Designação	Combinação	Nº Barra	Perfil	L [m]	Área [mm²]	Tipo de Aço	Secção	$N_{c.Ed}$ [kN]	$N_{t.Ed}$ [kN]	$V_{z.Ed}$ [kN]	$V_{y.Ed}$ [kN]	$M_{Ed,z}$ [kN.m]	$M_{Ed,y}$ [kN.m]
								Esforços actuantes de cálculo (análise por troço)					
Madre Cobertura	ELU_Wyy	2942	IPE 140	2.90	1643	S 235	P_i	-	0.00	5.91	-0.07	0.00	0.00
			IPE 140	2.90	1643	S 235	P_m	-	0.00	5.91	0.13	-0.09	-7.14
			IPE 140	2.90	1643	S 235	P_f	-	0.00	-1.19	0.13	-0.09	-6.85
Madre Tapamentos	ELU_Wy	3768	UPN 140	3.55	2040	S 235	P_i	-	0.00	0.87	-0.60	-0.11	9.06
			UPN 140	3.55	2040	S 235	P_m	-	0.00	6.46	0.20	0.24	2.56
			UPN 140	3.55	2040	S 235	P_f	-	0.00	12.05	1.01	-0.83	-13.87
Travessa	ELU_Cob	2073	HE 200 B	7.31	7808	S 235	P_i	-	15.69	35.11	-0.26	-0.68	-85.65
			HE 200 B	7.31	7808	S 235	P_m	-	12.95	15.78	-0.26	0.26	19.87
			HE 200 B	7.31	7808	S 235	P_f	-	11.65	1.45	-1.79	-0.49	56.92
Pilar	ELU_Cob	2035	HE 240 B	9.00	10600	S 235	P_i	-93.03	-	-13.24	-1.25	-3.54	-47.40
			HE 240 B	9.00	10600	S 235	P_m	-86.36	-	-13.45	-1.25	2.48	12.96
			HE 240 B	9.00	10600	S 235	P_f	-80.18	-	-16.94	-1.25	8.72	84.75

Nº Barra	Secção	Carac. geo. Eixo YY - maior inércia: I_{perfil} [cm⁴]	W_{pl} [cm³]	W_{el} [cm³]	$A_{v.z}$ [cm²]	Carac. geo - Eixo ZZ - menor inércia: I_{perfil} [cm⁴]	W_{pl} [cm³]	W_{el} [cm³]	$A_{v.y}$ [cm²]	Classe: Bending	Compression	Esforços resistentes: $N_{t.rd}$ [kN]	$V_{pl,rd.z}$ [kN]	$V_{pl,rd.y}$ [kN]	$M_{pl,rd.y}$ [kN.m]	$M_{pl,rd.z}$ [kN.m]	$M_{el,rd.y}$ [kN.m]	$M_{el,rd.z}$ [kN.m]	Flexão com Esforço Transverso Plástico (§ 6.2.8): $h_w/t_w < (72\varepsilon)/\eta$	$V_{sd.z} > 0,5 V_{pl.rd.z}$	$V_{sd.y} > 0,5 V_{pl.rd.y}$	Esforço Transverso Elástico $(\tau_{ed}*3^{0.5}*\gamma_{M0})/f_y$: Eixo ZZ	Eixo YY
2942	P_i	541.2	88.34	77.32	7.64	44.92	19.25	12.31	8.79	1	1	386.1	103.7	119.3	20.8	4.5	18.2	2.9	OK	Desprezar Ved,z	Desprezar Ved,y	0.07	0.00
2942	P_m	541.2	88.34	77.32	7.64	44.92	19.25	12.31	8.79	1	1	386.1	103.7	119.3	20.8	4.5	18.2	2.9	OK	Desprezar Ved,z	Desprezar Ved,y	0.07	0.00
2942	P_f	541.2	88.34	77.32	7.64	44.92	19.25	12.31	8.79	1	1	386.1	103.7	119.3	20.8	4.5	18.2	2.9	OK	Desprezar Ved,z	Desprezar Ved,y	-0.01	0.00
3768	P_i	605	103	86.4	10.41	62.7	28.3	14.8	9.99	1	1	479.4	141.2	135.5	24.2	6.7	20.3	3.5	OK	Desprezar Ved,z	Desprezar Ved,y	0.01	0.00
3768	P_m	605	103	86.4	10.41	62.7	28.3	14.8	9.99	1	1	479.4	141.2	135.5	24.2	6.7	20.3	3.5	OK	Desprezar Ved,z	Desprezar Ved,y	0.06	0.00
3768	P_f	605	103	86.4	10.41	62.7	28.3	14.8	9.99	1	1	479.4	141.2	135.5	24.2	6.7	20.3	3.5	OK	Desprezar Ved,z	Desprezar Ved,y	0.11	0.01
2073	P_i	5696	642.5	569.6	24.83	2003	305.8	200.3	53.25	1	1	1834.9	336.9	722.5	151.0	71.9	133.9	47.1	OK	Desprezar Ved,z	Desprezar Ved,y	0.17	0.00
2073	P_m	5696	642.5	569.6	24.83	2003	305.8	200.3	53.25	1	1	1834.9	336.9	722.5	151.0	71.9	133.9	47.1	OK	Desprezar Ved,z	Desprezar Ved,y	0.08	0.00
2073	P_f	5696	642.5	569.6	24.83	2003	305.8	200.3	53.25	1	1	1834.9	336.9	722.5	151.0	71.9	133.9	47.1	OK	Desprezar Ved,z	Desprezar Ved,y	0.01	0.00
2035	P_i	11260	1053	938.3	33.23	3923	498.4	326.9	72.77	1	1	2491.0	450.9	987.3	247.5	117.1	220.5	76.8	OK	Desprezar Ved,z	Desprezar Ved,y	-0.05	0.00
2035	P_m	11260	1053	938.3	33.23	3923	498.4	326.9	72.77	1	1	2491.0	450.9	987.3	247.5	117.1	220.5	76.8	OK	Desprezar Ved,z	Desprezar Ved,y	-0.05	0.00
2035	P_f	11260	1053	938.3	33.23	3923	498.4	326.9	72.77	1	1	2491.0	450.9	987.3	247.5	117.1	220.5	76.8	OK	Desprezar Ved,z	Desprezar Ved,y	-0.06	0.00

