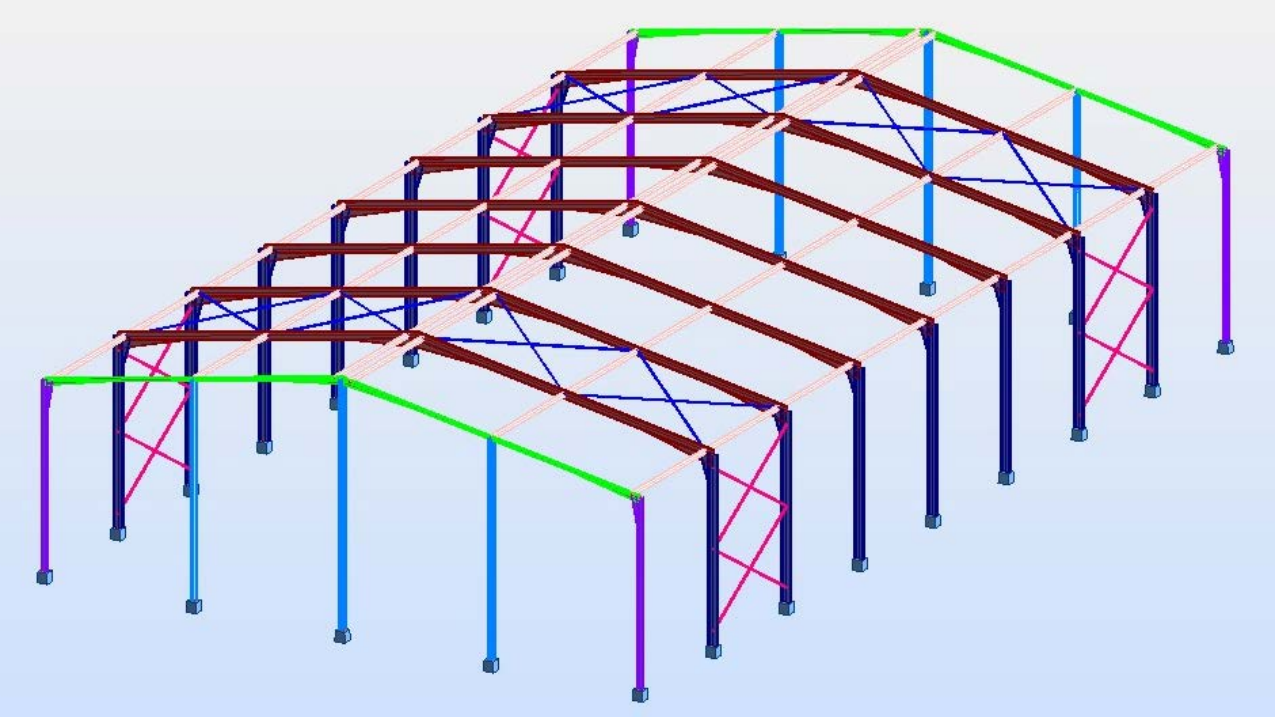
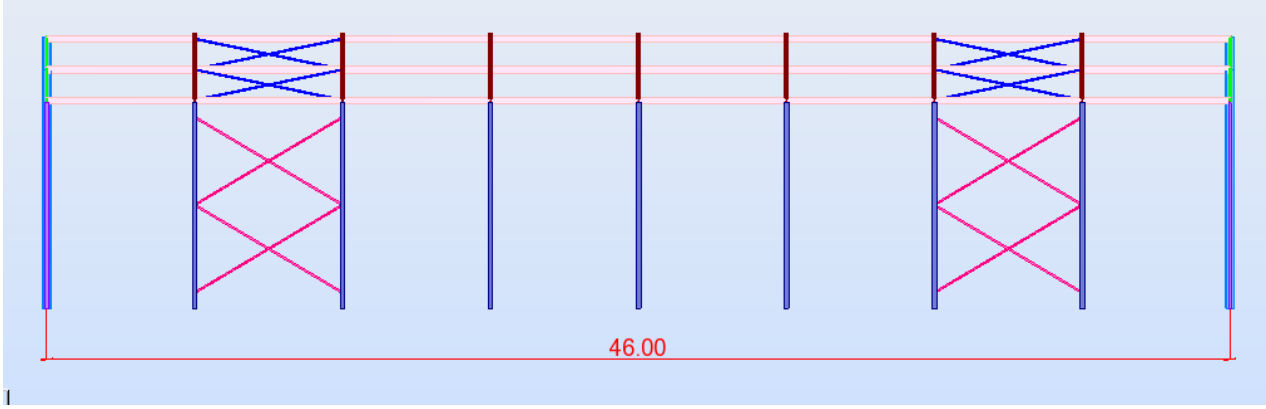
Project: play ground 27-46m

