RÉPUBLIQUE TUNISIENNE
MINISTERE DE L'INTERIEUR
DIRECTION GENERALE DE LA GARDE NATIONALE

LA DIRECTION DE LA MUTUELLE DU PERSONNEL DE LA GARDE NATIONALE ET DE LA PROTECTION CIVILE

CONSTRUCTION D'UN IMMEUBLE (R+3) A USAGE DE COMMERCE AU RDC ET ADMINISTRATIFS AUX ÉTAGES COURANTS SISE A CITE TAIEB MHIRI L'AOUINA

LOT : STRUCTURE



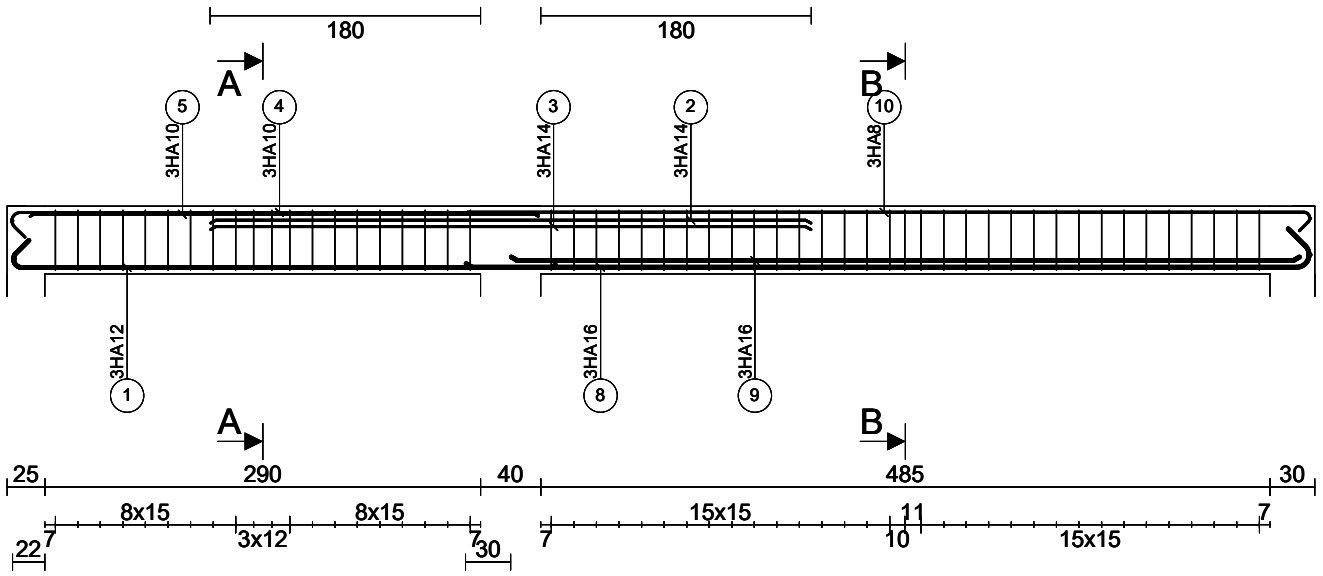
CAHIER DE FERRAILLAGE
" DES POUTRES ET NERVURES"

JUILLET.2026

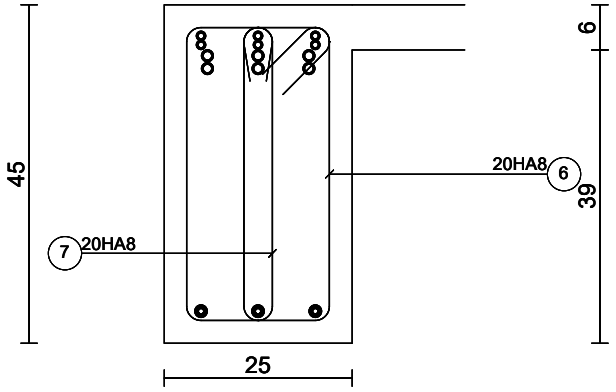
Best Engineering
مكتب الدّراسات ومتابعة الأشغال الهندسيّة
Colisée Soula Esc. B 3ème étage, El Manar II - 2092 TUNIS
Tél : +216 71 88 35 07 - Fax : +216 71 88 26 11
contact@best-tunisia.com - www.best-tunisia.com

GRAITEC	A1(25x45) PH RDC	A1.1 A A1.2	Béton=0.91 m3 Acier=160.6 kg d=175.8 kg/m3 Fi=10.6 mm Cof=8.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	1 2
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

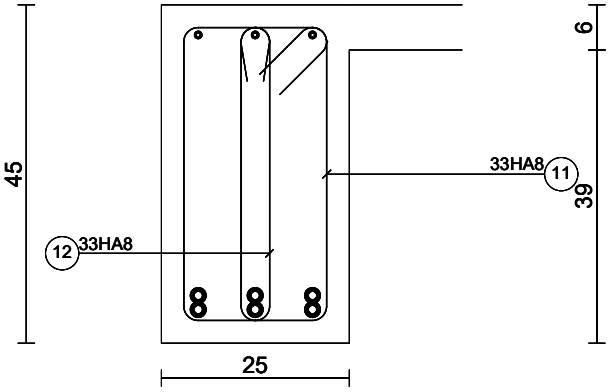
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

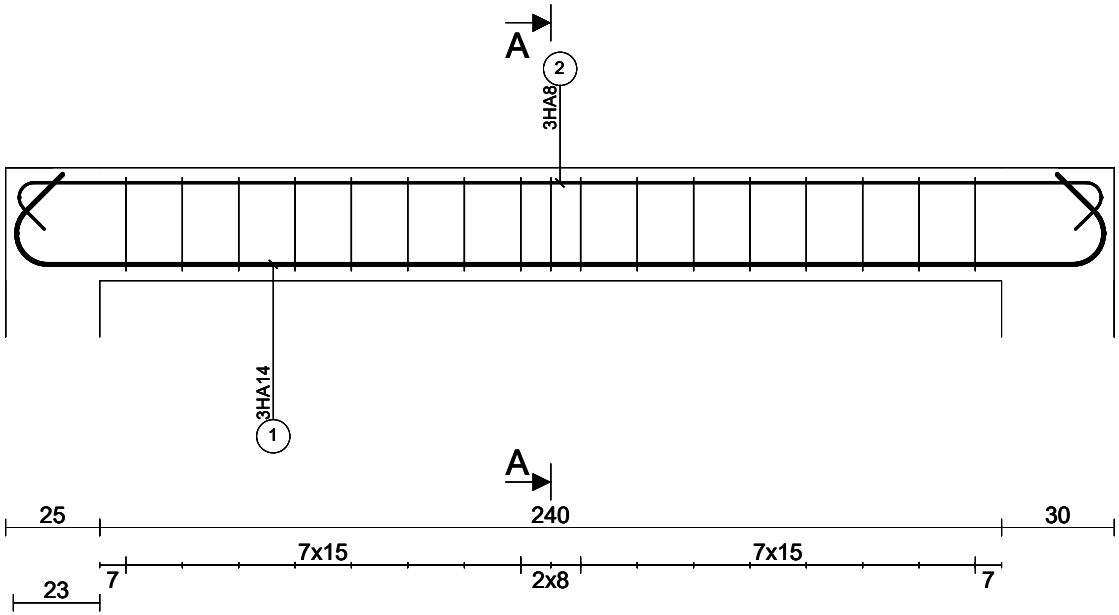


	Barre	Lg	Forme
1	3HA12	380	18 / 11 / 135° / 362
2	3HA14	400	400
3	3HA14	400	400
4	3HA10	368	16 / 11 / 135° / 351
5	3HA10	339	339
6	20HA8	135	40 / 20
7	20HA8	99	40
8	3HA16	588	25 / 17 / 135° / 562
9	3HA16	525	525
10	3HA8	576	12 / 8 / 135° / 563
11	33HA8	135	40 / 20
12	33HA8	99	40

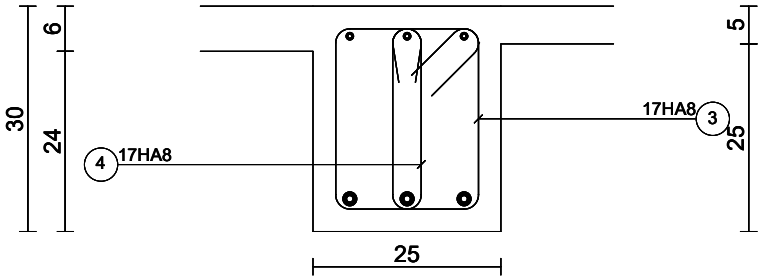
Barre	Lg/Poids
HA8	141.1/55.7
HA10	21.2/13.1
HA12	11.4/10.1
HA14	24.0/29.0
HA16	33.4/52.7

GRAITEC	A2(25x30) PH RDC	A2	Béton=0.18 m3 Acier=27.7 kg d=153.2 kg/m3 Fi=9.6 mm Cof=1.8 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	7 7
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/10

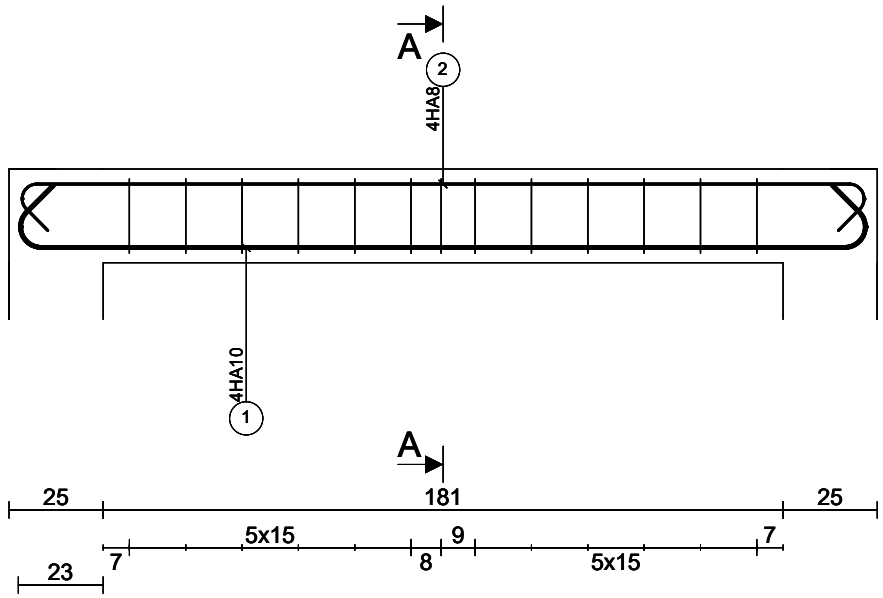


	Barre	Lg	Forme
1	3HA14	340	23 16 23 135° 135° 291
2	3HA8	315	12 8 8 12 135° 135° 289
3	17HA8	105	25 20
4	17HA8	69	25

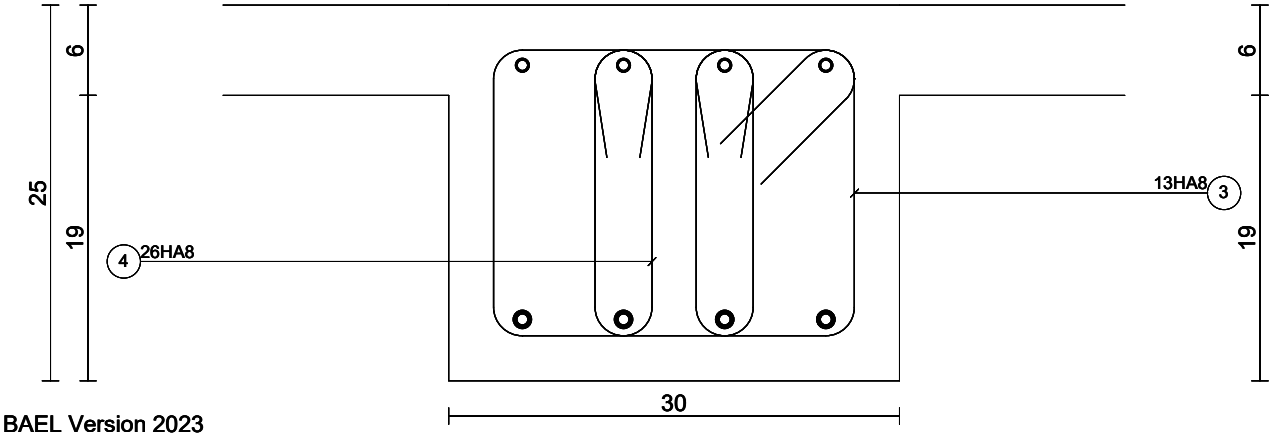
Barre	Lg/Poids
HA8 HA14	39.0/15.4 10.2/12.3

GRAITEC	Poutre n030 Niveau n02 PH RDC	A2BIS	Béton=0.13 m3 Acier=21.8 kg d=165.4 kg/m3 Fi=8.5 mm Cof=1.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	30 30
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5



	Barre	Lg	Forme
1	4HA10	260	16 16 135° 1111 135° 226
2	4HA8	251	12 12 135° 8 8 135° 225
3	13HA8	105	20 25
4	26HA8	59	20

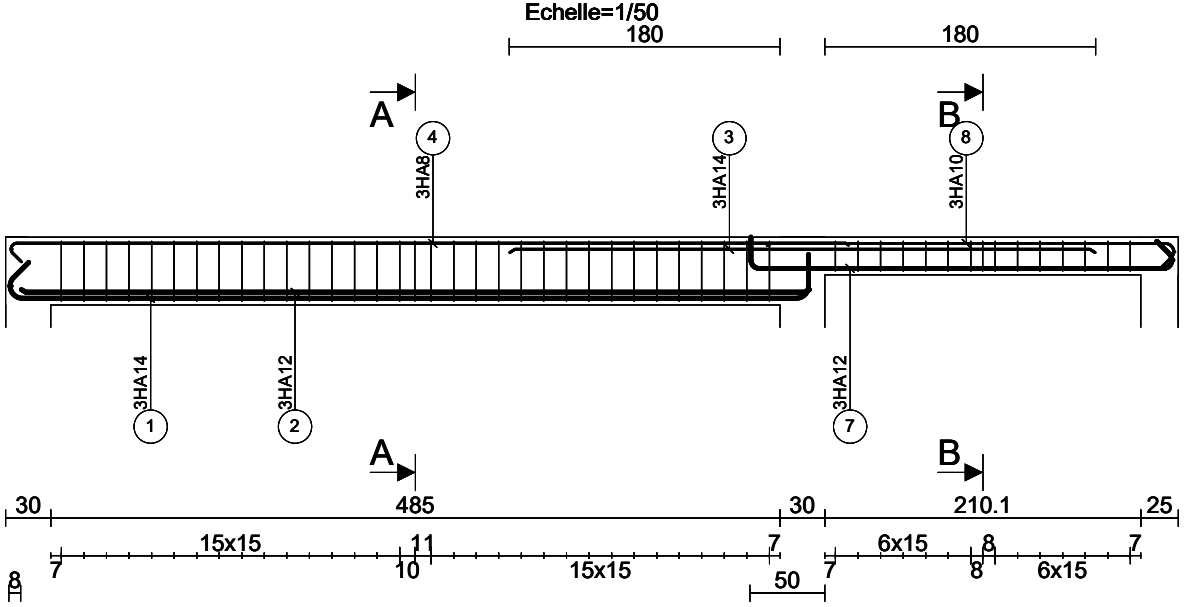
Barre	Lg/Poids
HA8 HA10	39.0/15.4 10.4/6.4

GRAITEC

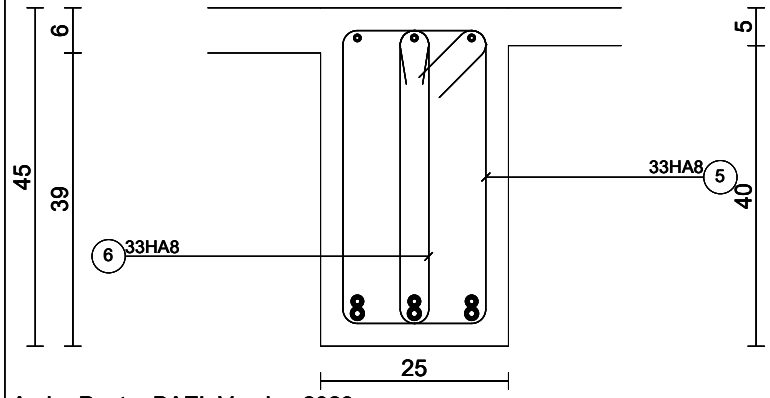
A3.1(25x45)/A3.2(25x25) PH RDC	A3.1 A A3.2	Béton=0.65 m3 Acier=109.4 kg d=169.5 kg/m3 Fi=9.9 mm Cof=6.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	8 8
IMMEUBLE MUTUELLE R+3				

Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable

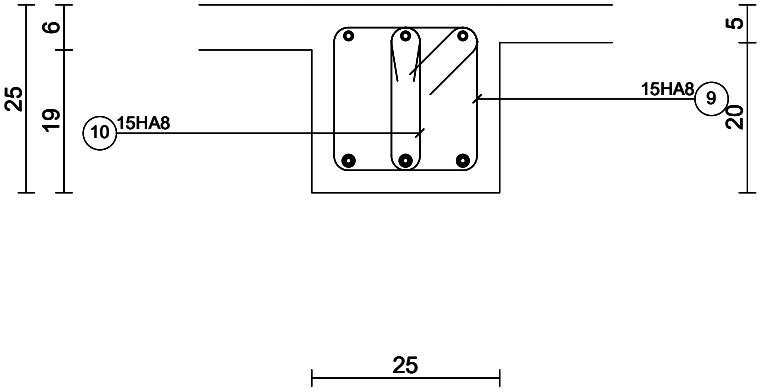
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

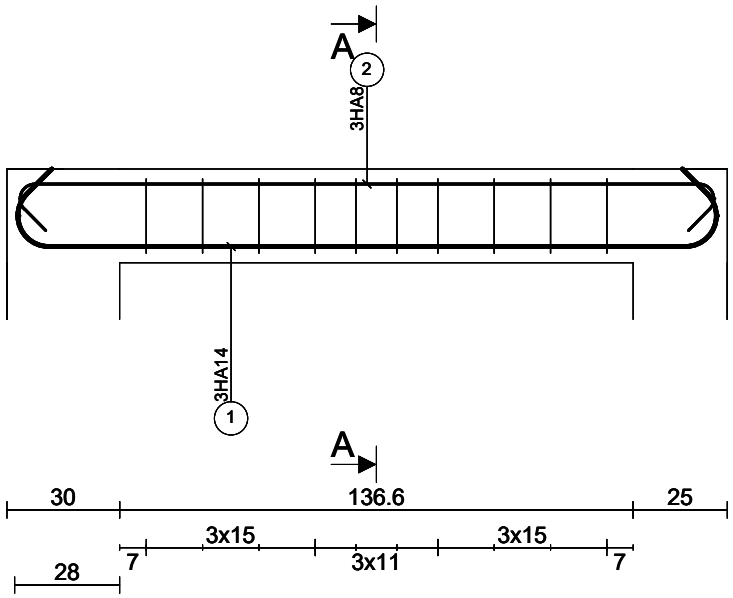


	Barre	Lg	Forme
1	3HA14	582	23, 16, 16, 30, 135°, 90°, 533
2	3HA12	525	525
3	3HA14	390	390
4	3HA8	571	8, 12, 135°, 558
5	33HA8	135	40, 20
6	33HA8	99	40
7	3HA12	321	24, 11, 11, 18, 90°, 135°, 282
8	3HA10	288	16, 11, 135°, 271
9	15HA8	95	20, 20
10	15HA8	59	20

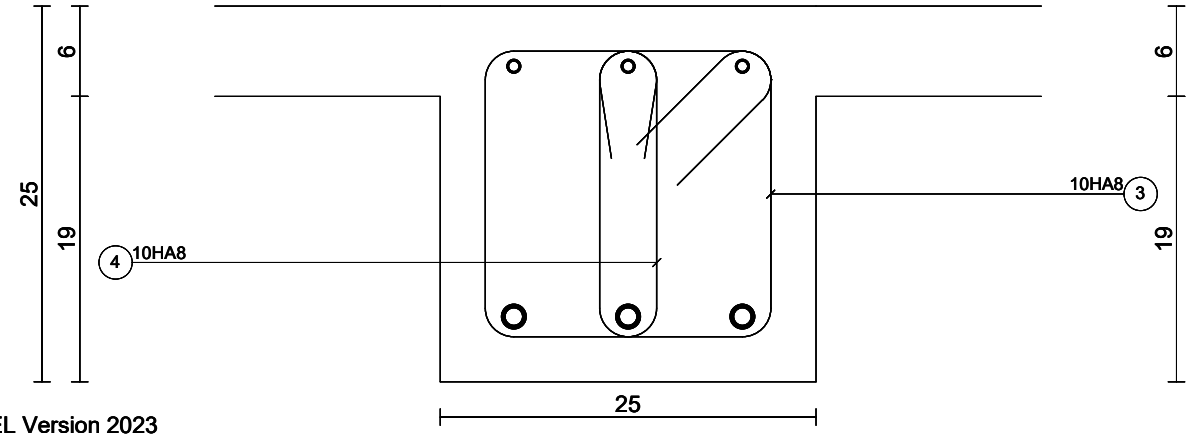
Barre	Lg/Poids
HA8	117.3/46.3
HA10	8.6/5.3
HA12	25.4/22.5
HA14	29.2/35.2

GRAITEC	A3BIS(25x25) PH RDC	A3BIS	Béton=0.09 m3 Acier=17.1 kg d=188.1 kg/m3 Fi=9.8 mm Cof=0.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

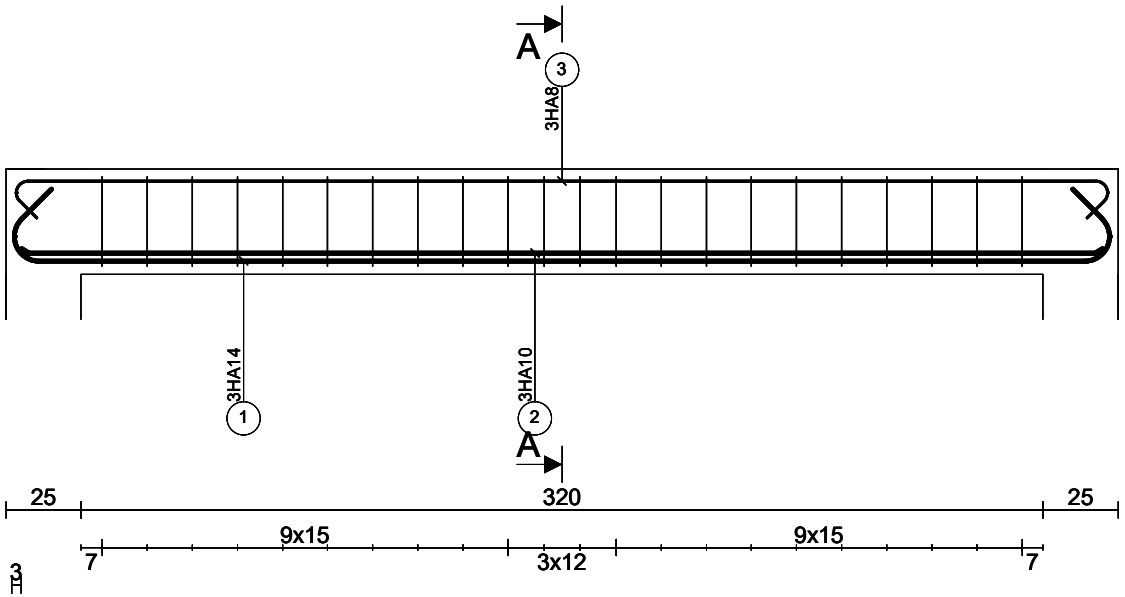


	Barre	Lg	Forme
1	3HA14	236	23 16 23 135° 135° 188
2	3HA8	211	12 8 8 12 135° 135° 186
3	10HA8	95	20 20
4	10HA8	59	20