Encurvadura por compressão (§ 6.3.1)

Nº Barra	Secção	Curva de enc.yy	Curva de enc.zz	β_A	α_{yy}	α_{zz}	Ly [cm]	Lz [cm]	Kyy	Kz z	$L_{cr,yy}$ [cm]	$L_{cr,zz}$ [cm]	λ_y	λ_z	λ_1	$\bar{\lambda}_y$	$\bar{\lambda}_z$	$\bar{\lambda}_y \leq 0,2$	$\bar{\lambda}_z \leq 0,2$	ϕ_y	ϕ_z	χ_y	χ_z	χ_{min}	$N_{b,rd.y}$ [kN]	$N_{b,rd.z}$ [kN]	$N_{Ed}/N_{b,rd}$
2942	P_i	a	b	1	0.21	0.34	290	290	1	1	290	290	50.52	175.76	93.90	0.54	1.87	Calcular Encurvadura	Calcular Encurvadura	0.68	2.54	0.91	0.24	0.24	352.139	90.914	0.000
2942	P_m	a	b	1	0.21	0.34	290	290	1	1	290	290	50.52	175.76	93.90	0.54	1.87	Calcular Encurvadura	Calcular Encurvadura	0.68	2.54	0.91	0.24	0.24	352.139	90.914	0.000
2942	P_f	a	b	1	0.21	0.34	290	290	1	1	290	290	50.52	175.76	93.90	0.54	1.87	Calcular Encurvadura	Calcular Encurvadura	0.68	2.54	0.91	0.24	0.24	352.139	90.914	0.000
3768	P_i	c	c	1	0.49	0.49	355	355	1	1	355	355	65.14	202.86	93.90	0.69	2.16	Calcular Encurvadura	Calcular Encurvadura	0.86	3.31	0.73	0.17	0.17	349.286	82.276	0.000
3768	P_m	c	c	1	0.49	0.49	355	355	1	1	355	355	65.14	202.86	93.90	0.69	2.16	Calcular Encurvadura	Calcular Encurvadura	0.86	3.31	0.73	0.17	0.17	349.286	82.276	0.000
3768	P_f	c	c	1	0.49	0.49	355	355	1	1	355	355	65.14	202.86	93.90	0.69	2.16	Calcular Encurvadura	Calcular Encurvadura	0.86	3.31	0.73	0.17	0.17	349.286	82.276	0.000
2073	P_i	b	c	1	0.34	0.49	731.1	731.1	1	1	731.1	731.1	85.61	144.20	93.90	0.91	1.54	Calcular Encurvadura	Calcular Encurvadura	1.04	2.01	0.65	0.30	0.30	1199.375	556.416	0.000
2073	P_m	b	c	1	0.34	0.49	731.1	731.1	1	1	731.1	731.1	85.61	144.20	93.90	0.91	1.54	Calcular Encurvadura	Calcular Encurvadura	1.04	2.01	0.65	0.30	0.30	1199.375	556.416	0.000
2073	P_f	b	c	1	0.34	0.49	731.1	731.1	1	1	731.1	731.1	85.61	144.20	93.90	0.91	1.54	Calcular Encurvadura	Calcular Encurvadura	1.04	2.01	0.65	0.30	0.30	1199.375	556.416	0.000
2035	P_i	b	c	1	0.34	0.49	900	900	1	1	900	900	87.29	148.03	93.90	0.93	1.58	Calcular Encurvadura	Calcular Encurvadura	1.06	2.08	0.64	0.29	0.29	1599.466	724.889	0.128
2035	P_m	b	c	1	0.34	0.49	900	900	1	1	900	900	87.29	148.03	93.90	0.93	1.58	Calcular Encurvadura	Calcular Encurvadura	1.06	2.08	0.64	0.29	0.29	1599.466	724.889	0.119
2035	P_f	b	c	1	0.34	0.49	900	900	1	1	900	900	87.29	148.03	93.90	0.93	1.58	Calcular Encurvadura	Calcular Encurvadura	1.06	2.08	0.64	0.29	0.29	1599.466	724.889	0.111

Encurvadura Lateral - $M_{b,Rd}$

Nº Barra	Secção	k_z	L [m]	L_{cr} [m]	k_w	ψ	Tipo carregamento	C1	C2	C3	Za [cm]	Zs [cm]	Zj [cm]	Zg [cm]	M_{cr} [KN.m]	Wy [cm³]	$\bar{\lambda}_{LT}$	$\bar{\lambda}_{LT} \leq 0,2$	Curva de Enc. Lat.	α_{LT}	ϕ_{LT}	χ_{LT}	$M_{b,rd.y}$ [kN.m]	$M_{ed,y}/M_{b,rd.y}$
2942	P_i	1	2.9	2.9	1	0.00	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	18.728	88.34	1.053	Calcular Bambeamento	a	0.21	1.144	0.629	13.050	0.000
2942	P_m	1	2.9	2.9	1	0.00	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	18.728	88.34	1.053	Calcular Bambeamento	a	0.21	1.144	0.629	13.050	0.547
2942	P_f	1	2.9	2.9	1	0.00	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	18.728	88.34	1.053	Calcular Bambeamento	a	0.21	1.144	0.629	13.050	0.525
3768	P_i	1	3.5	3.5	1	-0.65	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	47.991	103.00	0.710	Calcular Bambeamento	d	0.76	0.946	0.637	15.407	0.588
3768	P_m	1	3.5	3.5	1	-0.65	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	47.991	103.00	0.710	Calcular Bambeamento	d	0.76	0.946	0.637	15.407	0.166
3768	P_f	1	3.5	3.5	1	-0.65	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	47.991	103.00	0.710	Calcular Bambeamento	d	0.76	0.946	0.637	15.407	0.901
2073	P_i	1	7.3	7.3	1	-0.66	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	523.650	642.50	0.537	Calcular Bambeamento	a	0.21	0.680	0.912	137.759	0.622
2073	P_m	1	7.3	7.3	1	-0.66	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	523.650	642.50	0.537	Calcular Bambeamento	a	0.21	0.680	0.912	137.759	0.144
2073	P_f	1	7.3	7.3	1	-0.66	cud_sa	1.132	0.459	0.525	0.000	0.000	0.000	0.00	523.650	642.50	0.537	Calcular Bambeamento	a	0.21	0.680	0.912	137.759	0.413
2035	P_i	1	9.0	9.0	1	-0.56	me	2.700	0.000	0.603	0.000	0.000	0.000	0.00	836.609	#####	0.544	Calcular Bambeamento	a	0.21	0.684	0.910	225.203	0.210
2035	P_m	1	9.0	9.0	1	-0.56	me	2.700	0.000	0.603	0.000	0.000	0.000	0.00	836.609	#####	0.544	Calcular Bambeamento	a	0.21	0.684	0.910	225.203	0.058
2035	P_f	1	9.0	9.0	1	-0.56	me	2.700	0.000	0.603	0.000	0.000	0.000	0.00	836.609	#####	0.544	Calcular Bambeamento	a	0.21	0.684	0.910	225.203	0.376

