Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	COL400	-655.0	0.0	-77.7	0.0	21.6	0.0
LE2	COL400	-655.0	32.1	0.0	0.0	0.0	72.5

Bloque de la cimentación

Ítem	Valor	Unidad
CB 1		
Dimensiones	800 x 800	mm
Profundidad	750	mm
Anclaje	1/2 A325	
Longitud del anclaje	300	mm
Transferencia de la fuerza cortante	Fricción	

Verificación

Resumen

Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.0 < 5.0%	OK
Anclajes	2.9 < 100%	OK
Soldaduras	75.4 < 100%	OK
Bloque de hormigón	20.0 < 100%	OK
Cortante	44.9 < 100%	OK
Pandeo	No calculado	

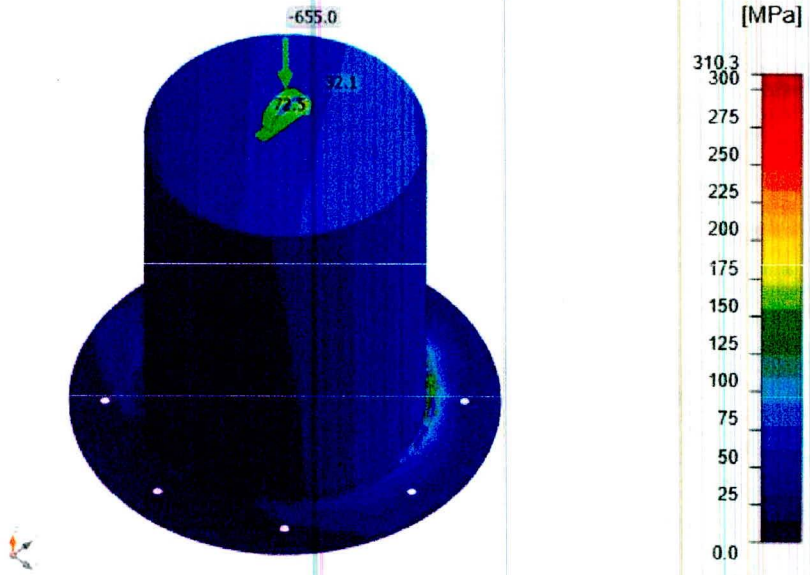
Placas

Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
COL400	344.7	12.7	LE2	101.3	0.0	0.0	OK
BP1	344.7	12.7	LE2	182.2	0.0	0.0	OK

Datos de diseño

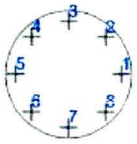
Material	f_y [MPa]	ε_{lim} [%]
A572 Gr.50	344.7	5.0

Verificación de deformación, LE2



Tensión equivalente LE2

Anclajes

Forma	Ítem	Cargas	N_f [kN]	V [kN]	ϕN_{cbg} [kN]	ϕV_{cp} [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
	A1	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A2	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A3	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A4	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A5	LE2	1.5	0.0	77.4	326.0	2.9	0.0	0.3	OK
	A6	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A7	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK
	A8	LE1	0.0	0.0	-	326.0	0.0	0.0	0.0	OK

Datos de diseño

Calidad	ϕN_{sa} [kN]		ϕV_{sa} [kN]	
1/2 A325 - 1		53.1		29.6

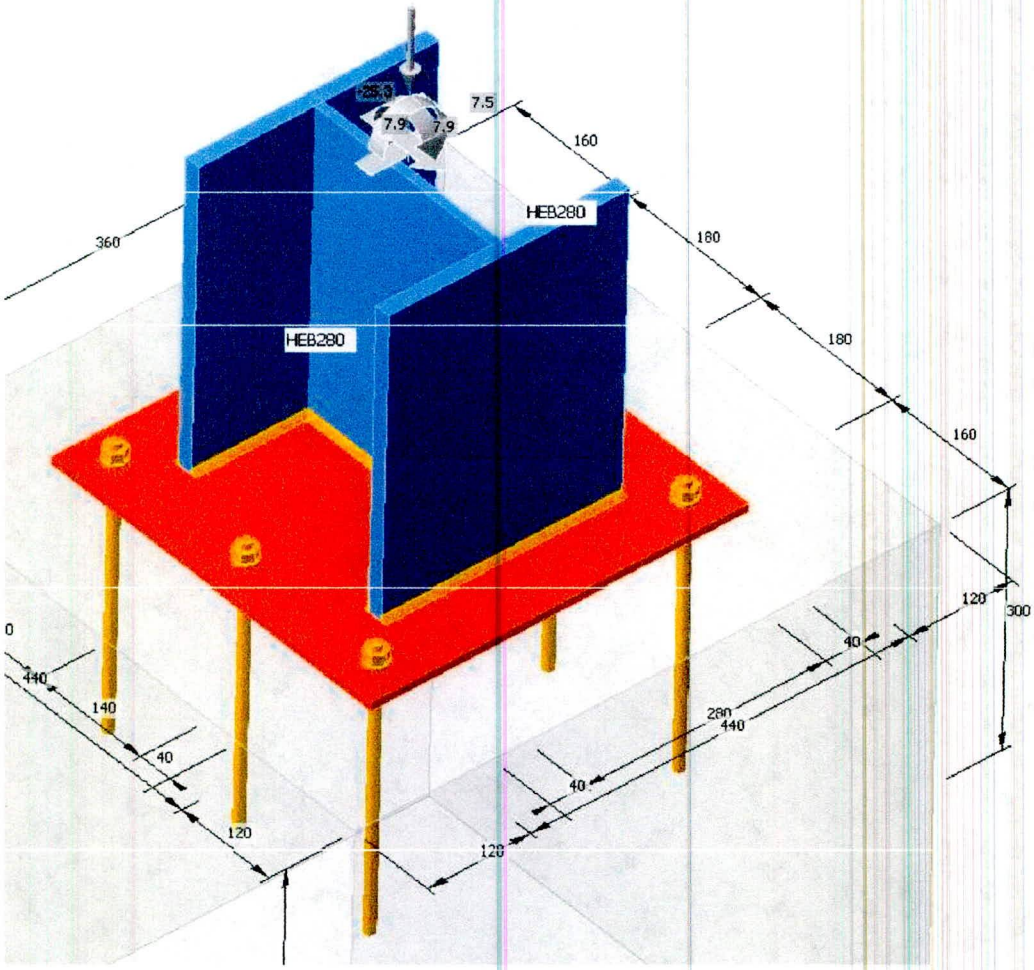
Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
COL400-arc 17	FP2	E7018	◢4.2◣	◢6.0◣	379	19	LE1	20.4	26.1	78.2	OK
		E7018	◢4.2◣	◢6.0◣	379	19	LE1	20.0	26.1	76.5	OK

Explicación del símbolo

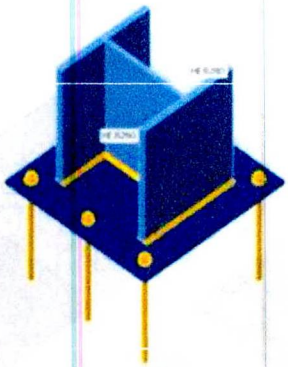
T_h	Espesor de garganta de soldadura
L_s	Tamaño de la soldadura
L	Longitud de la soldadura
L_c	Longitud del elemento crítico de la soldadura
F_n	Fuerza en el elemento crítico de la soldadura
ϕR_n	Resistencia de la soldadura
Ut	Utilización

4. Placa base columna HEB280



Elementos estructurales

Nombre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
HEB280	7 - CON1(HEB280)	0.0	-90.0	0.0	0	0	0	Nodo



Secciones

Nombre	Material
7 - CON1(HEB280)	A572 Gr 50

Anclajes

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibrio)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	HEB280	-338.0	7.5	-25.3	0.0	7.9	7.9

Verificación

Resumen

Nombre	Valor		Estado de la verificación
Análisis	100.0%	OK	
Placas	0.0 < 5.0%	OK	
Anclajes	6.1 < 100%	OK	
Soldaduras	61.9 < 100%	OK	
Bloque de hormigón	13.4 < 100%	OK	
Cortante	29.0 < 100%	OK	
Pandeo	No calculado		

Placas

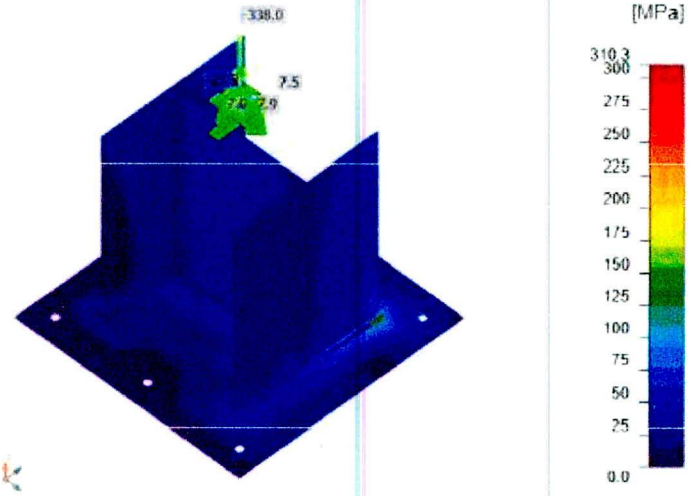
Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
HEB280-bfl 1	344.7	18.0	LE1	65.1	0.0	0.0	OK
HEB280-tfl 1	344.7	18.0	LE1	52.3	0.0	0.0	OK
HEB280-w 1	344.7	10.5	LE1	44.7	0.0	0.0	OK
BP1	344.7	10.0	LE1	144.8	0.0	0.0	OK

Datos de diseño

Material	f_y [MPa]	ε_{lim} [%]
A572 Gr.50	344.7	5.0

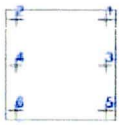
Explicación del símbolo

ε_{Pl}	Deformación plástica
σc_{Ed}	Tensiones de Contacto
σ_{Ed}	Ec. tensión
f_y	Límite elástico
ε_{lim}	Límite de la deformación plástica



Tensión equivalente LE1

Anclajes

Forma	Ítem	Cargas	N_t [kN]	V [kN]	ΦN_{cbg} [kN]	ΦV_{cp} [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
	A1	LE1	1.1	0.0	112.7	267.7	6.1	0.0	0.9	OK
	A2	LE1	0.6	0.0	112.7	267.7	6.1	0.0	0.9	OK
	A3	LE1	2.2	0.0	112.7	267.7	6.1	0.0	0.9	OK
	A4	LE1	1.2	0.0	112.7	267.7	6.1	0.0	0.9	OK
	A5	LE1	1.1	0.0	112.7	267.7	6.1	0.0	0.9	OK
	A6	LE1	0.6	0.0	112.7	267.7	6.1	0.0	0.9	OK

Datos de diseño

Calidad	ΦN_{sa} [kN]	ΦV_{sa} [kN]
1/2 A325 - 1	53.1	29.6

Explicación del símbolo

N_t	Fuerza de tracción
V	Resultante de las fuerzas cortantes Vy, Vz en el tornillo
ΦN_{cbg}	Resistencia al arrancamiento del cono de hormigon a tracción de acuerdo con – ACI 318-14 – 17.4.2
ΦV_{cp}	Resistencia al desprendimiento del hormigon por cabeceo del anclaje a cortante de acuerdo con – ACI 318-14 – 17.5.3
Ut_t	Utilización a tracción
Ut_s	Utilización a cortante
Ut_{ts}	Utilización a tensión y cortante

Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
BP1	HEB280-bfl 1	E7018	◢4.2◣	◢8.0◣	280	28	LE1	21.2	36.3	58.4	OK
		E7018	◢4.2◣	◢8.0◣	280	28	LE1	22.5	36.4	61.9	OK
BP1	HEB280-tfl 1	E7018	◢4.2◣	◢8.0◣	280	28	LE1	16.4	36.0	45.6	OK
		E7018	◢4.2◣	◢8.0◣	280	28	LE1	17.9	36.1	49.4	OK
BP1	HEB280-w 1	E7018	◢4.2◣	◢8.0◣	261	26	LE1	6.8	35.9	18.3	OK
		E7018	◢4.2◣	◢8.0◣	261	26	LE1	6.0	35.6	17.0	OK

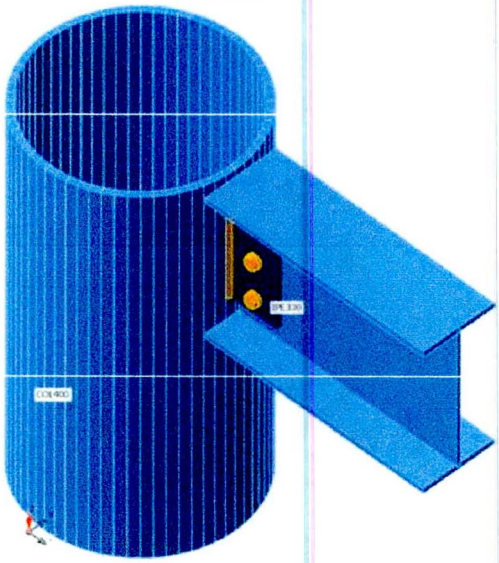
Explicación del símbolo

T_h	Espesor de garganta de soldadura
L_s	Tamaño de la soldadura
L	Longitud de la soldadura
L_c	Longitud del elemento crítico de la soldadura
F_n	Fuerza en el elemento crítico de la soldadura
ϕR_n	Resistencia de la soldadura, AISC 360-10 J2.4
Ut	Utilización

5. IPE330 A COLUMNA CIRCULAR ø400mm (N+0.00)

Elementos estructurales

Nombre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en	X [mm]
COL400	3 - CHS406.4/12.5	0.0	90.0	0.0	0	0	0	Nodo	0
IPE330	2 - IPE300	0.0	0.0	0.0	0	0	0	Tornillos	258



Tornillos

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibro)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	IPE330	0.0	0.0	-58.0	0.0	0.0	0.0

Verificación

Resumen

Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.0 < 5.0%	OK
Tornillos	55.1 < 100%	OK
Soldaduras	75.0 < 100%	OK
Pandeo	No calculado	
GMNA	Calculado	

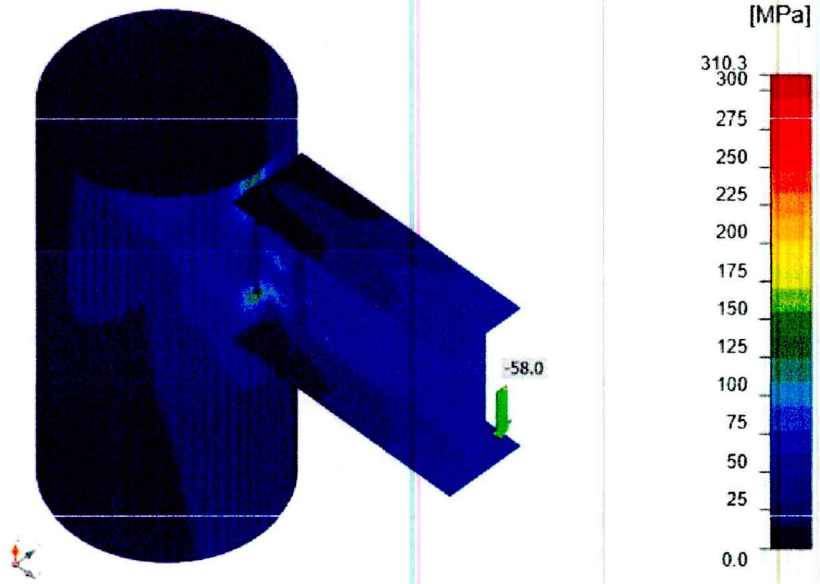
Placas

Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
COL400	344.7	12.5	LE1	138.7	0.0	0.0	OK
IPE330-bfl 1	344.7	10.7	LE1	44.1	0.0	0.0	OK
IPE330-tfl 1	344.7	10.7	LE1	44.6	0.0	0.0	OK
IPE330-w 1	344.7	7.1	LE1	191.1	0.0	12.6	OK
FP2	344.7	10.0	LE1	152.5	0.0	12.6	OK

Datos de diseño

Material	f_y [MPa]	ε_{lim} [%]
A572 Gr.50	344.7	5.0

Verificación de deformación. LE1



Tensión equivalente. LE1

Tornillos

Forma	Ítem	Calidad	Cargas	F_t [kN]	V [kN]	$\phi R_{n,portante}$ [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
2	B1	1/2 A325 - 1	LE1	1.7	19.5	72.7	2.8	55.1	-	OK
1	B2	1/2 A325 - 1	LE1	3.9	19.2	72.7	6.6	54.2	-	OK
3	B3	1/2 A325 - 1	LE1	1.7	19.4	72.7	2.9	54.9	-	OK

Datos de diseño

Calidad	$\phi R_{n,tracción}$ [kN]	$\phi R_{n,cortante}$ [kN]
1/2 A325 - 1	58.9	35.3

Explicación del símbolo

F_t	Fuerza de tracción
V	Resultante de las fuerzas cortantes Vy, Vz en el tornillo.
$\phi R_{n,portante}$	Resistencia a aplastamiento de la chapa provocado por el tornillo
Ut_t	Utilización a tracción
Ut_s	Utilización a cortante
Ut_{ts}	Utilización a tensión y cortante
$\phi R_{n,tracción}$	Resistencia de los pernoss a tracción, según AISC 360-10 tabla J3.2
$\phi R_{n,cortante}$	Resistencia de los pernos a cortante, según AISC 360-16 tabla J3.2

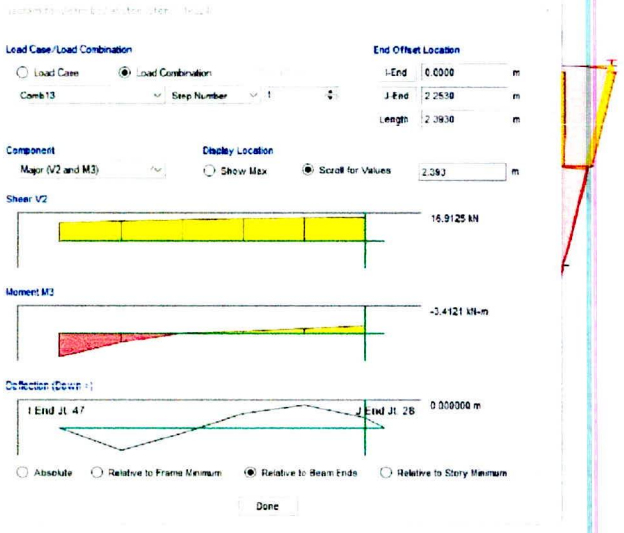
Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
COL400-arc 17	FP2	E7018	◢4.2◣	◢6.0◣	229	14	LE1	13.4	17.9	75.0	OK
		E7018	◢4.2◣	◢6.0◣	229	14	LE1	10.5	16.4	63.9	OK

Explicación del símbolo

T_h	Espesor de garganta de soldadura
L_s	Tamaño de la soldadura
L	Longitud de la soldadura
L_c	Longitud del elemento crítico de la soldadura
F_n	Fuerza en el elemento crítico de la soldadura
ϕR_n	Resistencia de la soldadura, AISC 360-10 J2.4
Ut	Utilización

IPE240 A HEB280

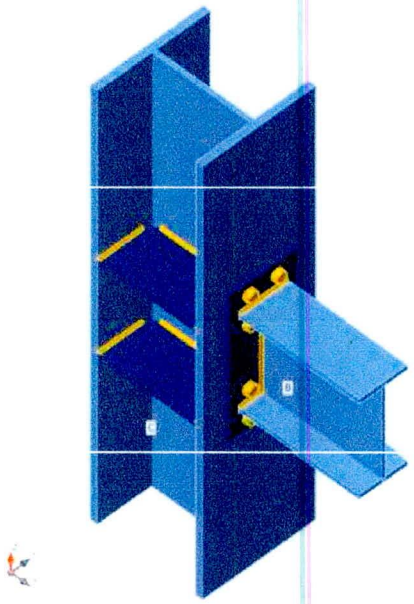


Diseño

Nombre	ipe240aheb280
Descripción	
Análisis	Tensión, deformación/ Carga simplificada
Normativa de cálculo	AISC - LRFD 2016

Elementos estructurales

Nombre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en
C	8 - HEB280	0.0	-90.0	0.0	0	0	0	Nodo
B	21 - CON1(IPE240)	0.0	0.0	0.0	0	0	0	Nodo



Secciones

Nombre	Material
8 - HEB280	A572 Gr.50
21 - CON1(IPE240)	A572 Gr.50

Tornillos

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibro)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	B	0.0	0.0	-16.9	0.0	3.4	0.0

Verificación

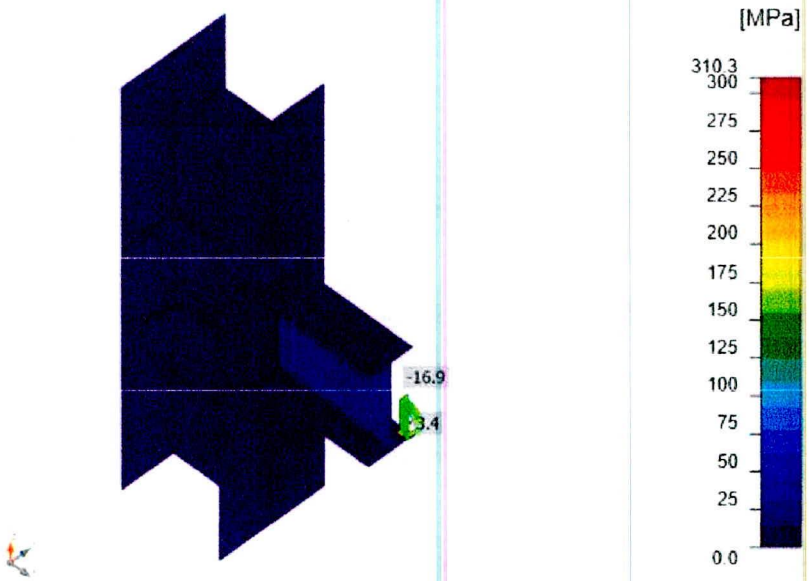
Resumen

Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.0 < 5.0%	OK
Tornillos	6.0 < 100%	OK
Soldaduras	5.4 < 100%	OK
Pandeo	No calculado	

Placas

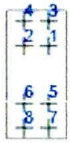
Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
C-bfl 1	344.7	18.0	LE1	9.3	0.0	1.5	OK
C-tfl 1	344.7	18.0	LE1	0.9	0.0	0.0	OK
C-w 1	344.7	10.5	LE1	2.7	0.0	0.0	OK
B-bfl 1	344.7	9.8	LE1	13.2	0.0	0.0	OK
B-tfl 1	344.7	9.8	LE1	13.2	0.0	0.0	OK
B-w 1	344.7	6.2	LE1	22.6	0.0	0.0	OK
EP1	344.7	8.0	LE1	27.0	0.0	2.8	OK
STIFF1a	344.7	6.0	LE1	1.8	0.0	0.0	OK
STIFF1b	344.7	6.0	LE1	1.8	0.0	0.0	OK
STIFF1c	344.7	6.0	LE1	1.9	0.0	0.0	OK
STIFF1d	344.7	6.0	LE1	1.9	0.0	0.0	OK