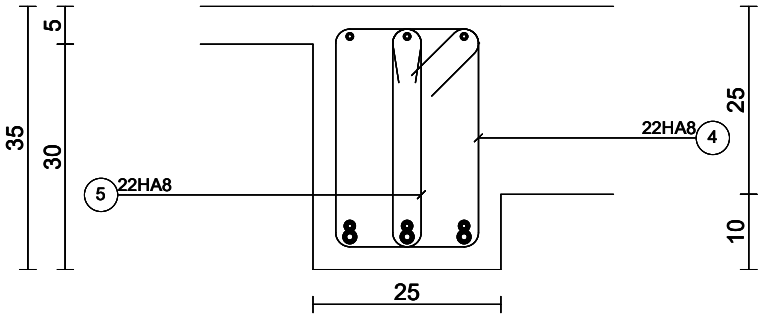
Barre	Lg/Poids
HA8 HA14	21.7/8.6 7.1/8.6

GRAITEC	A4(25x35) PH RDC	A4	Béton=0.18 m3 Acier=43.1 kg d=233.0 kg/m3 Fi=9.5 mm Cof=2.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	17 17
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/25



Coupe A-A
Echelle=1/10

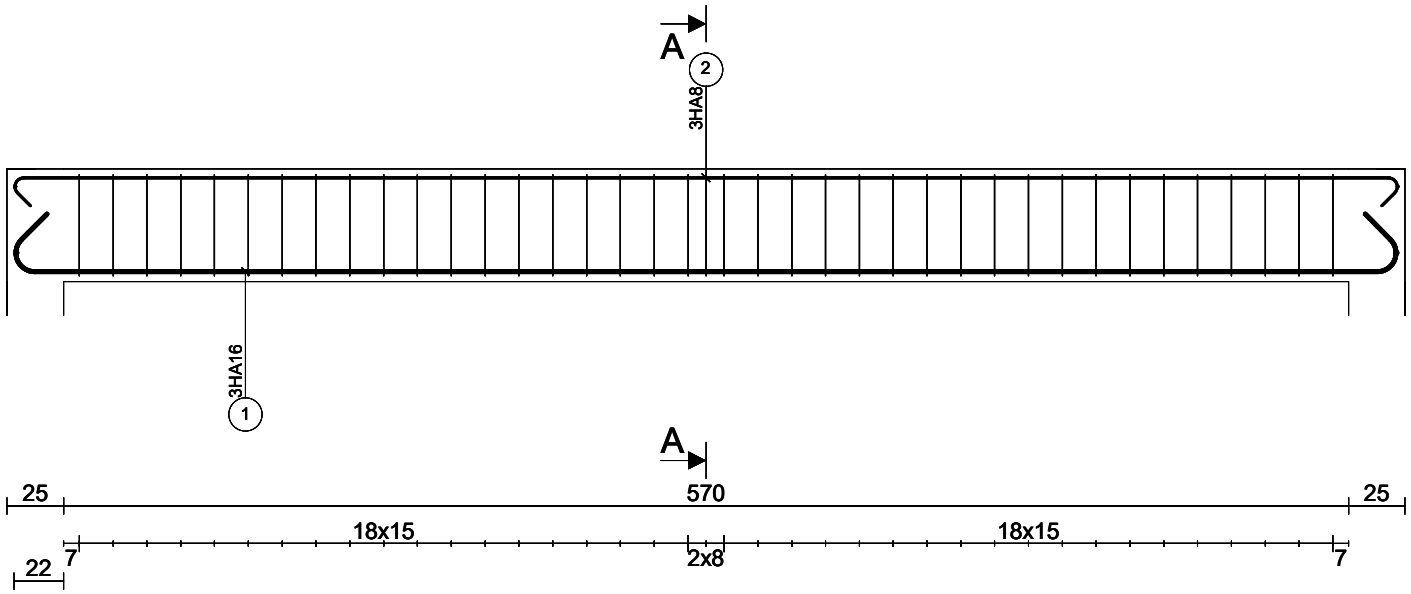


	Barre	Lg	Forme
1	3HA14	415	23 16 23 135° 135° 366
2	3HA10	360	360
3	3HA8	390	12 8 8 12 135° 135° 364
4	22HA8	115	30 20
5	22HA8	79	30

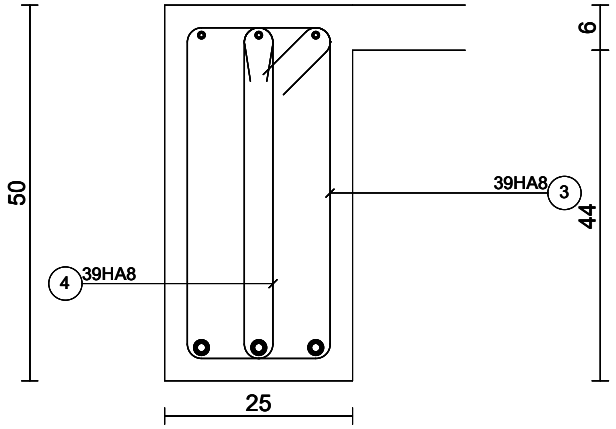
Barre	Lg/Poids
HA8 HA10 HA14	54.3/21.4 10.8/6.7 12.4/15.0

GRAITEC	A5(25x50) PH RDC	A5	Béton=0.73 m3 Acier=78.2 kg d=107.3 kg/m3 Fi=9.6 mm Cof=6.8 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	9 9
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/10

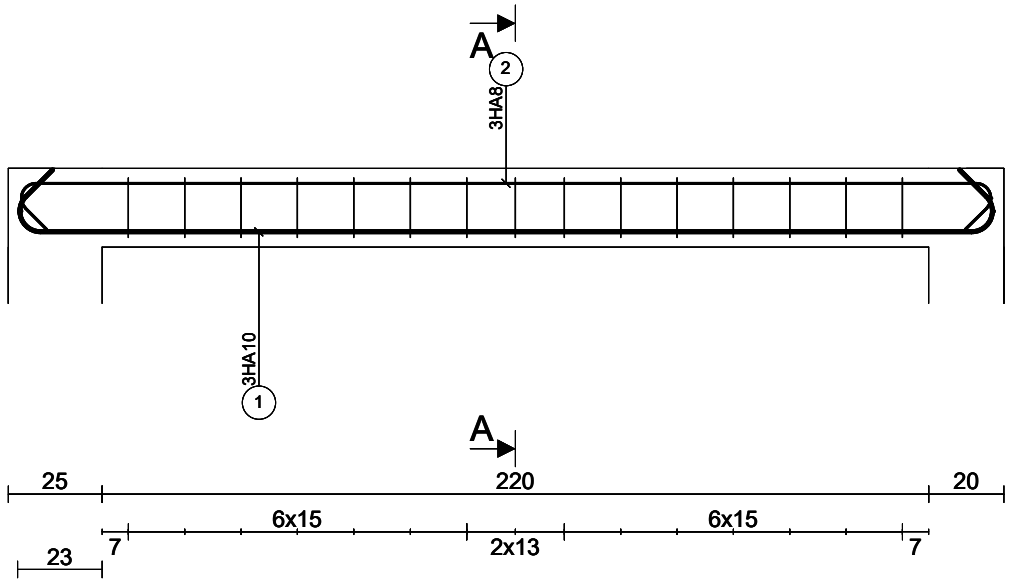


	Barre	Lg	Forme
1	3HA16	667	25 1717 25 135° 135° 614
2	3HA8	640	12 8 8 12 135° 135° 614
3	39HA8	145	45 20
4	39HA8	109	45

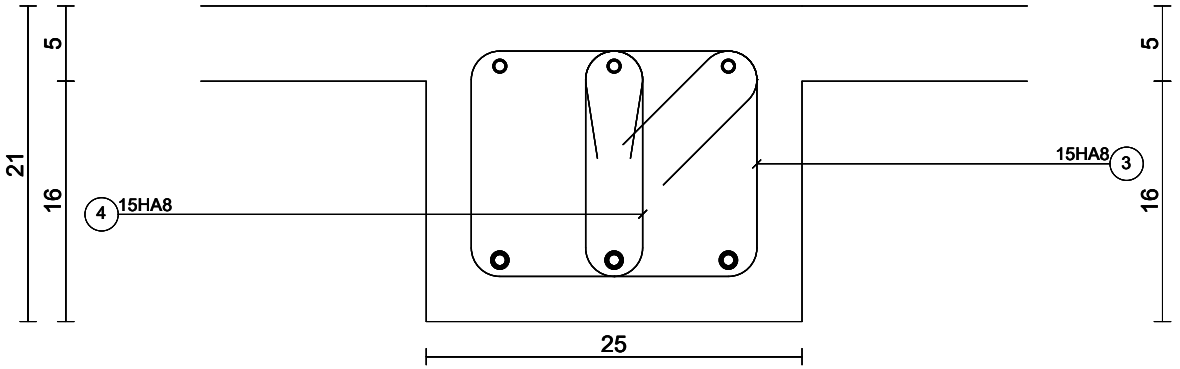
Barre	Lg/Poids
HA8 HA16	118.1/46.6 20.0/31.6

GRAITEC	A6(25x21) PH RDC	A6	Béton=0.11 m3 Acier=16.9 kg d=159.9 kg/m3 Fi=8.5 mm Cof=1.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	20 20
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

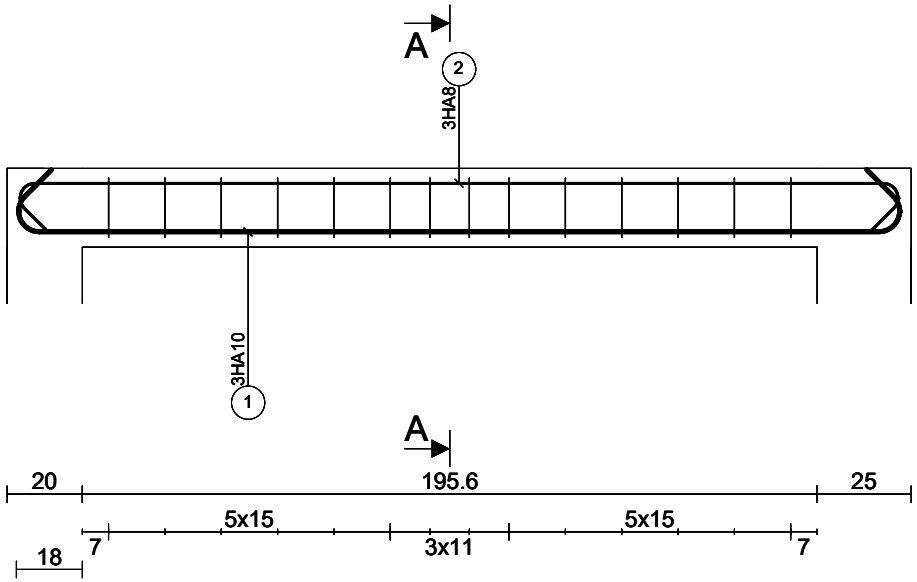


	Barre	Lg	Forme
1	3HA10	294	16 16 1111 135° 135° 260
2	3HA8	285	12 12 8 8 135° 135° 259
3	15HA8	87	16 20
4	15HA8	51	16

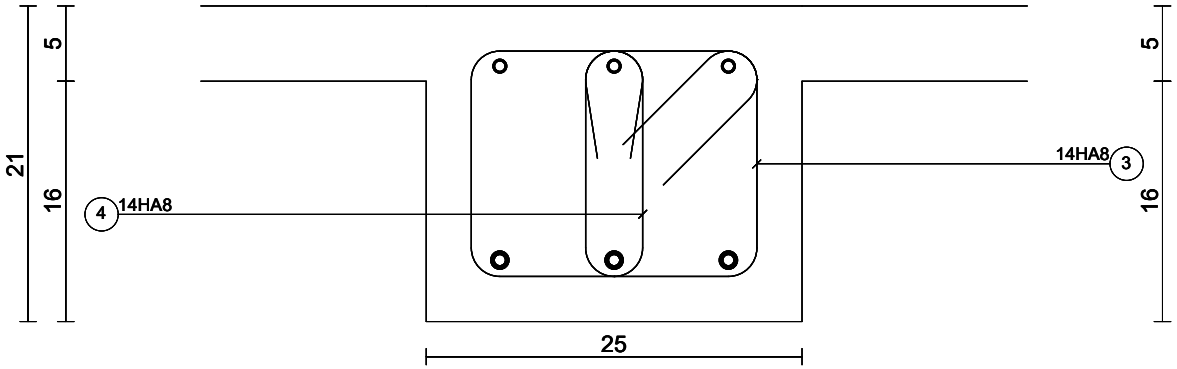
Barre	Lg/Poids
HA8 HA10	29.2/11.5 8.8/5.4

GRAITEC	A7(25x21) PH RDC	A7	Béton=0.10 m3 Acier=15.7 kg d=162.8 kg/m3 Fi=8.5 mm Cof=1.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	21 21
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

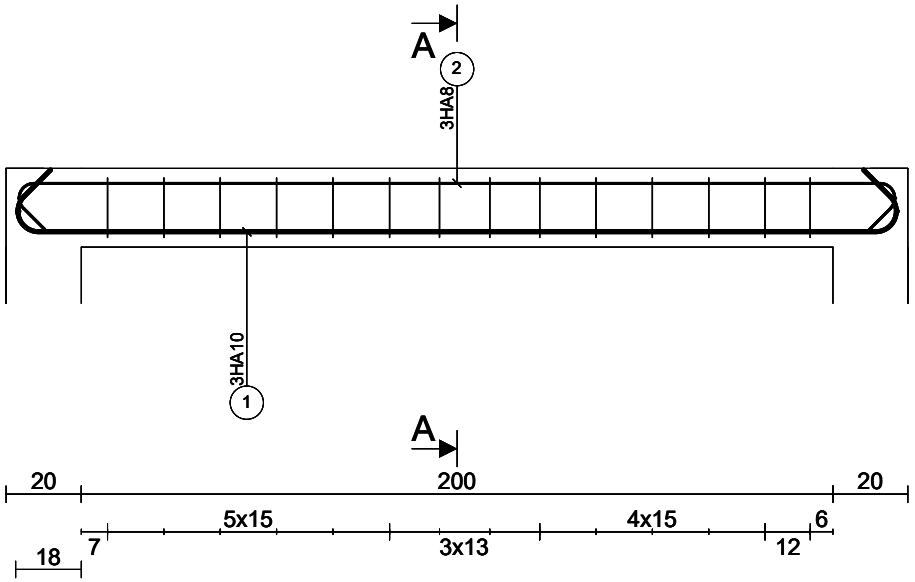


	Barre	Lg	Forme
1	3HA10	269	16 16 1111 135° 135° 236
2	3HA8	260	12 12 8 8 135° 135° 235
3	14HA8	87	16 20
4	14HA8	51	16

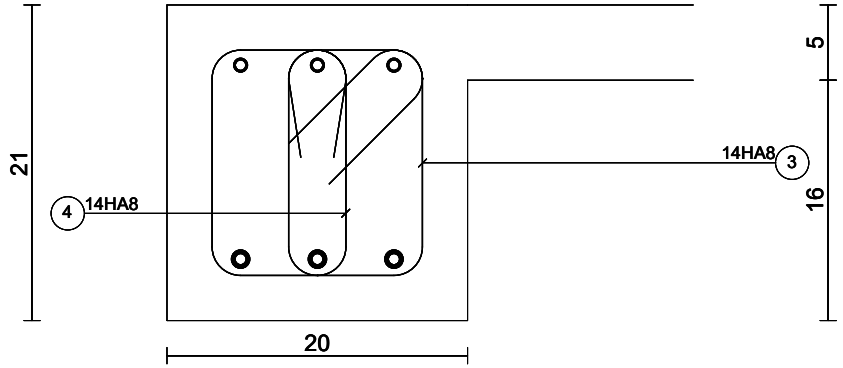
Barre	Lg/Poids
HA8 HA10	27.1/10.7 8.1/5.0

GRAITEC	A8(20x21) PH RDC	A8	Béton=0.09 m3 Acier=15.1 kg d=170.0 kg/m3 Fi=8.5 mm Cof=1.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	19 19
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

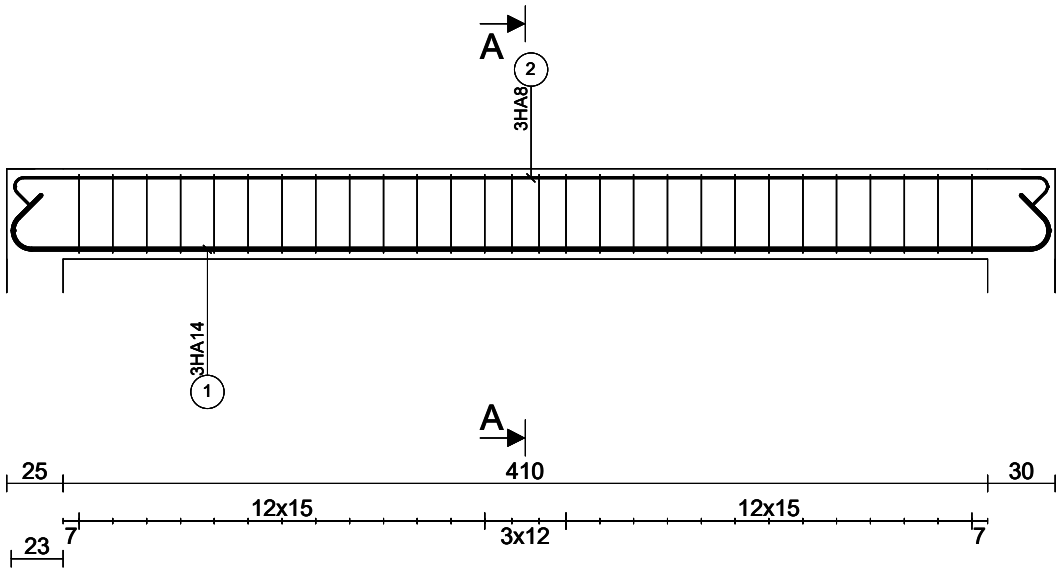


	Barre	Lg	Forme
1	3HA10	269	16, 16, 1111, 135°, 135°, 235
2	3HA8	260	12, 12, 8, 8, 135°, 135°, 234
3	14HA8	77	16, 15
4	14HA8	51	16

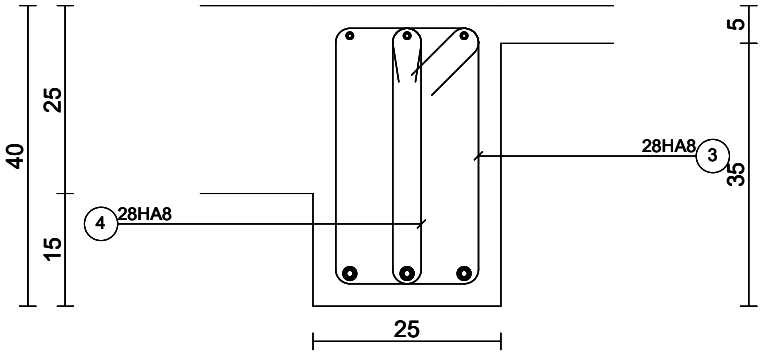
Barre	Lg/Poids
HA8 HA10	25.7/10.1 8.1/5.0

GRAITEC	A9(25x40) PH RDC	A9	Béton=0.29 m3 Acier=47.8 kg d=164.5 kg/m3 Fi=9.3 mm Cof=3.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	14 14
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/10

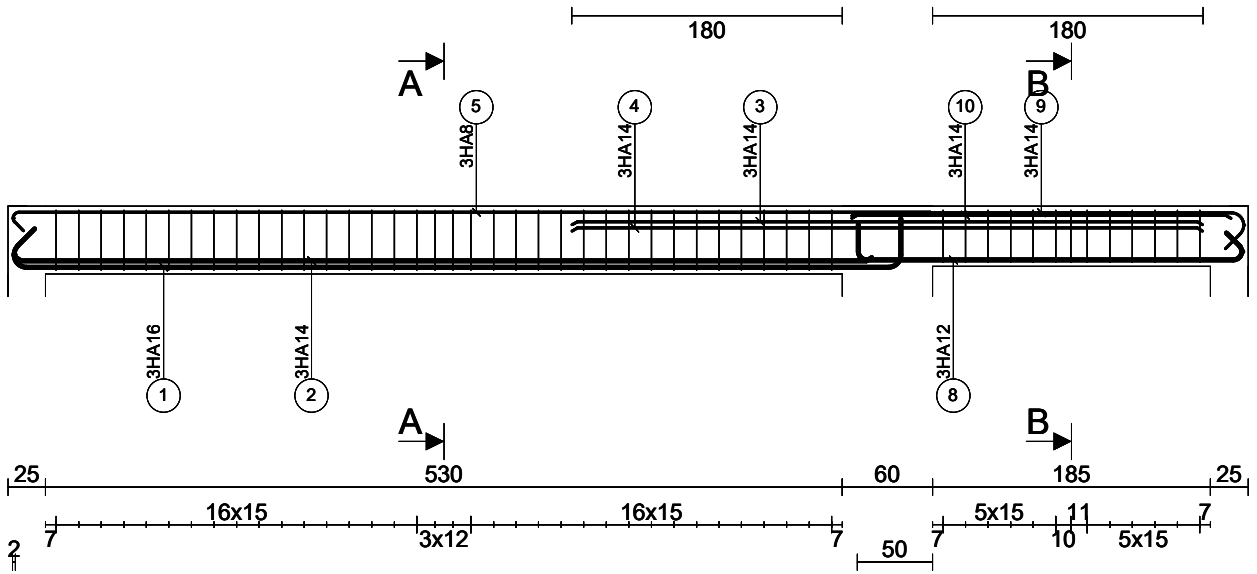


	Barre	Lg	Forme
1	3HA14	510	23 16 23 135° 135° 461
2	3HA8	485	12 8 8 12 135° 135° 459
3	28HA8	125	35 20
4	28HA8	89	35

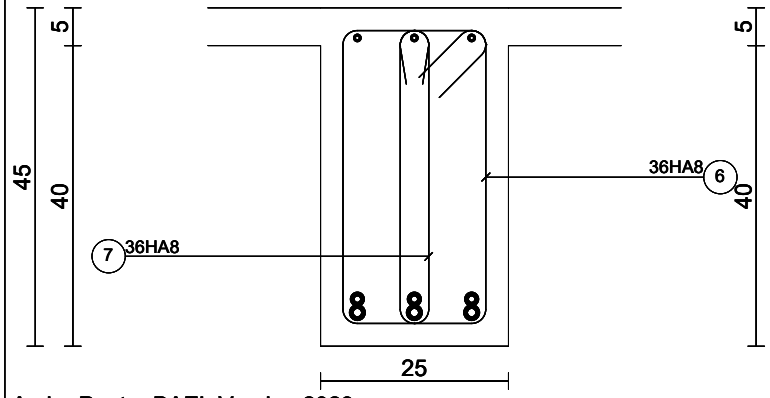
Barre	Lg/Poids
HA8 HA14	74.3/29.3 15.3/18.5

GRAITEC	A10.1(25x45)/A10.2(25x40) PH RDC	A10.1 A A10.2	Béton=0.79 m3 Acier=160.7 kg d=202.1 kg/m3 Fi=10.9 mm Cof=7.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	18 18
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

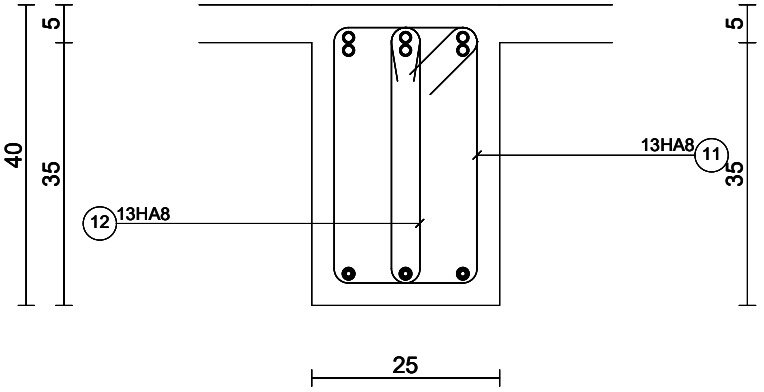
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

