

Ce calcul a été effectué avec le logiciel Freelem version 9.2.0 tuyauterie, conformément au Eurocode5. NF EN 1995-1-1 de novembre 2005 - Conception et calcul des structures en bois

Récapitulatif des données de calcul

Tableau des noeuds

N°	X (mm)	Y (mm)	Z (mm)	Appui
1	0	0	0	BlocageDX_DY_DZ_RX_RZ
2	10000	0	0	BlocageDZ
3	5000	0	2330	Libre
4	5000	0	0	Libre
5	3187	0	1485	Libre
6	6813	0	1485	Libre

Tableau des barres

N°	Noeud 1	Noeud 2	Profilé	Liaisons	Matériau	Angle (°)	Ky	Lfy(mm)	Kz	Lfz(mm)	Ldev_sup (mm)	Ldev_inf (mm)
1	4	2	MOISE_175x75	Enc-Art	RESINEUX_C18	0	1	5000	1	5000	5000	5000
2	1	5	REC_200x150	Enc-Enc	RESINEUX_C18	0	1	3516	1	3516	3516	3516
3	3	6	REC_200x150	Enc-Enc	RESINEUX_C18	0	1	2000	1	2000	2000	2000
4	1	4	MOISE_175x75	Art-Enc	RESINEUX_C18	0	1	5000	1	5000	5000	5000
5	3	4	REC_150x150	Art-Art	RESINEUX_C18	0	1	2330	1	2330	2330	2330
6	5	3	REC_200x150	Enc-Art	RESINEUX_C18	0	1	2000	1	2000	2000	2000
7	6	2	REC_200x150	Enc-Enc	RESINEUX_C18	0	1	3516	1	3516	3516	3516
8	4	5	REC_125x75	Art-Art	RESINEUX_C18	0	1	2344	1	2344	2344	2344
9	4	6	REC_125x75	Art-Art	RESINEUX_C18	0	1	2344	1	2344	2344	2344

Tableau des chargements

N°	Nom	Type	Localisation				Niveau Eurocode5
1	G	Linéique	6/2/3/7	0 N/mm	0 N/mm	-2.5 N/mm	
2	S	Linéique	6/2/3/7	0 N/mm	0 N/mm	-2 N/mm	
3	Sad	Linéique	6/2/3/7	0 N/mm	0 N/mm	-4.9 N/mm	

Tableau des combinaisons

N°	Nom	Cas	Coef	Cas	Coef	Règle
101		1	1.35	2	1.5	Linéaire
102		1	1	3	1	Linéaire

Caractéristiques matériaux

Matériau	E (MPa)	ρ (kg/m ³)	G (MPa)	f _{mk} (MPa)	f _{t0k} (MPa)	f _{t90k} (MPa)	f _{c0k} (MPa)	f _{c90k} (MPa)	f _{vk} (MPa)	E005 (MPa)
RESINEUX_C18	9000	380	560	18	11	.5	18	2.2	2	6000

Humidité bois : >13% et <20% (sous abri)

Caractéristiques profilés

Profilé	A _x (mm ²)	A _y (mm ²)	A _z (mm ²)	W _y (mm ²)	W _z (mm ²)	I _t (cm ⁴)	W _t (cm ³)	I _y (cm ⁴)	W _{fy} (cm ³)	I _z (cm ⁴)	W _{fz} (cm ³)
MOISE_175x75	26250	21875	21875	17500	17500	3596.7	499.86	6699.2	765.63	34453.1	2296.87
REC_200x150	30000	25000	25000	20000	20000	12149.1	1011.21	10000	1000	5625	750
REC_150x150	22500	18750	18750	15000	15000	7129.7	701.5	4218.8	562.5	4218.8	562.5
REC_125x75	9375	7813	7813	6250	6250	1100.5	165.81	1220.7	195.31	439.5	117.19

Résultats de calcul

Résultats intermédiaires

Barre	Noeud	Cas	k _{mod}	γ_M	k _h	f _{td} (MPa)	f _{cd} (MPa)	f _{md} (MPa) a)	f _{vd} (MPa)	σ_{Mcrit} (MPa)	λ_{relm}	k _{crit}	λ_{rel}	k	k _c
1	4	101	.9	1.3	1	7.62	12.46	12.46	1.38	15.04	1.09	.74	2.01	2.7	.22
1	2	101	.9	1.3	1	7.62	12.46	12.46	1.38	15.04	1.09	.74	2.01	2.7	.22
2	1	101	.9	1.3	1	7.62	12.46	12.46	1.38	149.74	.35	1	1.42	1.61	.42
2	5	101	.9	1.3	1	7.62	12.46	12.46	1.38	149.74	.35	1	1.42	1.61	.42
3	3	101	.9	1.3	1	7.62	12.46	12.46	1.38	263.25	.26	1	.81	.87	.82
3	6	101	.9	1.3	1	7.62	12.46	12.46	1.38	263.25	.26	1	.81	.87	.82
4	1	101	.9	1.3	1	7.62	12.46	12.46	1.38	15.04	1.09	.74	2.01	2.7	.22
4	4	101	.9	1.3	1	7.62	12.46	12.46	1.38	15.04	1.09	.74	2.01	2.7	.22
5	3	101	.9	1.3	1	7.62	12.46	12.46	1.38	301.29	.24	1	.94	1	.73
5	4	101	.9	1.3	1	7.62	12.46	12.46	1.38	301.29	.24	1	.94	1	.73
6	5	101	.9	1.3	1	7.62	12.46	12.46	1.38	263.25	.26	1	.81	.87	.82
6	3	101	.9	1.3	1	7.62	12.46	12.46	1.38	263.25	.26	1	.81	.87	.82
7	6	101	.9	1.3	1	7.62	12.46	12.46	1.38	149.74	.35	1	1.42	1.61	.42
7	2	101	.9	1.3	1	7.62	12.46	12.46	1.38	149.74	.35	1	1.42	1.61	.42
8	4	101	.9	1.3	1.04	7.9	12.46	12.92	1.38	89.85	.45	1	1.89	2.44	.25
8	5	101	.9	1.3	1.04	7.9	12.46	12.92	1.38	89.85	.45	1	1.89	2.44	.25
9	4	101	.9	1.3	1.04	7.9	12.46	12.92	1.38	89.85	.45	1	1.89	2.44	.25
9	6	101	.9	1.3	1.04	7.9	12.46	12.92	1.38	89.85	.45	1	1.89	2.44	.25

Résultats contraintes

Barre	Noeud	Cas	σ_{ax} (MPa)	σ_{fy} (MPa)	σ_{fz} (MPa)	σ_{vy} (MPa)	σ_{vz} (MPa)	σ_T (MPa)	Ratio axial flamb.	Ratio flexion Y dévers.	Ratio cisaillement	Ratio flexion +traction	Ratio flexion +compression	Ratio flexion déviée	Ratio flexion déviée +compression	Ratio max
1	4	101	-2.1	.51	0	0	0	0	.28	.06	0	.32	0	.04	0	.32
1	2	101	-2.1	0	0	0	0	0	.28	0	0	.28	0	0	0	.28
2	1	101	2.16	0	0	0	.43	0	.41	0	.31	0	.41	0	.41	.41
2	5	101	1.84	-5.73	0	0	-.59	0	.35	.46	.43	0	.56	.46	.69	.69
3	3	101	1.34	0	0	0	.15	0	.13	0	.11	0	.13	0	.13	.13
3	6	101	1.52	-5.73	0	0	-.43	0	.15	.46	.31	0	.36	.46	.59	.59
4	1	101	-2.1	0	0	0	0	0	.28	0	0	.28	0	0	0	.28
4	4	101	-2.1	.51	0	0	0	0	.28	.06	0	.32	0	.04	0	.32
5	3	101	-1.27	0	0	0	0	0	.17	0	0	.17	0	0	0	.17
5	4	101	-1.27	0	0	0	0	0	.17	0	0	.17	0	0	0	.17
6	5	101	1.52	-5.73	0	0	.43	0	.15	.46	.31	0	.36	.46	.59	.59
6	3	101	1.34	0	0	0	-.15	0	.13	0	.11	0	.13	0	.13	.13
7	6	101	1.84	-5.73	0	0	-.59	0	.35	.46	.43	0	.56	.46	.69	.69
7	2	101	2.16	0	0	0	-.43	0	.41	0	.31	0	.41	0	.41	.41
8	4	101	2.42	0	0	0	0	0	.77	0	0	0	.77	0	.77	.77
8	5	101	2.42	0	0	0	0	0	.77	0	0	0	.77	0	.77	.77
9	4	101	2.42	0	0	0	0	0	.77	0	0	0	.77	0	.77	.77
9	6	101	2.42	0	0	0	0	0	.77	0	0	0	.77	0	.77	.77

Résultats efforts

Ba	Nd	Cas	Fu (N)	Fv (N)	Fw (N)	Mu (N.m)	Mv (N.m)	Mw (N.m)
1	4	101	-55107	0	-79	0	393	0
1	4	102	-63968	0	-91	0	456	0
1	2	101	-55107	0	-79	0	0	0
1	2	102	-63968	0	-91	0	0	0
2	1	101	64770	0	8529	0	0	0
2	1	102	75184	0	9901	0	0	0
2	5	101	55303	0	-11788	0	-5728	0
2	5	102	64195	0	-13683	0	-6649	0
3	3	101	40084	0	2915	0	0	0
3	3	102	46529	0	3384	0	0	0
3	6	101	45471	0	-8643	0	-5728	0
3	6	102	52782	0	-10032	0	-6649	0
4	1	101	-55107	0	79	0	0	0
4	1	102	-63968	0	91	0	0	0
4	4	101	-55107	0	79	0	393	0
4	4	102	-63968	0	91	0	456	0
5	3	101	-28582	0	0	0	0	0
5	3	102	-33178	0	0	0	0	0
5	4	101	-28582	0	0	0	0	0
5	4	102	-33178	0	0	0	0	0
6	5	101	45471	0	8643	0	-5728	0
6	5	102	52782	0	10032	0	-6649	0
6	3	101	40084	0	-2915	0	0	0
6	3	102	46529	0	-3384	0	0	0
7	6	101	55303	0	11788	0	-5728	0
7	6	102	64195	0	13683	0	-6649	0
7	2	101	64770	0	-8529	0	0	0
7	2	102	75184	0	-9901	0	0	0
8	4	101	22678	0	0	0	0	0
8	4	102	26324	0	0	0	0	0
8	5	101	22678	0	0	0	0	0
8	5	102	26324	0	0	0	0	0
9	4	101	22678	0	0	0	0	0
9	4	102	26324	0	0	0	0	0
9	6	101	22678	0	0	0	0	0
9	6	102	26324	0	0	0	0	0

Résultats réactions

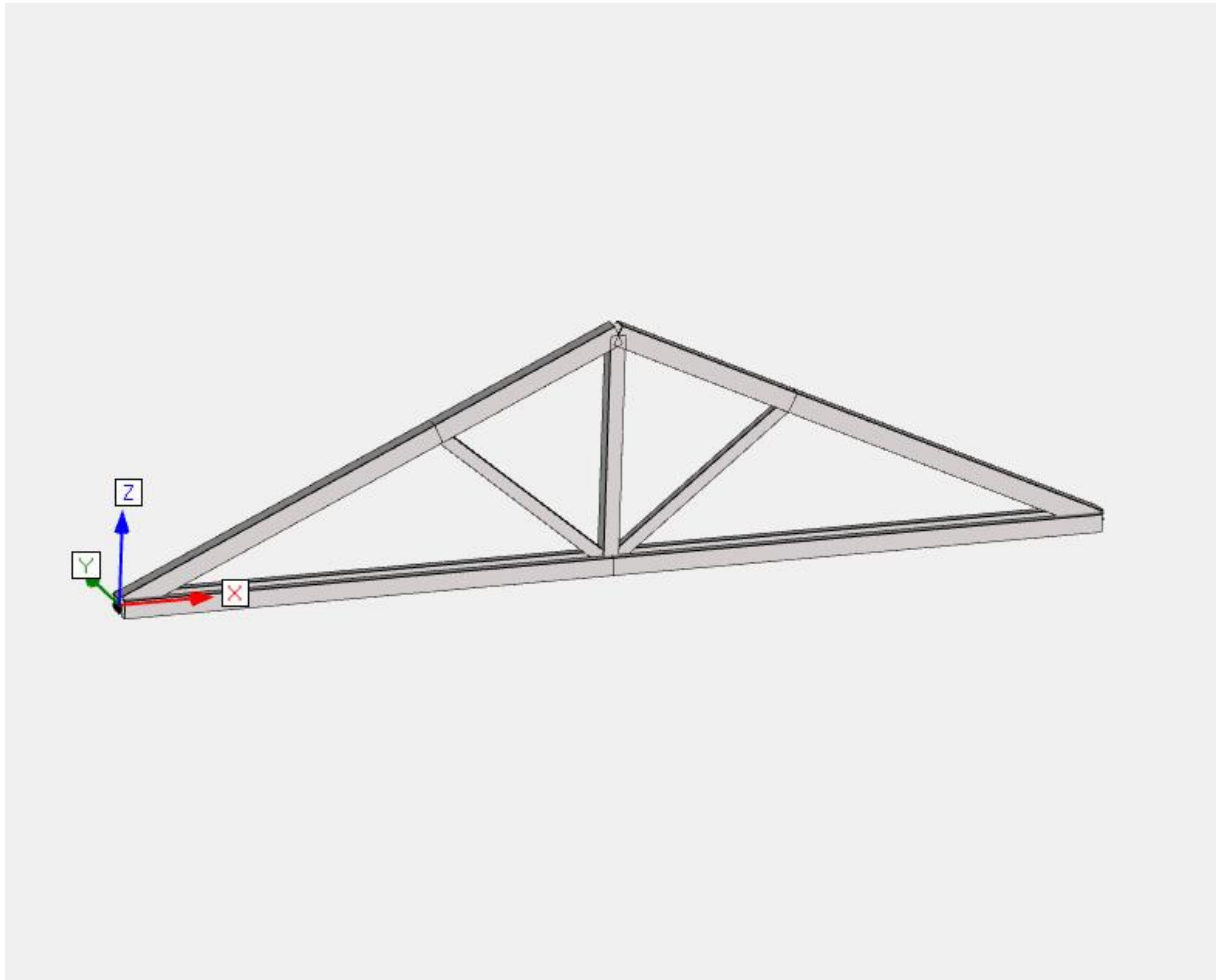
N°	Cas	Fx (N)	Fy (N)	Fz (N)	Mx (N.m)	My (N.m)	Mz (N.m)
1	101	0	0	35166	0	0	0
1	102	0	0	40820	0	0	0
2	101	0	0	35166	0	0	0
2	102	0	0	40820	0	0	0

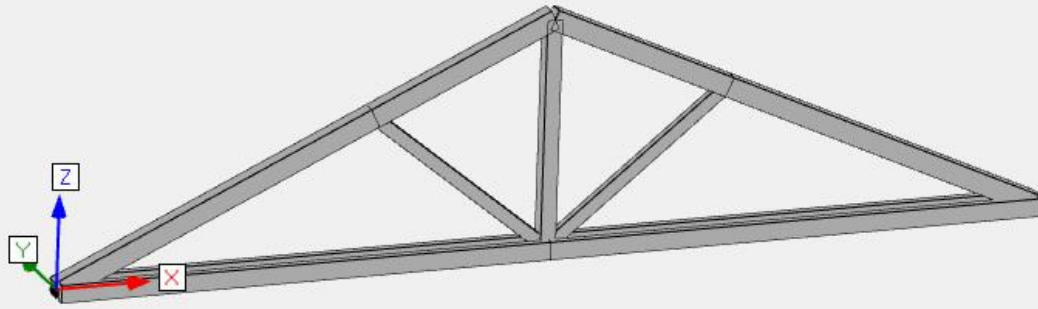
Synthèse des résultats de calculs : conclusion

Ce calcul a été effectué conformément Eurocode5.

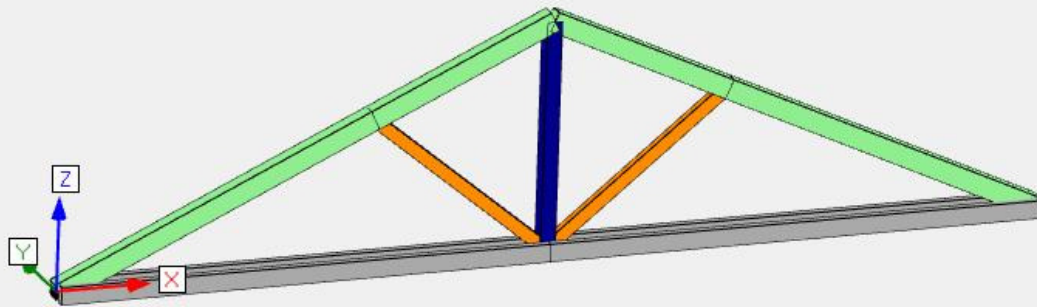
Le ratio maximal dans les profils est égal à .77.

captures d'écran de la modélisation





RESINEUX_C18

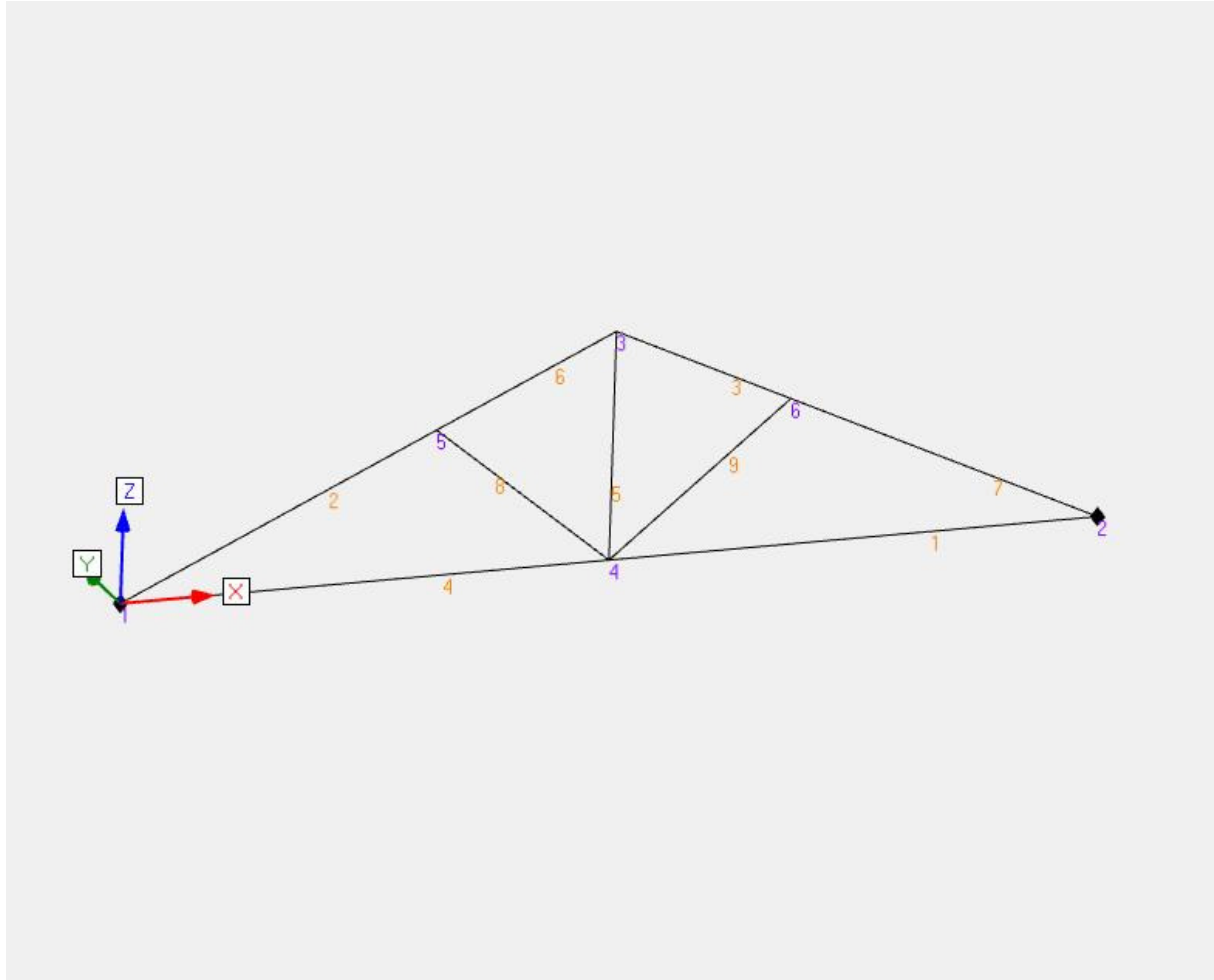


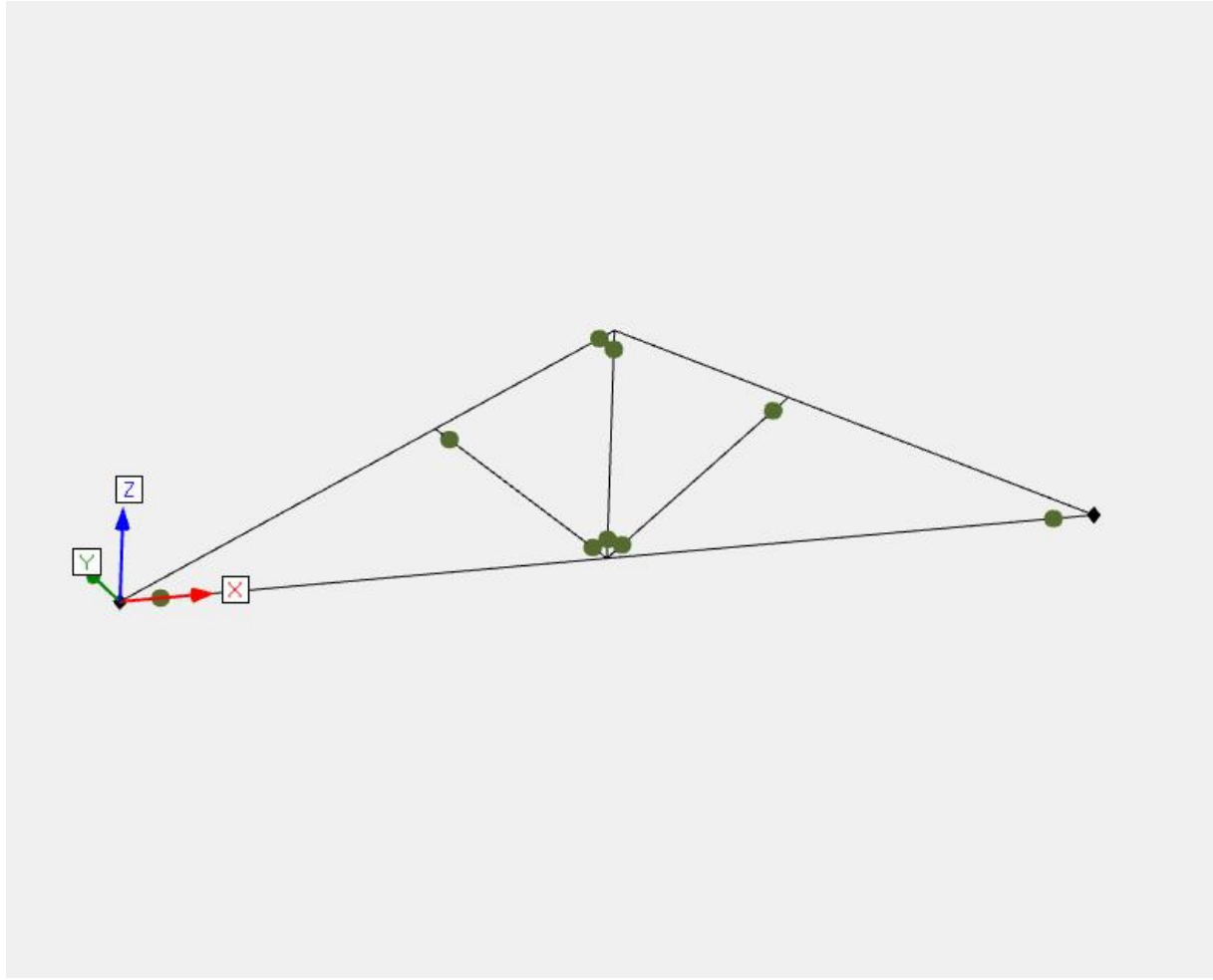
REC_125x75

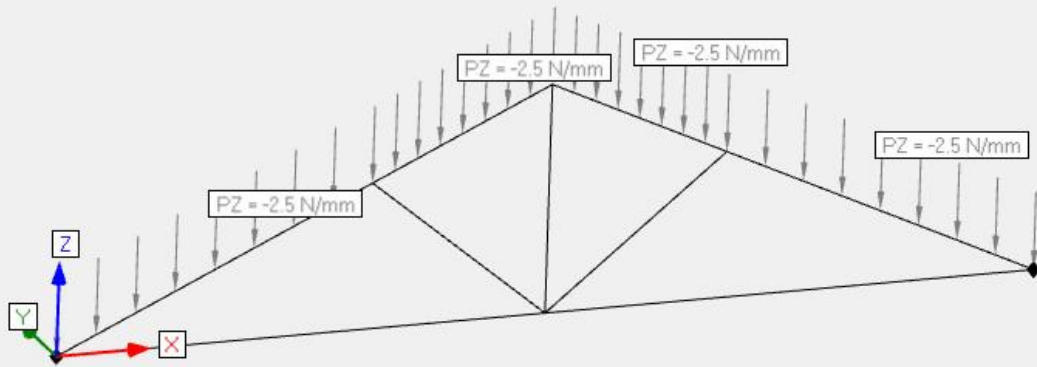
REC_150x150

REC_200x150