Verificación de deformación. LE1



Tensión equivalente. LE1

Tornillos

Forma	Ítem	Calidad	Cargas	F_t [kN]	V [kN]	$\phi R_{n,portante}$ [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
	B1	1/2 A325 - 1	LE1	1.3	2.1	82.0	2.1	5.9	-	OK
	B2	1/2 A325 - 1	LE1	1.3	2.1	82.0	2.1	5.9	-	OK
	B3	1/2 A325 - 1	LE1	1.2	2.1	73.7	2.0	6.0	-	OK
	B4	1/2 A325 - 1	LE1	1.2	2.1	73.7	2.0	6.0	-	OK
	B5	1/2 A325 - 1	LE1	0.4	2.1	82.0	0.7	6.0	-	OK
	B6	1/2 A325 - 1	LE1	0.4	2.1	82.0	0.7	6.0	-	OK
	B7	1/2 A325 - 1	LE1	0.1	2.1	82.0	0.2	6.0	-	OK
	B8	1/2 A325 - 1	LE1	0.1	2.1	82.0	0.2	6.0	-	OK

Datos de diseño

Calidad	$\phi R_{n,tracción}$ [kN]		$\phi R_{n,cortante}$ [kN]	
1/2 A325 - 1		58.9		35.3

Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
EP1	B-bfl 1	E70xx	◢3.5◣	◢5.0◣	120	24	LE1	0.3	27.5	1.1	OK
		E70xx	◢3.5◣	◢5.0◣	120	24	LE1	1.4	27.5	4.9	OK
EP1	B-tfl 1	E70xx	◢3.5◣	◢5.0◣	120	24	LE1	1.5	27.5	5.4	OK
		E70xx	◢3.5◣	◢5.0◣	120	24	LE1	0.4	27.5	1.4	OK
EP1	B-w 1	E70xx	◢3.5◣	◢5.0◣	230	23	LE1	1.3	25.8	4.9	OK
		E70xx	◢3.5◣	◢5.0◣	230	23	LE1	1.2	25.8	4.7	OK
C-bfl 1	STIFF1a	E70xx	◢3.5	◢5.0	111	28	LE1	0.5	31.8	1.6	OK
C-w 1	STIFF1a	E70xx	◢3.5	◢5.0	195	33	LE1	0.2	25.9	0.6	OK
C-tfl 1	STIFF1a	E70xx	◢3.5	◢5.0	111	28	LE1	0.1	27.0	0.5	OK
C-bfl 1	STIFF1b	E70xx	◢3.5	◢5.0	111	28	LE1	0.5	31.8	1.6	OK
C-w 1	STIFF1b	E70xx	◢3.5	◢5.0	195	33	LE1	0.2	26.0	0.6	OK
C-tfl 1	STIFF1b	E70xx	◢3.5	◢5.0	111	28	LE1	0.1	27.0	0.5	OK
C-bfl 1	STIFF1c	E70xx	◢3.5	◢5.0	111	28	LE1	0.5	31.3	1.7	OK
C-w 1	STIFF1c	E70xx	◢3.5	◢5.0	196	33	LE1	0.1	27.1	0.5	OK
C-tfl 1	STIFF1c	E70xx	◢3.5	◢5.0	111	28	LE1	0.1	27.0	0.5	OK
C-bfl 1	STIFF1d	E70xx	◢3.5	◢5.0	111	28	LE1	0.5	31.3	1.7	OK
C-w 1	STIFF1d	E70xx	◢3.5	◢5.0	196	33	LE1	0.1	27.1	0.5	OK
C-tfl 1	STIFF1d	E70xx	◢3.5	◢5.0	111	28	LE1	0.1	27.0	0.5	OK

Explicación del símbolo

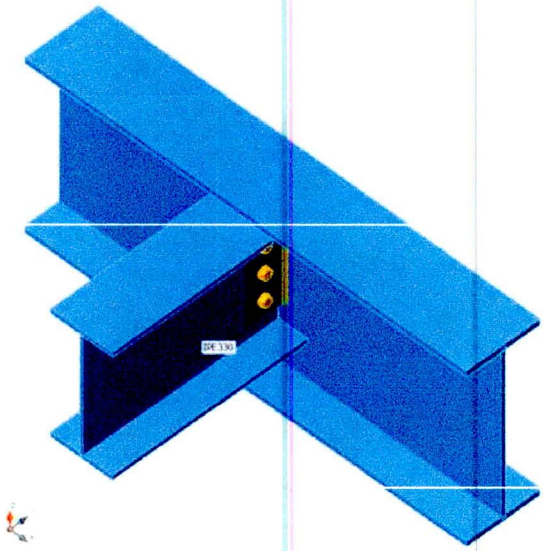
T_h	Espesor de garganta de soldadura
L_s	Tamaño de la soldadura
L	Longitud de la soldadura
L_c	Longitud del elemento crítico de la soldadura
F_n	Fuerza en el elemento crítico de la soldadura
ϕR_n	Resistencia de la soldadura, AISC 360-10 J2.4
Ut	Utilización

VIGA IPE330 A VIGA IPE450



Elementos estructurales

Nombre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en	X [mm]
IPE450	14 - CON1(IPE450)	0.0	0.0	0.0	0	0	0	Nodo	0
IPE330	15 - CON1(IPE330)	-90.0	0.0	0.0	0	0	60	Tornillos	60



Tornillos

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibro)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	IPE330	0.0	0.0	-77.2	0.0	0.0	0.0

Verificación

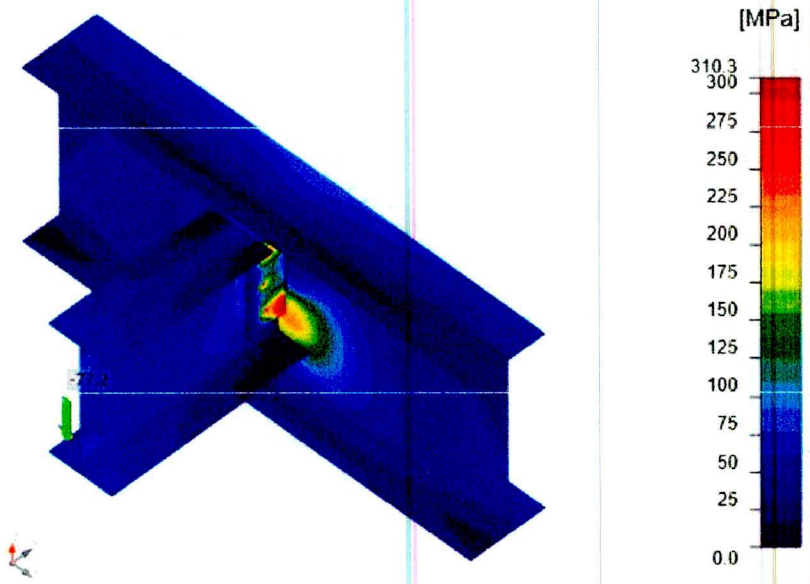
Resumen

Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.3 < 5.0%	OK
Tornillos	73.0 < 100%	OK
Soldaduras	80.8 < 100%	OK
Pandeo	No calculado	

Placas

Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
IPE450-bfl 1	344.7	14.6	LE1	88.9	0.0	0.0	OK
IPE450-tfl 1	344.7	14.6	LE1	88.0	0.0	0.0	OK
IPE450-w 1	344.7	9.4	LE1	257.5	0.0	0.0	OK
IPE330-bfl 1	344.7	11.5	LE1	50.9	0.0	0.0	OK
IPE330-tfl 1	344.7	11.5	LE1	50.6	0.0	0.0	OK
IPE330-w 1	344.7	7.5	LE1	268.3	0.0	22.9	OK
FP1	344.7	6.0	LE1	310.9	0.3	22.9	OK

Verificación de deformación. LE1



Tensión equivalente. LE1

Tornillos

Forma	Ítem	Calidad	Cargas	F_t [kN]	V [kN]	$\phi R_{n,portante}$ [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
2	B1	1/2 A325 - 1	LE1	1.4	25.8	61.5	2.4	72.9	-	OK
1	B2	1/2 A325 - 1	LE1	5.4	25.6	61.5	9.2	72.4	-	OK
3	B3	1/2 A325 - 1	LE1	2.6	25.8	61.5	4.3	73.0	-	OK

Datos de diseño

Calidad	$\phi R_{n,tracción}$ [kN]	$\phi R_{n,cortante}$ [kN]
1/2 A325 - 1	58.9	35.3

Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
IPE450.w 1	FP1	E7018	◢3.5◣	◢5.0◣	229	14	LE1	12.5	16.0	78.2	OK
		E7018	◢3.5◣	◢5.0◣	229	14	LE1	13.1	16.3	80.8	OK

Combinaciones / Hipótesis de Cargas	Carga Última En Dirección Horizontal W(Kg/m)			Carga Última En Dirección Vertical W(Kg/m)				
	Wu(m + vol)	W G + γ(g)	ΣWu	Wu(m + vol)	W G + γ(g)	wQwp + γQW	wEwh+γQW	Wu
1.4CM+0CV+0W	5.45	0	5.45	27.24	0	0	0	27.24
1.2CM+1.6CV+0W	4.67	20.4	25.07	23.35	101.98	0	0	125.33
1.2CM+1.6CV+0.8W	4.67	20.4	25.07	23.35	101.98	41.6	41.6	166.93
1.2CM+0.5CV+1.6W	4.67	6.37	11.04	23.35	31.87	83.2	-83.2	138.42
1.2CM+1CV+0W	4.67	12.75	17.42	23.35	63.74	0	0	87.09
0.9CM+0CV+1.6W	3.5	0	3.5	17.51	0	83.2	83.2	100.71
0.9CM+0CV+0W	3.5	0	3.5	17.51	0	0	0	17.51

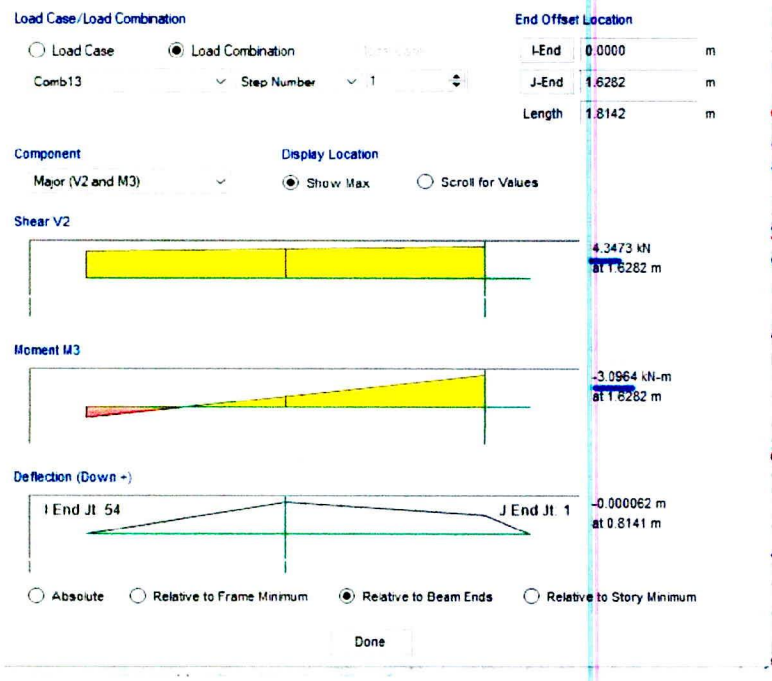
Combinaciones / Hipótesis de Cargas	Momento Último Mu(Kg-m)		Cortante Último Vu(Kg)	
	Muy	Mux	Vuy	Vux
1.4CM+0CV+0W	24.51	122.56	8.17	81.71
1.2CM+1.6CV+0W	112.79	563.97	37.6	375.98
1.2CM+1.6CV+0.8W	112.79	747.53	37.6	498.35
1.2CM+0.5CV+1.6W	49.63	615.59	16.56	410.4
1.2CM+1CV+0W	78.38	391.88	26.13	261.25
0.9CM+0CV+1.6W	15.76	445.92	5.25	297.28
0.9CM+0CV+0W	15.76	78.79	5.25	52.53