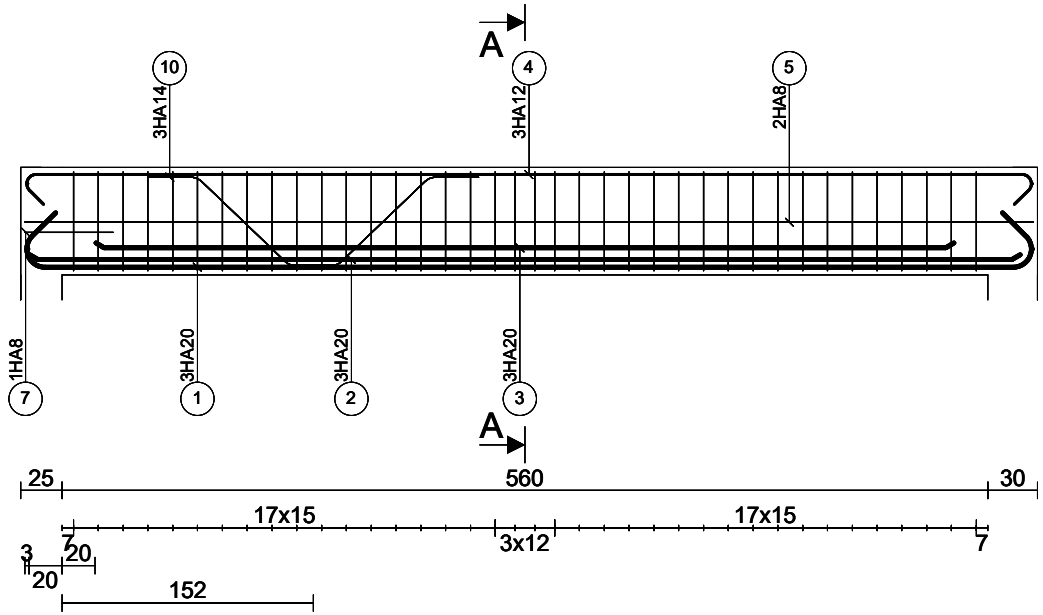


	Barre	Lg	Forme
1	3HA16	646	25, 1717, 33, 135°, 592, 90°
2	3HA14	570	570
3	3HA14	420	420
4	3HA14	420	420
5	3HA8	626	12, 8, 613, 135°
6	36HA8	135	40, 20
7	36HA8	99	40
8	3HA12	296	18, 24, 11, 11, 90°, 257, 135°
9	3HA14	286	23, 16, 135°, 262
10	3HA14	253	253
11	13HA8	125	35, 20
12	13HA8	89	35

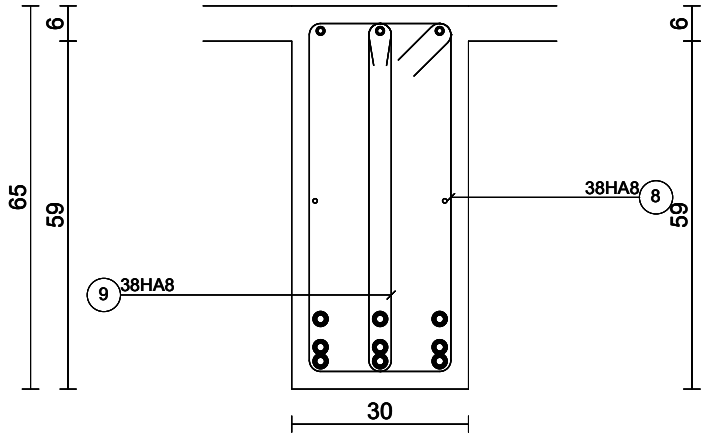
Barre	Lg/Poids
HA8	130.6/51.5
HA12	8.9/7.9
HA14	58.5/70.7
HA16	19.4/30.6

GRAITEC	A11(30x65) PH RDC	A11	Béton=1.09 m3 Acier=214.8 kg d=197.3 kg/m3 Fi=12.5 mm Cof=8.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	28 28
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/45



Coupe A-A
Echelle=1/13

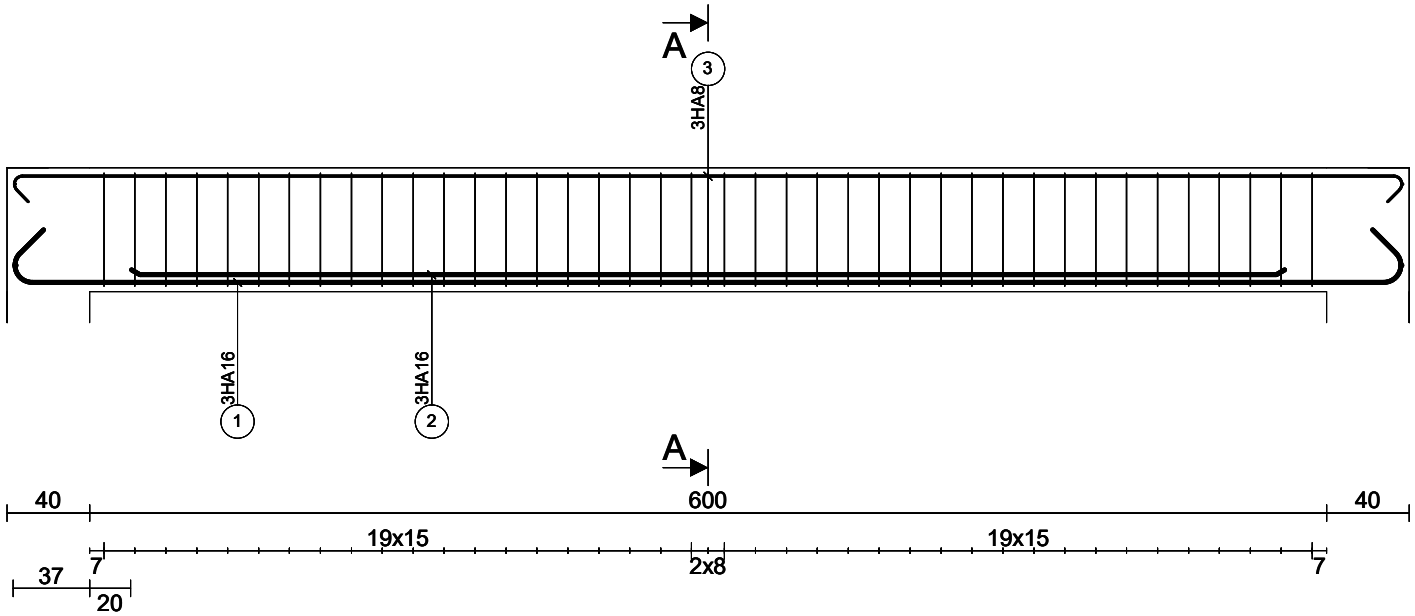


	Barre	Lg	Forme
1	3HA20	677	32 2222 32 135° 610 135°
2	3HA20	600	600
3	3HA20	520	520
4	3HA12	647	18 1111 18 135° 609 135°
5	2HA8	610	610
6	12HA8	42	25
7	1HA8	126	53 23 53
8	38HA8	185	60 25
9	38HA8	139	60
10	3HA14	241	30 30 55 45° 45° 30

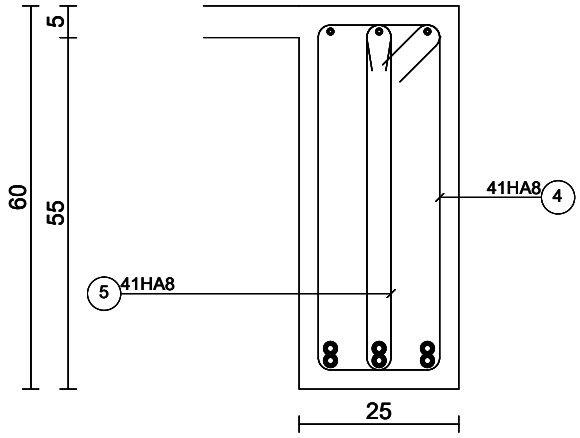
Barre	Lg/Poids
HA8	141.5/55.8
HA12	19.4/17.2
HA14	7.2/8.8
HA20	53.9/133.0

GRAITEC	A12(25x60) PH RDC	A12	Béton=0.98 m3 Acier=116.7 kg d=119.4 kg/m3 Fi=10.3 mm Cof=8.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	3 3
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/36



Coupe A-A
Echelle=1/12

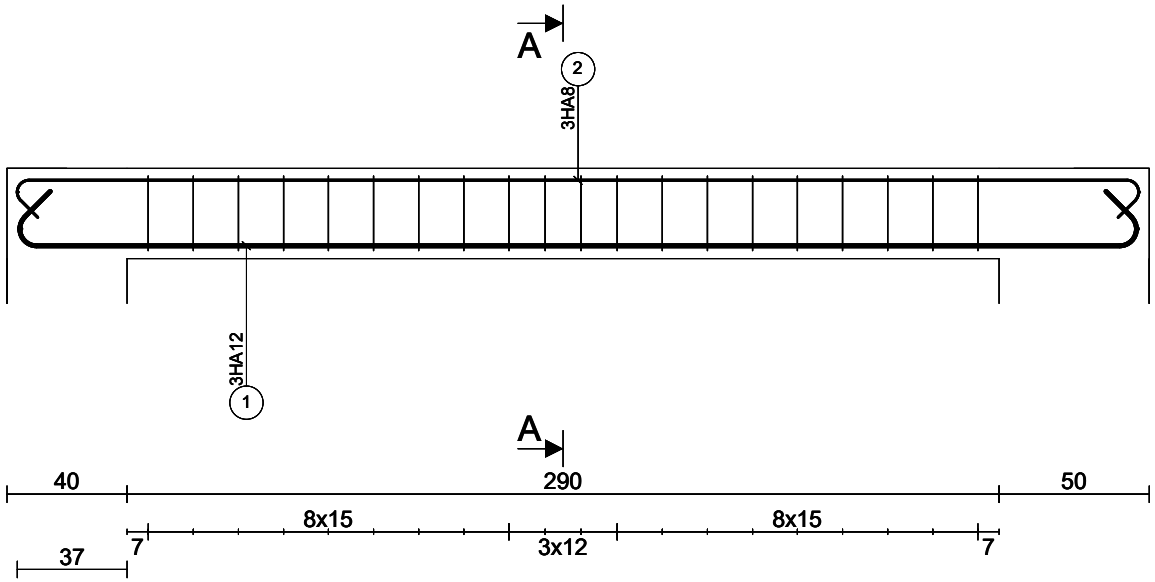


	Barre	Lg	Forme
1	3HA16	727	25 / 25 / 1717 / 135° / 135° / 674
2	3HA16	560	560
3	3HA8	700	12 / 12 / 8 / 8 / 135° / 135° / 674
4	41HA8	165	55 / 20
5	41HA8	129	55

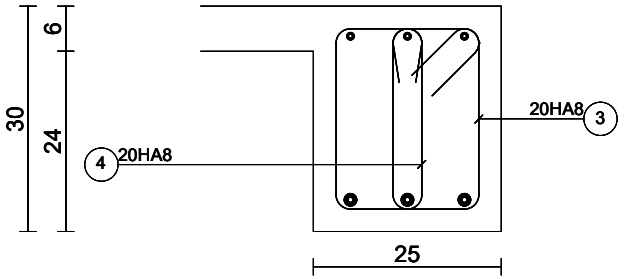
Barre	Lg/Poids
HA8 HA16	141.4/55.8 38.6/60.9

GRAITEC	A13(25x30) PH RDC	A13	Béton=0.26 m3 Acier=29.4 kg d=114.5 kg/m3 Fi=9.0 mm Cof=2.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	4 4
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/25



Coupe A-A
Echelle=1/10

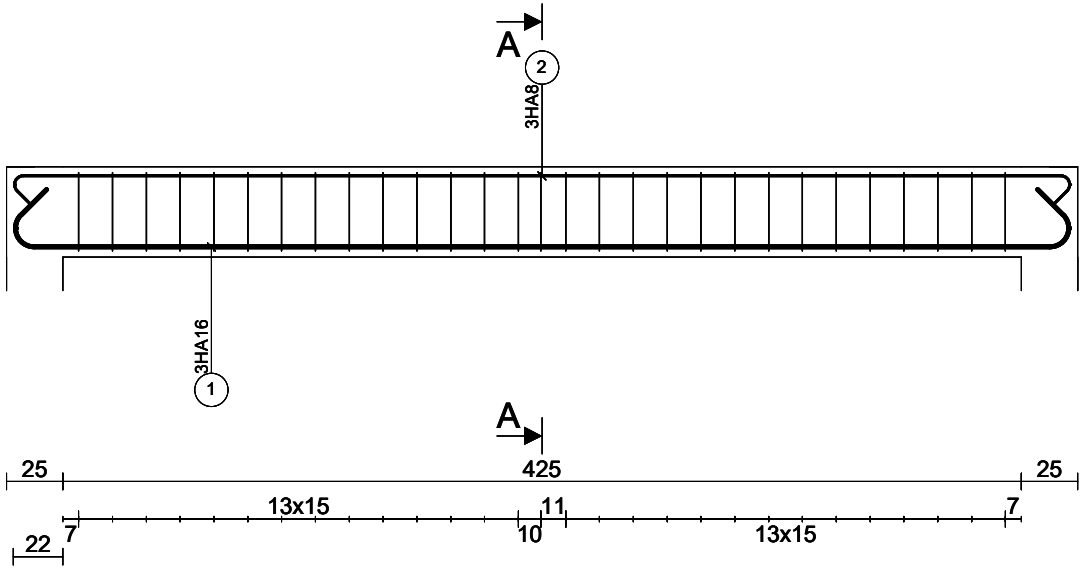


	Barre	Lg	Forme
1	3HA12	411	18 18 1111 135° 135° 373
2	3HA8	400	12 12 8 8 135° 135° 374
3	20HA8	105	25 20
4	20HA8	69	25

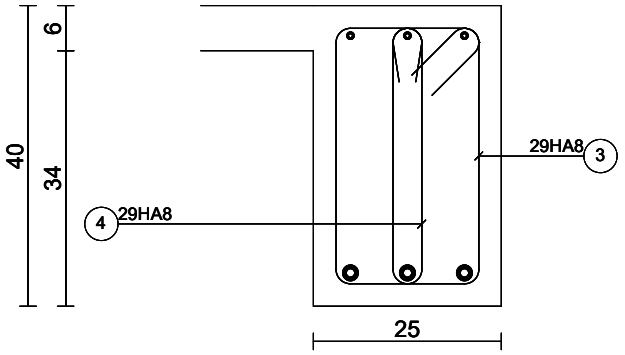
Barre	Lg/Poids
HA8 HA12	46.7/18.4 12.3/10.9

GRAITEC	A14(25x40) PH RDC	A14	Béton=0.44 m3 Acier=55.0 kg d=125.2 kg/m3 Fi=9.8 mm Cof=4.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	6 6
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/10

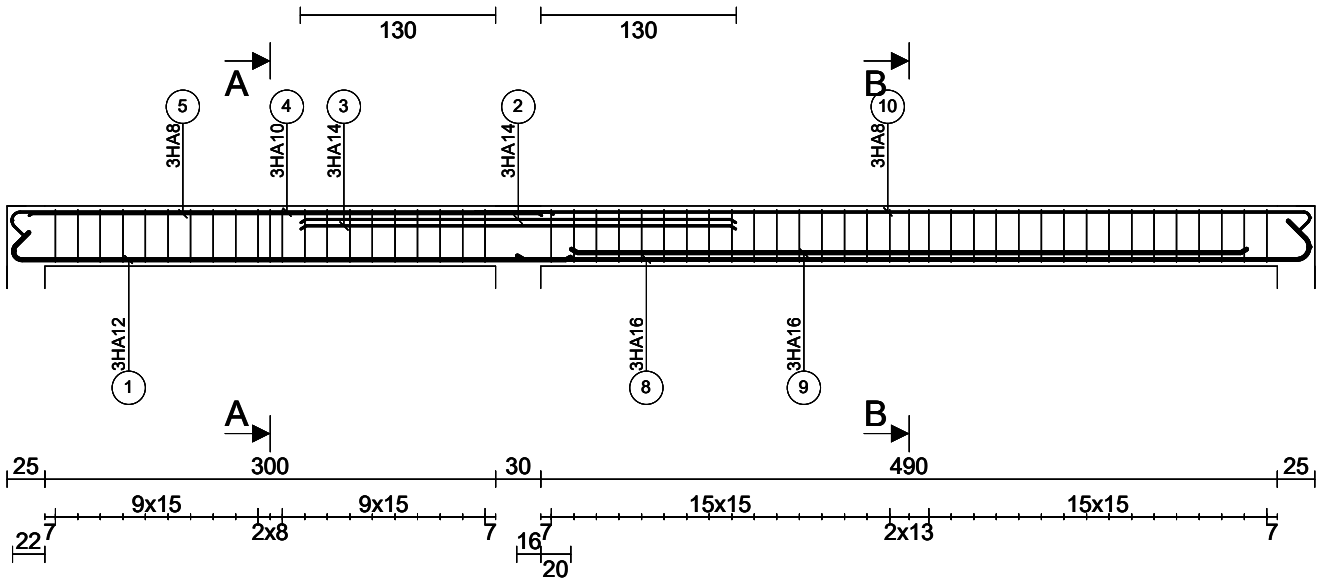


	Barre	Lg	Forme
1	3HA16	522	25 1717 25 135° 135° 469
2	3HA8	495	12 8 8 12 135° 135° 469
3	29HA8	125	35 20
4	29HA8	89	35

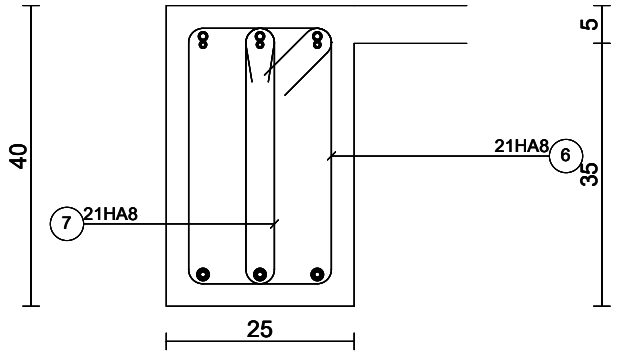
Barre	Lg/Poids
HA8 HA16	76.8/30.3 15.6/24.7

GRAITEC	A15(25x40) PH 1ERE ETAGE	A15.1 A A15.2	Béton=0.82 m3 Acier=142.3 kg d=174.4 kg/m3 Fi=10.4 mm Cof=7.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	1/2
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

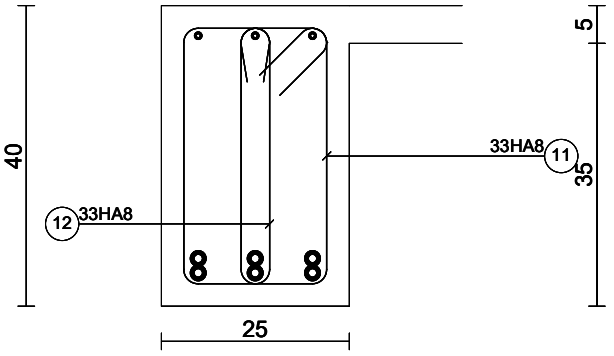
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

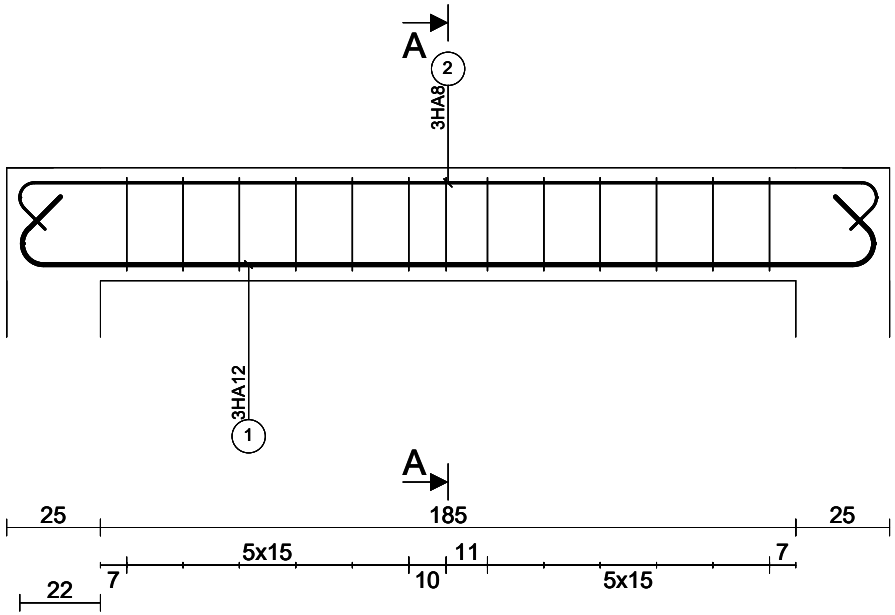


	Barre	Lg	Forme
1	3HA12	390	18 ⌀ 11 135° 372
2	3HA14	290	290
3	3HA14	290	290
4	3HA10	378	16 ⌀ 11 135° 361
5	3HA8	341	341
6	21HA8	125	35 20
7	21HA8	89	35
8	3HA16	554	16 ⌀ 17 135° 528
9	3HA16	450	450
10	3HA8	571	12 ⌀ 8 135° 558
11	33HA8	125	35 20
12	33HA8	89	35

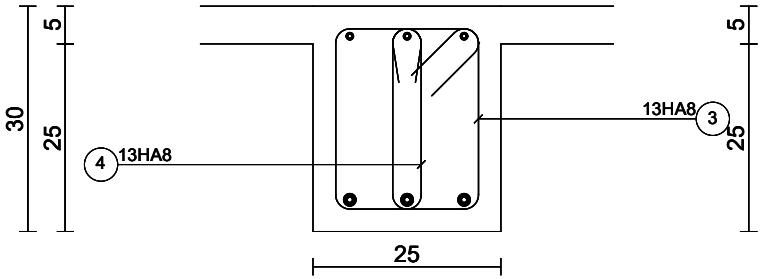
Barre	Lg/Poids
HA8	142.7/56.3
HA10	11.3/7.0
HA12	11.7/10.4
HA14	17.4/21.0
HA16	30.1/47.6

GRAITEC	A16(25x30) PH 1ERE ETAGE	A16	Béton=0.15 m3 Acier=19.0 kg d=129.3 kg/m3 Fi=9.0 mm Cof=1.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	30 30
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/10



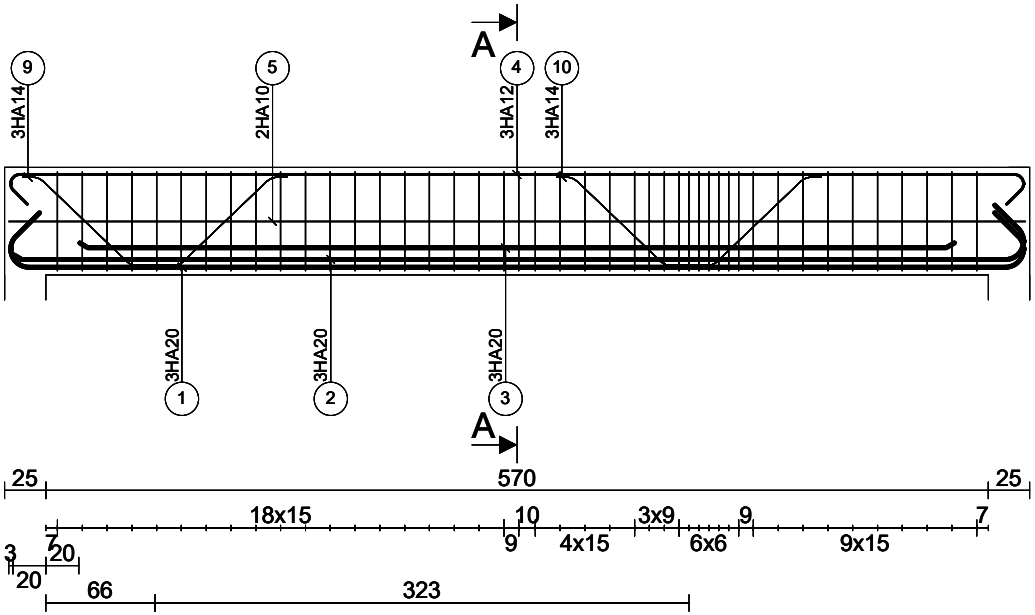
	Barre	Lg	Forme
1	3HA12	266	18 1111 18 135° 228 135°
2	3HA8	255	12 8 8 12 135° 229 135°
3	13HA8	105	25 20
4	13HA8	69	25