KHERBET DAWOUD



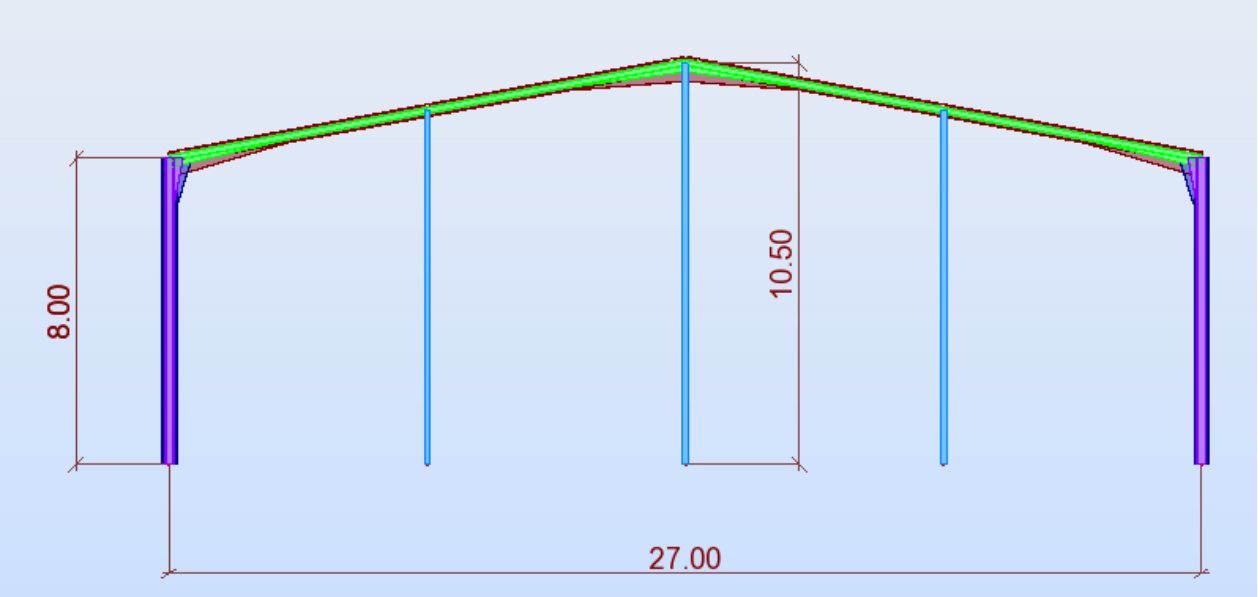
SIDE VIEW :

TOTAL LENGTH = 46 m

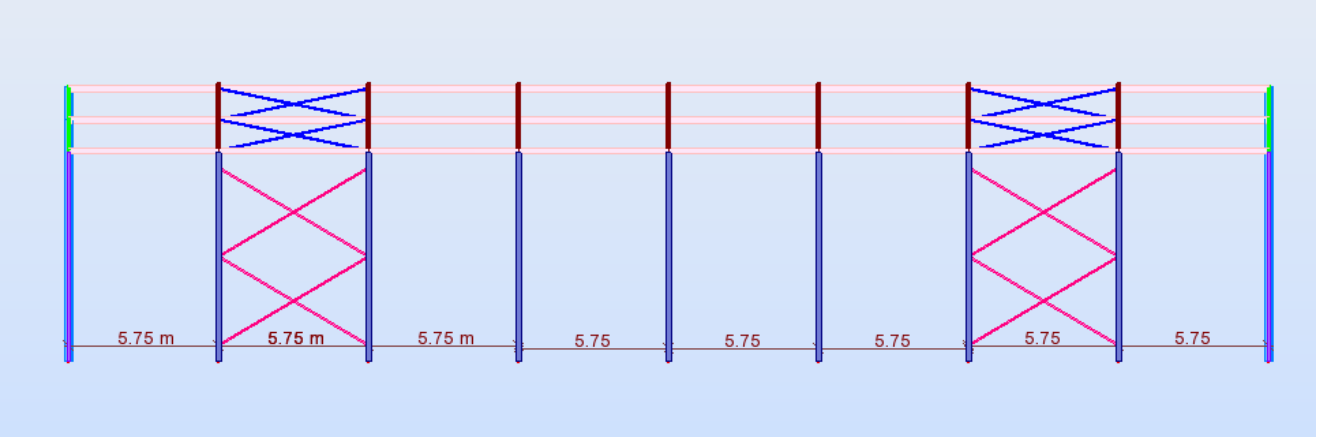


FRONT VIEW :