Colunas-Vigas (Compressão + Flexão Desviada)

Susc. à def. por torç.?	Med,y entre travamentos em zz - C_{my}: L [m]	Med,y	Tipo de Diag. de Momentos	tipo de carga	M_h	α_s	α_h	ψ	C_{my}	Med,y entre travamentos em yy - C_{mLT}: L [m]	Med,y	Tipo de Diag. de Momentos	tipo de carga	M_h	α_s	α_h	ψ	C_{mLT}	Med,z entre travamentos em yy - C_{mz}: L [m]	Med,z	Tipo de Diag. de Momentos	tipo de carga	M_h	α_s	α_h	ψ	C_{mz}	Kyy	Kyz	Kzy	Kzz	$N_{ED}/N_{brd,y}$	$N_{ED}/N_{brd,z}$	$K_{yy}*(M_{Y,ED}/M_{brd,y})$	$K_{zy}*(M_{Y,ED}/M_{brd,y})$	$k_{yz}*(M_{z,ED}/M_{rd,z})$	$k_{zz}*(M_{z,ED}/M_{rd,z})$	Rácio da Eq. 6.61	Rácio da Eq. 6.62
Sim	2.90	0.00	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	0.00	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	0.00	>1_recta	cu	-0.09	1.00	-	0.00	1.00	0.998	0.599	1.000	0.998	0.000	0.000	0.546	0.547	0.012	0.019	0.557	0.566
Sim	2.90	-7.14	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	-7.14	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	-0.09	>1_recta	cu	-0.09	1.00	-	0.00	1.00	0.998	0.599	1.000	0.998	0.000	0.000	0.546	0.547	0.012	0.019	0.557	0.566
Sim	2.90	-6.85	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	-6.85	>1_recta	cu	-6.85	-	0.96	0.00	1.00	2.90	-0.09	>1_recta	cu	-0.09	1.00	-	0.00	1.00	0.998	0.599	1.000	0.998	0.000	0.000	0.546	0.547	0.012	0.019	0.557	0.566
Sim	10.00	9.06	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	9.06	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	-0.11	1_recta	cc	-0.83	-0.29	-	0.13	0.65	0.400	0.392	1.000	0.653	0.000	0.000	0.360	0.901	0.049	0.082	0.409	0.982
Sim	10.00	2.56	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	2.56	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	0.24	1_recta	cc	-0.83	-0.29	-	0.13	0.65	0.400	0.392	1.000	0.653	0.000	0.000	0.360	0.901	0.049	0.082	0.409	0.982
Sim	10.00	-13.87	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	-13.87	1_recta	cc	-13.87	-0.18	-	-0.65	0.40	10.00	-0.83	1_recta	cc	-0.83	-0.29	-	0.13	0.65	0.400	0.392	1.000	0.653	0.000	0.000	0.360	0.901	0.049	0.082	0.409	0.982
Sim	14.62	-85.65	>1_recta	cu	-85.65	0.09	-	0.04	0.40	7.31	-85.65	>1_recta	cu	-85.65	-0.23	-	-0.66	0.40	7.31	-0.68	>1_recta	cu	-0.68	-0.38	-	0.73	0.40	0.400	0.243	1.000	0.405	0.000	0.000	0.249	0.622	0.002	0.004	0.251	0.626
Sim	14.62	-7.60	>1_recta	cu	-85.65	0.09	-	0.04	0.40	7.31	19.87	>1_recta	cu	-85.65	-0.23	-	-0.66	0.40	7.31	0.26	>1_recta	cu	-0.68	-0.38	-	0.73	0.40	0.400	0.243	1.000	0.405	0.000	0.000	0.249	0.622	0.002	0.004	0.251	0.626
Sim	14.62	-3.59	>1_recta	cu	-85.65	0.09	-	0.04	0.40	7.31	56.92	>1_recta	cu	-85.65	-0.23	-	-0.66	0.40	7.31	-0.49	>1_recta	cu	-0.68	-0.38	-	0.73	0.40	0.400	0.243	1.000	0.405	0.000	0.000	0.249	0.622	0.002	0.004	0.251	0.626
Sim	9.00	-47.40	>1_recta	cu	-47.40	-0.01	-	-0.09	0.40	9.00	-47.40	>1_recta	cu	84.75	0.15	-	-0.56	0.40	9.00	-3.54	>1_recta	cc	8.72	0.28	-	-0.41	0.43	0.417	0.302	0.914	0.504	0.058	0.128	0.157	0.344	0.023	0.038	0.238	0.510
Sim	9.00	0.42	>1_recta	cu	-47.40	-0.01	-	-0.09	0.40	9.00	12.96	>1_recta	cu	84.75	0.15	-	-0.56	0.40	9.00	2.48	>1_recta	cc	8.72	0.28	-	-0.41	0.43	0.417	0.302	0.914	0.504	0.058	0.128	0.157	0.344	0.023	0.038	0.238	0.510
Sim	9.00	4.42	>1_recta	cu	-47.40	-0.01	-	-0.09	0.40	9.00	84.75	>1_recta	cu	84.75	0.15	-	-0.56	0.40	9.00	8.72	>1_recta	cc	8.72	0.28	-	-0.41	0.43	0.417	0.302	0.914	0.504	0.058	0.128	0.157	0.344	0.023	0.038	0.238	0.510