Barre	Lg/Poids
HA8 HA12	30.2/11.9 8.0/7.1

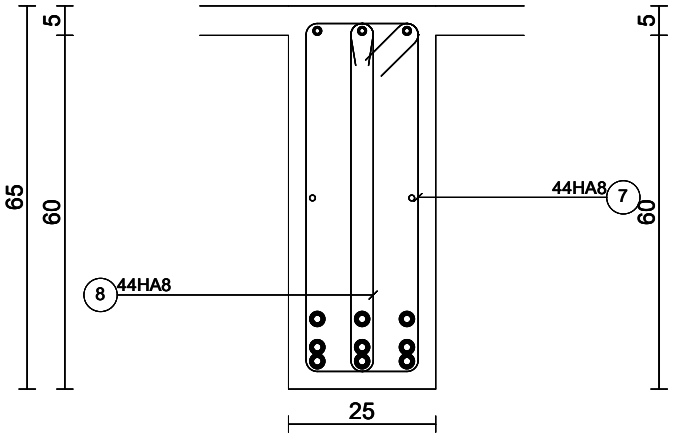
Arche Poutre BAEL Version 2023

GRAITEC	A17(30x65) PH 1ERE ETAGE	A17	Béton=0.93 m3 Acier=233.3 kg d=250.8 kg/m3 Fi=12.5 mm Cof=8.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	30 30
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/45



Coupe A-A
Echelle=1/13

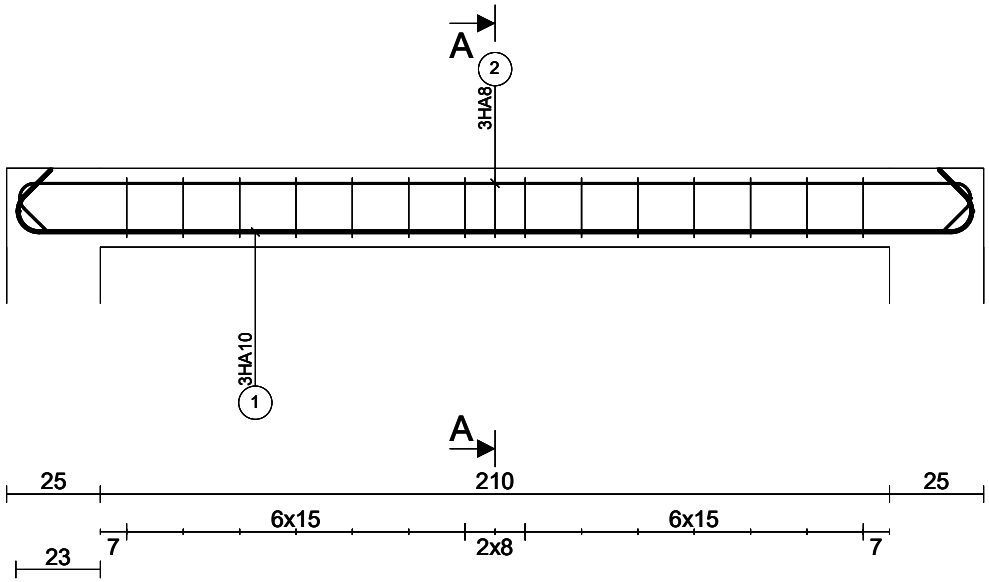


	Barre	Lg	Forme
1	3HA20	682	32 32 2222 135° 135° 615
2	3HA20	646	32 22 135° 612
3	3HA20	530	530
4	3HA12	652	18 18 1111 135° 135° 614
5	2HA10	615	615
6	12HA8	37	20
7	44HA8	175	60 20
8	44HA8	139	60
9	3HA14	201	10 10 55 45° 45° 30
10	3HA14	201	10 10 55 45° 45° 30

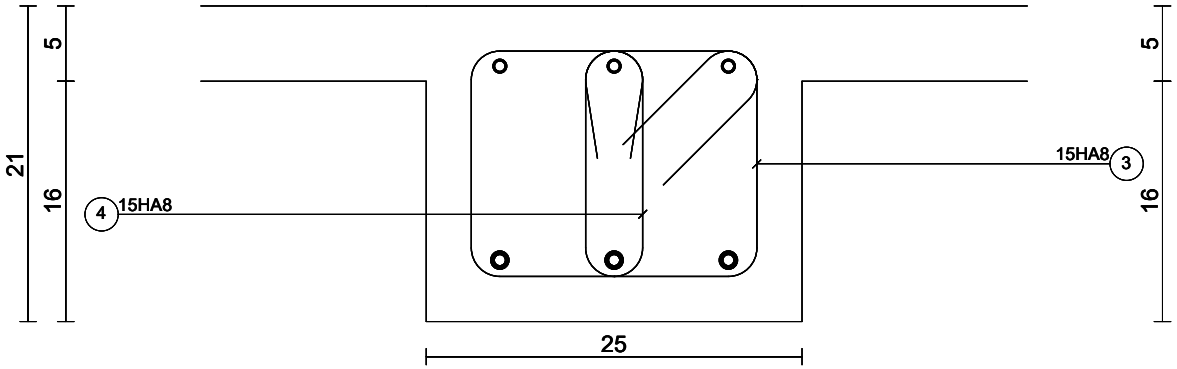
Barre	Lg/Poids
HA8	142.4/56.2
HA10	12.3/7.6
HA12	19.6/17.4
HA14	12.1/14.6
HA20	55.8/137.5

GRAITEC	A18(25x21) PH 1ERE ETAGE	A18	Béton=0.10 m3 Acier=16.8 kg d=161.5 kg/m3 Fi=8.5 mm Cof=1.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

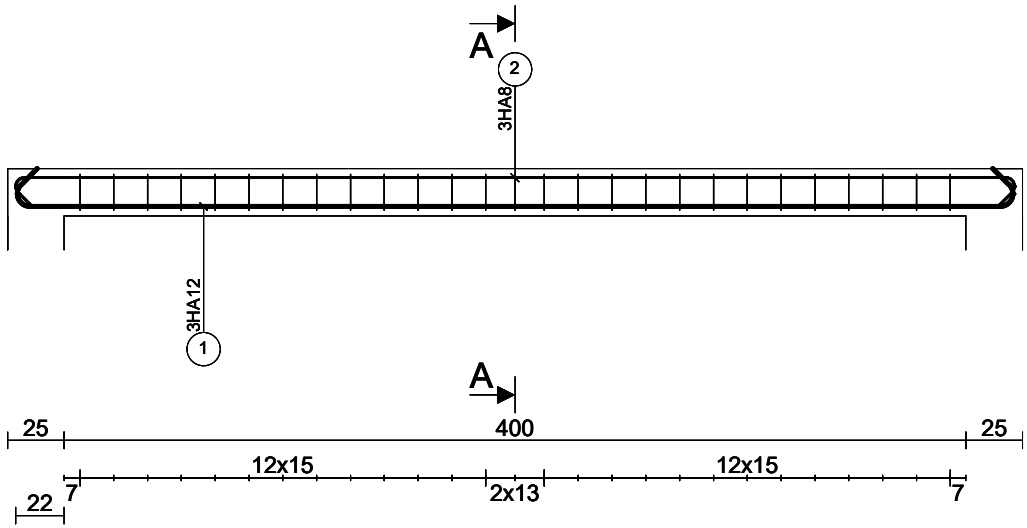


	Barre	Lg	Forme
1	3HA10	289	16 16 1111 135° 135° 255
2	3HA8	280	12 12 8 8 135° 135° 254
3	15HA8	87	16 20
4	15HA8	51	16

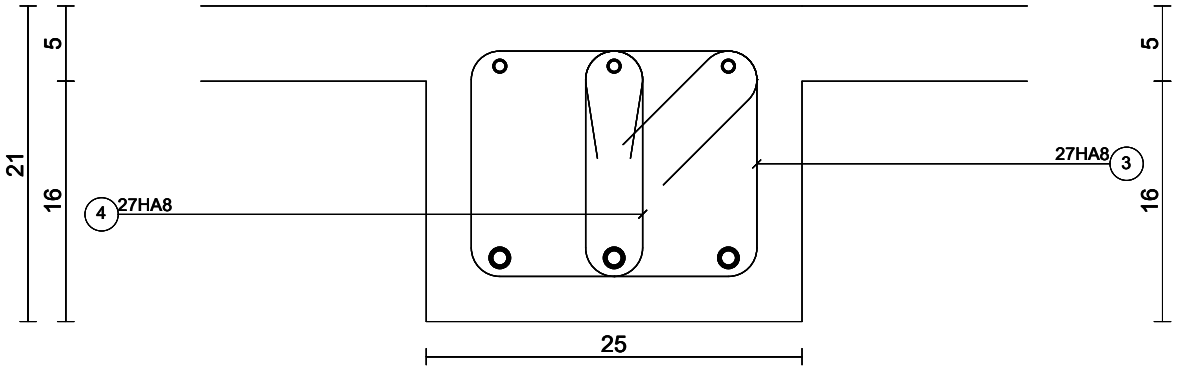
Barre	Lg/Poids
HA8 HA10	29.0/11.5 8.7/5.3

GRAITEC	A19(25x21) PH 1ERE ETAGE	A19	Béton=0.18 m3 Acier=33.0 kg d=183.5 kg/m3 Fi=9.0 mm Cof=2.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	29 29
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/5



	Barre	Lg	Forme
1	3HA12	481	18 1111 18 135° 135° 443
2	3HA8	470	12 8 8 12 135° 135° 444
3	27HA8	87	16 20
4	27HA8	51	16

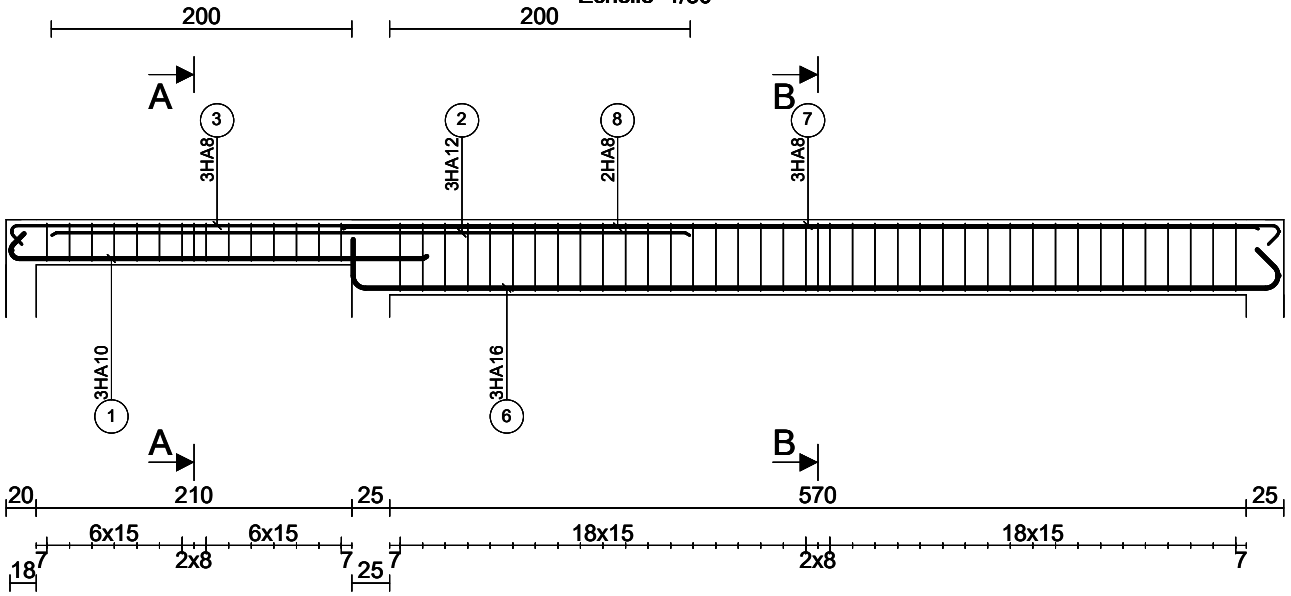
Barre	Lg/Poids
HA8 HA12	51.2/20.2 14.4/12.8

GRAITEC

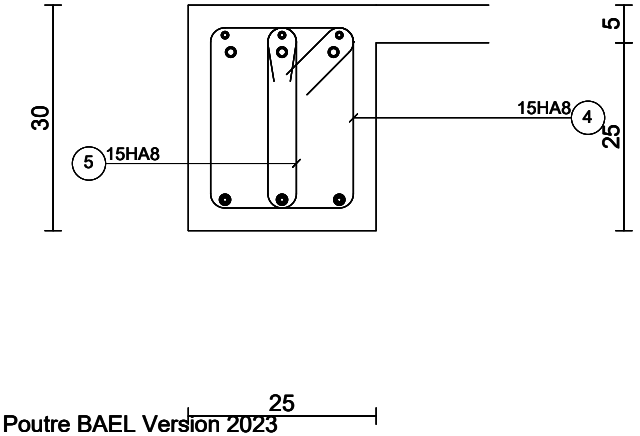
A20.1(25x30)/A20.2(25x50) PH 1ERE ETAGE IMMEUBLE MUTUELLE R+3	A20.1 A A20.2	Béton=0.89 m3 Acier=113.5 kg d=127.8 kg/m3 Fi=9.4 mm Cof=8.5 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	10 10

Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable

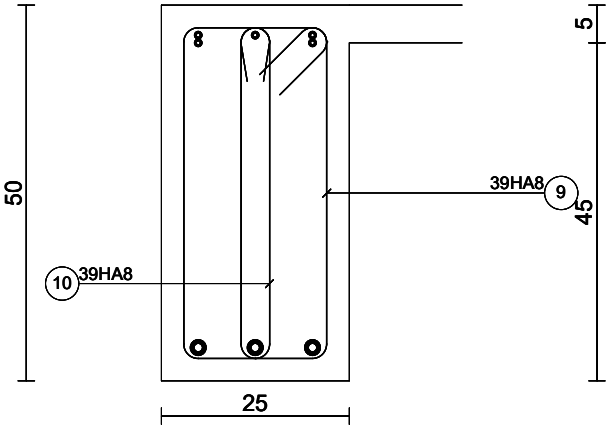
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

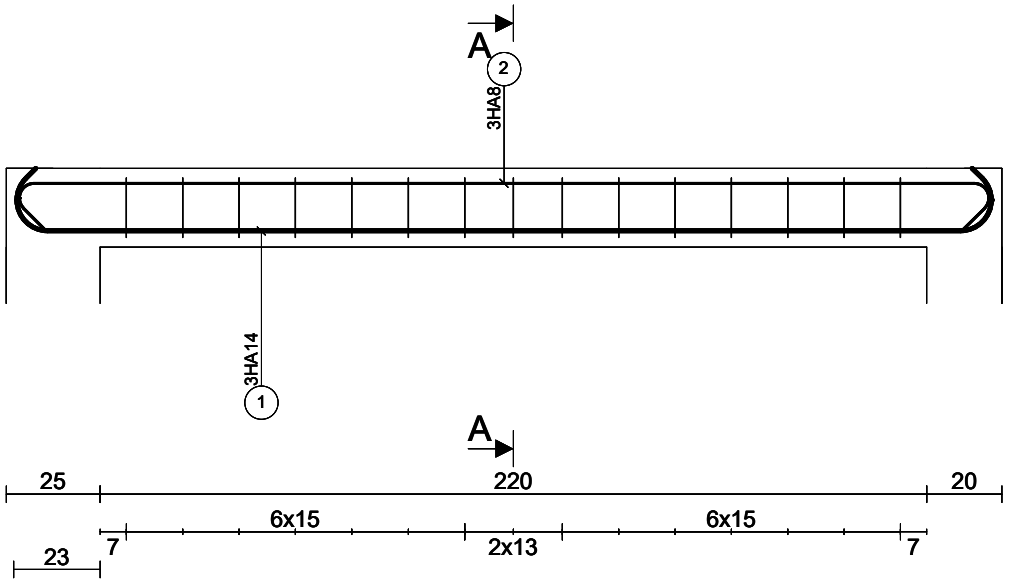


	Barre	Lg	Forme
1	3HA10	294	16, 11, 135°, 277
2	3HA12	425	425
3	3HA8	283	8, 17, 135°, 270
4	15HA8	105	25, 20
5	15HA8	69	25
6	3HA16	671	33, 17, 17, 25, 90°, 135°, 617
7	3HA8	636	12, 8, 135°, 623
8	2HA8	609	609
9	39HA8	145	45, 20
10	39HA8	109	45

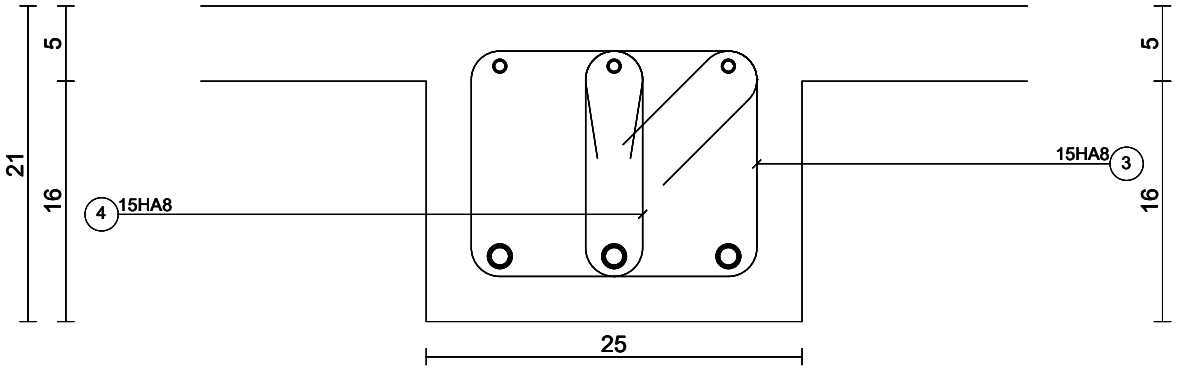
Barre	Lg/Poids
HA8	164.7/65.0
HA10	8.8/5.4
HA12	12.7/11.3
HA16	20.1/31.8

GRAITEC	A21(25x21) PH 1ERE ETAGE	A21	Béton=0.11 m3 Acier=22.7 kg d=214.5 kg/m3 Fi=9.8 mm Cof=1.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	20 20
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5



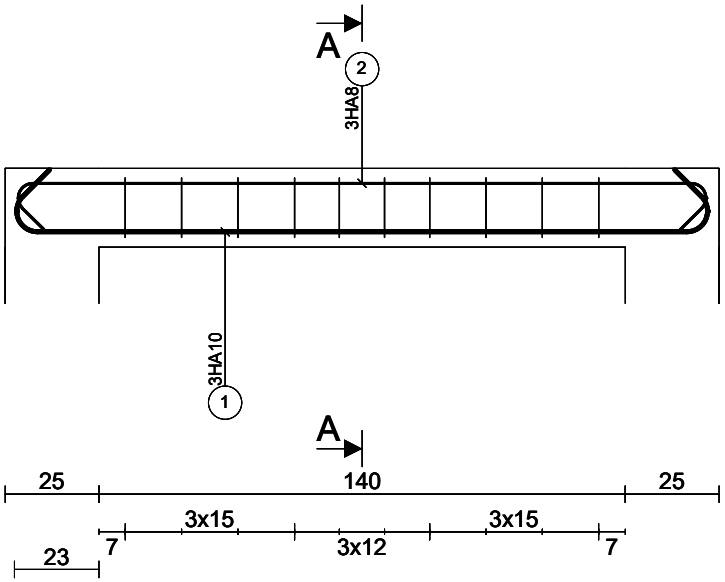
	Barre	Lg	Forme
1	3HA14	310	23 16 16 23 135° 135° 261
2	3HA8	285	12 8 8 12 135° 135° 259
3	15HA8	87	16 20
4	15HA8	51	16

Barre	Lg/Poids
HA8 HA14	29.2/11.5 9.3/11.2

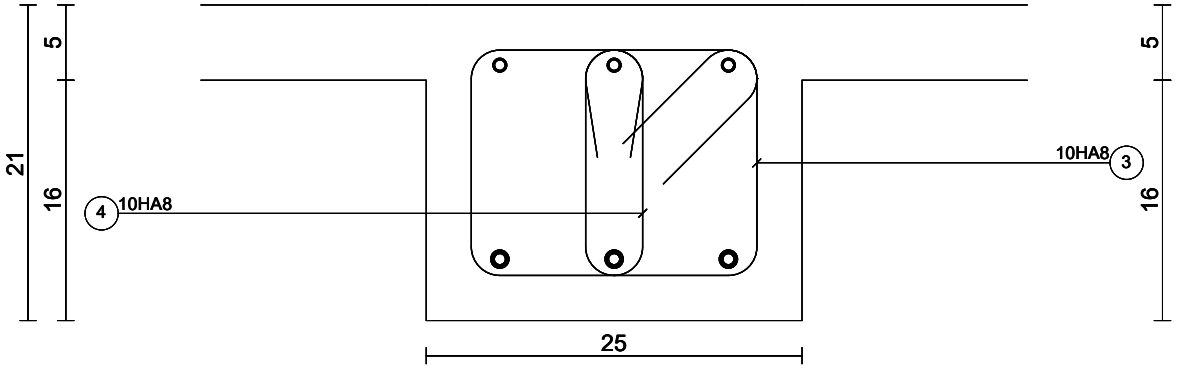
Arche Poutre BAEL Version 2023

GRAITEC	A22(25x21) PH 1ERE ETAGE	A22	Béton=0.08 m3 Acier=12.0 kg d=157.3 kg/m3 Fi=8.5 mm Cof=0.8 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	33 33
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5



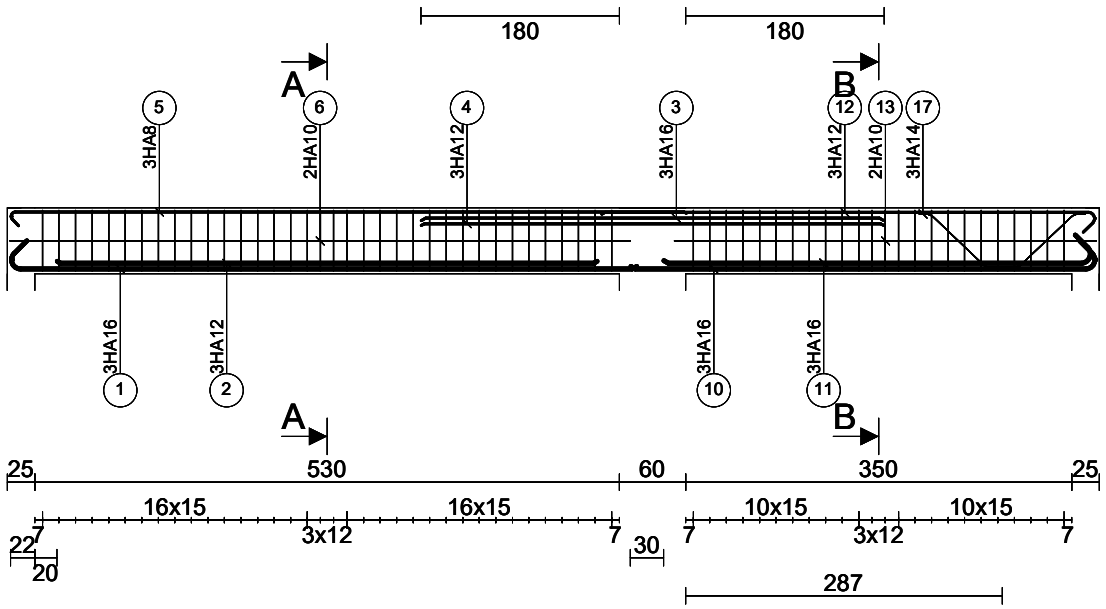
	Barre	Lg	Forme
1	3HA10	219	16, 16, 1111, 135°, 135°, 185
2	3HA8	210	12, 12, 8, 8, 135°, 135°, 184
3	10HA8	87	16, 20
4	10HA8	51	16

Barre	Lg/Poids
HA8 HA10	20.0/7.9 6.6/4.0

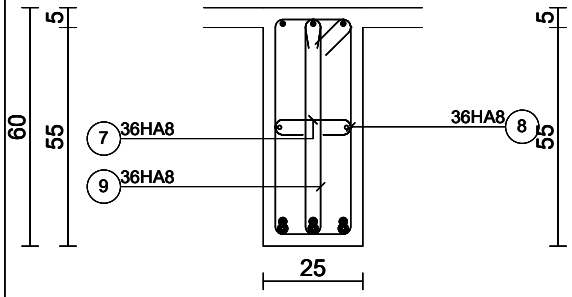
GRAITEC	A23(25x60) PH 1ERE ETAGE	A23.1 A A23.2	Béton=1.36 m3 Acier=229.7 kg d=168.7 kg/m3 Fi=10.5 mm Cof=11.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm
	IMMEUBLE MUTUELLE R+3			34/34

Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable

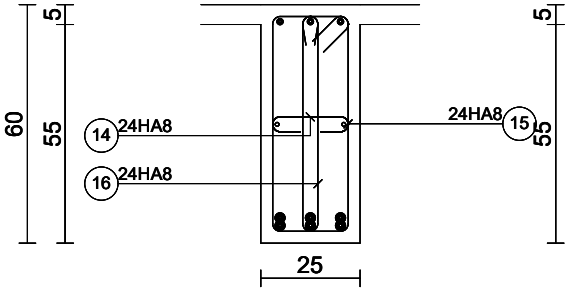
Elévation
Echelle=1/69



Coupe A-A
Echelle=1/19



Coupe B-B
Echelle=1/19

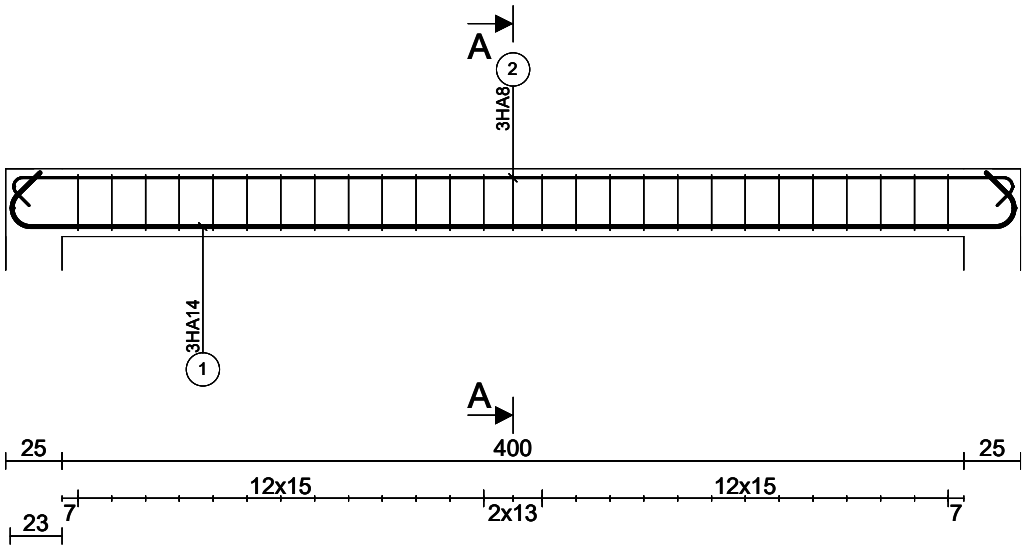


	Barre	Lg	Forme	Barre	Lg	Forme
1	3HA16	594	25, ⌀17, 135°, 568			
2	3HA12	490	490			
3	3HA16	420	420			
4	3HA12	420	420			
5	3HA8	626	12, 8, 613, 135°			
6	2HA10	562	562			
7	36HA8	37	20			
8	36HA8	165	55, 20			
9	36HA8	129	55			
10	3HA16	448	25, ⌀17, 422, 135°			
11	3HA16	414	25, ⌀17, 388, 135°			
12	3HA12	467	18, ⌀11, 135°, 448			
13	2HA10	383	383			
14	24HA8	37	20			
15	24HA8	165	55, 20			
16	24HA8	129	55			
17	3HA14	187	10, 10, 50, 45°, 45°, 30			

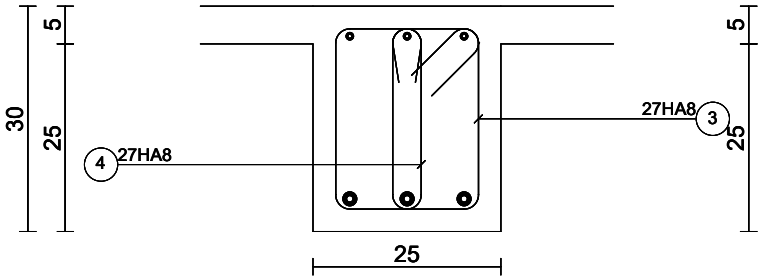
Barre	Lg/Poids	Barre	Lg/Poids
HA8 HA10 HA12	217.2/85.7 18.9/11.7 41.3/36.7	HA14 HA16	5.6/6.8 56.3/88.9

GRAITEC	A24(25x30) PH 1ERE ETAGE	A24	Béton=0.28 m3 Acier=42.0 kg d=149.3 kg/m3 Fi=9.5 mm Cof=3.0 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	35 35
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/10

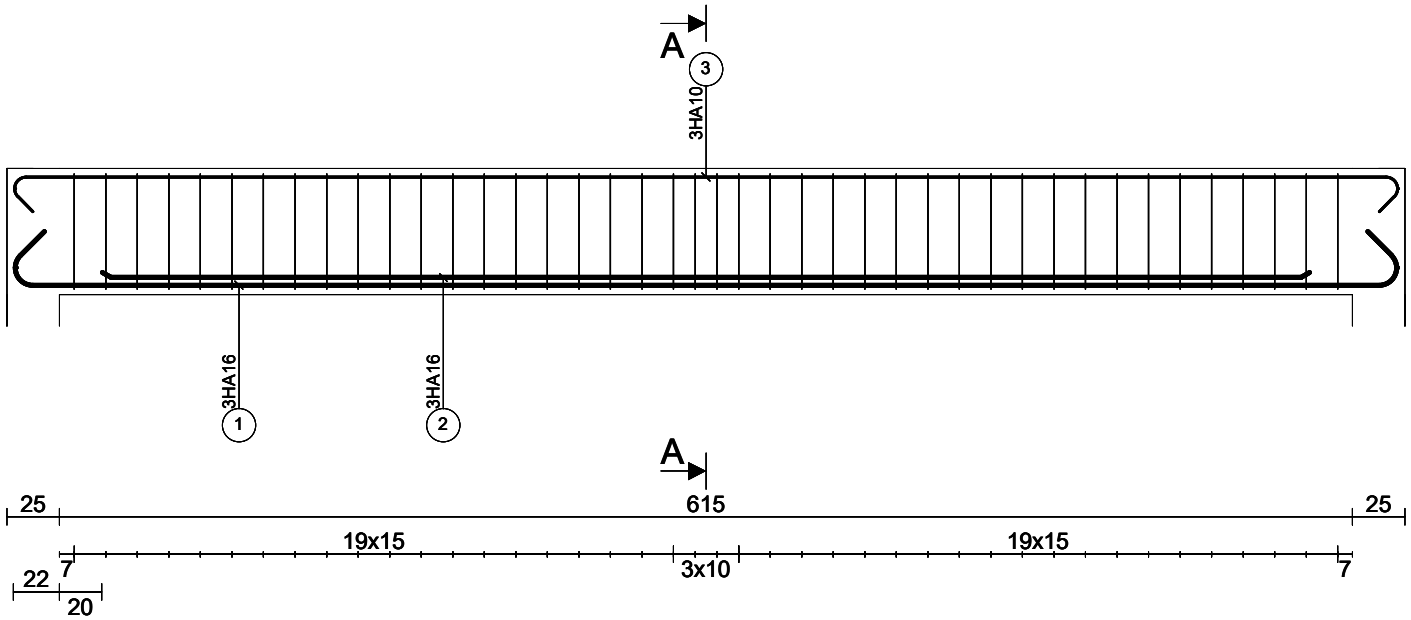


	Barre	Lg	Forme
1	3HA14	495	23 16 16 23 135° 135° 446
2	3HA8	470	12 8 8 12 135° 135° 444
3	27HA8	105	25 20
4	27HA8	69	25

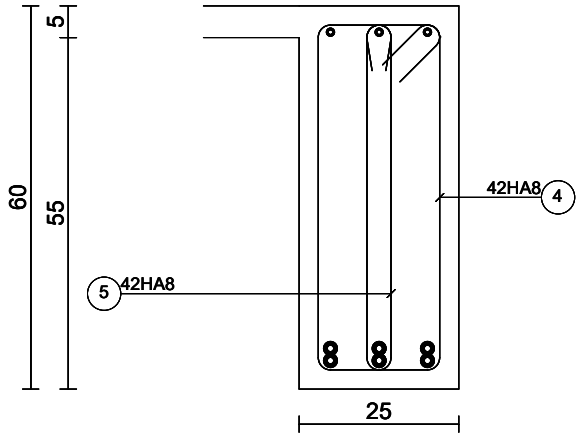
Barre	Lg/Poids
HA8 HA14	61.0/24.1 14.8/17.9

GRAITEC	A25(25x60) PH 1ERE ETAGE	A25	Béton=0.96 m3 Acier=122.4 kg d=128.0 kg/m3 Fi=10.4 mm Cof=8.6 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	3 3
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/36



Coupe A-A
Echelle=1/12

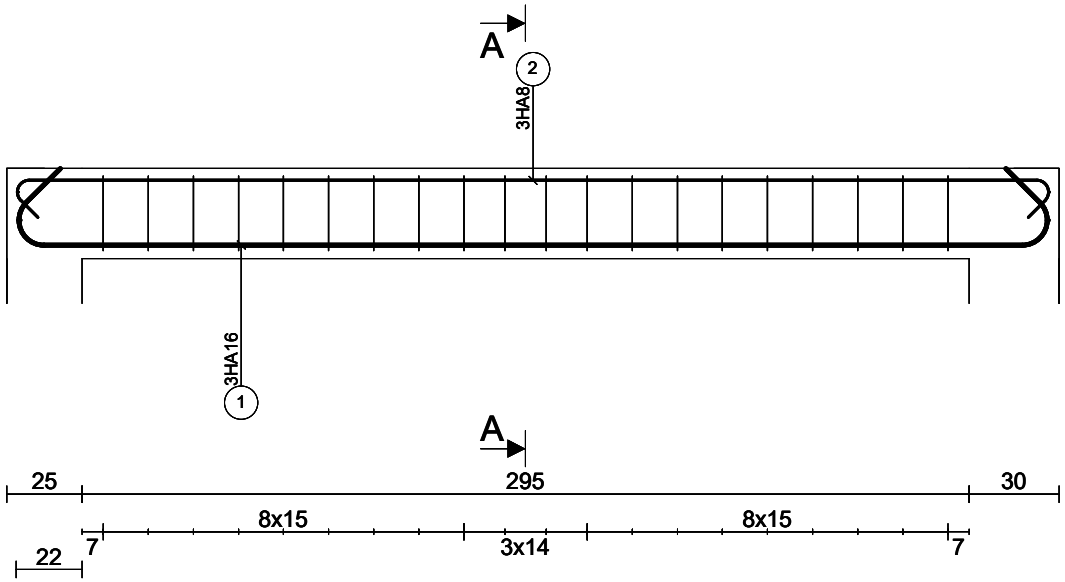


	Barre	Lg	Forme
1	3HA16	712	25 / 1717 / 25 135° 659 135°
2	3HA16	575	575
3	3HA10	693	16 / 1111 / 16 135° 659 135°
4	42HA8	165	55 20
5	42HA8	129	55

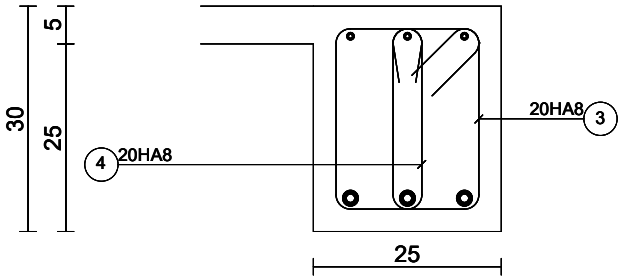
Barre	Lg/Poids
HA8 HA10 HA16	123.3/48.7 20.8/12.8 38.6/60.9

GRAITEC	A26(25x30) PH 1ERE ETAGE	A26	Béton=0.24 m3 Acier=36.9 kg d=153.2 kg/m3 Fi=10.2 mm Cof=2.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	4 4
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/25



Coupe A-A
Echelle=1/10



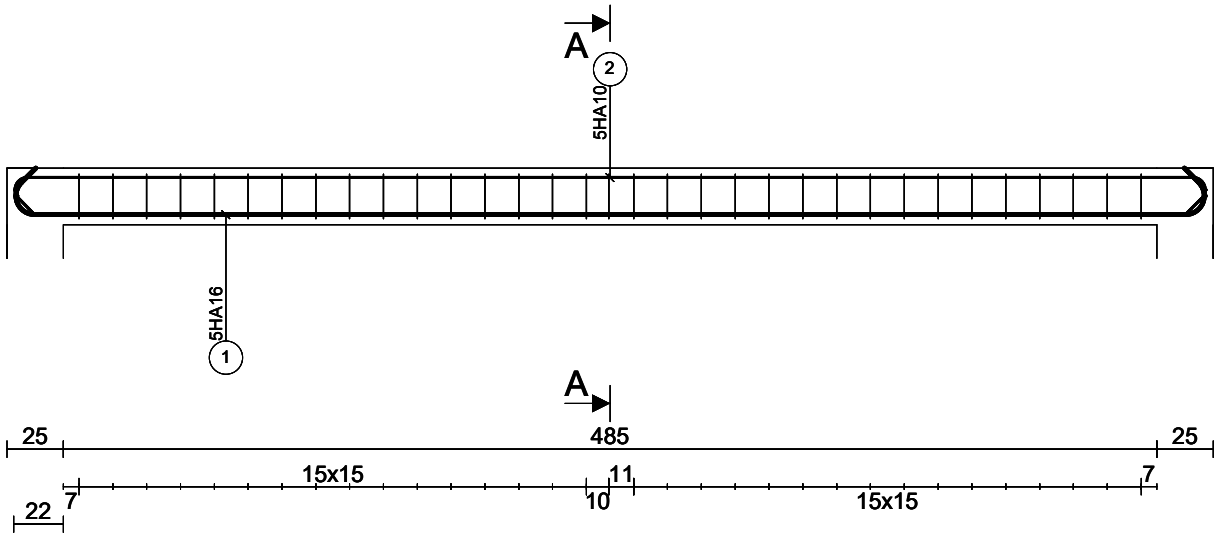
	Barre	Lg	Forme
1	3HA16	397	25 25 1717 135° 135° 344
2	3HA8	370	12 12 8 8 135° 135° 344
3	20HA8	105	25 20
4	20HA8	69	25

Barre	Lg/Poids
HA8 HA16	45.8/18.1 11.9/18.8

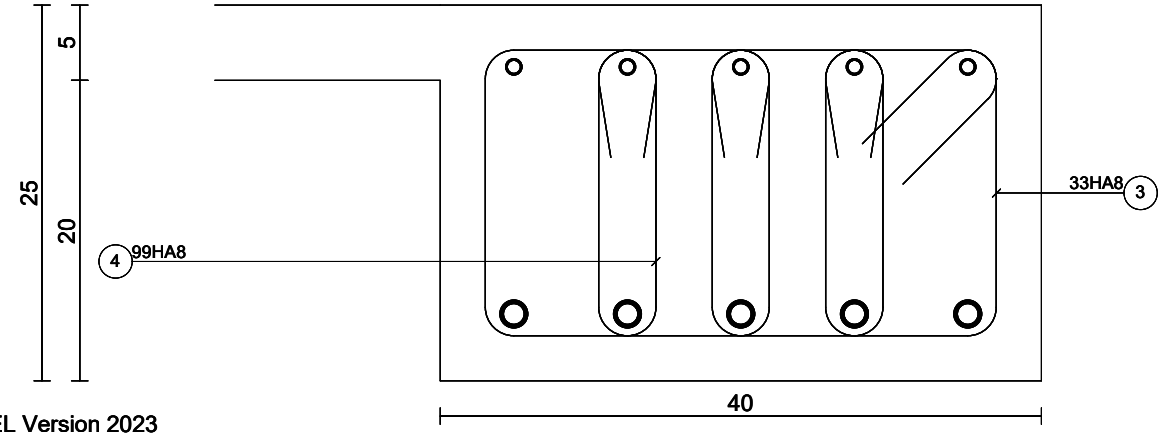
Arche Poutre BAEL Version 2023

GRAITEC	A27(40x25) 5cm en allége PH 1ERE ETAGE	A27	Béton=0.48 m3 Acier=102.5 kg d=212.9 kg/m3 Fi=10.3 mm Cof=4.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	32 32
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/5

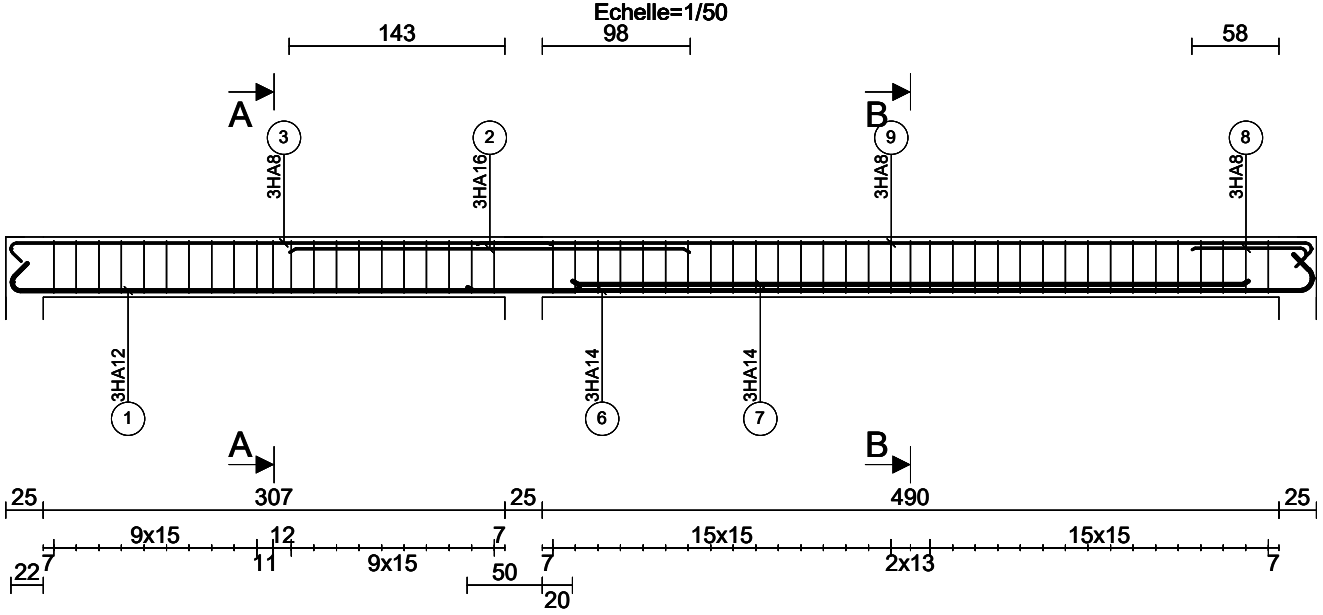


	Barre	Lg	Forme
1	5HA16	582	25 25 1717 135° 135° 529
2	5HA10	563	16 16 1111 135° 135° 529
3	33HA8	125	20 35
4	99HA8	59	20

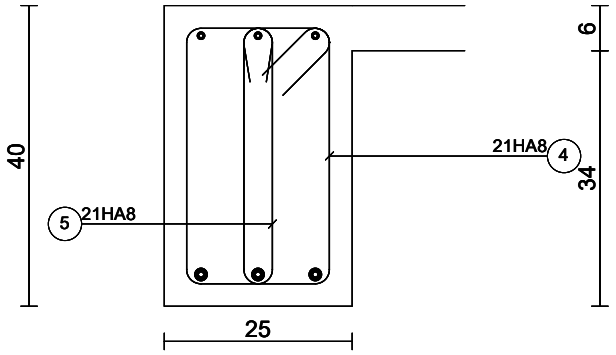
Barre	Lg/Poids
HA8	99.5/39.2
HA10	28.1/17.3
HA16	29.1/45.9

GRAITEC	A28(25x40) PH 3EME	A28.1 A A28.2	Béton=0.81 m3 Acier=118.5 kg d=146.9 kg/m3 Fi=9.9 mm Cof=7.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	1 2
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

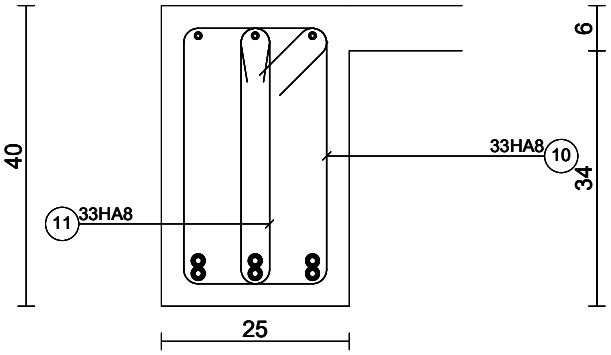
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

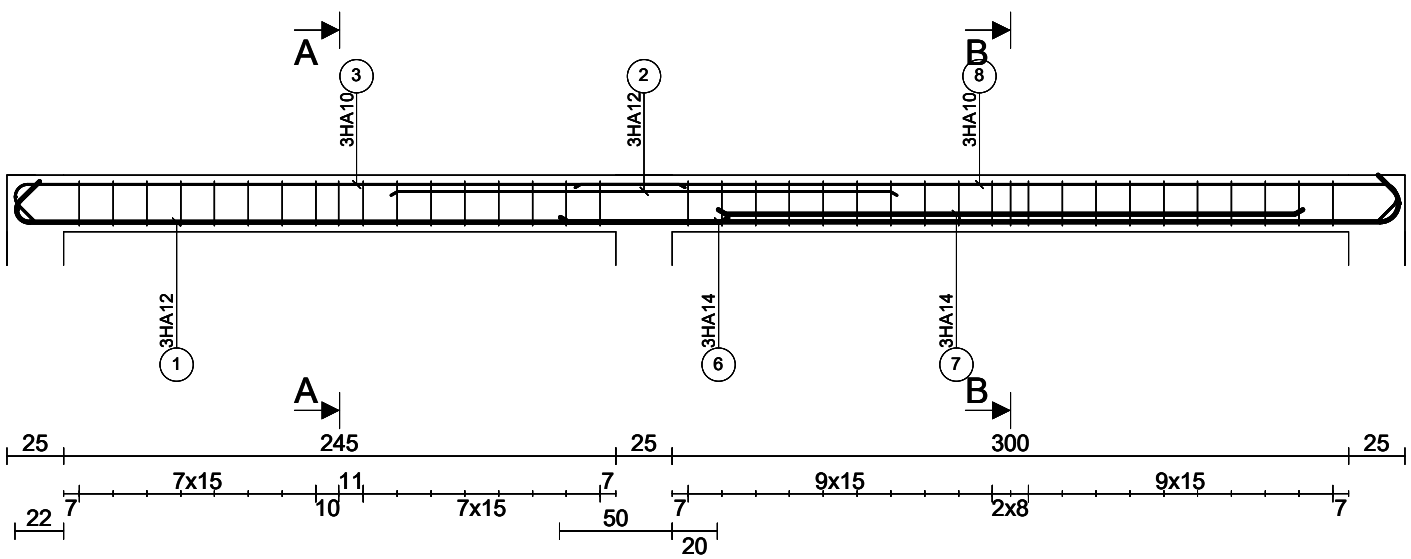


	Barre	Lg	Forme
1	3HA12	397	18, 11, 135°, 379
2	3HA16	267	267
3	3HA8	373	8, 13, 360, 135°
4	21HA8	125	35, 20
5	21HA8	89	35
6	3HA14	587	16, 13, 563, 135°
7	3HA14	450	450
8	3HA8	89	12, 8, 135°, 77
9	3HA8	568	12, 8, 135°, 555
10	33HA8	125	35, 20
11	33HA8	89	35