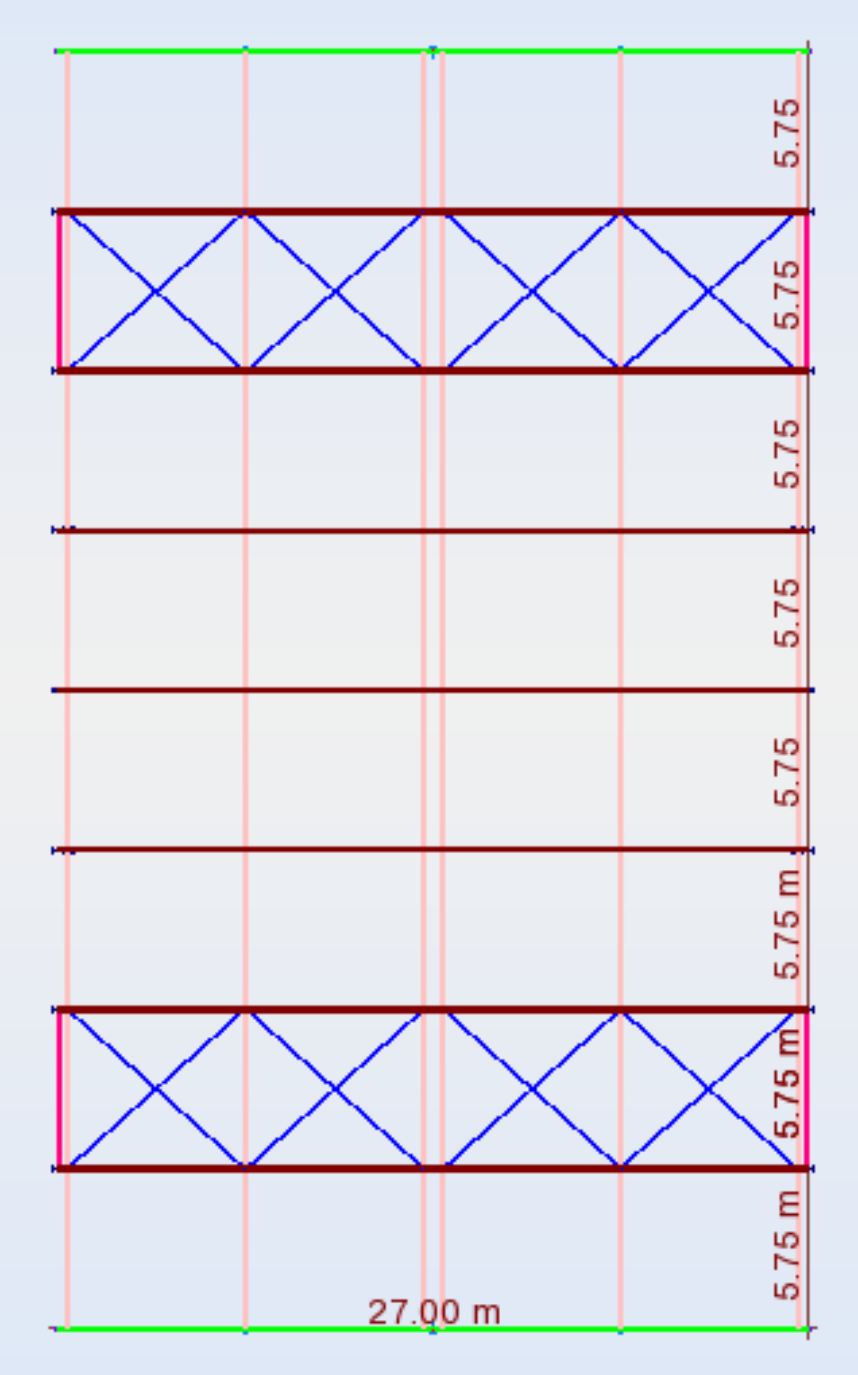
SPAN = 27 m , Column Height = 8m , Maximum Height = 10.5m



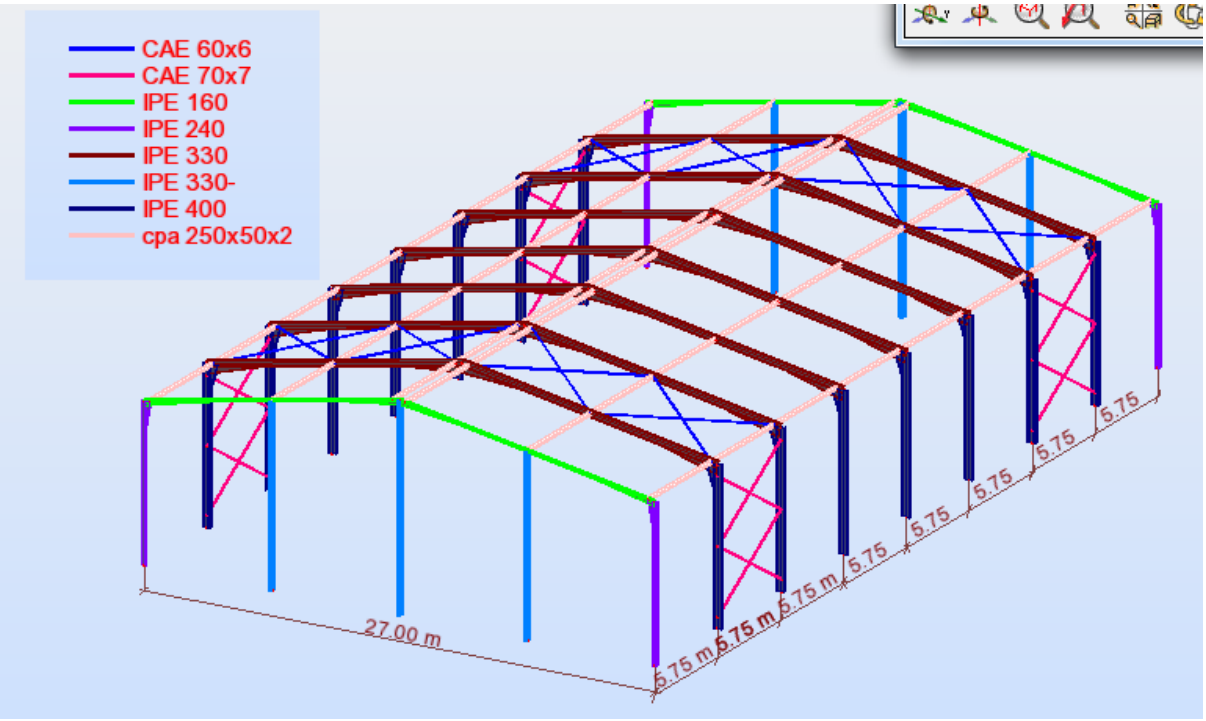
Distance between axes = 5.75 m



Top View :