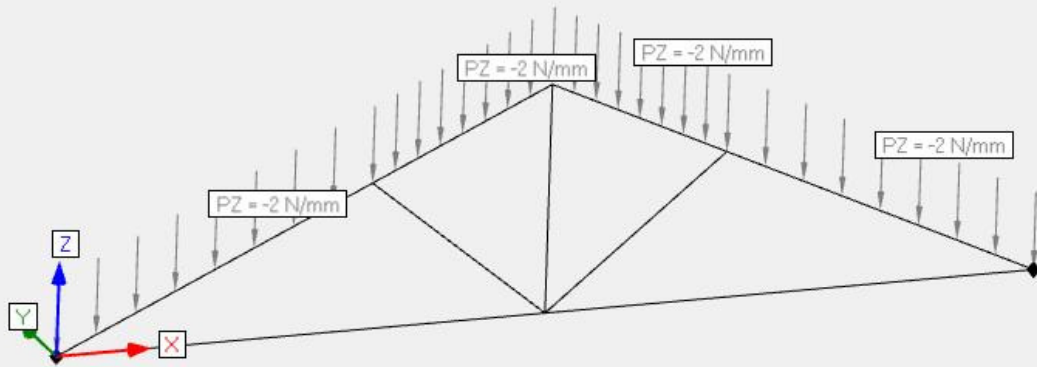
MOISE_175x75



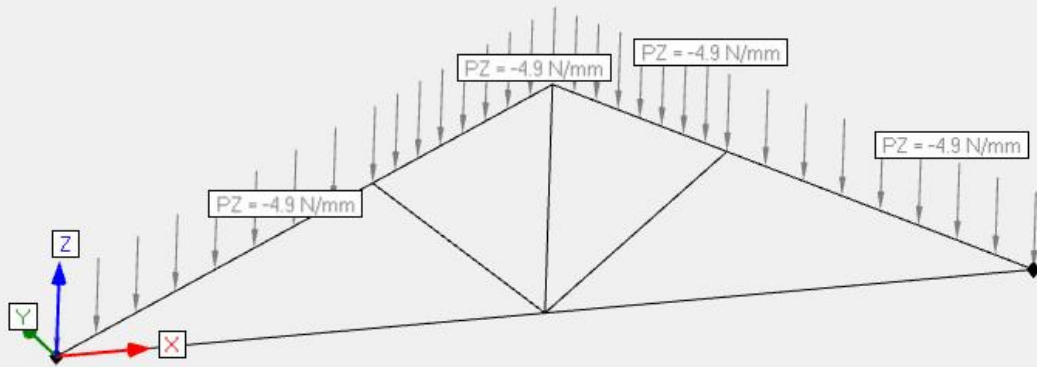




Chargement n° 1 : G



Chargement n° 2 : S



Chargement n° 3 : Sad