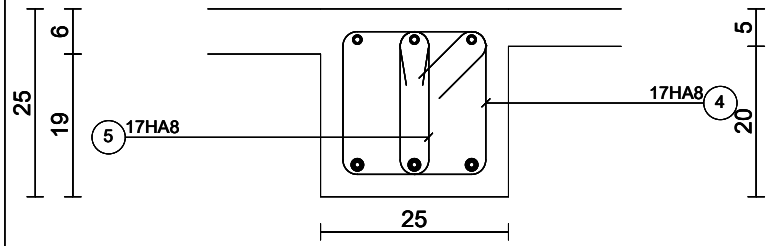
Barre	Lg/Poids
HA8	146.3/57.7
HA12	11.9/10.6
HA14	31.1/37.6
HA16	8.0/12.6

GRAITEC	A28BIS(25x25) PH 2EME	A28*BIS.1 A A28*BIS.2	Béton=0.30 m3 Acier=74.7 kg d=247.1 kg/m3 Fi=10.2 mm Cof=3.5 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	41 41
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

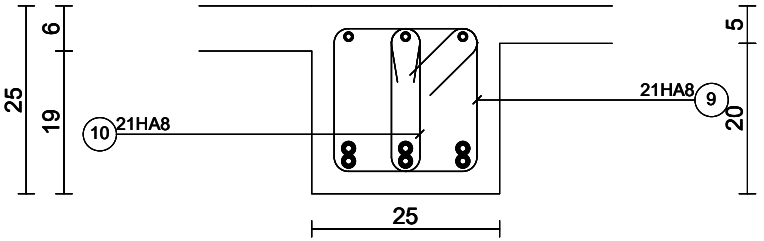
Elévation
Echelle=1/33



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

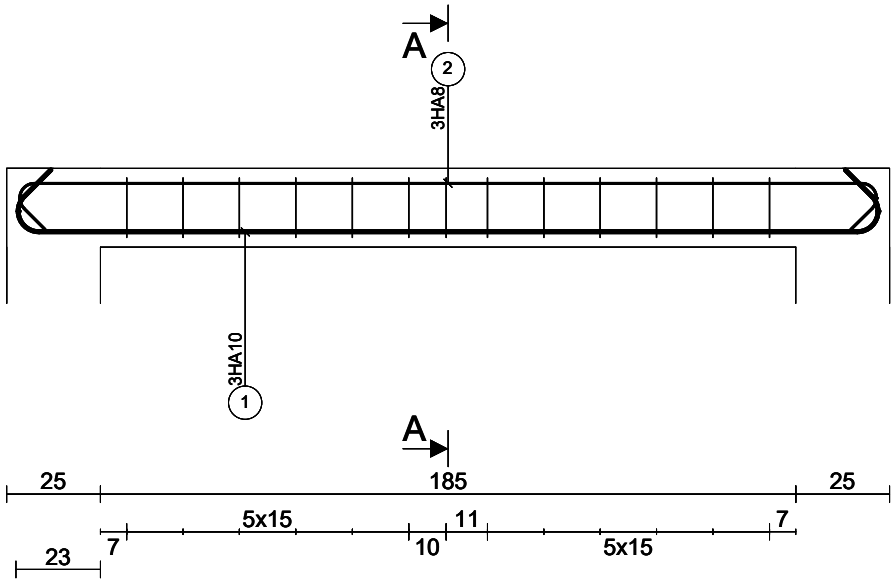


	Barre	Lg	Forme
1	3HA12	335	18, 11, 135°, 317
2	3HA12	225	225
3	3HA10	315	16, 11, 298, 135°
4	17HA8	95	20, 20
5	17HA8	59	20
6	3HA14	397	23, 16, 373, 135°
7	3HA14	260	260
8	3HA10	382	16, 11, 135°, 365
9	21HA8	95	20, 20
10	21HA8	59	20

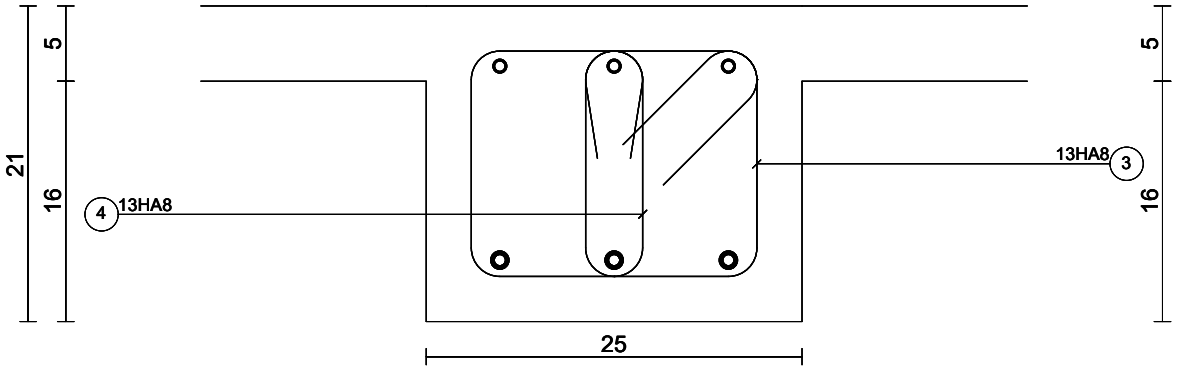
Barre	Lg/Poids
HA8	58.4/23.0
HA10	20.9/12.9
HA12	16.8/14.9
HA14	19.7/23.8

GRAITEC	A29(25x21) PH 3EME	A29	Béton=0.09 m3 Acier=15.0 kg d=159.0 kg/m3 Fi=8.5 mm Cof=1.1 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	43 43
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

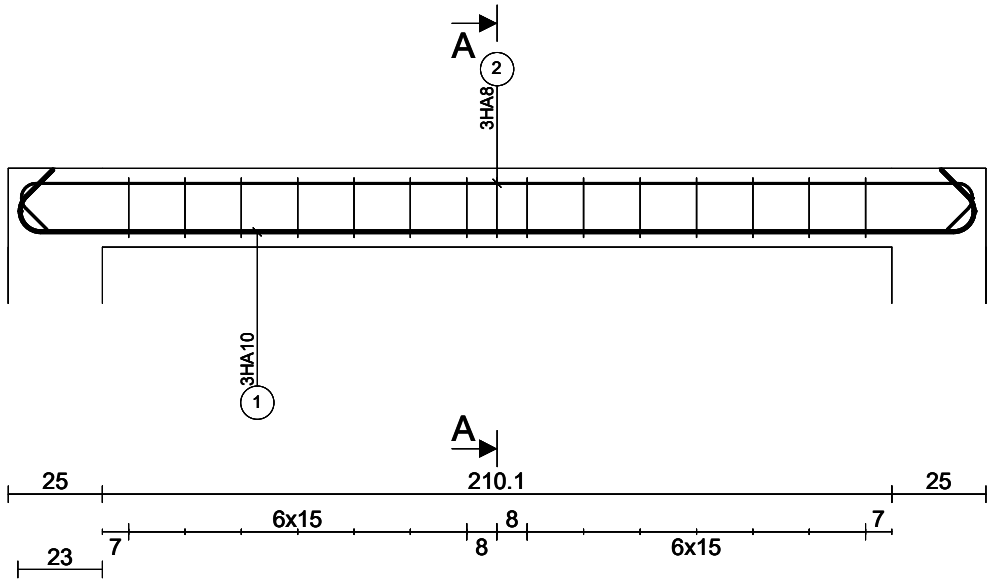


	Barre	Lg	Forme
1	3HA10	264	16, 16, 1111, 135°, 135°, 230
2	3HA8	255	12, 12, 8, 8, 135°, 135°, 229
3	13HA8	87	16, 20
4	13HA8	51	16

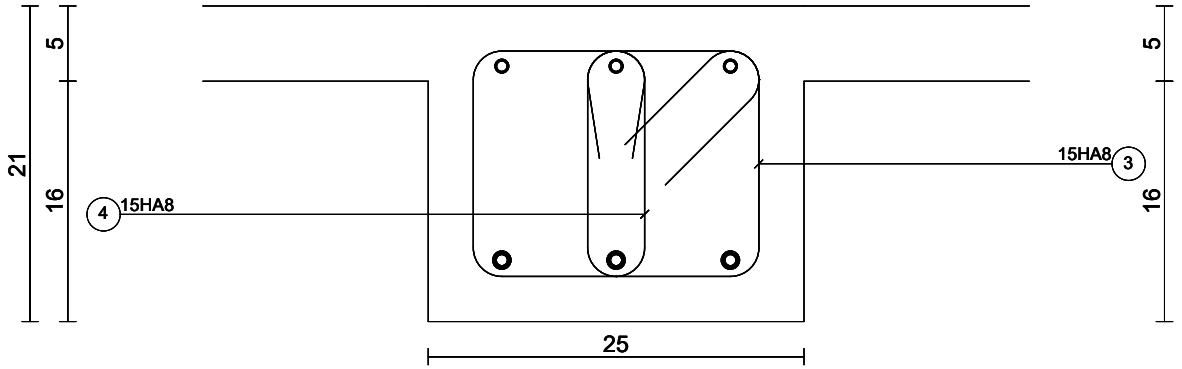
Barre	Lg/Poids
HA8 HA10	25.5/10.1 7.9/4.9

GRAITEC	A30(25x21) PH 3EME	A30	Béton=0.10 m3 Acier=16.8 kg d=161.4 kg/m3 Fi=8.5 mm Cof=1.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

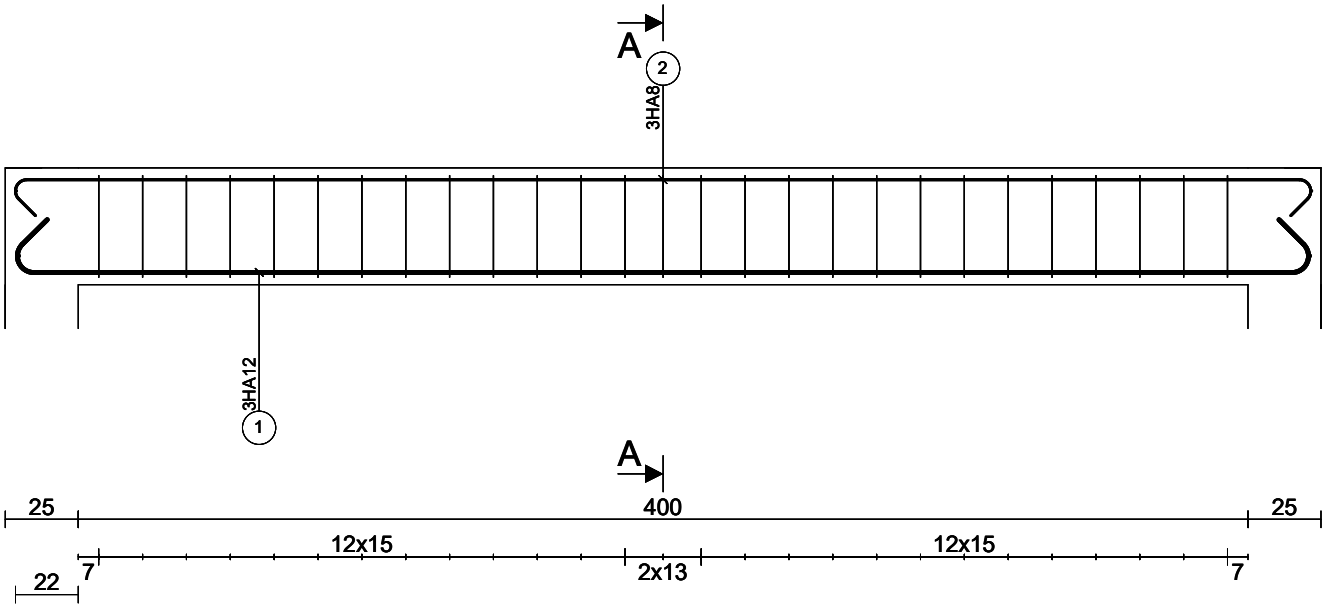


	Barre	Lg	Forme
1	3HA10	289	16 1111 16 135° 255 135°
2	3HA8	280	12 8 8 12 135° 254 135°
3	15HA8	87	16 20
4	15HA8	51	16

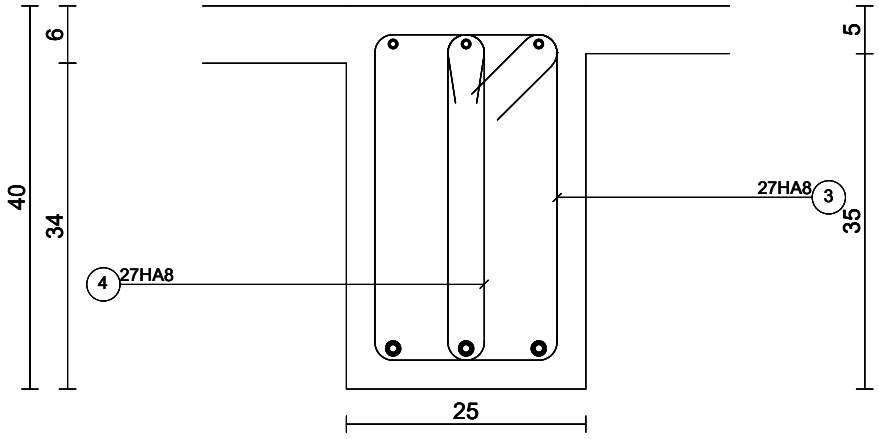
Barre	Lg/Poids
HA8 HA10	29.0/11.5 8.7/5.3

GRAITEC	A31(25x40) PH 3EME	A31	Béton=0.39 m3 Acier=41.1 kg d=105.9 kg/m3 Fi=8.8 mm Cof=3.8 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	39 39
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/26



Coupe A-A
Echelle=1/8

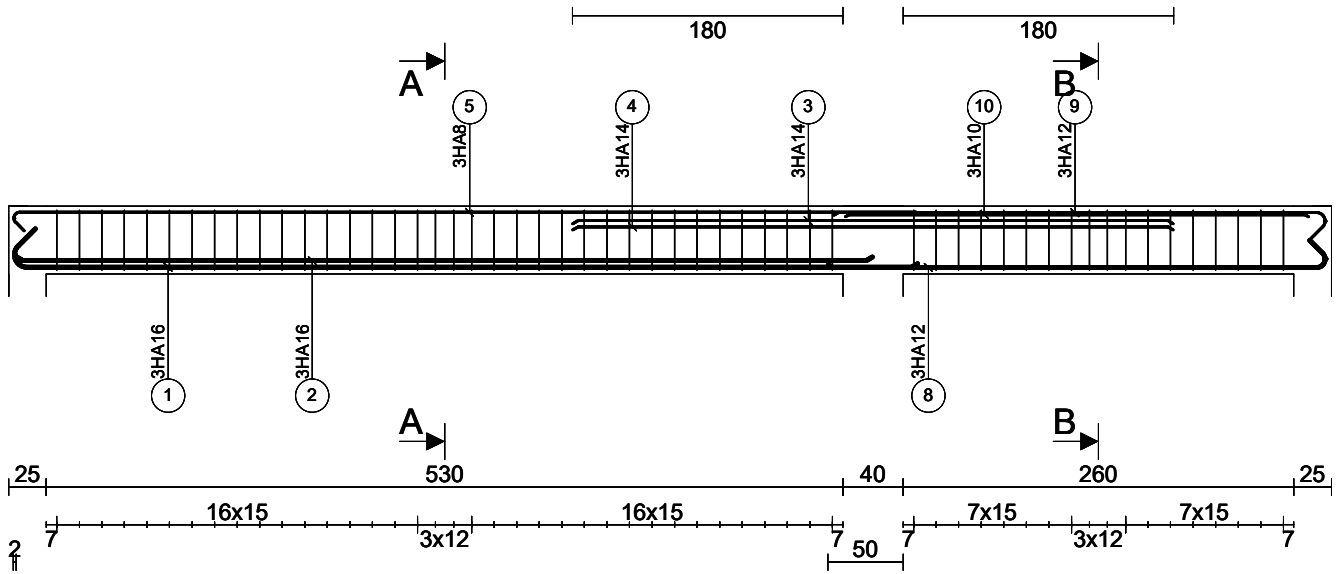


	Barre	Lg	Forme
1	3HA12	481	18 1111 18 135° 443 135°
2	3HA8	470	12 8 8 12 135° 444 135°
3	27HA8	125	35 20
4	27HA8	89	35

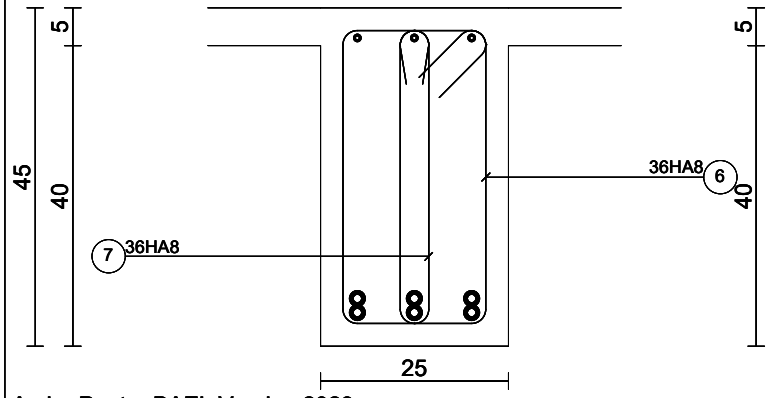
Barre	Lg/Poids
HA8 HA12	71.8/28.3 14.4/12.8

GRAITEC	A32(25x45) PH 3EME	A32.1 A A32.2	Béton=0.88 m3 Acier=167.1 kg d=190.7 kg/m3 Fi=10.7 mm Cof=8.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	45 45
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

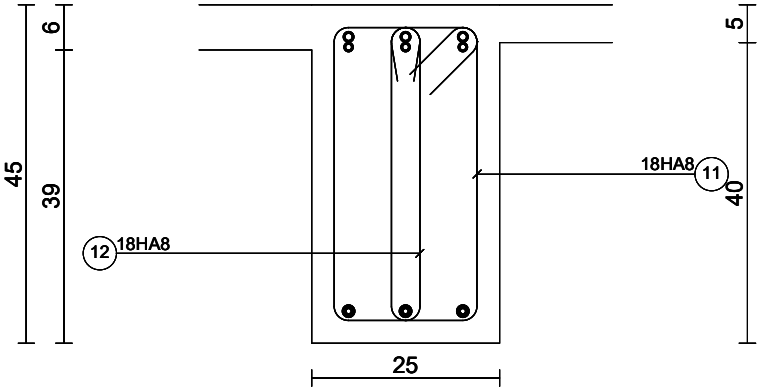
Elévation
Echelle=1/50



Coupe A-A
Echelle=1/10



Coupe B-B
Echelle=1/10

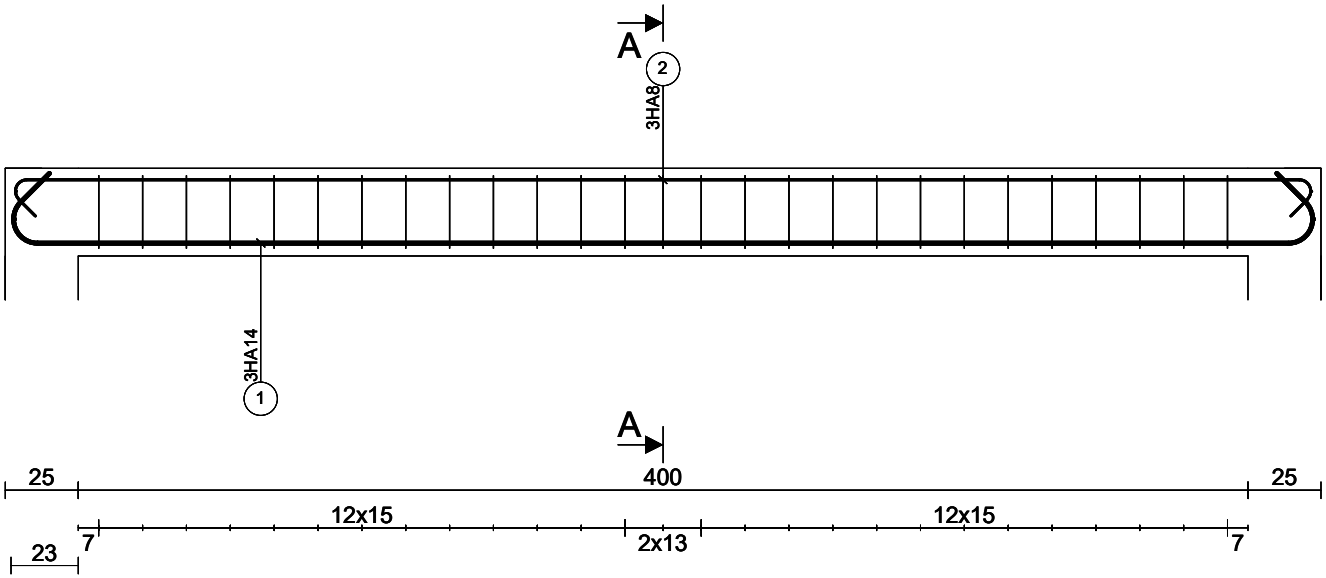


	Barre	Lg	Forme
1	3HA16	628	25 / 17 / 135° / 602
2	3HA16	570	570
3	3HA14	400	400
4	3HA14	400	400
5	3HA8	616	12 / 8 / 135° / 603
6	36HA8	135	40 / 20
7	36HA8	99	40
8	3HA12	350	18 / 11 / 135° / 332
9	3HA12	347	18 / 11 / 135° / 328
10	3HA10	309	309
11	18HA8	135	40 / 20
12	18HA8	99	40

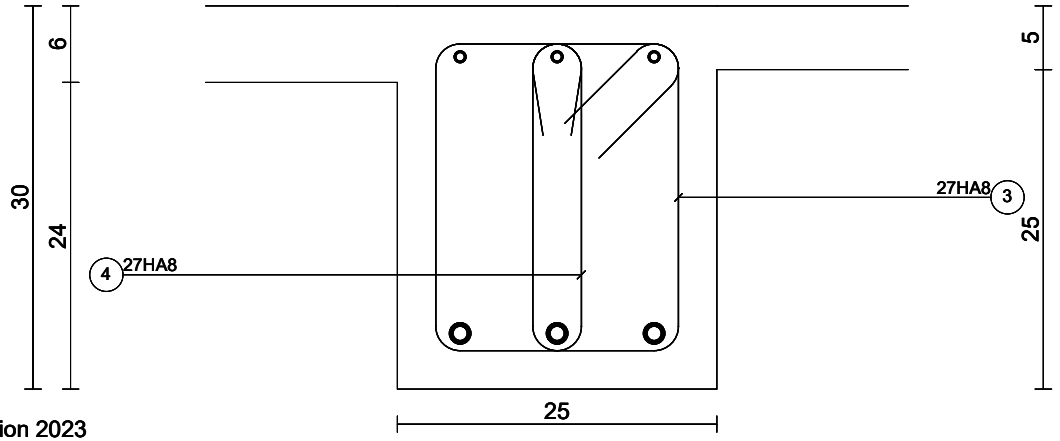
Barre	Lg/Poids
HA8	144.6/57.1
HA10	9.3/5.7
HA12	20.9/18.6
HA14	24.0/29.0
HA16	35.9/56.7