Análise da secção Tranversal (Flexão Composta Desviada + Esforço Transverso)

n	a	Momentos segundo eixo YY - Classes 1 ou 2: $0.25*N_{pl,Rd}$	$0.5*A_w*f_y/\gamma_{M0}$	Condição de verificação	$M_{N,Rd.y}$	α	$(M_{Ed,y}/M_{N,Rd.y})^{\alpha}$	Momentos segundo eixo ZZ - Classes 1 ou 2: A_w*f_y/γ_{M0}	Condição de verificação	$M_{N,Rd.z}$	β	$(M_{Ed,z}/M_{N,Rd.z})^{\beta}$	Classe 3 (Falta fazer uma verificação da análise de tensões, se é inferior a f_y): $N_{Ed}/N_{t,Rd}$	$M_{Ed,y}/M_{el,Rd.y}$	$M_{Ed,z}/M_{el,Rd.z}$	Rácio da Eq.6.41 ou Eq.6.2
0.000	0.387	96.53	69.69	Desprezável	20.76	2.00	0.00	139.39	Desprezável	4.52	1.00	0.00	0.000	0.000	0.000	0.000
0.000	0.387	96.53	69.69	Desprezável	20.76	2.00	0.12	139.39	Desprezável	4.52	1.00	0.02	0.000	0.393	0.030	0.138
0.000	0.387	96.53	69.69	Desprezável	20.76	2.00	0.11	139.39	Desprezável	4.52	1.00	0.02	0.000	0.377	0.030	0.128
0.000	0.412	119.85	98.70	Desprezável	24.21	2.00	0.14	197.40	Desprezável	6.65	1.00	0.02	0.000	0.446	0.032	0.157
0.000	0.412	119.85	98.70	Desprezável	24.21	2.00	0.01	197.40	Desprezável	6.65	1.00	0.04	0.000	0.126	0.070	0.048
0.000	0.412	119.85	98.70	Desprezável	24.21	2.00	0.33	197.40	Desprezável	6.65	1.00	0.13	0.000	0.683	0.240	0.454
0.009	0.232	458.72	179.78	Desprezável	150.99	2.00	0.32	359.55	Desprezável	71.86	1.00	0.01	0.009	0.640	0.014	0.331
0.009	0.232	458.72	179.78	Desprezável	150.99	2.00	0.02	359.55	Desprezável	71.86	1.00	0.00	0.009	0.148	0.006	0.021
0.009	0.232	458.72	179.78	Desprezável	150.99	2.00	0.14	359.55	Desprezável	71.86	1.00	0.01	0.009	0.425	0.010	0.149
0.037	0.230	622.75	242.05	Desprezável	247.46	2.00	0.04	484.10	Desprezável	117.12	1.00	0.03	0.037	0.215	0.046	0.067
0.037	0.230	622.75	242.05	Desprezável	247.46	2.00	0.00	484.10	Desprezável	117.12	1.00	0.02	0.037	0.059	0.032	0.024
0.037	0.230	622.75	242.05	Desprezável	247.46	2.00	0.12	484.10	Desprezável	117.12	1.00	0.07	0.037	0.384	0.114	0.192

Legenda:	
Dados de entrada	
Resultados	
Si - Secção inicial	
Sm - Secção média	
Sf - Secção final	
me - momentos nas extremidades	
cud_sa - carga uniforme em viga simplesmente apoiada	
cu - carga uniforme	
1_recta - Variação linear de 1 troço	
>1_recta - Variação parabólica ou linear com mais de 1 troço	