Section By Colors :



Peripheric Columns	: IPE240
Intermediate Columns	: IPE 400
Peripheric Rafters	: IPE 160
Intermediate Rafters	: IPE330
Pignons (Front Columns)	: IPE 330
Top Purlins	: Galvanised C purlins 250 height , 2mm Thickness
Roof Bracing	: Angles L 60*60*6 mm
Wall Bracing	: Angles L 70*70*7 mm

Play ground not covered .

Calculation notes

Project properties: **new play ground 27-46m design**

Structure type: Space frame

Structure gravity center coordinates:
X = 13.500 *(m)*
Y = 17.850 *(m)*
Z = 5.229 *(m)*
Central moments of inertia of a structure:
Ix = 6558851.531 *(kg*m2)*
Iy = 3152452.475 *(kg*m2)*
Iz = 9225857.453 *(kg*m2)*
Mass = 30250.631 *(kg)*

Structure description

Number of nodes:	327
Number of bars:	250
Bar finite elements:	526
Planar finite elements:	0
Volumetric finite elements:	0
No of static degr. of freedom:	1818
Cases:	34
Combinations:	26

Section properties:

Roof bracing CAE 60x6

HY=6.0, HZ=6.0 [cm]
AX=6.91 [cm2]
IX=0.82, IY=22.79, IZ=22.79 [cm4]
Material=ACIER E24

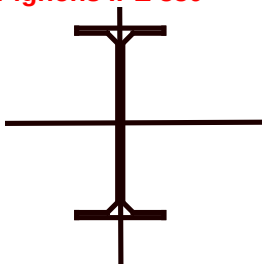
Wall bracing CAE 70x7

HY=7.0, HZ=7.0 [cm]
AX=9.40 [cm2]
IX=1.52, IY=42.30, IZ=42.30 [cm4]
Material=ACIER E24

Rafters IPE 330

HY=16.0, HZ=33.0 [cm]
AX=62.61 [cm2]
IX=25.70, IY=11766.90, IZ=788.14 [cm4]
Material=ACIER E24

Pignons IPE 330-



HY=16.0, HZ=33.0 [cm]
AX=62.61 [cm2]
IX=25.70, IY=11766.90, IZ=788.14 [cm4]
Material=ACIER E24

Peripherical Rafters IPE 160

HY=8.2, HZ=16.0 [cm]
AX=20.09 [cm2]
IX=3.53, IY=869.29, IZ=68.31 [cm4]
Material=ACIER E24

Roof Purlins cpa 250x50x2

HY=5.0, HZ=25.0 [cm]
AX=7.84 [cm2]
IX=0.14, IY=670.42, IZ=26.07 [cm4]
Material=ACIER E24