GRAITEC	A33(25x30) PH 3EME	A33	Béton=0.28 m3 Acier=42.0 kg d=152.3 kg/m3 Fi=9.5 mm Cof=3.0 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	40 40
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/26



Coupe A-A
Echelle=1/6

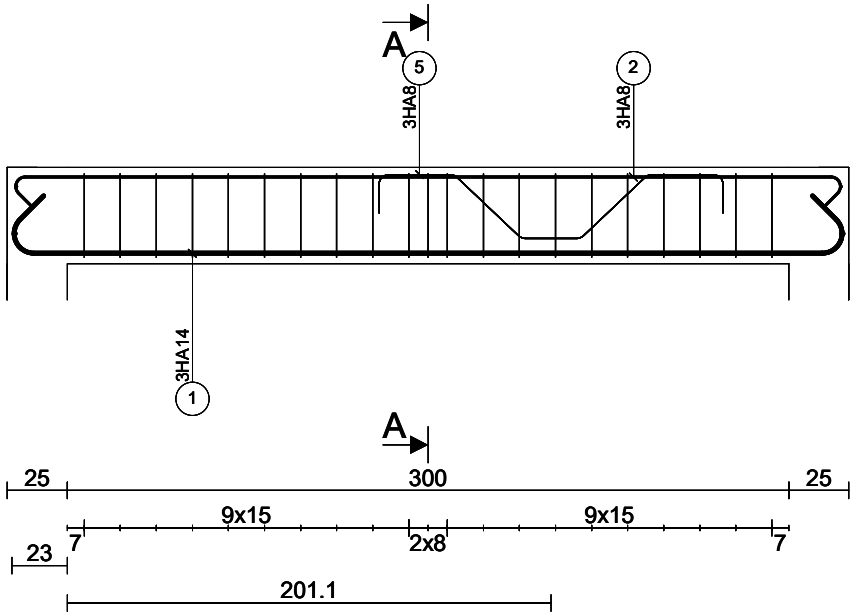


	Barre	Lg	Forme
1	3HA14	495	23 16 23 135° 135° 446
2	3HA8	470	12 8 8 12 135° 135° 444
3	27HA8	105	25 20
4	27HA8	69	25

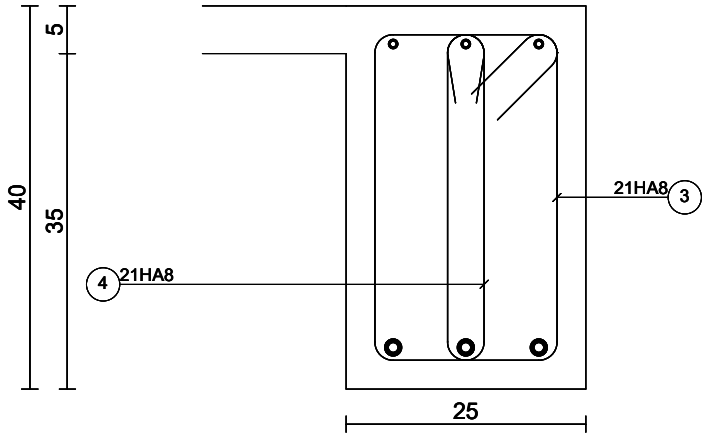
Barre	Lg/Poids
HA8 HA14	61.0/24.1 14.8/17.9

GRAITEC	A34(25x40) PH 3EME	A34	Béton=0.33 m3 Acier=38.7 kg d=117.8 kg/m3 Fi=9.2 mm Cof=3.0 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	4 4
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/31



Coupe A-A
Echelle=1/8

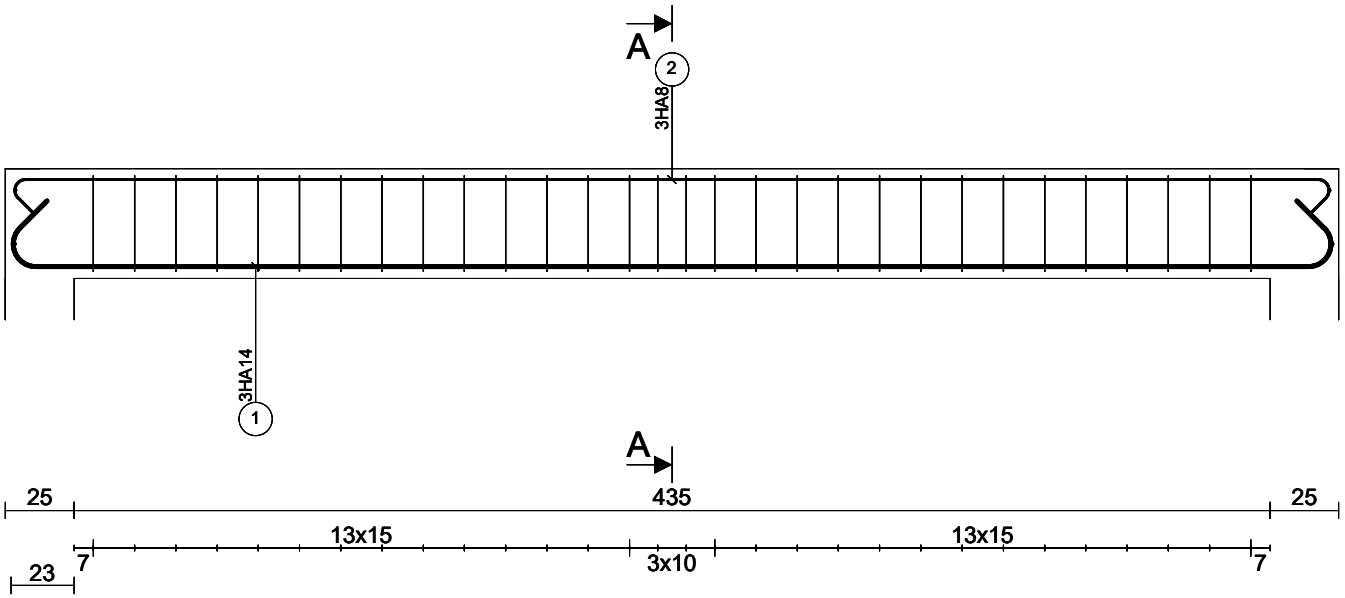


	Barre	Lg	Forme
1	3HA14	395	23 16 16 23 135° 135° 346
2	3HA8	370	12 8 8 12 135° 135° 344
3	21HA8	125	35 20
4	21HA8	89	35
5	3HA8	192	32 32 28 45° 45° 25

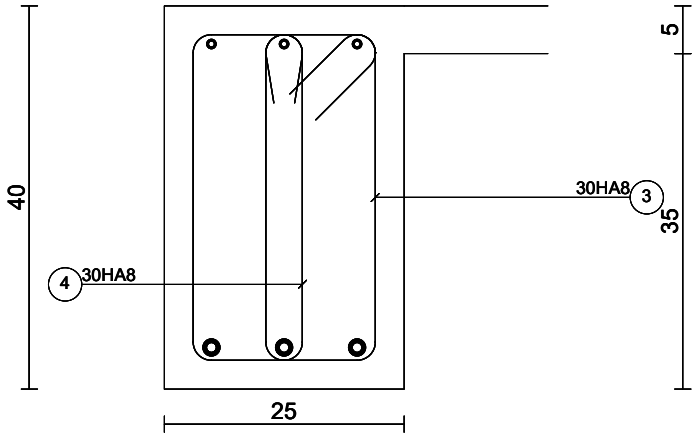
Barre	Lg/Poids
HA8 HA14	61.7/24.3 11.8/14.3

GRAITEC	A35(25x40) PH 3EME	A35	Béton=0.45 m3 Acier=50.5 kg d=111.0 kg/m3 Fi=9.3 mm Cof=4.3 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	12 12
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/27



Coupe A-A
Echelle=1/8

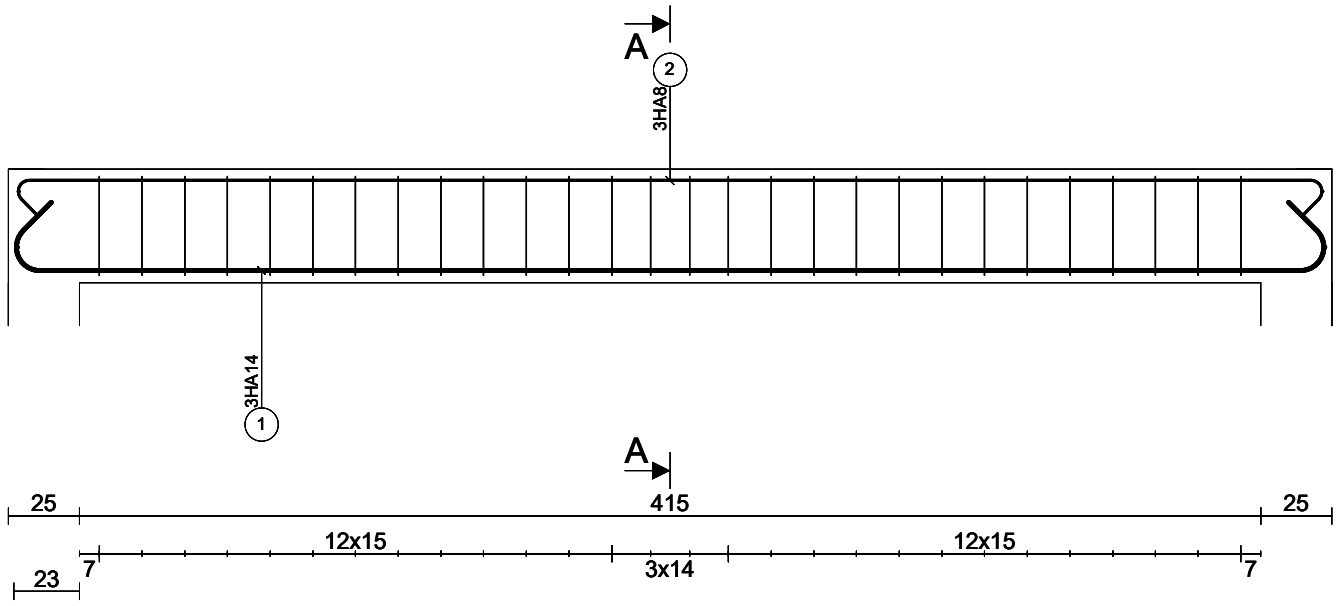


	Barre	Lg	Forme
1	3HA14	530	23 23 1616 135° 135° 481
2	3HA8	505	12 12 8 8 135° 135° 479
3	30HA8	125	35 20
4	30HA8	89	35

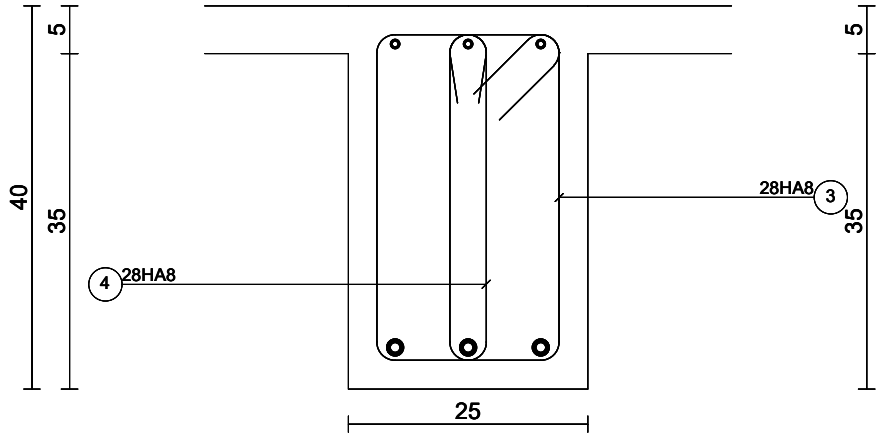
Barre	Lg/Poids
HA8 HA14	79.2/31.3 15.9/19.2

GRAITEC	A36(25x40) PH 3EME	A36	Béton=0.41 m3 Acier=47.8 kg d=117.5 kg/m3 Fi=9.3 mm Cof=3.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	14 14
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/26



Coupe A-A
Echelle=1/8

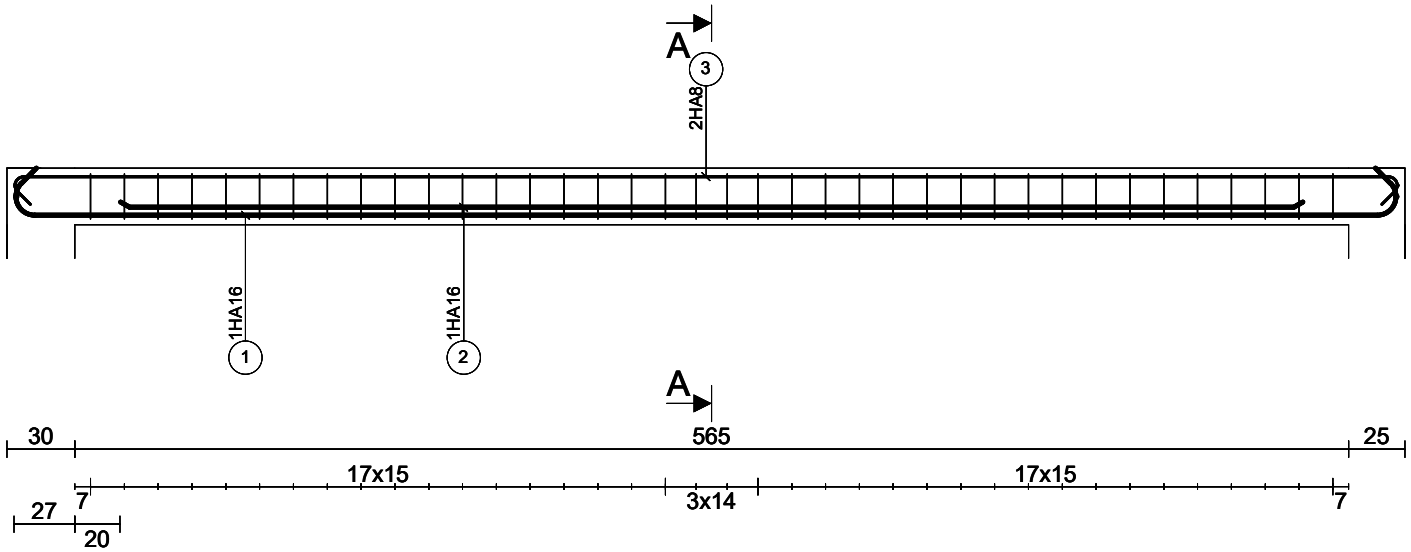


	Barre	Lg	Forme
1	3HA14	510	23 16 23 135° 135° 461
2	3HA8	485	12 8 8 12 135° 135° 459
3	28HA8	125	35 20
4	28HA8	89	35

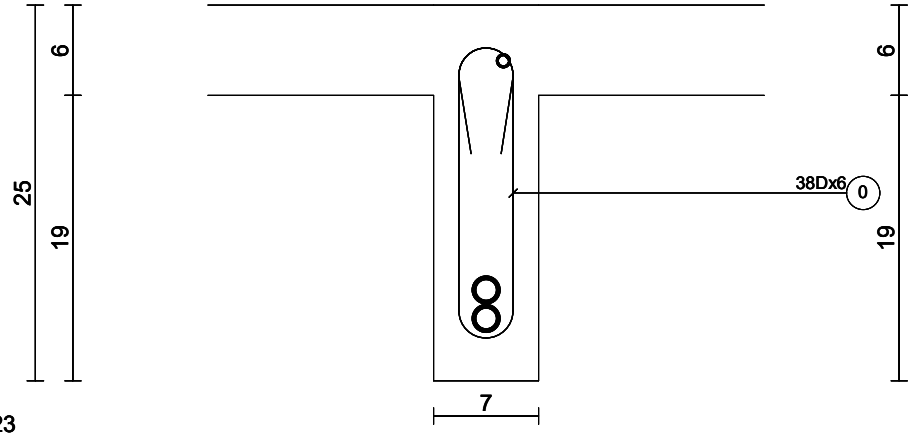
Barre	Lg/Poids
HA8 HA14	74.3/29.3 15.3/18.5

GRAITEC	N1(19+6) PH RDC	N1	Béton=0.08 m3 Acier=28.8 kg d=349.6 kg/m3 Fi=10.0 mm Cof=2.5 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/33



Coupe A-A
Echelle=1/5

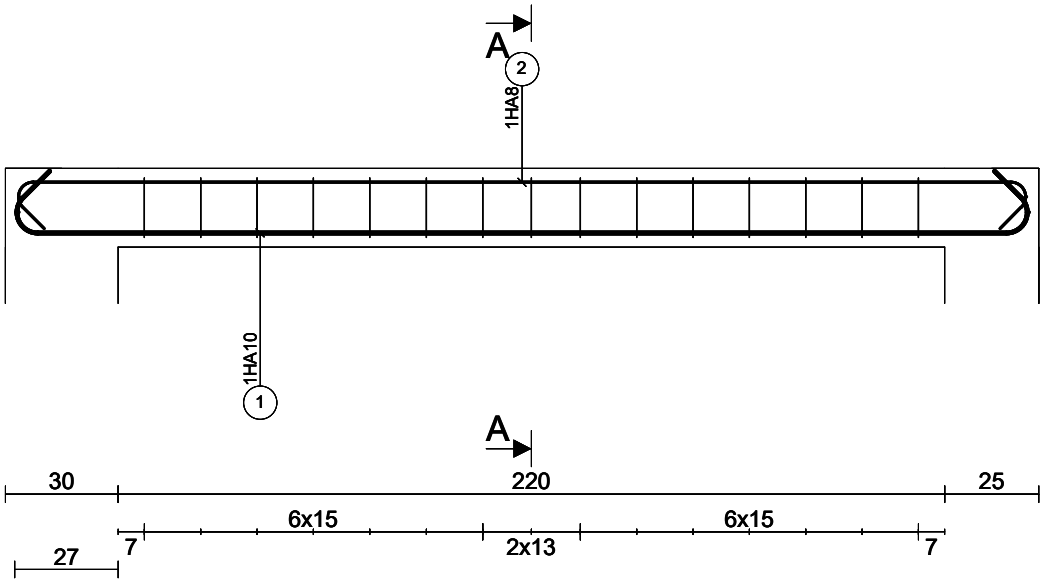


	Barre	Lg	Forme
1	1HA16	667	25 / 1717 / 25 — 135° 614 135°
2	1HA16	525	525
3	2HA8	640	12 / 8 / 8 / 12 — 135° 614 135°
0	38Dx6	59	20

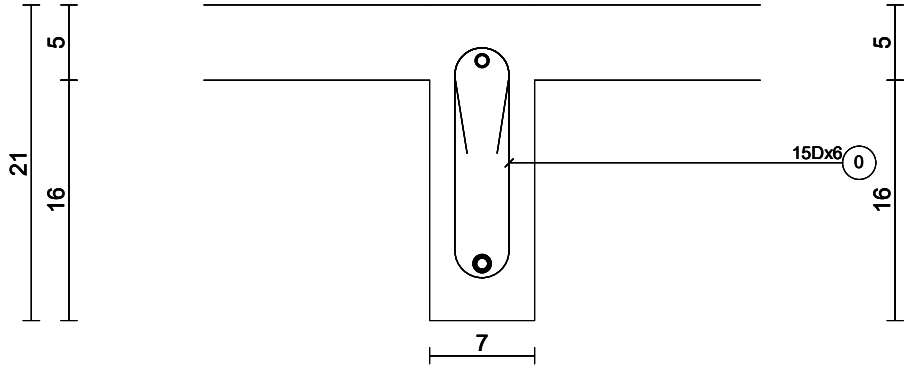
Barre	Lg/Poids
HA8 HA16 Dx6	12.8/5.0 11.9/18.8 22.4/5.0

GRAITEC	N2(16+5) PH RDC	N2	Béton=0.03 m3 Acier=4.7 kg d=153.6 kg/m3 Fi=7.5 mm Cof=0.9 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/20



Coupe A-A
Echelle=1/5

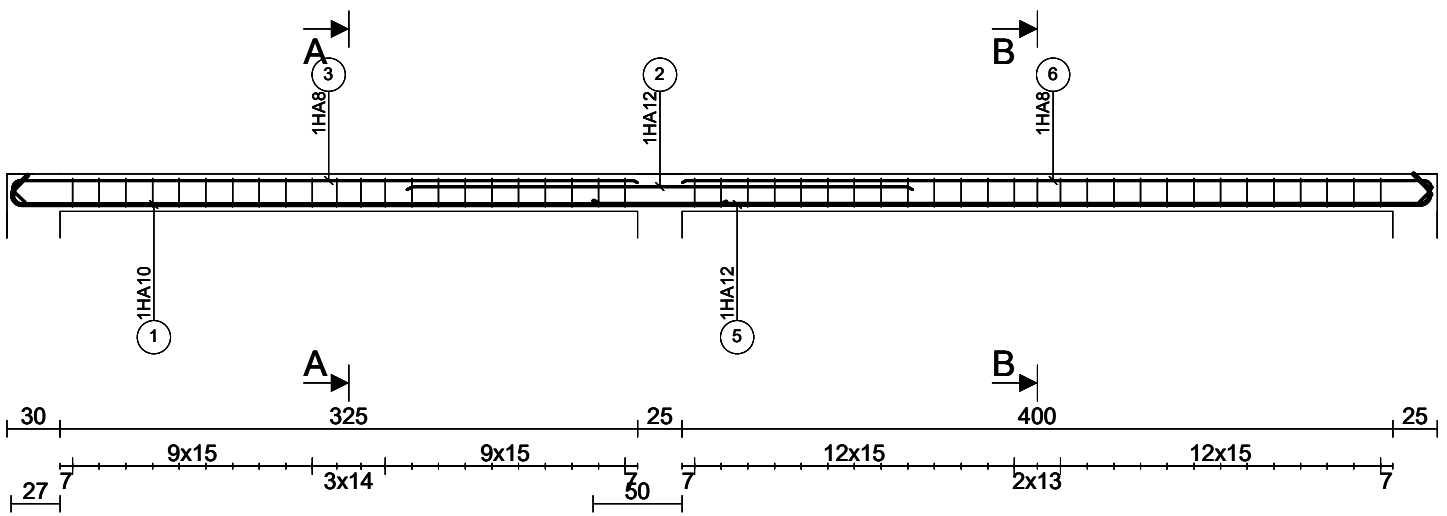


	Barre	Lg	Forme
1	1HA10	304	16 16 135° 1111 135° 270
2	1HA8	295	12 12 135° 8 8 135° 269
0	15Dx6	51	16

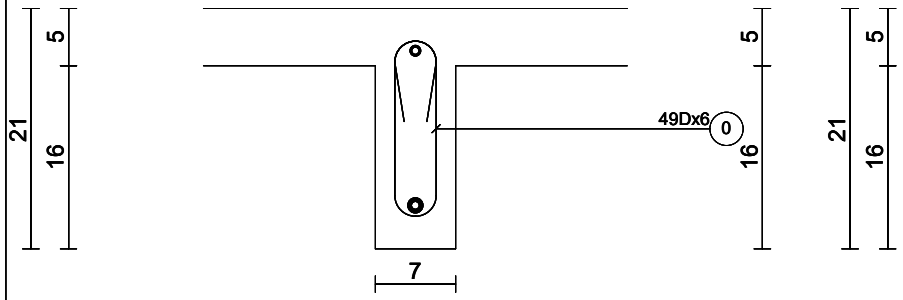
Barre	Lg/Poids
HA8 HA10 Dx6	2.9/1.2 3.0/1.9 7.6/1.7

