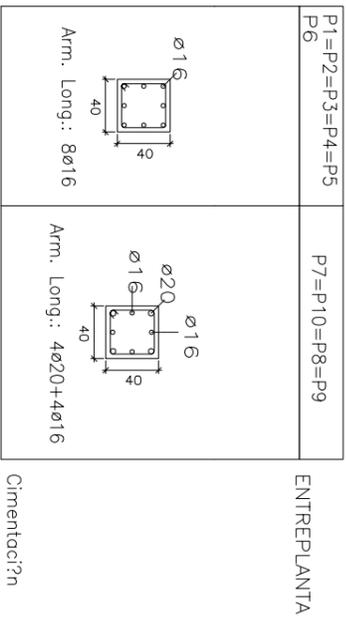
PLANO DE REPLANTEO DE PILARES

DETALLE DE PILAR PREFABRICADO "R" CON ZAPATA



MATERIALES Y PROCEDIMIENTOS NO TRADICIONALES DE CONSTRUCCION EN OBRA
 INSTITUTO DOCUMENTO DE IDONEIDAD TECNICA Nº-346
 EDICION 2019
 Sistema de pilares R prefabricados de hormigon
 ROLSA
 Rolser, Surocos S.A. (desarrollador) (asesor)
 Rolser, Surocos S.A. (desarrollador) (asesor)
 ACTUALMENTE SE DISPONE DE MARCADOR "CE" Y TAMBIEN SE SIGAN CUMPLIENDO LOS REQUISITOS TECNICOS MARCADOS EN EL CITADO D.I.T.

P1=P2=P3=P4=P5 P7=P10=P8=P9 ENTREPILANTA



Cimentoc?n

CUADRO DE CARACTERISTICAS SEGUN EHE-08				CERTIFICANTE		
MATERIAL	ELEMENTO	HORMIGON	NIVEL DE CONTROL	δ _s	δ ₁	δ ₂
HORMIGON	PILAR	HA-35 - F1/216	100X100	1,50		
ARMADURAS	PILAR	AP-500-S	NORMAL		1,15	
CONTROL EJECUCION	NORMAL	C.PERMANENTES C.VARIABLES C.ACCIDENTALES			1,35	1,50
						1,00

PLANO: REPLANTEO DE PILARES FECHA: 23.12.2020

R.B.: 0026-06-20

PROYECTA DE SOLUCION: ESTACION DE BOMBEO

SITUACION: ZAMORA

PARA: ITACVYL

ARQUINO: