

Hypothèse de calculs

Béton

C30/37 - XF1 : zone façades

Armatures

-HA: $f_{yk} = 500$ Mpa de classe B

Résistance au feu

REI = 1 h

Enrobage

4 cm

POIDS Préfa: 26 049 kg

RECAP. TOTAL BARRES HA		
Diamètres	Longueurs	Poids
8	1113	440
10	170	105
12	455	404
		Poids total = 948 kg

Section : 20 x 78ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

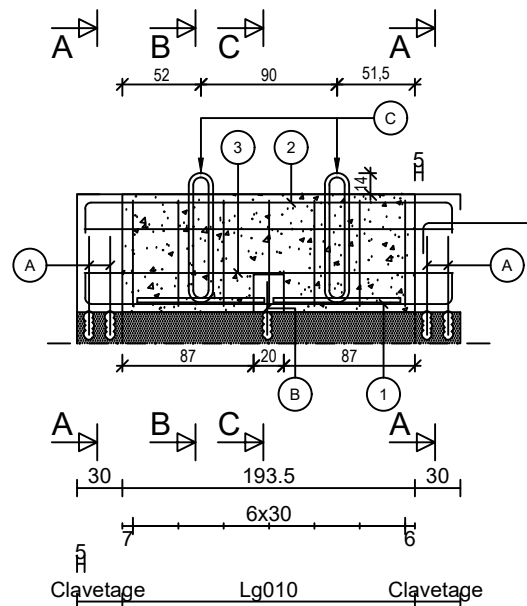
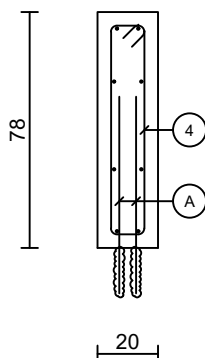
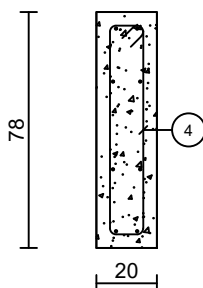
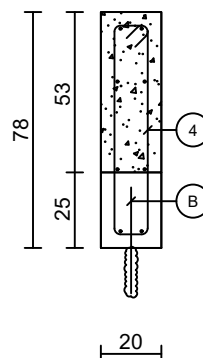
Scelllements (Résine
HIT HY 200)

Béton
C30/37

Poids Préfa
678 Kg

Zone Préfa

NOTA : Empochement à rigidifier avec un bastaing chevillé

Élévation
Echelle=1/50

Coupe A-A
Echelle=1/25

Coupe B-B
Echelle=1/25

Coupe C-C
Echelle=1/25


	Barre	Lg	Forme
1	2HA8	279	
2	2HA8	279	
3	4HA8	244	
4	7HA8	173	
A	2x2HA12	65	
B	1HA12	35	
C	2HA12 (Acier doux)	283	
Barre		Lg/Poids	
HA8		33.0/13.0	



LE HAVRE CROISIERES
FONDATION - T23

Lg011

Béton=0.94 m3
Acier=55.0 kg d=58.6 kg/m3
Fi=10.1 mm Cof=10.3 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

3
14

Section : 20 x 68ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

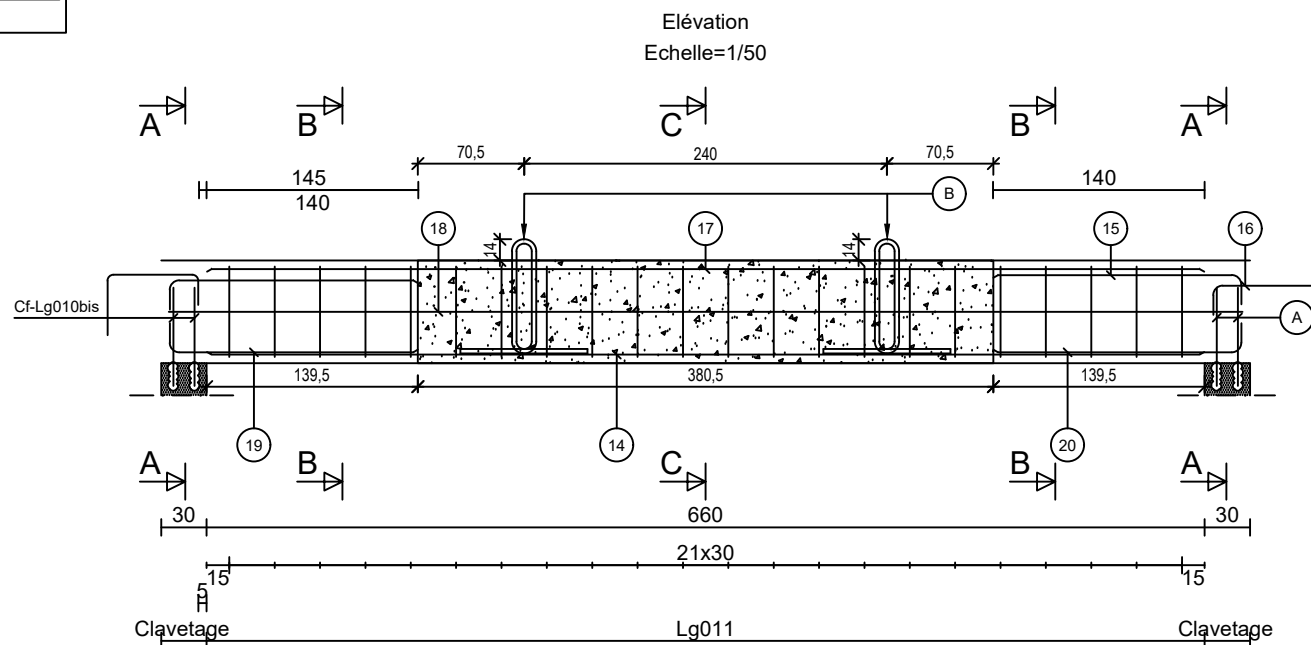
* Aciers non
soudés

⊠ Scelllements (Résine
HIT HY 200)

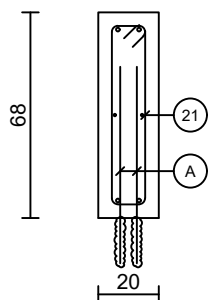
Béton
C30/37

Poids Préfa
1192 Kg

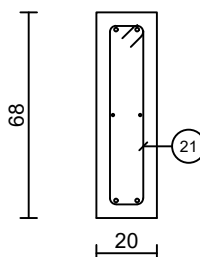
Zone Préfa



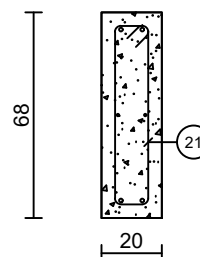
Coupe A-A
Echelle=1/25



Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



	Barre	Lg	Forme
*	14	2HA12	660
	15	2HA12	181
*	16	2HA12	171
	17	2HA10	660
	18	2HA8	710
*	19	2HA12	181
	20	2HA12	181
*	21	22HA8	153
	A	2HA12	65
⊠	B	2HA12 (Acier doux)	263
Barre		Lg/Poids	
HA8		47.8/18.9	
HA12		40.7/36.1	



LE HAVRE CROISIERES
FONDATION - T23

Lg012

Béton=0.86 m3
Acier=52.8 kg d=61.1 kg/m3
Fi=10.3 mm Cof=9.8 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

4
14

Section : 20 x 68ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

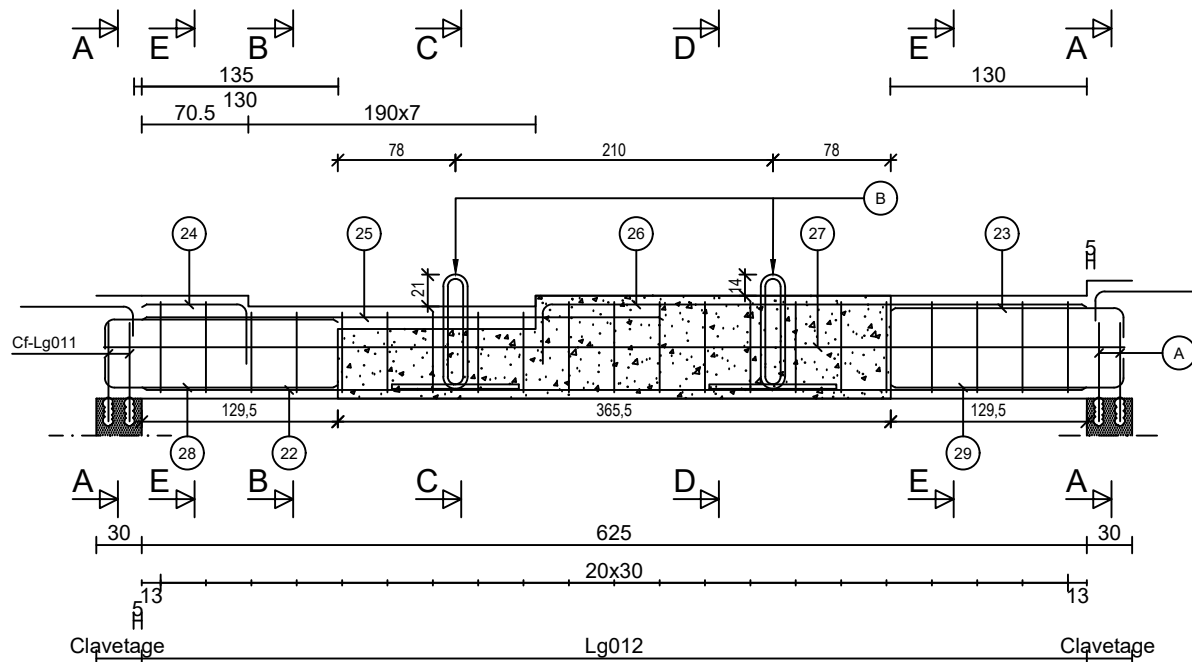
☒ Scelléments (Résine
HIT HY 200)

Béton
C30/37

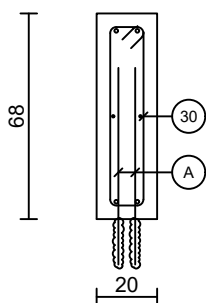
Poids Préfa
1147 Kg

Zone Préfa

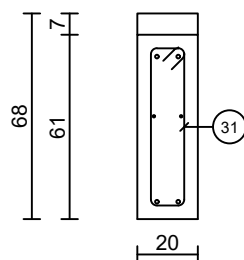
Elévation
Echelle=1/50



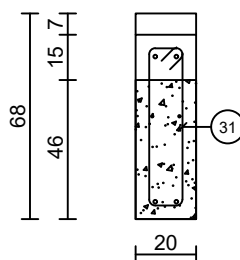
Coupe A-A
Echelle=1/25



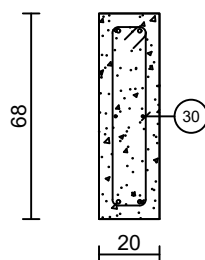
Coupe B-B
Echelle=1/25



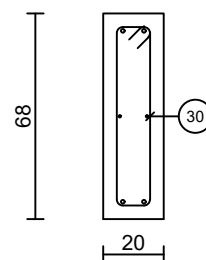
Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



Barre		Lg	Forme
22	2HA12	625	625
* 23	2HA12	171	
24	2HA10	106	
25	2HA10	345	345
26	2HA10	396	
27	2HA8	675	675
* 28	2HA12	171	
* 29	2HA12	171	
30	14HA8	153	
31	7HA8	139	
☒ A	2HA12	65	
B	2HA12 (Acier doux)	263	
Barre		Lg/Poids	
HA8		44.6/17.6	
HA12		39.7/35.2	

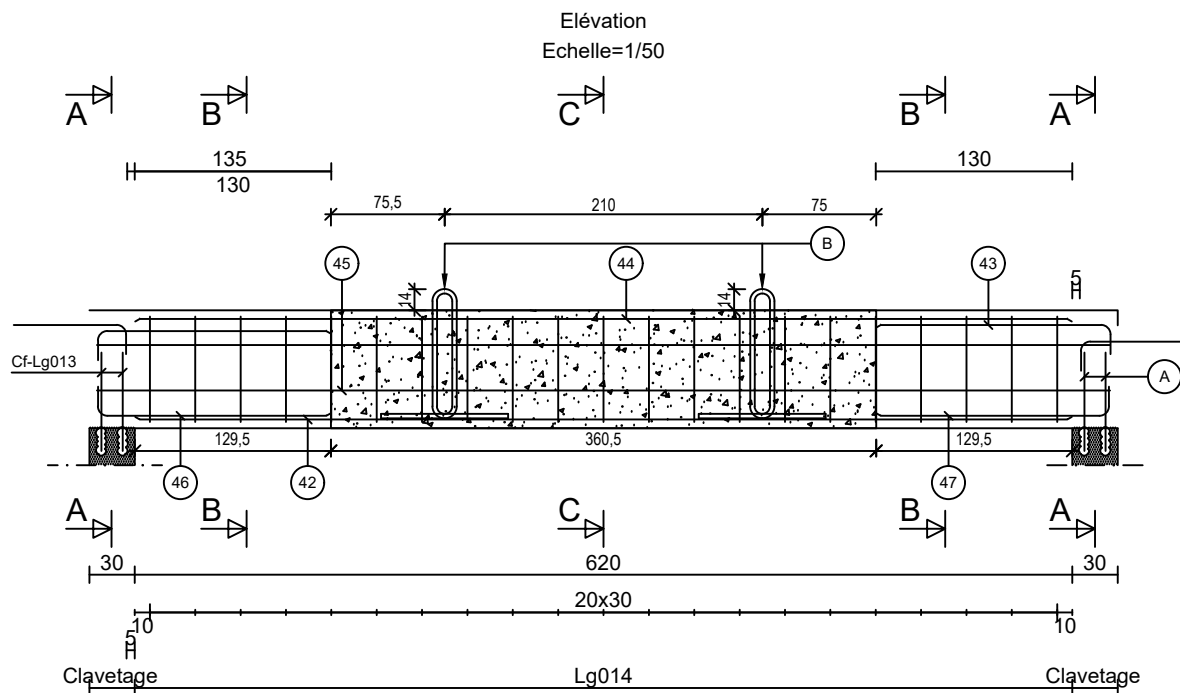
* Aciers non soudés

Scelléments (Résine HIT HY 200)

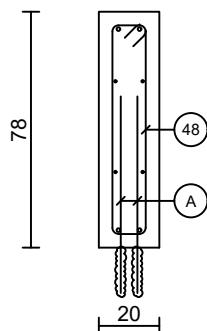
Béton C30/37

Poids Préfa 1292 Kg

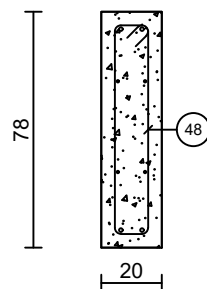
Zone Préfa



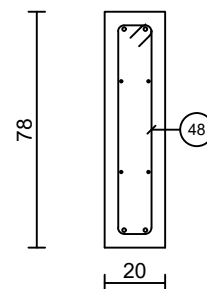
Coupe A-A
Echelle=1/25



Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



	Barre		Lg	Forme
	42	2HA12	620	620
*	43	2HA12	172	20 13 90° 156
	44	2HA10	620	620
	45	4HA8	670	670
*	46	2HA12	171	20 13 90° 155
*	47	2HA12	171	13 20 155 90°
	48	21HA8	173	70 12
α	A	2HA12	65	50 15
	B	2HA12 (Acier doux)	283	85 53 53
Barre			Lg/Poids	
HA8			63.1/24.9	
HA12			35.1/31.1	

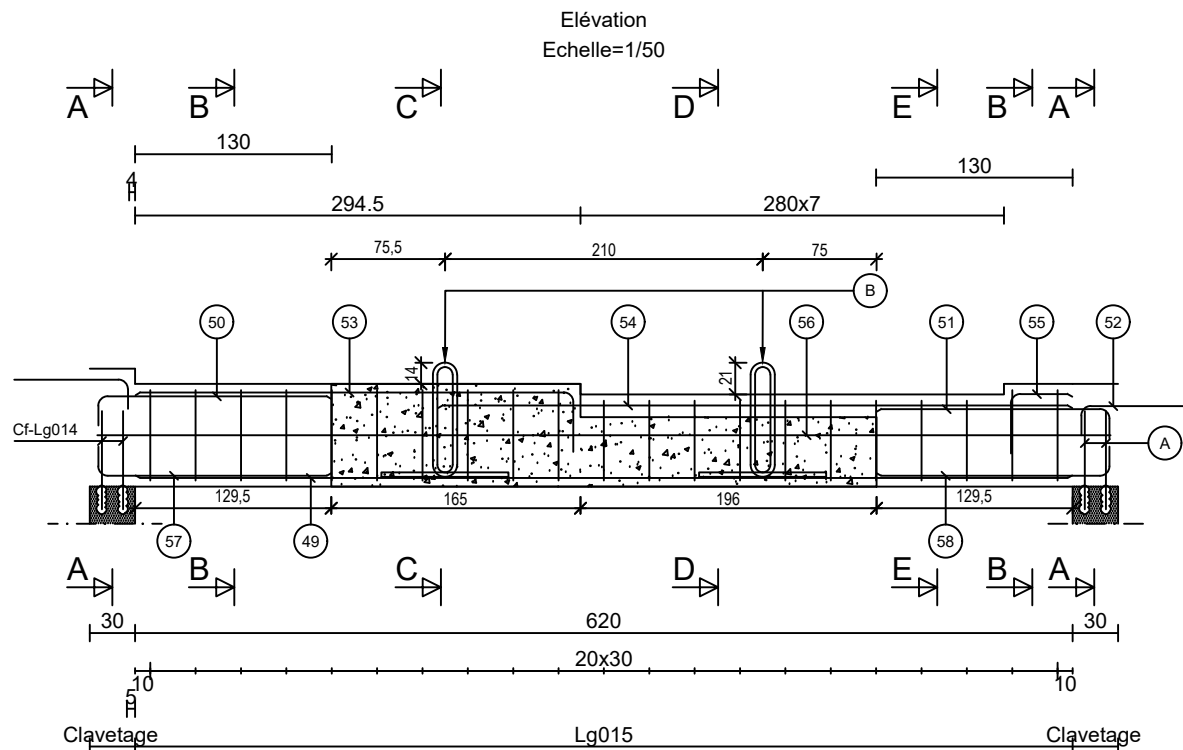
* Aciers non soudés

☒ Scelléments (Résine HIT HY 200)

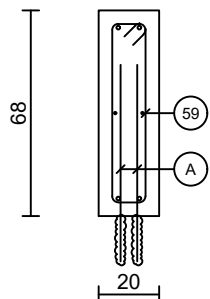
Béton
C30/37

Poids Préfa
1136 Kg

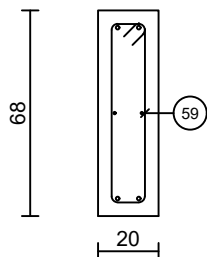
Zone Préfa



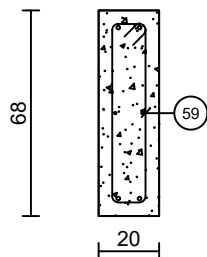
Coupe A-A
Echelle=1/25



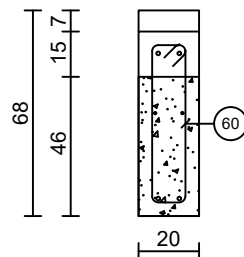
Coupe B-B
Echelle=1/25



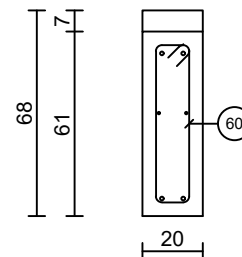
Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



	Barre	Lg	Forme
49	2HA12	620	620
* 50	2HA12	171	13 20 155 90°
* 51	2HA12	171	20 13 90° 155
* 52	2HA12	171	13 20 155 90°
53	2HA10	326	40 13 90° 291
54	2HA10	420	420
55	2HA10	77	13 40 42 90°
56	2HA8	670	670
* 57	2HA12	171	20 13 90° 155
* 58	2HA12	171	13 20 155 90°
59	12HA8	153	60 12
60	9HA8	139	53 12
☒ A	2HA12	65	50 15
B	2HA12 (Acier doux)	263	75 53 53
Barre		Lg/Poids	
HA8		44.2/17.5	
HA12		46.0/40.8	



LE HAVRE CROISIERES
FONDATION - T23

Lg016

Béton=0.84 m3
Acier=52.2 kg d=61.8 kg/m3
Fi=10.3 mm Cof=9.7 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

8
14

Section : 20 x 68ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

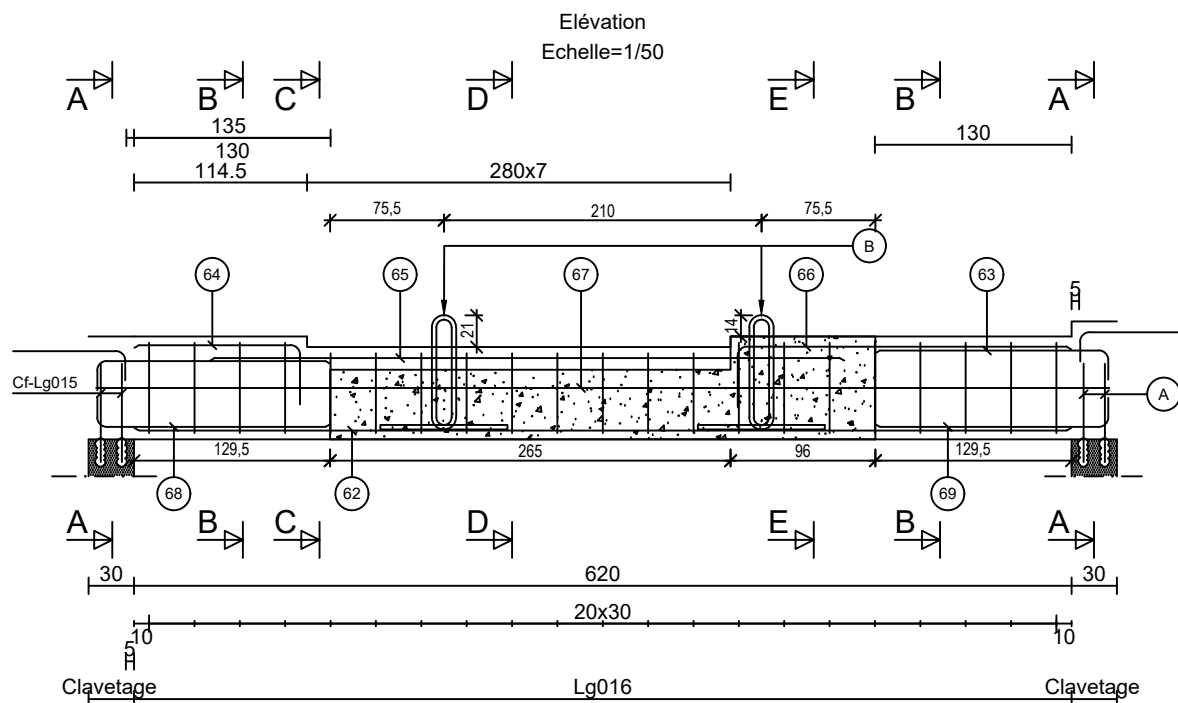
* Aciers non
soudés

☒ Scelllements (Résine
HIT HY 200)

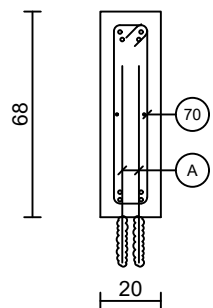
Béton
C30/37

Poids Préfa
1130 Kg

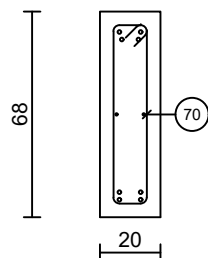
Zone Préfa



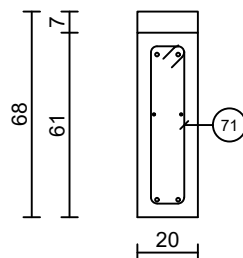
Coupe A-A
Echelle=1/25



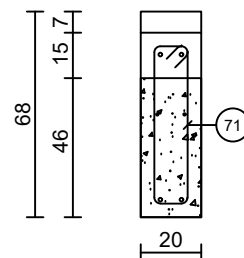
Coupe B-B
Echelle=1/25



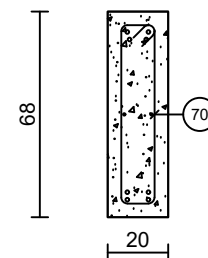
Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



	Barre	Lg	Forme
	62	2HA12	620
*	63	2HA12	171 20 13 90° 155
	64	2HA10	146 40 13 90° 111
	65	2HA10	420
	66	2HA10	257 13 40 222 90°
	67	2HA8	670
*	68	2HA12	171 20 13 90° 155
*	69	2HA12	171 13 20 155 90°
	70	12HA8	153 60 12
	71	9HA8	139 53 12
☒	A	2HA12	65 50 15
	B	2HA12 (Acier doux)	263 75 53 53
Barre		Lg/Poids	
HA8		44.2/17.5	
HA12		39.1/34.7	