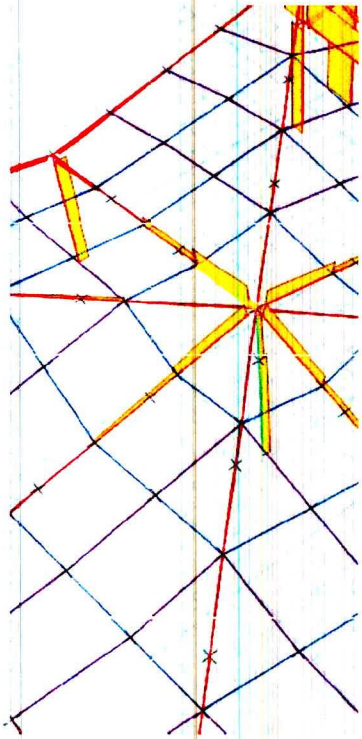
Mux = 748 kg.m

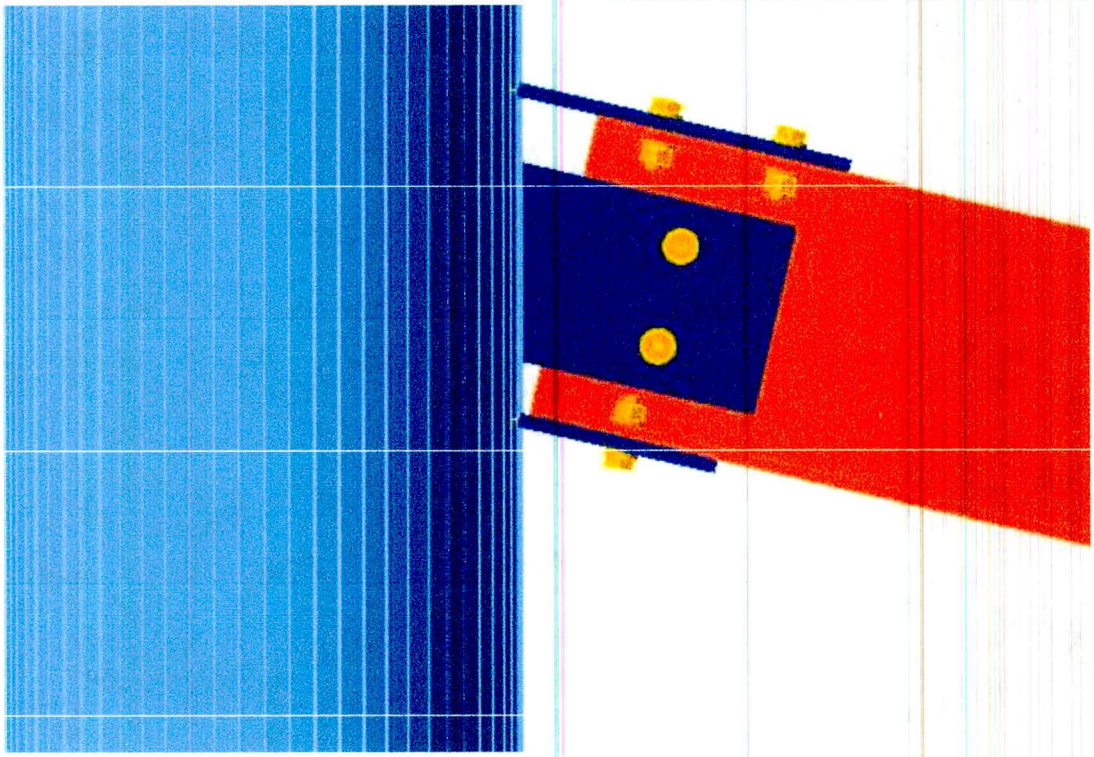
Muy = 113 kg.m

Vux = 498 kg

VIGA IPE240 A COLø400

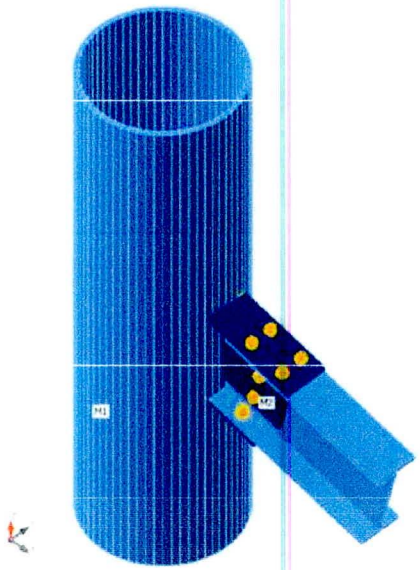






Elementos estructurales

Nombre	Sección transversal	β – Dirección [°]	γ - Inclinación [°]	α - Rotación [°]	Desplazamiento ex [mm]	Desplazamiento ey [mm]	Desplazamiento ez [mm]	Fuerzas en	X [mm]
M1	3 - CHS406.4/12.5	0.0	-90.0	0.0	0	0	0	Nodo	0
M2	13 - CON1(IPE240)	0.0	13.0	0.0	0	0	0	Posición	491



Secciones

Nombre	Material
3 - CHS406.4/12.5	A572 Gr.50
13 - CON1(IPE240)	A572 Gr.50

Tornillos

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibro)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	M2	0.0	0.0	-14.9	0.0	3.5	0.0

Verificación

Resumen

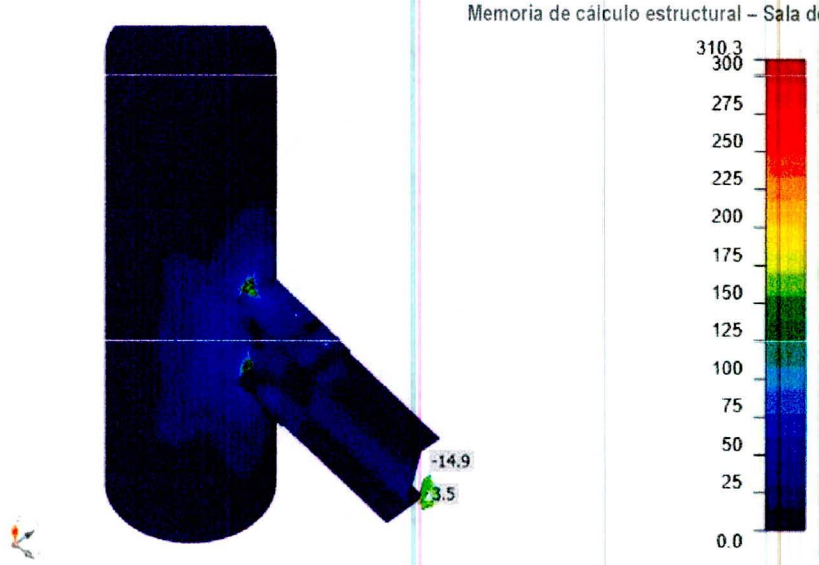
Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.1 < 5.0%	OK
Tornillos	36.4 < 100%	OK
Soldaduras	0.0 < 100%	OK
Pandeo	No calculado	
GMNA	Calculado	

Placas

Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
M1	344.7	12.5	LE1	181.7	0.0	0.0	OK
M2-bfl 1	344.7	9.8	LE1	83.4	0.0	5.3	OK
M2-tfl 1	344.7	9.8	LE1	50.9	0.0	6.4	OK
M2-w 1	344.7	6.2	LE1	65.2	0.0	6.4	OK
FP1	344.7	10.0	LE1	60.7	0.0	3.1	OK
FP2	344.7	10.0	LE1	153.3	0.0	3.3	OK
FP3	344.7	10.0	LE1	310.5	0.1	12.0	OK

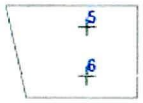
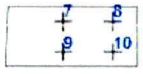
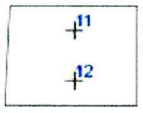
Datos de diseño

Material	f_y [MPa]	ε_{lim} [%]
A572 Gr.50	344.7	5.0



Tensión equivalente. LE1

Tornillos

Forma	Ítem	Calidad	Cargas	F_t [kN]	V [kN]	$\phi R_{n,portante}$ [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
	B5	1/2 A325 - 1	LE1	0.8	4.3	63.5	1.3	12.3	-	OK
	B6	1/2 A325 - 1	LE1	0.7	5.9	63.5	1.2	16.8	-	OK
	B7	1/2 A325 - 1	LE1	0.6	6.3	100.4	1.1	17.8	-	OK
	B8	1/2 A325 - 1	LE1	1.1	6.3	100.4	1.8	17.8	-	OK
	B9	1/2 A325 - 1	LE1	0.7	6.9	100.4	1.2	19.5	-	OK
	B10	1/2 A325 - 1	LE1	1.0	6.9	100.4	1.7	19.5	-	OK
	B11	1/2 A325 - 1	LE1	0.3	9.7	100.4	0.5	27.4	-	OK
	B12	1/2 A325 - 1	LE1	0.1	12.9	100.4	0.2	36.4	-	OK

Explicación del símbolo

F_t	Fuerza de tracción
V	Resultante de las fuerzas cortantes Vy, Vz en el tornillo.
$\phi R_{n,portante}$	Resistencia a aplastamiento de la chapa provocado por el tornillo
Ut_t	Utilización a tracción
Ut_s	Utilización a cortante
Ut_{ts}	Utilización a tensión y cortante
$\phi R_{n,traccion}$	Resistencia de los pernoss a tracción, según AISC 360-10 tabla J3.2
$\phi R_{n,cortante}$	Resistencia de los pernos a cortante, según AISC 360-16 tabla J3.2

Weld sections

Item	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
M1-arc 48	FP1	E7018	-	-	154	-	-	-	-	-	OK
M1-arc 48	FP2	E7018	-	-	120	-	-	-	-	-	OK
M1-arc 48	FP3	E7018	-	-	120	-	-	-	-	-	OK

Explicación del símbolo

T_h	Espesor de garganta de soldadura
L_s	Tamaño de la soldadura
L	Longitud de la soldadura
L_c	Longitud del elemento crítico de la soldadura
F_n	Fuerza en el elemento crítico de la soldadura
ϕR_n	Resistencia de la soldadura, AISC 360-10 J2.4
Ut	Utilización

IPE330 A HEB280 LATERAL

Diagram for Beam B82 at Story Story1 IPE330

Load Case/Load Combination

○ Load Case ◉ Load Combination Modal Case

Comb13 | Step Number | 1

End Offset Location

I-End	0.0000	m
J-End	2.2267	m
Length	2.3667	m

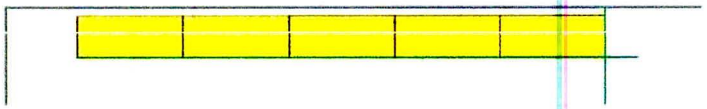
Component

Major (V2 and M3)

Display Location

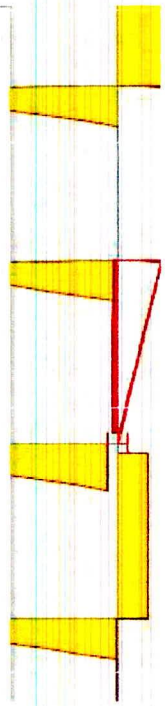
○ Show Max ◉ Scroll for Values 2.2837 m

Shear V2

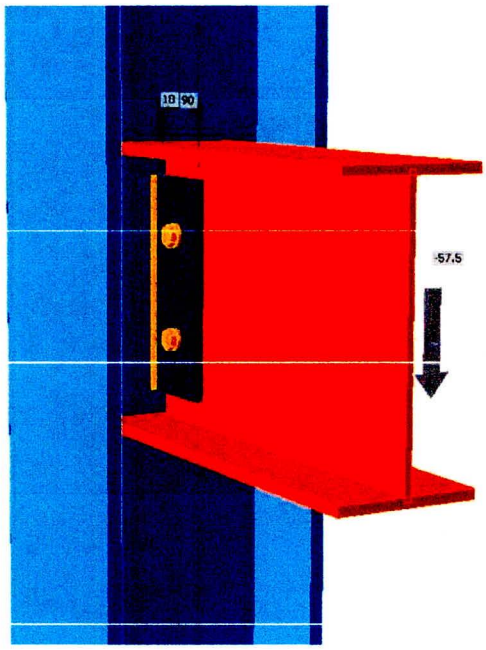


Moment M3





Deflection (Down +)