GRAITEC	N3(16+5) PH RDC	N3.1 A N3.2	Béton=0.09 m3 Acier=18.2 kg d=201.5 kg/m3 Fi=8.1 mm Cof=2.8 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

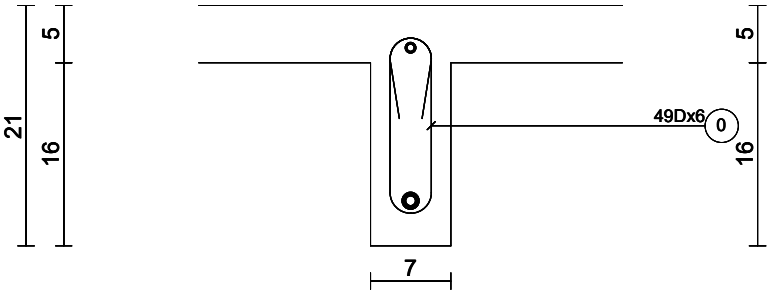
Elévation
Echelle=1/42



Coupe A-A
Echelle=1/7



Coupe B-B
Echelle=1/7

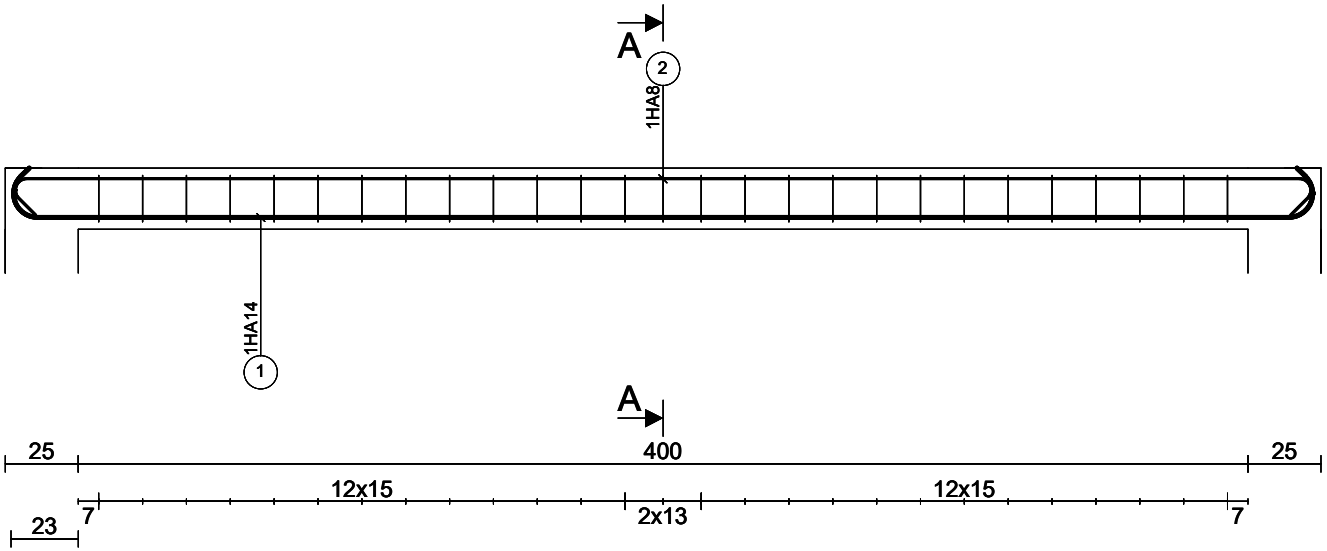


	Barre	Lg	Forme
1	1HA10	419	16 ⌀ 11 135° 402
2	1HA12	285	285
3	1HA8	365	12 ⌀ 8 135° 352
5	1HA12	490	18 ⌀ 11 135° 471
6	1HA8	435	12 ⌀ 8 135° 422
0	49Dx6	51	16

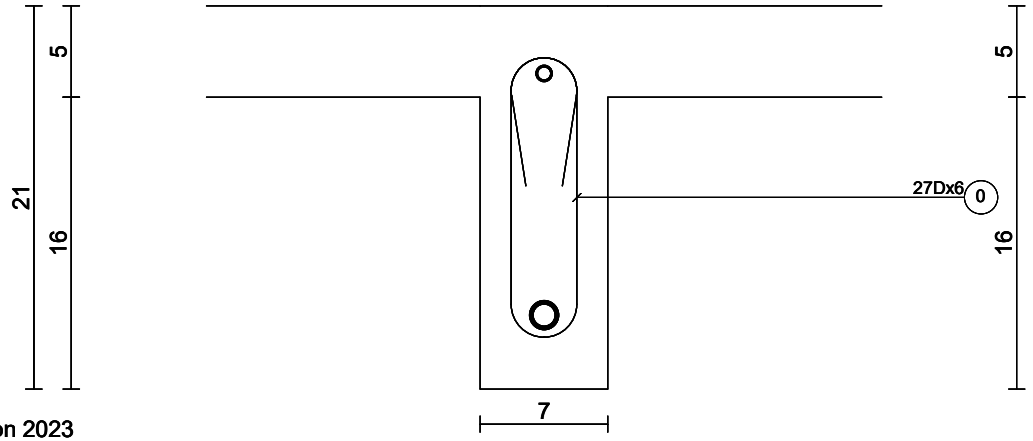
Barre	Lg/Poids
HA8	8.0/3.2
HA10	4.2/2.6
HA12	7.8/6.9
Dx6	25.0/5.5

GRAITEC	N4(16+5) PH RDC	N4	Béton=0.05 m3 Acier=10.9 kg d=215.9 kg/m3 Fi=8.7 mm Cof=1.6 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/26



Coupe A-A
Echelle=1/4

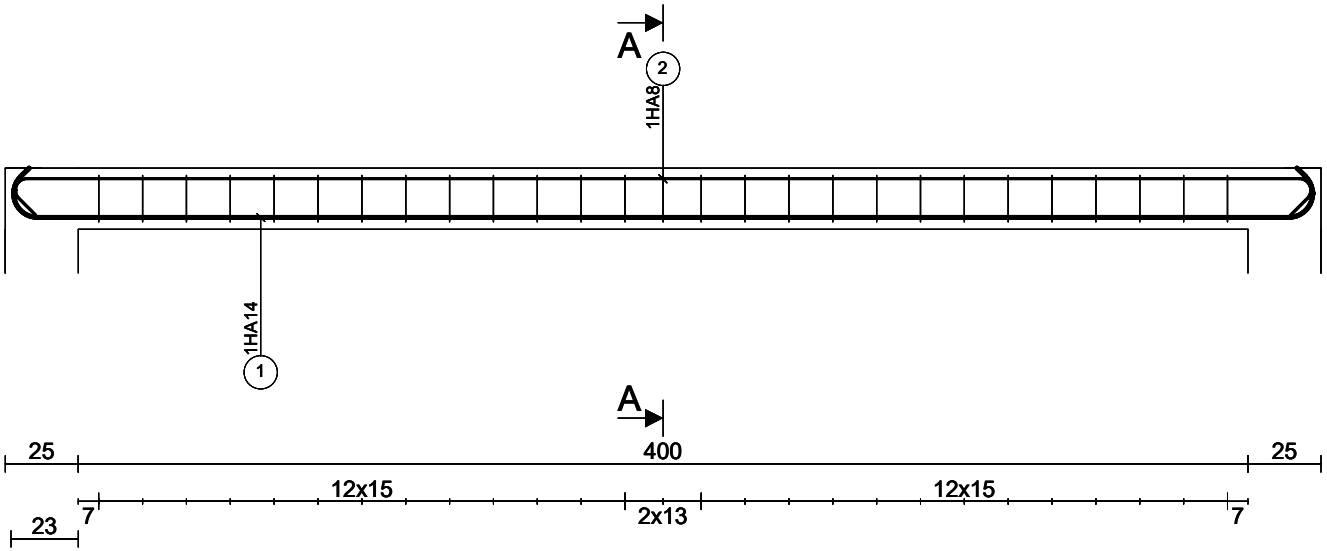


	Barre	Lg	Forme
1	1HA14	495	23 23 16 16 135° 135° 446
2	1HA8	470	12 12 8 8 135° 135° 444
0	27Dx6	51	16

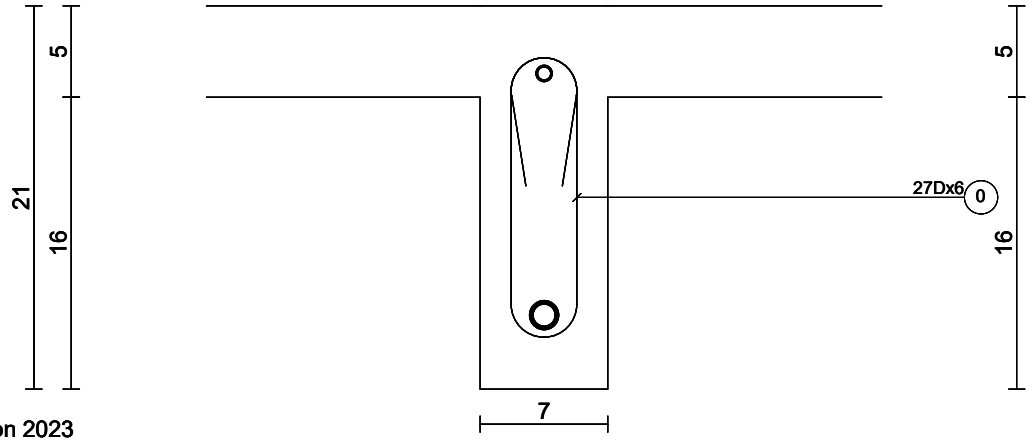
Barre	Lg/Poids
HA8 HA14 Dx6	4.7/1.9 4.9/6.0 13.8/3.1

GRAITEC	N5(16+5) PH RDC	N5	Béton=0.05 m3 Acier=10.9 kg d=215.9 kg/m3 Fi=8.7 mm Cof=1.6 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/26



Coupe A-A
Echelle=1/4

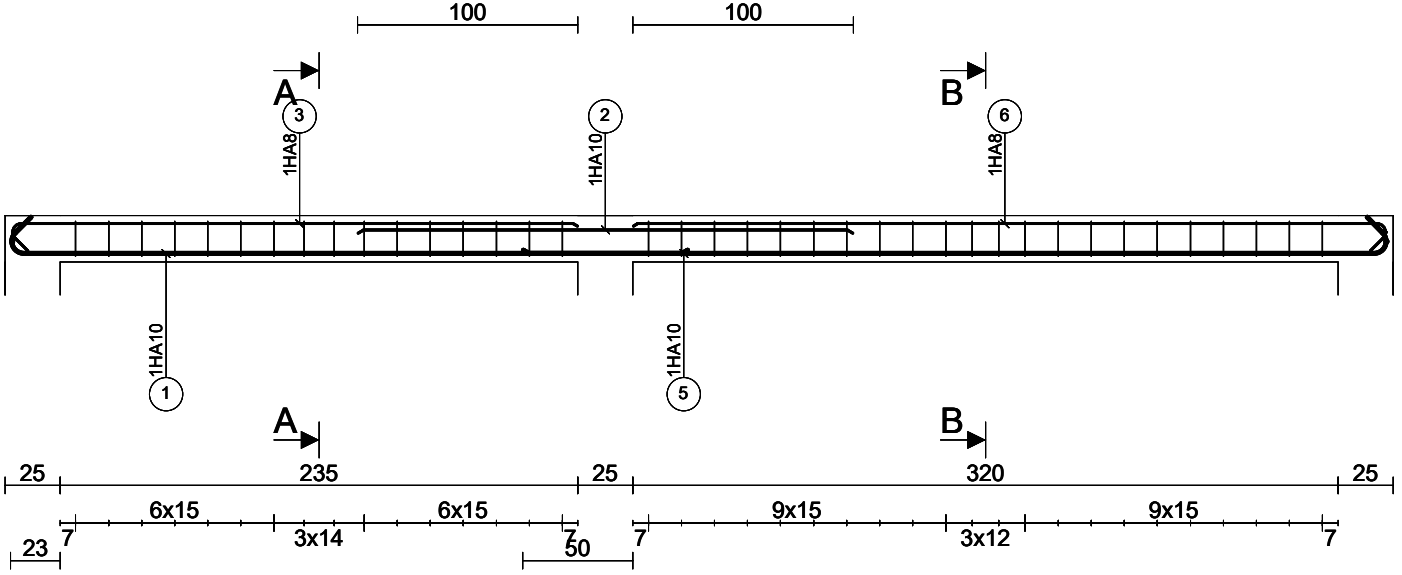


	Barre	Lg	Forme
1	1HA14	495	23 23 16 16 135° 135° 446
2	1HA8	470	12 12 8 8 135° 135° 444
0	27Dx6	51	16

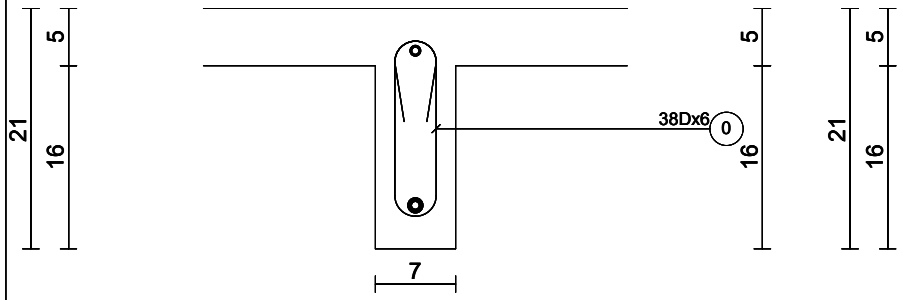
Barre	Lg/Poids
HA8 HA14 Dx6	4.7/1.9 4.9/6.0 13.8/3.1

GRAITEC	N6(16+5) PH RDC	N6.1 A N6.2	Béton=0.07 m3 Acier=12.7 kg d=179.6 kg/m3 Fi=7.6 mm Cof=2.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

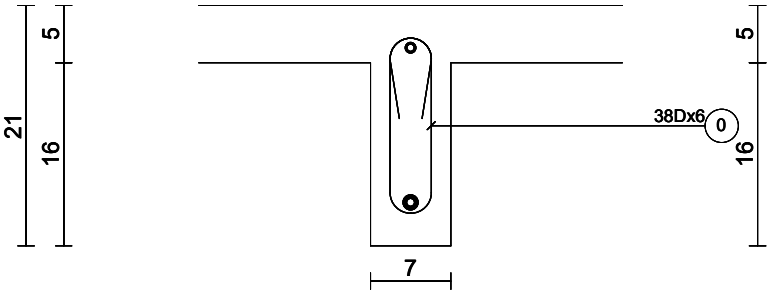
Elévation
Echelle=1/34



Coupe A-A
Echelle=1/7



Coupe B-B
Echelle=1/7

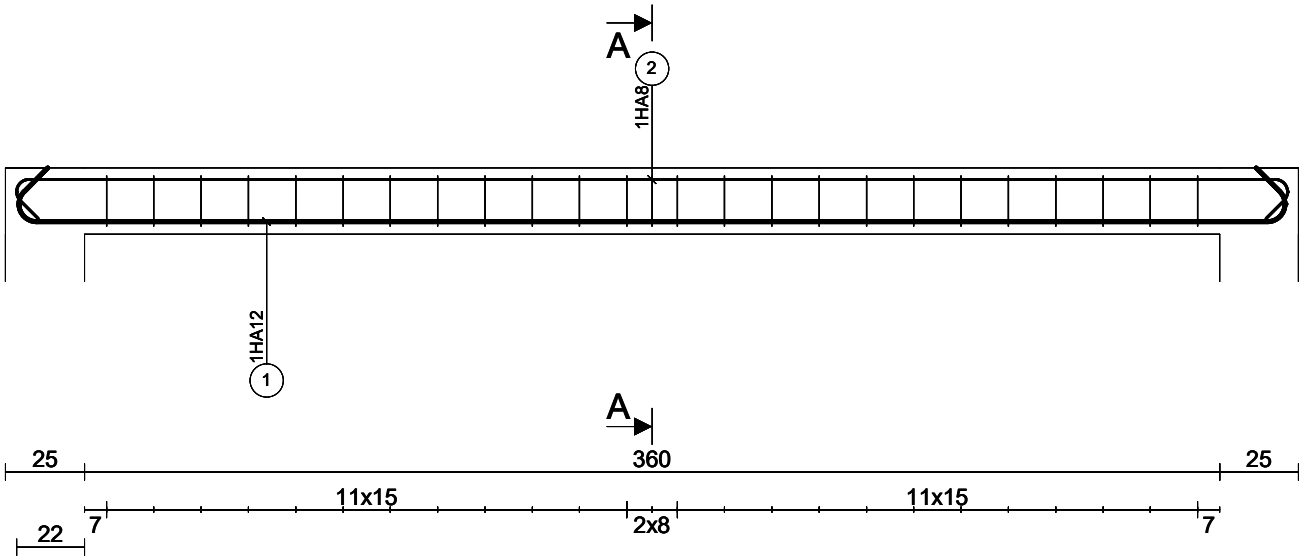


	Barre	Lg	Forme
1	1HA10	324	16, 11, 135°, 308
2	1HA10	225	225
3	1HA8	270	8, 12, 257, 135°
5	1HA10	409	16, 11, 393, 135°
6	1HA8	355	12, 8, 135°, 342
0	38Dx6	51	16

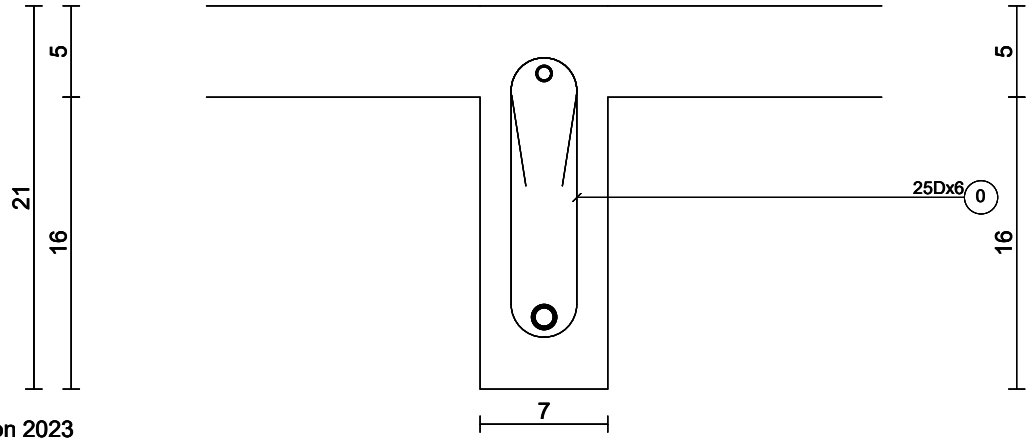
Barre	Lg/Poids
HA8 HA10 Dx6	6.2/2.5 9.6/5.9 19.4/4.3

GRAITEC	N7(16+5) PH RDC	N7	Béton=0.05 m3 Acier=8.4 kg d=183.7 kg/m3 Fi=8.0 mm Cof=1.4 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/24



Coupe A-A
Echelle=1/4

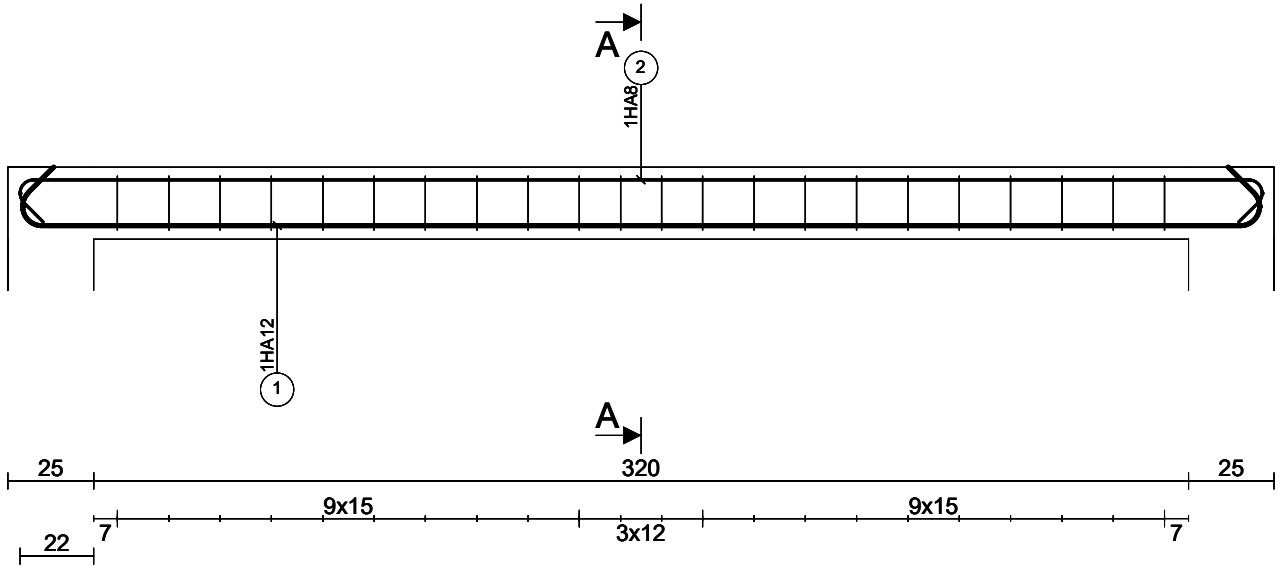


	Barre	Lg	Forme
1	1HA12	441	18 18 135° 1111 135° 403
2	1HA8	430	12 12 135° 8 8 135° 404
0	25Dx6	51	16

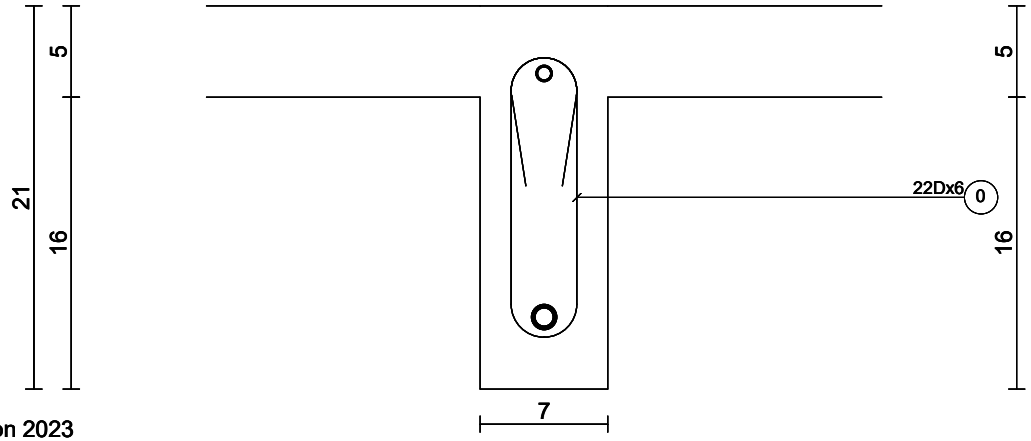
Barre	Lg/Poids
HA8 HA12 Dx6	4.3/1.7 4.4/3.9 12.7/2.8

GRAITEC	N8(16+5) PH RDC	N8	Béton=0.04 m3 Acier=7.6 kg d=183.0 kg/m3 Fi=8.0 mm Cof=1.2 m²	Eb=2.5 cm Eh=2.5 cm El=2.5 cm	31 31
	IMMEUBLE MUTUELLE R+3				
	Fc28= 22 MPa Fe= 400 MPa Fissuration peu préjudiciable				

Elévation
Echelle=1/22



Coupe A-A
Echelle=1/4



	Barre	Lg	Forme
1	1HA12	401	18 18 135° 1111 135° 363
2	1HA8	390	12 12 135° 8 8 135° 364
0	22Dx6	51	16

Barre	Lg/Poids
HA8 HA12 Dx6	3.9/1.5 4.0/3.6 11.2/2.5