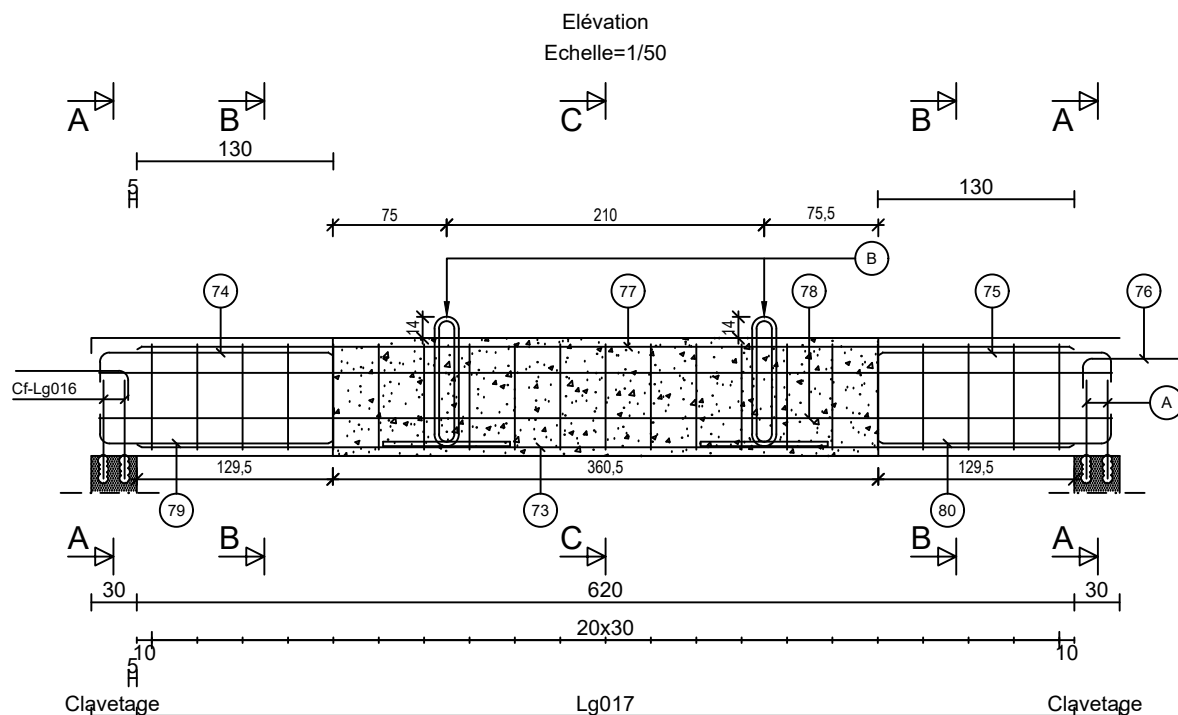
* Aciers non soudés

Scelléments (Résine HIT HY 200)

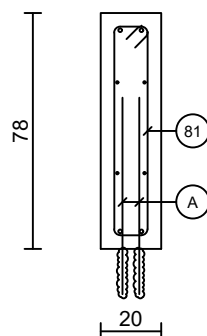
Béton
C30/37

Poids Préfa
1297 Kg

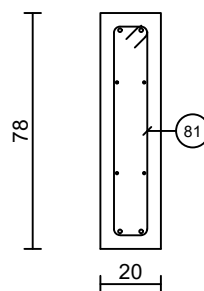
Zone Préfa



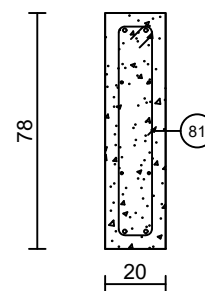
Coupe A-A
Echelle=1/25



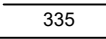
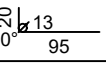
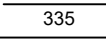
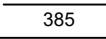
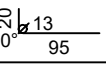
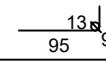
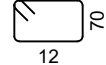
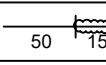
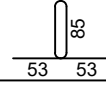
Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



	Barre	Lg	Forme
73	2HA12	620	620
* 74	2HA12	171	13 20 155 90°
* 75	2HA12	171	20 13 90° 155
* 76	2HA12	111	13 20 95 90°
77	2HA10	620	620
78	4HA8	670	670
* 79	2HA12	171	20 13 90° 155
* 80	2HA12	171	13 20 155 90°
81	21HA8	173	70 12
α A	2HA12	65	50 15
B	2HA12 (Acier doux)	283	85 53 53
Barre		Lg/Poids	
HA8		63.1/24.9	
HA12		40.7/36.1	