Secciones

Nombre	Material
12 - CON1(HEB280)	A572 Gr.50
15 - CON1(IPE330)	A572 Gr.50

Tornillos

Nombre	Conjunto de tornillo	Diámetro [mm]	fu [MPa]	Área bruta [mm²]
1/2 A325	1/2 A325	13	827.4	127

Cargas (No se requiere el equilibro)

Nombre	Elemento	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	B	0.0	0.0	-57.5	0.0	0.0	0.0

Verificación

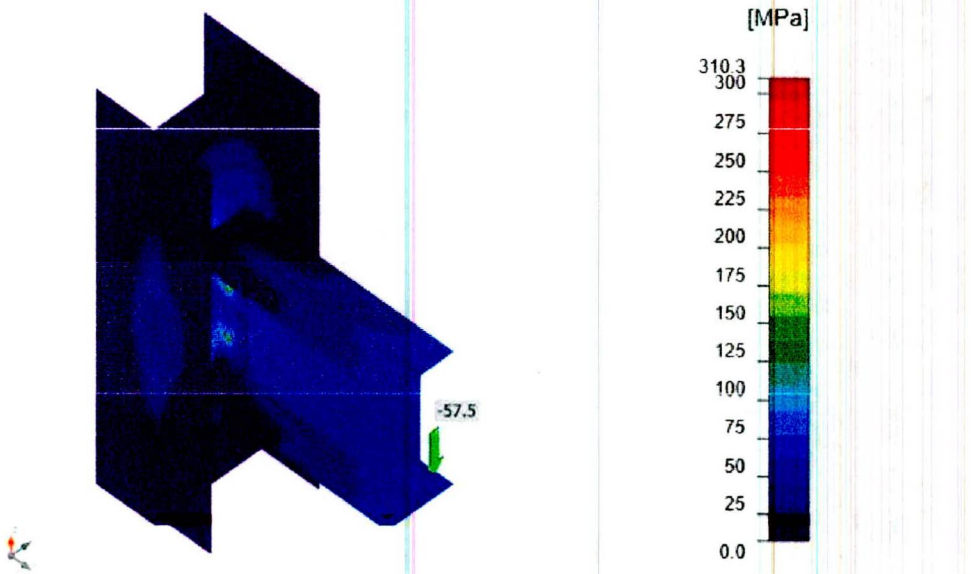
Resumen

Nombre	Valor	Estado de la verificación
Análisis	100.0%	OK
Placas	0.0 < 5.0%	OK
Tornillos	81.5 < 100%	OK
Soldaduras	68.5 < 100%	OK
Pandeo	No calculado	

Placas

Nombre	f_y [MPa]	Espesor [mm]	Cargas	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Estado de la verificación
C-bfl 1	344.7	18.0	LE1	18.6	0.0	0.0	OK
C-tfl 1	344.7	18.0	LE1	22.8	0.0	0.0	OK
C-w 1	344.7	10.5	LE1	123.1	0.0	0.0	OK
B-bfl 1	344.7	11.5	LE1	37.8	0.0	0.0	OK
B-tfl 1	344.7	11.5	LE1	37.6	0.0	0.0	OK
B-w 1	344.7	7.5	LE1	258.4	0.0	15.5	OK
FP1	344.7	10.0	LE1	204.7	0.0	15.5	OK

Verificación de deformación, LE1



Tensión equivalente, LE1

Tornillos

Forma	Ítem	Calidad	Cargas	F_t [kN]	V [kN]	$\phi R_{n,portante}$ [kN]	Ut_t [%]	Ut_s [%]	Ut_{ts} [%]	Estado
1	B1	1/2 A325 - 1	LE1	5.0	28.7	76.8	8.5	81.1	-	OK
2	B2	1/2 A325 - 1	LE1	2.2	28.8	76.8	3.8	81.5	-	OK

Datos de diseño

Calidad	$\phi R_{n,tracción}$ [kN]	$\phi R_{n,cortante}$ [kN]
1/2 A325 - 1	58.9	35.3

Weld sections

Ítem	Borde	Xu	T_h [mm]	L_s [mm]	L [mm]	L_c [mm]	Cargas	F_n [kN]	ϕR_n [kN]	Ut [%]	Estado
C-w 1	FP1	E7018	◢3.5◣	◢5.0◣	249	16	LE1	12.1	17.7	68.5	OK
		E7018	◢3.5◣	◢5.0◣	249	16	LE1	7.2	17.6	41.0	OK

TABLE: Element Forces - Beams

Story	Beam	Unique Name	Output Case	Case Type	Step Type	Station	P	V2	V3
						m	kN	kN	kN
Story3	B318	318	Comb13	Combination	Max	1.9261	-0.0261	0.061	0
Story3	B318	318	Comb13	Combination	Min	0	-0.183	-0.061	0
Story3	B318	318	Comb13	Combination	Min	0.963	-0.1726	0	0
Story3	B318	318	Comb13	Combination	Min	1.9261	-0.1622	0.0392	0
							Maximo:	0.0689	

Máxima reacción en elementos 2"x1/4"

$\phi Rn \leq \phi\ Aw * Fw = 0.707*D*L*0.6Fexx$

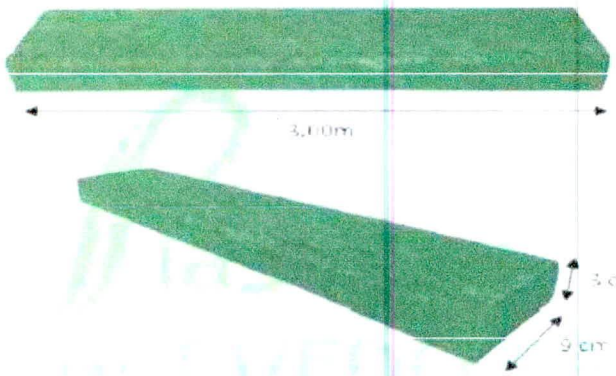
$0.07\ kN \leq 0.75 * 0.318 *2*50 *420/1000 = 10.02\ kN$ Ok.

Anexos

PISO SENDEROS

FICHA TÉCNICA VARETA PLÁSTICA

Código	3.3	VARETA MADERA PLÁSTICA



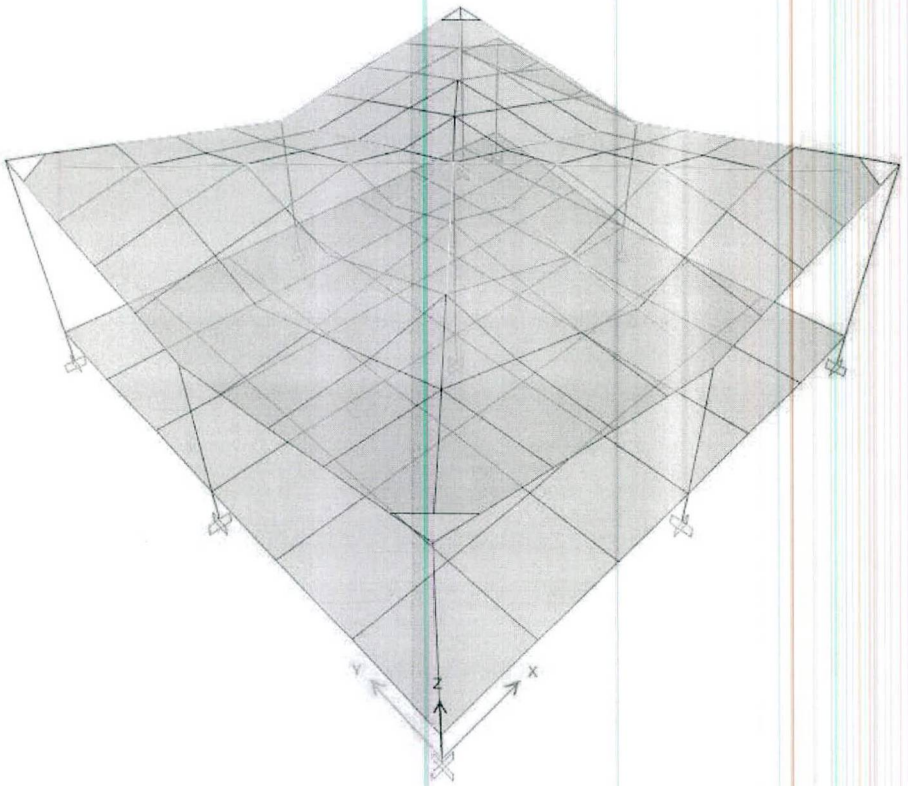
ESPECIFICACIONES

REFERENCIA						FECHA
	Ancho		Largo		Espesor	27 de marzo de 2021
Vareta	9 cm	x	3,00 m	x	3 cm	MATERIAL
BENEFICIOS						Polietileno y Polipropileno

- Material anti corrosivo.
- Se puede clavar, apuntillar, atornillar, grapar, etc.
- No requiere aislantes para usos electricos.
- Sustituye el uso de otros materiales como el metal o madera.
- No requiere mantenimiento.
- Repele la humedad.
- Resistente a la intemperie, bajo cualquier condición meteorológica.

PESO	CAPACIDAD
7 kg	400 Kilos Aprox.
VIDA ÚTIL	
15-20 AÑOS	
PLÁSTICOS ACEVEDO S.A.S	

ETABS®



Project Report

Model File: SalaIntroducción, Revision 0
2/02/2025

1247

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1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Story Data

Table 1.1 - Story Definitions

Tower	Name	Height m	Master Story	Similar To	Splice Story	Color
T1	Story3	1.5	Yes	None	No	Gray8Dark
T1	Story2	3.5	No	Story3	No	Blue
T1	Story1	0.8	No	Story3	No	Green

1.2 Grid Data

Table 1.2 - Grid Definitions - General

Tower	Name	Type	Ux m	Uy m	Rz deg	Story Range	Bubble Size m	Color
T1	G1	Cartesian	0	0	0	Default	1	Black

Table 1.3 - Grid Definitions - Grid Lines

Name	Grid Line Type	ID	Ordinate m	Bubble Location	Visible
G1	X (Cartesian)	A	0	End	Yes
G1	X (Cartesian)	B	7.1	End	Yes
G1	X (Cartesian)	C	14.2	End	Yes
G1	Y (Cartesian)	1	0	Start	Yes
G1	Y (Cartesian)	3	14.2	Start	Yes

1.3 Point Coordinates

Table 1.4 - Point Bays

Label	Is Auto Point	X m	Y m	DZBelow m
1	No	7.1	7.1	0
2	No	7.1	2.3667	1
3	No	7.1	4.7333	0.5
4	No	7.1	14.2	0
5	No	7.1	0	0
6	No	0	14.2	0
7	No	14.2	14.2	0
8	No	0	7.1	0
9	No	14.2	7.1	0
10	No	14.2	0	0
11	No	0	0	0
12	No	7.1	11.8333	1
13	No	7.1	9.4667	0.5
14	No	11.8333	7.1	1
15	No	9.4667	7.1	0.5
16	No	0	0.8875	0.1875
17	No	2.3667	7.1	1
18	No	4.7333	7.1	0.5
19	No	2.6625	11.5375	0.125
20	No	4.8813	9.3188	0.0625

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Label	Is Auto Point	X m	Y m	DZBelow m
21	No	9.3188	9.3188	0.0625
22	No	11.5375	11.5375	0.125
23	No	0	13.3125	0.1875
24	No	9.3188	4.8813	0.0625
25	No	11.5375	2.6625	0.125
26	No	2.6625	2.6625	0.125
27	No	4.8813	4.8813	0.0625
28	No	15.93	14.2	0
29	No	5.5469	14.2	1.1719
30	No	0.8875	14.2	0.1875
31	No	0	2.3667	0
32	No	0	4.7333	0
33	No	0	9.4667	0
34	No	0	11.8333	0
35	No	7.1	2.3667	0
36	No	7.1	4.7333	0
37	No	13.3125	14.2	0.1875
38	No	7.1	9.4667	0
39	No	7.1	11.8333	0
40	No	3.9938	14.2	0.8438
41	No	14.797	9.55	0
42	No	14.2	9.55	0
43	No	14.2	11.875	0
44	No	14.2	13.3125	0.1875
45	No	14.2	2.3667	0
46	No	14.2	4.7333	0
47	No	15.3635	11.875	0
48	No	2.1078	12.0922	0.1406
49	No	3.7719	10.4281	0.0938
50	No	5.4359	8.7641	0.0469
51	No	14.2	0.8875	0.1875
52	No	7.1	12.425	1.125
53	No	7.1	10.65	0.75
54	No	7.1	8.875	0.375
55	No	2.4406	14.2	0.5156
56	No	5.4359	12.3141	0.7969
57	No	3.7719	12.2031	0.4688
58	No	13.3125	0	0.1875
59	No	5.4359	10.5391	0.4219
60	No	7.1	1.775	1.125
61	No	7.1	3.55	0.75
62	No	2.3667	14.2	0
63	No	4.7333	14.2	0
64	No	9.4667	14.2	0
65	No	0.8875	0	0.1875
66	No	11.8333	14.2	0
67	No	2.3667	7.1	0
68	No	0.4438	13.7563	0.1875
69	No	13.7563	13.7563	0.1875
70	No	13.7563	0.4438	0.1875
71	No	0.4438	0.4438	0.1875
72	No	4.7333	7.1	0
73	No	2.3667	0	0
74	No	4.7333	0	0
75	No	9.4667	0	0

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Label	Is Auto Point	X m	Y m	DZBelow m
76	No	11.8333	0	0
77	No	2.3667	11.8333	0
78	No	4.7333	11.8333	0
79	No	9.4667	11.8472	0
80	No	11.8333	11.8611	0
81	No	2.3667	9.4667	0
82	No	4.7333	9.4667	0
83	No	9.4667	9.4944	0
84	No	11.8333	9.5222	0
85	No	2.3667	4.7333	0
86	No	4.7333	4.7333	0
87	No	9.4667	4.7333	0
88	No	11.8333	4.7333	0
89	No	2.3667	2.3667	0
90	No	4.7333	2.3667	0
91	No	9.4667	2.3667	0
92	No	11.8333	2.3667	0
93	No	9.4667	7.1	0
94	No	11.8333	7.1	0
95	No	7.1	5.325	0.375
96	No	12.425	7.1	1.125
97	No	10.65	7.1	0.75
98	No	8.875	7.1	0.375
99	No	1.775	7.1	1.125
100	No	3.55	7.1	0.75
101	No	5.325	7.1	0.375
102	No	8.7641	8.7641	0.0469
103	No	10.4281	10.4281	0.0938
104	No	12.0922	12.0922	0.1406
105	No	8.7641	5.4359	0.0469
106	No	10.4281	3.7719	0.0938
107	No	12.0922	2.1078	0.1406
108	No	2.1078	2.1078	0.1406
109	No	3.7719	3.7719	0.0938
110	No	5.4359	5.4359	0.0469
111	No	8.7641	10.5391	0.4219
112	No	10.5391	8.7641	0.4219
113	No	10.5391	5.4359	0.4219
114	No	8.7641	3.6609	0.4219
115	No	5.4359	3.6609	0.4219
116	No	3.6609	5.4359	0.4219
117	No	3.6609	8.7641	0.4219
118	No	8.7641	12.3141	0.7969
119	No	10.4281	12.2031	0.4688
120	No	12.3141	8.7641	0.7969
121	No	12.2031	10.4281	0.4688
122	No	12.3141	5.4359	0.7969
123	No	12.2031	3.7719	0.4688
124	No	8.7641	1.8859	0.7969
125	No	10.4281	1.9969	0.4688
126	No	5.4359	1.8859	0.7969
127	No	3.7719	1.9969	0.4688
128	No	1.8859	5.4359	0.7969
129	No	1.9969	3.7719	0.4688
130	No	1.8859	8.7641	0.7969

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Label	Is Auto Point	X m	Y m	DZBelow m
131	No	1.9969	10.4281	0.4688
132	No	0	5.5469	1.1719
133	No	0	3.9938	0.8438
134	No	0	2.4406	0.5156
135	No	0	8.6531	1.1719
136	No	0	10.2063	0.8438
137	No	0	11.7594	0.5156
138	No	8.6531	14.2	1.1719
139	No	10.2063	14.2	0.8438
140	No	11.7594	14.2	0.5156
141	No	14.2	8.6531	1.1719
142	No	14.2	10.2063	0.8438
143	No	14.2	11.7594	0.5156
144	No	14.2	5.5469	1.1719
145	No	14.2	3.9938	0.8438
146	No	14.2	2.4406	0.5156
147	No	8.6531	0	1.1719
148	No	10.2063	0	0.8438
149	No	11.7594	0	0.5156
150	No	5.5469	0	1.1719
151	No	3.9938	0	0.8438
152	No	2.4406	0	0.5156

Table 1.5 - Point Object Connectivity

UniqueName	Is Auto Point	Story	PointBay	IsSpecial	X m	Y m	Z m
2	No	Story3	1	No	7.1	7.1	5.8
19	No	Story3	6	No	0	14.2	5.8
23	No	Story3	7	No	14.2	14.2	5.8
35	No	Story3	10	No	14.2	0	5.8
39	No	Story3	11	No	0	0	5.8
15	No	Story3	16	No	0	0.8875	5.6125
46	No	Story3	23	No	0	13.3125	5.6125
53	No	Story3	30	No	0.8875	14.2	5.6125
60	No	Story3	37	No	13.3125	14.2	5.6125
67	No	Story3	44	No	14.2	13.3125	5.6125
74	No	Story3	51	No	14.2	0.8875	5.6125
81	No	Story3	58	No	13.3125	0	5.6125
88	No	Story3	65	No	0.8875	0	5.6125
91	No	Story3	68	No	0.4438	13.7563	5.6125
92	No	Story3	69	No	13.7563	13.7563	5.6125
93	No	Story3	70	No	13.7563	0.4438	5.6125
94	No	Story3	71	No	0.4438	0.4438	5.6125
5	No	Story3	2	No	7.1	2.3667	4.8
6	No	Story3	3	No	7.1	4.7333	5.3
7	No	Story3	12	No	7.1	11.8333	4.8
8	No	Story3	13	No	7.1	9.4667	5.3
9	No	Story3	14	No	11.8333	7.1	4.8
11	No	Story3	15	No	9.4667	7.1	5.3
27	No	Story3	17	No	2.3667	7.1	4.8
31	No	Story3	18	No	4.7333	7.1	5.3
42	No	Story3	19	No	2.6625	11.5375	5.675
43	No	Story3	20	No	4.8813	9.3188	5.7375
44	No	Story3	21	No	9.3188	9.3188	5.7375
45	No	Story3	22	No	11.5375	11.5375	5.675

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UniqueName	Is Auto Point	Story	PointBay	IsSpecial	X m	Y m	Z m
47	No	Story3	24	No	9.3188	4.8813	5.7375
48	No	Story3	25	No	11.5375	2.6625	5.675
49	No	Story3	26	No	2.6625	2.6625	5.675
50	No	Story3	27	No	4.8813	4.8813	5.7375
104	No	Story3	48	No	2.1078	12.0922	5.6594
105	No	Story3	49	No	3.7719	10.4281	5.7063
106	No	Story3	50	No	5.4359	8.7641	5.7531
107	No	Story3	52	No	7.1	12.425	4.675
108	No	Story3	53	No	7.1	10.65	5.05
109	No	Story3	54	No	7.1	8.875	5.425
110	No	Story3	29	No	5.5469	14.2	4.6281
111	No	Story3	40	No	3.9938	14.2	4.9563
112	No	Story3	55	No	2.4406	14.2	5.2844
113	No	Story3	56	No	5.4359	12.3141	5.0031
114	No	Story3	57	No	3.7719	12.2031	5.3313
115	No	Story3	59	No	5.4359	10.5391	5.3781
116	No	Story3	60	No	7.1	1.775	4.675
117	No	Story3	61	No	7.1	3.55	5.05
118	No	Story3	95	No	7.1	5.325	5.425
119	No	Story3	96	No	12.425	7.1	4.675
120	No	Story3	97	No	10.65	7.1	5.05
121	No	Story3	98	No	8.875	7.1	5.425
122	No	Story3	99	No	1.775	7.1	4.675
123	No	Story3	100	No	3.55	7.1	5.05
124	No	Story3	101	No	5.325	7.1	5.425
125	No	Story3	102	No	8.7641	8.7641	5.7531
126	No	Story3	103	No	10.4281	10.4281	5.7063
127	No	Story3	104	No	12.0922	12.0922	5.6594
128	No	Story3	105	No	8.7641	5.4359	5.7531
129	No	Story3	106	No	10.4281	3.7719	5.7063
130	No	Story3	107	No	12.0922	2.1078	5.6594
131	No	Story3	108	No	2.1078	2.1078	5.6594
132	No	Story3	109	No	3.7719	3.7719	5.7063
133	No	Story3	110	No	5.4359	5.4359	5.7531
134	No	Story3	111	No	8.7641	10.5391	5.3781
135	No	Story3	112	No	10.5391	8.7641	5.3781
136	No	Story3	113	No	10.5391	5.4359	5.3781
137	No	Story3	114	No	8.7641	3.6609	5.3781
138	No	Story3	115	No	5.4359	3.6609	5.3781
139	No	Story3	116	No	3.6609	5.4359	5.3781
140	No	Story3	117	No	3.6609	8.7641	5.3781
141	No	Story3	118	No	8.7641	12.3141	5.0031
142	No	Story3	119	No	10.4281	12.2031	5.3313
143	No	Story3	120	No	12.3141	8.7641	5.0031
144	No	Story3	121	No	12.2031	10.4281	5.3313
145	No	Story3	122	No	12.3141	5.4359	5.0031
146	No	Story3	123	No	12.2031	3.7719	5.3313
147	No	Story3	124	No	8.7641	1.8859	5.0031
148	No	Story3	125	No	10.4281	1.9969	5.3313
149	No	Story3	126	No	5.4359	1.8859	5.0031
150	No	Story3	127	No	3.7719	1.9969	5.3313
151	No	Story3	128	No	1.8859	5.4359	5.0031
152	No	Story3	129	No	1.9969	3.7719	5.3313
153	No	Story3	130	No	1.8859	8.7641	5.0031
154	No	Story3	131	No	1.9969	10.4281	5.3313

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UniqueName	Is Auto Point	Story	PointBay	IsSpecial	X m	Y m	Z m
155	No	Story3	132	No	0	5.5469	4.6281
156	No	Story3	133	No	0	3.9938	4.9563
157	No	Story3	134	No	0	2.4406	5.2844
158	No	Story3	135	No	0	8.6531	4.6281
159	No	Story3	136	No	0	10.2063	4.9563
160	No	Story3	137	No	0	11.7594	5.2844
161	No	Story3	138	No	8.6531	14.2	4.6281
162	No	Story3	139	No	10.2063	14.2	4.9563
163	No	Story3	140	No	11.7594	14.2	5.2844
164	No	Story3	141	No	14.2	8.6531	4.6281
165	No	Story3	142	No	14.2	10.2063	4.9563
166	No	Story3	143	No	14.2	11.7594	5.2844
167	No	Story3	144	No	14.2	5.5469	4.6281
168	No	Story3	145	No	14.2	3.9938	4.9563
169	No	Story3	146	No	14.2	2.4406	5.2844
170	No	Story3	147	No	8.6531	0	4.6281
171	No	Story3	148	No	10.2063	0	4.9563
172	No	Story3	149	No	11.7594	0	5.2844
173	No	Story3	150	No	5.5469	0	4.6281
174	No	Story3	151	No	3.9938	0	4.9563
175	No	Story3	152	No	2.4406	0	5.2844
1	No	Story2	1	No	7.1	7.1	4.3
10	No	Story2	4	No	7.1	14.2	4.3
14	No	Story2	5	No	7.1	0	4.3
18	No	Story2	6	No	0	14.2	4.3
22	No	Story2	7	No	14.2	14.2	4.3
26	No	Story2	8	No	0	7.1	4.3
30	No	Story2	9	No	14.2	7.1	4.3
34	No	Story2	10	No	14.2	0	4.3
38	No	Story2	11	No	0	0	4.3
180	No	Story2	42	No	14.2	9.55	4.3
181	No	Story2	43	No	14.2	11.875	4.3
177	No	Story2	28	Yes	15.93	14.2	4.3
178	No	Story2	41	Yes	14.797	9.55	4.3
179	No	Story2	47	Yes	15.3635	11.875	4.3
3	No	Story1	1	No	7.1	7.1	0.8
12	No	Story1	4	No	7.1	14.2	0.8
16	No	Story1	5	No	7.1	0	0.8
20	No	Story1	6	No	0	14.2	0.8
24	No	Story1	7	No	14.2	14.2	0.8
28	No	Story1	8	No	0	7.1	0.8
32	No	Story1	9	No	14.2	7.1	0.8
36	No	Story1	10	No	14.2	0	0.8
40	No	Story1	11	No	0	0	0.8
54	No	Story1	31	No	0	2.3667	0.8
55	No	Story1	32	No	0	4.7333	0.8
56	No	Story1	33	No	0	9.4667	0.8
57	No	Story1	34	No	0	11.8333	0.8
58	No	Story1	35	No	7.1	2.3667	0.8
59	No	Story1	36	No	7.1	4.7333	0.8
61	No	Story1	38	No	7.1	9.4667	0.8
62	No	Story1	39	No	7.1	11.8333	0.8
65	No	Story1	42	No	14.2	9.55	0.8
66	No	Story1	43	No	14.2	11.875	0.8
70	No	Story1	45	No	14.2	2.3667	0.8

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UniqueName	Is Auto Point	Story	PointBay	IsSpecial	X m	Y m	Z m
71	No	Story1	46	No	14.2	4.7333	0.8
51	No	Story1	28	Yes	15.93	14.2	0.8
64	No	Story1	41	No	14.797	9.55	0.8
68	No	Story1	47	No	15.3635	11.875	0.8
52	No	Story1	62	No	2.3667	14.2	0.8
63	No	Story1	63	No	4.7333	14.2	0.8
69	No	Story1	64	No	9.4667	14.2	0.8
72	No	Story1	66	No	11.8333	14.2	0.8
73	No	Story1	67	No	2.3667	7.1	0.8
75	No	Story1	72	No	4.7333	7.1	0.8
76	No	Story1	73	No	2.3667	0	0.8
77	No	Story1	74	No	4.7333	0	0.8
78	No	Story1	75	No	9.4667	0	0.8
79	No	Story1	76	No	11.8333	0	0.8
80	No	Story1	77	No	2.3667	11.8333	0.8
82	No	Story1	78	No	4.7333	11.8333	0.8
83	No	Story1	79	No	9.4667	11.8472	0.8
84	No	Story1	80	No	11.8333	11.8611	0.8
85	No	Story1	81	No	2.3667	9.4667	0.8
86	No	Story1	82	No	4.7333	9.4667	0.8
87	No	Story1	83	No	9.4667	9.4944	0.8
89	No	Story1	84	No	11.8333	9.5222	0.8
90	No	Story1	85	No	2.3667	4.7333	0.8
95	No	Story1	86	No	4.7333	4.7333	0.8
96	No	Story1	87	No	9.4667	4.7333	0.8
97	No	Story1	88	No	11.8333	4.7333	0.8
98	No	Story1	89	No	2.3667	2.3667	0.8
99	No	Story1	90	No	4.7333	2.3667	0.8
100	No	Story1	91	No	9.4667	2.3667	0.8
101	No	Story1	92	No	11.8333	2.3667	0.8
102	No	Story1	93	No	9.4667	7.1	0.8
103	No	Story1	94	No	11.8333	7.1	0.8
4	No	Base	1	No	7.1	7.1	0
13	No	Base	4	No	7.1	14.2	0
17	No	Base	5	No	7.1	0	0
21	No	Base	6	No	0	14.2	0
25	No	Base	7	No	14.2	14.2	0
29	No	Base	8	No	0	7.1	0
33	No	Base	9	No	14.2	7.1	0
37	No	Base	10	No	14.2	0	0
41	No	Base	11	No	0	0	0
176	No	Base	28	No	15.93	14.2	0

1.4 Line Connectivity

Table 1.6 - Column Bays

Label	PointBayI	PointBayJ	IEndStory
C1	1	1	Below
C2	28	28	Below
C3	4	4	Below
C4	5	5	Below
C5	6	6	Below
C6	7	7	Below
C7	8	8	Below
C8	9	9	Below

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Label	PointBayI	PointBayJ	IEndStory
C9	10	10	Below
C10	11	11	Below

Table 1.7 - Beam Bays

Label	PointBayI	PointBayJ
B4	4	29
B5	29	40
B6	40	55
B9	55	30
B10	55	48
B11	7	28
B12	52	56
B17	56	57
B18	57	48
B19	40	57
B20	16	11
B28	23	6
B31	29	56
B32	68	48
B33	48	49
B34	49	50
B35	50	1
B36	30	6
B37	57	49
B38	53	59
B39	4	52
B40	52	53
B41	53	54
B42	54	1
B43	54	50
B44	37	7
B47	59	49
B48	56	59
B49	59	50
B52	44	7
B56	9	41
B57	41	47
B58	47	28
B59	11	31
B60	51	10
B61	31	32
B62	32	8
B63	8	33
B64	33	34
B65	34	6
B66	5	35
B67	35	36
B68	58	10
B69	36	1
B70	1	38
B71	38	39
B72	39	4
B73	43	47
B75	42	41
B76	65	11
B78	42	43

Label	PointBayI	PointBayJ
B79	43	7
B83	5	60
B84	60	61
B85	61	95
B86	95	1
B87	9	42
B89	9	96
B90	10	45
B91	45	46
B92	46	9
B93	96	97
B95	97	98
B96	98	1
B97	8	99
B98	99	100
B99	100	101
B101	101	1
B102	1	102
B103	102	103
B104	103	104
B105	104	69
B107	1	105
B108	105	106
B109	106	107
B110	107	70
B111	71	108
B113	108	109
B114	109	110
B115	110	1
B131	23	68
B132	68	30
B133	37	69
B134	69	44
B135	58	70
B136	70	51
B137	16	71
B138	71	65
B140	54	102
B141	98	102
B142	98	105
B143	6	62
B144	62	63
B145	63	4
B146	4	64
B147	64	66
B148	66	7
B149	8	67
B150	67	72
B151	72	1
B152	11	73
B153	73	74
B154	74	5
B155	5	75
B156	75	76
B157	76	10
B158	34	77

Label	PointBayI	PointBayJ
B159	77	78
B160	78	39
B161	39	79
B162	79	80
B163	80	43
B164	33	81
B165	81	82
B166	82	38
B167	38	83
B168	83	84
B169	84	42
B170	32	85
B171	85	86
B172	86	36
B173	36	87
B174	87	88
B175	88	46
B176	31	89
B177	89	90
B178	90	35
B179	35	91
B180	91	92
B181	92	45
B182	1	93
B183	93	94
B184	94	9
B185	73	89
B186	89	85
B187	85	67
B188	67	81
B189	81	77
B190	77	62
B191	74	90
B192	90	86
B193	86	72
B194	72	82
B195	82	78
B196	78	63
B197	75	91
B198	91	87
B199	87	93
B200	93	83
B201	83	79
B202	79	64
B203	76	92
B204	92	88
B205	88	94
B206	94	84
B207	84	80
B208	80	66
B209	95	105
B210	95	110
B211	101	110
B212	101	50
B213	53	111
B214	111	103

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Label	PointBayI	PointBayJ
B215	97	112
B216	112	103
B217	97	113
B218	113	106
B219	61	114
B220	114	106
B221	61	115
B222	115	109
B223	100	116
B224	116	109
B225	100	117
B226	117	49
B227	52	118
B228	118	119
B229	119	104
B230	96	120
B231	120	121
B232	121	104
B233	96	122
B234	122	123
B235	123	107
B236	60	124
B237	124	125
B238	125	107
B239	60	126
B240	126	127
B241	127	108
B242	99	128
B243	128	129
B244	129	108
B245	99	130
B246	130	131
B247	131	48
B248	8	132
B249	132	133
B250	133	134
B251	134	16
B252	8	135
B253	135	136
B254	136	137
B255	137	23
B256	4	138
B257	138	139
B258	139	140
B259	140	37
B260	9	141
B261	141	142
B262	142	143
B263	143	44
B264	9	144
B265	144	145
B266	145	146
B267	146	51
B268	5	147
B269	147	148
B270	148	149

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Label	PointBayI	PointBayJ
B271	149	58
B272	5	150
B273	150	151
B274	151	152
B275	152	65
B276	111	102
B277	118	111
B278	138	118
B279	119	103
B280	139	119
B281	140	104
B282	143	104
B283	121	103
B284	142	121
B285	112	102
B286	120	112
B287	141	120
B288	113	105
B289	122	113
B290	144	122
B291	123	106
B292	145	123
B294	146	107
B295	149	107
B296	114	105
B297	124	114
B298	147	124
B299	125	106
B300	148	125
B301	137	48
B302	131	49
B303	136	131
B304	117	50
B305	130	117
B306	135	130
B307	116	110
B308	128	116
B309	132	128
B310	129	109
B311	133	129
B312	134	108
B313	152	108
B314	127	109
B315	151	127
B316	115	110
B317	126	115
B318	150	126

1.5 Area Connectivity

Table 1.8 - Floor Bays

Label	NumPoints	PointNumber	PointBay
F1	17	1	11
F1		2	5
F1		3	10
F1		4	45

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Label	NumPoints	PointNumber	PointBay
F1		5	46
F1		6	9
F1		7	41
F1		8	47
F1		9	28
F1		10	7
F1		11	4
F1		12	6
F1		13	34
F1		14	33
F1		15	8
F1		16	32
F1		17	31
F2	8	1	1
F2		2	27
F2		3	26
F2		4	71
F2		5	65
F2		6	5
F2		7	2
F2		8	3
F3	8	1	1
F3		2	3
F3		3	2
F3		4	5
F3		5	58
F3		6	70
F3		7	25
F3		8	24
F4	8	1	68
F4		2	19
F4		3	20
F4		4	1
F4		5	13
F4		6	12
F4		7	4
F4		8	30
F5	8	1	1
F5		2	21
F5		3	22
F5		4	69
F5		5	37
F5		6	4
F5		7	12
F5		8	13
F6	8	1	16
F6		2	71
F6		3	26
F6		4	27
F6		5	1
F6		6	18
F6		7	17
F6		8	8
F7	8	1	1
F7		2	15
F7		3	14