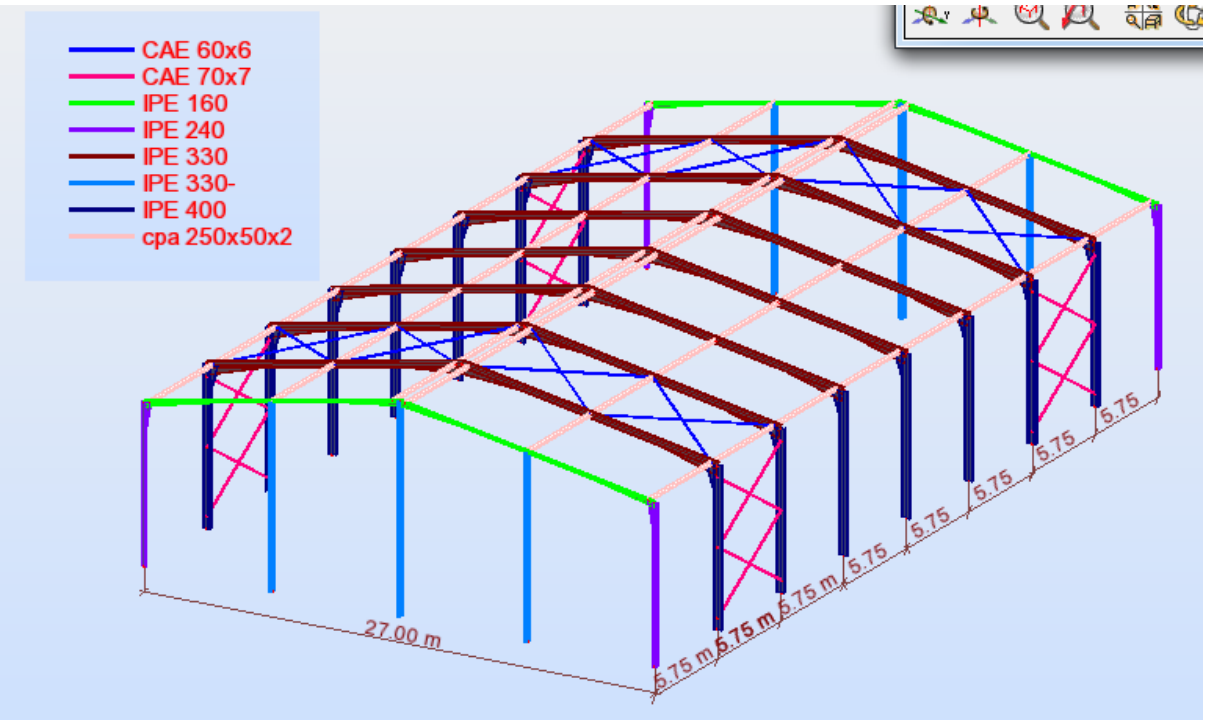
Main columns IPE 400

HY=18.0, HZ=40.0 [cm]
AX=84.46 [cm2]
IX=46.80, IY=23128.40, IZ=1317.82 [cm4]
Material=ACIER E24

Peripherical columns IPE 240

HY=12.0, HZ=24.0 [cm]
AX=39.12 [cm2]
IX=11.60, IY=3891.63, IZ=283.63 [cm4]
Material=ACIER E24

Sections by colors :



caractéristiques - Bars

Section name	Bar list	AX (cm2)	AY (cm2)	AZ (cm2)	IX (cm4)	IY (cm4)	IZ (cm4)
Roof Bracing CAE 60x6	164 A179	6.91	3.60	3.60	0.82	22.79	22.79
Wall Bracing CAE 70x7	196 A203	9.40	4.90	4.90	1.52	42.30	42.30
Raftters IPE 330	9A25P410A26P4	62.61	36.94	25.06	25.70	11766.90	788.14
Pignons columns IPE 330-	188 A193	62.61	36.94	25.06	25.70	11766.90	788.14
Peripherical rafters IPE 160	5 6 29 30	20.09	12.13	8.01	3.53	869.29	68.31
Roof Purlins cpa 250x50x2	31 32 34A163	7.84	1.96	4.96	0.14	670.42	26.07
Main Columns IPE 400	7A23P48A24P4	84.46	49.01	34.77	46.80	23128.40	1317.82
Peripherical Column IPE 240	1 2 27 28	39.12	23.93	15.06	11.60	3891.63	283.63

caractéristiques - Brackets

Bracket name	Bracket type	Length (cm) / REL	Height (cm) / REL	Width (cm) / REL	Thickness 1 (cm) / REL	Thickness 2 (cm) / REL	Position	List - beginning	List - end
Jarret_1	section	0.22 REL	1.00 REL	1.00 REL	1.00 REL	1.00 REL	down	5A29P4 6A30P4	5A29P4 6A30P4
Jarret_2	section	0.15 REL	1.00 REL	1.00 REL	1.00 REL	1.00 REL	down		1 7A27P4
Jarret_3	section	0.15 REL	1.00 REL	1.00 REL	1.00 REL	1.00 REL	up		2 8A28P4

caractéristiques - Materials

	Material	E (MPa)	G (MPa)	NI	LX (1/°C)	RO (daN/m3)	Re (MPa)
1	ACIER E24	210000.00	80800.00	0.30	0.00	7701.00	235.00

Loads :

- Cases: 1A10 12A41

Case	Load type	List	Load values
1	**self-weight**	1 2 5A32 34A179 188A203	PZ Negative Factor=1.00
1	**(FE) uniform Cover weight**	194 195	PZ=-6.00(daN/m2)
2	**(FE) uniform Live load @ roof**	194 195	PZ=-50.00(daN/m2)
3	**surface on object (Wind)**	194	PZ=102.18(daN/m2) Local=local
3	**surface on object (Wind)**	195	PZ=67.59(daN/m2) Local=local
4	**surface on object (Wind)**	194	PZ=38.72(daN/m2) Local=local
4	**surface on object (Wind)**	195	PZ=4.13(daN/m2) Local=local
5	**surface on object (Wind)**	194	PZ=99.86(daN/m2) Local=local
5	**surface on object (Wind)**	195	PZ=70.45(daN/m2) Local=local
6	**surface on object (Wind)**	194	PZ=36.39(daN/m2) Local=local
6	**surface on object (Wind)**	195	PZ=6.98(daN/m2) Local=local
7	**surface on object (Wind)**	194	PZ=84.63(daN/m2) Local=local
7	**surface on object (Wind)**	195	PZ=84.63(daN/m2) Local=local
8	**surface on object (Wind)**	194	PZ=21.16(daN/m2) Local=local
8	**surface on object (Wind)**	195	PZ=21.16(daN/m2) Local=local

Wind velocity 100km/h

combinaisons

- Cases: 9A34

Combinations	Name	Analysis type	Combination type	Definition
9	COMB1	Combinaison non-lin.	EFF	1*1.33+2*1.50
10	COMB2	Combinaison non-lin.	EFF	1*1.33+3*1.50
11	COMB3	Combinaison non-lin.	EFF	1*1.33+4*1.50
12	COMB4	Combinaison non-lin.	EFF	5*1.50
13	COMB5	Combinaison non-lin.	EFF	1*1.33+6*1.50
14	COMB6	Combinaison non-lin.	EFF	1*1.33+7*1.50
15	COMB7	Combinaison non-lin.	EFF	1*1.33+8*1.50
16	COMB8	Combinaison non-lin.	EFF	1*1.33+(2+3)*1.50
17	COMB9	Combinaison non-lin.	EFF	1*1.33+(2+4)*1.50
18	COMB10	Combinaison non-lin.	EFF	1*1.33+(2+5)*1.50
19	COMB11	Combinaison non-lin.	EFF	1*1.33+(2+6)*1.50
20	COMB12	Combinaison non-lin.	EFF	1*1.33+(2+7)*1.50
21	COMB13	Combinaison non-lin.	EFF	1*1.33+(2+8)*1.50
22	COMB14	Combinaison non-lin.	DEP	(1+2)*1.00
23	COMB15	Combinaison non-lin.	DEP	(1+3)*1.00
24	COMB16	Combinaison non-lin.	DEP	(1+4)*1.00
25	COMB17	Combinaison non-lin.	DEP	(1+5)*1.00
26	COMB18	Combinaison non-lin.	DEP	(1+6)*1.00
27	COMB19	Combinaison non-lin.	DEP	(1+7)*1.00
28	COMB20	Combinaison non-lin.	DEP	(1+8)*1.00
29	COMB21	Combinaison non-lin.	DEP	(1+2+3)*1.00
30	COMB22	Combinaison non-lin.	DEP	(1+2+4)*1.00
31	COMB23	Combinaison non-lin.	DEP	(1+2+5)*1.00
32	COMB24	Combinaison non-lin.	DEP	(1+2+6)*1.00
33	COMB25	Combinaison non-lin.	DEP	(1+2+7)*1.00
34	COMB26	Combinaison non-lin.	DEP	(1+2+8)*1.00

Réactions: Extrêmes globaux

	FX (daN)	FY (daN)	FZ (daN)	MX (daNm)	MY (daNm)	MZ (daNm)
MAX	8191.17	378.52	7748.74	1176.97	26590.33	0.66
Node	250	519	250	227	250	533
Case	12	14	9	14	14	12
MIN	-8827.67	-378.53	-12746.15	-1176.89	-31506.20	-0.66
Node	255	227	246	519	255	520
Case	12	14	12	14	12	12

Déplacements: Extrêmes globaux

- Cases: 1A34

	UX (cm)	UY (cm)	UZ (cm)	RX (Rad)	RY (Rad)	RZ (Rad)
MAX	1.7	0.2	1.4	0.042	0.028	0.008
Node	19	4	643	703	617	705
Case	10	12	12	12	12	14
MIN	-0.9	-0.2	-1.8	-0.042	-0.025	-0.008
Node	562	503	17	791	717	793
Case	14	12	9	12	14	14

Efforts: Extrêmes globaux

- Cases: 1A34

	FX (daN)	FY (daN)	FZ (daN)	MX (daNm)	MY (daNm)	MZ (daNm)
MAX	9022.24	110.76	8827.67	36.52	40943.39	262.57
Bar	25	347	15	216	18	211
Node	32	702	19	524	21	518
Case	9	14	12	12	12	10
MIN	-15124.20	-110.76	-11077.39	-36.53	-40943.39	-352.15
Bar	25	403	10	220	16	211
Node	32	777	11	537	21	504
Case	12	14	12	12	12	10

Contraintes: Extrêmes globaux

- Cases: 1A34

	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)	Fx/Ax (MPa)
MAX	535.47	21.35	428.36	176.54	0.0	0.0	23.71
Bar	238	142	209	353	239	239	229
Node	85	161	516	714	527	527	540
Case	14	12	14	14	1	1	12
MIN	-49.86	-471.72	0.0	0.0	-428.36	-60.46	-49.86
Bar	273	209	239	239	209	353	273
Node	493	516	527	527	516	714	493
Case	12	14	1	1	14	14	12

Steel design

CM66 - Member Verification (ULS) 256A259 268A279

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
256 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.14	9 COMB1
257 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.20	12 COMB4
258 Simple bar_	OK	CAE 60x6	ACIER E24	478.44	478.44	0.15	9 COMB1
259 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.17	12 COMB4
268 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.17	12 COMB4
269 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.15	9 COMB1
270 Simple bar_	OK	CAE 60x6	ACIER E24	478.44	478.44	0.20	12 COMB4
271 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.14	9 COMB1
272 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.13	9 COMB1
273 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.21	12 COMB4
274 Simple bar_	OK	CAE 60x6	ACIER E24	478.44	478.44	0.14	9 COMB1
275 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.19	12 COMB4
276 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.19	12 COMB4
277 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.14	9 COMB1
278 Simple bar_	OK	CAE 60x6	ACIER E24	478.44	478.44	0.21	12 COMB4
279 Simple bar_	OK	CAE 60x6	ACIER E24	478.43	478.43	0.13	9 COMB1

CM66 - Member Verification (ULS) 239 242A250P2 251 254 260A267

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
239 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
242 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
244 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
246 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
248 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
250 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
251 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
254 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
260 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
261 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
262 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
263 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
264 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1
265 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
266 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	12 COMB4
267 Simple bar_	OK	CAE 70x7	ACIER E24	314.85	314.85	0.00	9 COMB1

CM66 - Member Verification (ULS) 5 6 202 203

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
5 rafter_5	OK	IPE 160	ACIER E24	173.65	742.40	0.63	14 COMB6
6 rafter_6	OK	IPE 160	ACIER E24	173.65	742.40	0.97	10 COMB2
202 rafter_202	OK	IPE 160	ACIER E24	173.65	742.40	0.63	14 COMB6
203 琥-n	OK	IPE 160	ACIER E24	173.65	742.40	0.97	10 COMB2

CM66 - Member Verification (ULS) 1 2 200 201

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
1 Barre_1	OK	IPE 240	ACIER E24	52.41	207.63	0.23	10 COMB2
2 Poteau1_2	OK	IPE 240	ACIER E24	52.41	207.63	0.19	12 COMB4
200 Poteau1_20	OK	IPE 240	ACIER E24	52.41	207.63	0.23	10 COMB2
201 Poteau1_20	OK	IPE 240	ACIER E24	52.41	207.63	0.19	12 COMB4

CM66 - Member Verification (ULS) 9A25P4 10A26P4 215 216 219 220

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
9 rafter_9	OK	IPE 330	ACIER E24	83.61	385.49	0.85	12 COMB4
10 rafter_10	OK	IPE 330	ACIER E24	83.61	385.49	0.90	12 COMB4
13 rafter_13	OK	IPE 330	ACIER E24	83.61	385.49	0.85	12 COMB4
14 rafter_14	OK	IPE 330	ACIER E24	83.61	385.49	0.90	12 COMB4
17 rafter_17	OK	IPE 330	ACIER E24	83.61	385.49	0.85	12 COMB4
18 rafter_18	OK	IPE 330	ACIER E24	83.61	385.49	0.90	12 COMB4
21 rafter_21	OK	IPE 330	ACIER E24	83.61	385.49	0.85	12 COMB4
22 rafter_22	OK	IPE 330	ACIER E24	83.61	385.49	0.90	12 COMB4
25 rafter_25	OK	IPE 330	ACIER E24	83.61	385.49	0.85	12 COMB4
26 rafter_26	OK	IPE 330	ACIER E24	83.61	385.49	0.90	12 COMB4
215 rafter_215	OK	IPE 330	ACIER E24	83.61	385.49	0.76	12 COMB4
216 rafter_216	OK	IPE 330	ACIER E24	83.61	385.49	0.75	12 COMB4
219 rafter_219	OK	IPE 330	ACIER E24	83.61	385.49	0.76	12 COMB4
220 rafter_220	OK	IPE 330	ACIER E24	83.61	385.49	0.75	12 COMB4

CM66 - Member Verification (ULS) 188A190 210A212

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
188 Poteau1_18	OK	IPE 330-	ACIER E24	47.23	182.49	0.21	10 COMB2
189 Poteau1_18	OK	IPE 330-	ACIER E24	53.61	207.15	0.15	10 COMB2
190 Poteau1_19	OK	IPE 330-	ACIER E24	47.23	182.49	0.18	17 COMB9
210 Poteau1_21	OK	IPE 330-	ACIER E24	47.23	182.49	0.21	10 COMB2
211 Poteau1_21	OK	IPE 330-	ACIER E24	53.61	207.15	0.15	10 COMB2
212 Poteau1_21	OK	IPE 330-	ACIER E24	47.23	182.49	0.18	17 COMB9

CM66 - Member Verification (ULS) 7A23P4 8A24P4 213 214 217 218

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
7 Poteau1_7	OK	IPE 400	ACIER E24	31.34	141.57	0.97	12 COMB4
8 Poteau1_8	OK	IPE 400	ACIER E24	31.34	141.57	0.99	12 COMB4
11 Poteau1_11	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
12 Poteau1_12	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
15 Poteau1_15	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
16 Poteau1_16	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
19 Poteau1_19	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
20 Poteau1_20	OK	IPE 400	ACIER E24	31.58	141.57	0.99	12 COMB4
23 Poteau1_23	OK	IPE 400	ACIER E24	31.34	141.57	0.97	12 COMB4
24 Poteau1_24	OK	IPE 400	ACIER E24	31.34	141.57	0.99	12 COMB4
213 Poteau1_21	OK	IPE 400	ACIER E24	31.34	141.57	0.90	12 COMB4
214 Poteau1_21	OK	IPE 400	ACIER E24	31.34	141.57	0.83	12 COMB4
217 Poteau1_21	OK	IPE 400	ACIER E24	31.34	141.57	0.90	12 COMB4
218 Poteau1_21	OK	IPE 400	ACIER E24	31.34	141.57	0.83	12 COMB4

CM66 - Member Verification (SLS) 5 6 202 203

Results | Messages

Member		Section	Material	Ratio(uy	Case (uy)	Ratio(uz	Case (uz)
5 rafter_5	OK	IPE 160	ACIER E24	0.03	23 COMB15	0.20	27 COMB19
6 rafter_6	OK	IPE 160	ACIER E24	0.03	27 COMB19	0.37	23 COMB15
202 rafter_202	OK	IPE 160	ACIER E24	0.03	23 COMB15	0.20	27 COMB19
203 琥-n	OK	IPE 160	ACIER E24	0.03	27 COMB19	0.37	23 COMB15

CM66 - Member Verification (SLS) 1 2 200 201

Results | Messages

Member		Section	Material	Ratio(vx	Case (vx)	Ratio(vy	Case (vy)
1 Barre_1	OK	IPE 240	ACIER E24	0.26	23 COMB15	0.03	23 COMB15
2 Poteau1_2	OK	IPE 240	ACIER E24	0.26	23 COMB15	0.03	27 COMB19
200 Poteau1_20	OK	IPE 240	ACIER E24	0.26	23 COMB15	0.03	23 COMB15
201 Poteau1_20	OK	IPE 240	ACIER E24	0.26	23 COMB15	0.03	27 COMB19

CM66 - Member Verification (SLS) 9A25P4 10A26P4 215 216 219 220

Results | Messages

Member		Section	Material	Ratio(uy	Case (uy)	Ratio(uz	Case (uz)
9 rafter_9	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.63	33 COMB25
10 rafter_10	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.94	31 COMB23
13 rafter_13	OK	IPE 330	ACIER E24	0.01	31 COMB23	0.59	33 COMB25
14 rafter_14	OK	IPE 330	ACIER E24	0.01	31 COMB23	0.94	31 COMB23
17 rafter_17	OK	IPE 330	ACIER E24	0.00	31 COMB23	0.58	33 COMB25
18 rafter_18	OK	IPE 330	ACIER E24	0.00	33 COMB25	0.95	31 COMB23
21 rafter_21	OK	IPE 330	ACIER E24	0.01	31 COMB23	0.59	33 COMB25
22 rafter_22	OK	IPE 330	ACIER E24	0.01	31 COMB23	0.94	31 COMB23
25 rafter_25	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.63	33 COMB25
26 rafter_26	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.94	31 COMB23
215 rafter_215	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.55	33 COMB25
216 rafter_216	OK	IPE 330	ACIER E24	0.02	33 COMB25	0.75	31 COMB23
219 rafter_219	OK	IPE 330	ACIER E24	0.02	31 COMB23	0.55	33 COMB25
220 rafter_220	OK	IPE 330	ACIER E24	0.02	33 COMB25	0.75	31 COMB23

CM66 - Member Verification (SLS) 188A190 210A212

Results | Messages

Member		Section	Material	Ratio(vx	Case (vx)	Ratio(vy	Case (vy)
188 Poteau1_18	OK	IPE 330-	ACIER E24	0.22	24 COMB16	0.00	33 COMB25
189 Poteau1_18	OK	IPE 330-	ACIER E24	0.19	24 COMB16	0.01	31 COMB23
190 Poteau1_19	OK	IPE 330-	ACIER E24	0.22	24 COMB16	0.00	31 COMB23
210 Poteau1_21	OK	IPE 330-	ACIER E24	0.22	24 COMB16	0.00	33 COMB25
211 Poteau1_21	OK	IPE 330-	ACIER E24	0.19	24 COMB16	0.01	31 COMB23
212 Poteau1_21	OK	IPE 330-	ACIER E24	0.22	24 COMB16	0.00	31 COMB23

CM66 - Member Verification (SLS) 7A23P4 8A24P4 213 214 217 218

Results | Messages

Member		Section	Material	Ratio(vx	Case (vx)	Ratio(vy	Case (vy)
7 Poteau1_7	OK	IPE 400	ACIER E24	0.68	23 COMB15	0.02	23 COMB15
8 Poteau1_8	OK	IPE 400	ACIER E24	0.52	30 COMB22	0.02	25 COMB17
11 Poteau1_11	OK	IPE 400	ACIER E24	0.71	23 COMB15	0.01	23 COMB15
12 Poteau1_12	OK	IPE 400	ACIER E24	0.52	30 COMB22	0.01	25 COMB17
15 Poteau1_15	OK	IPE 400	ACIER E24	0.73	23 COMB15	0.00	27 COMB19
16 Poteau1_16	OK	IPE 400	ACIER E24	0.52	30 COMB22	0.00	22 COMB14
19 Poteau1_19	OK	IPE 400	ACIER E24	0.71	23 COMB15	0.01	23 COMB15
20 Poteau1_20	OK	IPE 400	ACIER E24	0.52	30 COMB22	0.01	25 COMB17
23 Poteau1_23	OK	IPE 400	ACIER E24	0.68	23 COMB15	0.02	23 COMB15
24 Poteau1_24	OK	IPE 400	ACIER E24	0.52	30 COMB22	0.02	25 COMB17
213 Poteau1_21	OK	IPE 400	ACIER E24	0.63	23 COMB15	0.03	23 COMB15
214 Poteau1_21	OK	IPE 400	ACIER E24	0.49	30 COMB22	0.03	25 COMB17
217 Poteau1_21	OK	IPE 400	ACIER E24	0.63	23 COMB15	0.03	23 COMB15
218 Poteau1_21	OK	IPE 400	ACIER E24	0.49	30 COMB22	0.03	25 COMB17