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Label	NumPoints	PointNumber	PointBay
F7		4	9
F7		5	44
F7		6	69
F7		7	22
F7		8	21
F8	8	1	70
F8		2	51
F8		3	9
F8		4	14
F8		5	15
F8		6	1
F8		7	24
F8		8	25
F9	8	1	8
F9		2	17
F9		3	18
F9		4	1
F9		5	20
F9		6	19
F9		7	68
F9		8	23
F11	7	1	9
F11		2	41
F11		3	47
F11		4	28
F11		5	7
F11		6	43
F11		7	42

1.6 Mass

Table 1.9 - Mass Source Definition

Name	Is Default	Include Lateral Mass?	Include Vertical Mass?	Lump Mass?	Source Self Mass?	Source Added Mass?	Source Load Patterns?	Move Mass Centroid?	Load Pattern	Multiplier
MsSrc1	Yes	Yes	No	Yes	No	No	Yes	No	Muerta	1

Table 1.10 - Mass Summary by Story

Story	UX kgf-s2/m	UY kgf-s2/m	UZ kgf-s2/m
Story3	347.37	347.37	0
Story2	662.31	662.31	0
Story1	2965.25	2965.25	0
Base	42.77	42.77	0

Table 1.11 - Mass Summary by Group

Group	Self Mass kgf-s2/m	Self Weight kgf	Mass X kgf-s2/m	Mass Y kgf-s2/m	Mass Z kgf-s2/m
All	0	35300.47	4752.98	4752.98	0

1.7 Groups

Table 1.12 - Group Definitions

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Name	Color	Steel Design?	Concrete Design?	Composite Design?
All	Yellow	No	No	No

2 Properties

This chapter provides property information for materials, frame sections, shell sections, and links.

2.1 Materials

Table 2.1 - Material Properties - General

Material	Type	SymType	Grade	Color	Notes
3000Psi	Concrete	Isotropic	f'c 3000 psi	Magenta	
4000Psi	Concrete	Isotropic	f'c 4000 psi	Magenta	
A36	Steel	Isotropic	Grade 36	Cyan	
A416Gr270	Tendon	Uniaxial	Grade 270	Gray8Dark	
A500GrB46	Steel	Isotropic	Grade B, Fy 46 (HSS Rect.)	Blue	
A572Gr50	Steel	Isotropic	Grade 50	Gray8Dark	
A615Gr60	Rebar	Uniaxial	Grade 60	Yellow	
A992Fy50	Steel	Isotropic	Grade 50	Red	

2.2 Frame Sections

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 4)

Name	Material	Shape	Color	Area m2	J m4	I33 m4	I22 m4	I23 m4
2"x1/4	A36	Steel Angle	16711808	0.0006	7.768E-09	1.385E-07	1.385E-07	8.124E-08
Cajon50x100x2.5	A500GrB46	Steel Tube	16744448	0.0006	1E-06	1E-06	2.542E-07	
Colcircular40	A572Gr50	Steel Pipe	Cyan	0.0157	0.000607	0.000304	0.000304	
HE280B	A572Fy50	Steel I/Wide Flange	Red	0.0131	1E-06	0.000193	6.6E-05	
IPE120	A572Gr50	Steel I/Wide Flange	4227327	0.0013	1.69E-08	3E-06	2.77E-07	
IPE200	A572Gr50	Steel I/Wide Flange	Green	0.0029	6.92E-08	1.9E-05	1E-06	
IPE220	A572Gr50	Steel I/Wide Flange	Cyan	0.0033	9.03E-08	2.8E-05	2E-06	
IPE240	A572Gr50	Steel I/Wide Flange	Red	0.0039	1.3E-07	3.9E-05	3E-06	
IPE270	A572Gr50	Steel I/Wide Flange	Magenta	0.0046	1.59E-07	5.8E-05	4E-06	
IPE300	A572Gr50	Steel I/Wide Flange	Yellow	0.0054	1.99E-07	8.4E-05	6E-06	
IPE330	A572Gr50	Steel I/Wide Flange	Gray8Dark	0.0063	2.81E-07	0.000118	8E-06	
IPE360	A572Gr50	Steel I/Wide Flange	Blue	0.0073	3.74E-07	0.000163	1E-05	
IPE400	A572Gr50	Steel I/Wide Flange	Green	0.0085	1E-06	0.000231	1.3E-05	
IPE450	A572Gr50	Steel I/Wide Flange	Blue	0.0099	1E-06	0.000337	1.7E-05	

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 4)

Name	IMajor m4	IMinor m4	MajorAngle deg	As2 m2	As3 m2	S33Pos m3	S33Neg m3	S22Pos m3	S22Neg m3	Z33 m3
2"x1/4	2.197E-07	5.722E-08	-45	0.0003	0.0003	4E-06	9E-06	9E-06	4E-06	7E-06
Cajon50x100x2.5				0.0004	0.0002	1.5E-05	1.5E-05	1E-05	1E-05	1.8E-05
Colcircular40				0.0079	0.0079	0.001496	0.001496	0.001496	0.001496	0.001965
HE280B				0.0029	0.0084	0.001376	0.001376	0.000471	0.000471	0.001534
IPE120				0.0005	0.0007	5.3E-05	5.3E-05	9E-06	9E-06	6.1E-05
IPE200				0.0011	0.0014	0.000194	0.000194	2.8E-05	2.8E-05	0.000221
IPE220				0.0013	0.0017	0.000252	0.000252	3.7E-05	3.7E-05	0.000285
IPE240				0.0015	0.002	0.000324	0.000324	4.7E-05	4.7E-05	0.000367
IPE270				0.0018	0.0023	0.000429	0.000429	6.2E-05	6.2E-05	0.000484
IPE300				0.0021	0.0027	0.000557	0.000557	8.1E-05	8.1E-05	0.000628
IPE330				0.0025	0.0031	0.000713	0.000713	9.9E-05	9.9E-05	0.000804
IPE360				0.0029	0.0036	0.000904	0.000904	0.000123	0.000123	0.001019
IPE400				0.0034	0.0041	0.001157	0.001157	0.000146	0.000146	0.001307
IPE450				0.0042	0.0046	0.0015	0.0015	0.000176	0.000176	0.001702

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 4)

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Name	Z22 m3	R33 m	R22 m	Cw m6	Fillet Radius m	CG Offset 3 m	CG Offset 2 m	PNA Offset 3 m	PNA Offset 2 m	SC Offset 3 m	SC Offset 2 m
2"x1/4	7E-06	0.0152	0.0152	1.493E-12		0.01015	-0.01015	0.01901	-0.01901	0.02137	-0.02137
Cajon50x100x2.5	1.1E-05	0.03604	0.02113		0.005	0	0	0	0		
Colcircular40	0.001965	0.13913	0.13913			0	0	0	0		
HE280B	0.000718	0.12128	0.07095	1E-06	0.024	0	0	0	0		
IPE120	1.4E-05	0.04908	0.01449	8.896E-10	0.007	0	0	0	0		
IPE200	4.5E-05	0.08257	0.02232	1.299E-08	0.012	0	0	0	0		
IPE220	5.8E-05	0.0911	0.02477	2.267E-08	0.012	0	0	0	0		
IPE240	7.4E-05	0.09977	0.02695	3.739E-08	0.015	0	0	0	0		
IPE270	9.7E-05	0.11231	0.03025	7.058E-08	0.015	0	0	0	0		
IPE300	0.000125	0.12463	0.03351	1.259E-07	0.015	0	0	0	0		
IPE330	0.000154	0.13712	0.03548	1.991E-07	0.018	0	0	0	0		
IPE360	0.000191	0.1496	0.03788	3.136E-07	0.018	0	0	0	0		
IPE400	0.000229	0.16545	0.03949	4.9E-07	0.021	0	0	0	0		
IPE450	0.000276	0.1848	0.04119	1E-06	0.021	0	0	0	0		

Table 2.2 - Frame Section Property Definitions - Summary (Part 4 of 4)

Name	Area Modifier	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
2"x1/4	1	1	1	1	1	1	1	1
Cajon50x100x2.5	1	1	1	1	1	1	1	1
Colcircular40	1	1	1	1	1	1	1	1
HE280B	1	1	1	1	1	1	1	1
IPE120	1	1	1	1	1	1	1	1
IPE200	1	1	1	1	1	1	1	1
IPE220	1	1	1	1	1	1	1	1
IPE240	1	1	1	1	1	1	1	1
IPE270	1	1	1	1	1	1	1	1
IPE300	1	1	1	1	1	1	1	1
IPE330	1	1	1	1	1	1	1	1
IPE360	1	1	1	1	1	1	1	1
IPE400	1	1	1	1	1	1	1	1
IPE450	1	1	1	1	1	1	1	1

2.3 Shell Sections

Table 2.3 - Area Section Property Definitions - Summary

Name	Type	Element Type	Total Thickness m	Deck Material	Deck Depth m
Deck10	Deck	Membrane	0.1	A500GrB46	0.05
Deckmadera	Deck	Membrane	0.01667		
Plank1	Slab	Membrane	0.2		
Teja	Deck	Membrane	0.015		

2.4 Reinforcement Sizes

Table 2.4 - Reinforcing Bar Sizes

Name	Diameter m	Area m2
6	0.006	2.83E-05
8	0.008	0.0001
10	0.01	0.0001

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Name	Diameter m	Area m2
12	0.012	0.0001
14	0.014	0.0002
16	0.016	0.0002
18	0.018	0.0003
20	0.02	0.0003
22	0.022	0.0004
25	0.025	0.0005
26	0.026	0.0005
28	0.028	0.0006
32	0.032	0.0008
36	0.036	0.001
40	0.04	0.0013
50	0.05	0.002

2.5 Links

Table 2.5 - Link Property Definitions - Summary

Name	Type	Degrees of Freedom	Mass kgf-s2/m	Weight kgf	Defined Length m	Defined Area m2
Link1	Linear	U1	0	0	1	1

3 Assignments

This chapter provides a listing of the assignments applied to the model.

3.1 Joint Assignments

Table 3.1 - Joint Assignments - Summary

Story	Label	UniqueName	Diaphragm	Restraints
Story3	1	2	From Area	
Story3	6	19	From Area	
Story3	7	23	From Area	
Story3	10	35	From Area	
Story3	11	39	From Area	
Story3	16	15	From Area	
Story3	23	46	From Area	
Story3	30	53	From Area	
Story3	37	60	From Area	
Story3	44	67	From Area	
Story3	51	74	From Area	
Story3	58	81	From Area	
Story3	65	88	From Area	
Story3	68	91	From Area	
Story3	69	92	From Area	
Story3	70	93	From Area	
Story3	71	94	From Area	
Story3	2	5	From Area	
Story3	3	6	From Area	
Story3	12	7	From Area	
Story3	13	8	From Area	
Story3	14	9	From Area	
Story3	15	11	From Area	
Story3	17	27	From Area	
Story3	18	31	From Area	
Story3	19	42	From Area	
Story3	20	43	From Area	
Story3	21	44	From Area	
Story3	22	45	From Area	
Story3	24	47	From Area	
Story3	25	48	From Area	
Story3	26	49	From Area	
Story3	27	50	From Area	
Story3	48	104	From Area	
Story3	49	105	From Area	
Story3	50	106	From Area	
Story3	52	107	From Area	
Story3	53	108	From Area	
Story3	54	109	From Area	
Story3	29	110	From Area	
Story3	40	111	From Area	
Story3	55	112	From Area	
Story3	56	113	From Area	
Story3	57	114	From Area	
Story3	59	115	From Area	
Story3	60	116	From Area	
Story3	61	117	From Area	
Story3	95	118	From Area	
Story3	96	119	From Area	
Story3	97	120	From Area	

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