	Barre	Lg	Forme
*	82	2HA12	335 
	83	2HA12	111 
	84	2HA10	335 
	85	4HA8	385 
*	86	2HA12	111 
*	87	2HA12	111 
	88	12HA8	173 
Ø	A	2HA12	65 
	B	2HA12 (Acier doux)	283 
Barre		Lg/Poids	
HA8 HA12		36.1/14.3 20.0/17.8	



LE HAVRE CROISIERES
FONDATION - T23

Lg019

Béton=0.87 m3
Acier=58.5 kg d=67.1 kg/m3
Fi=10.3 mm Cof=9.8 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

11
14

Section : 20 x 68ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

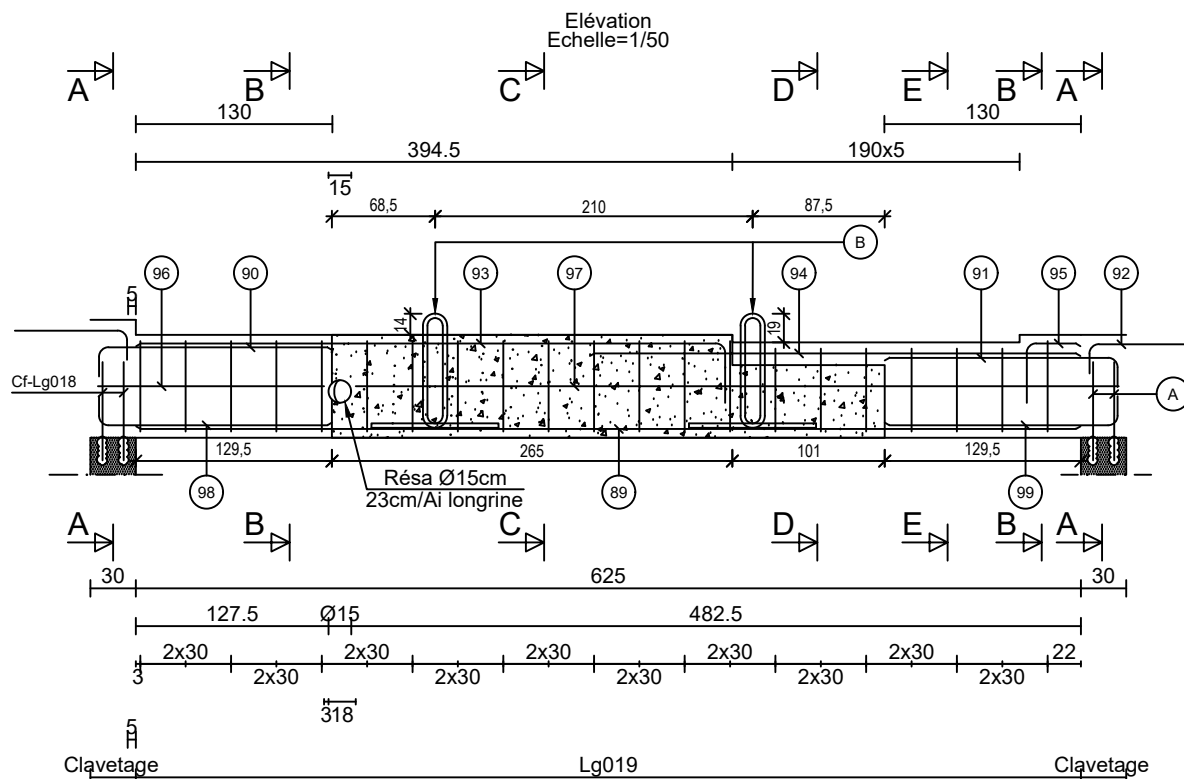
* Aciers non
soudés

Scelléments (Résine
HIT HY 200)

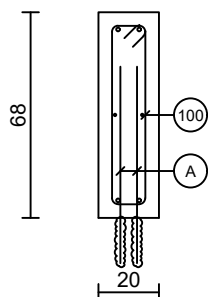
Béton
C30/37

Poids Préfa
1153 Kg

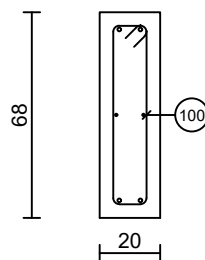
Zone Préfa



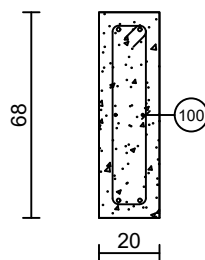
Coupe A-A
Echelle=1/25



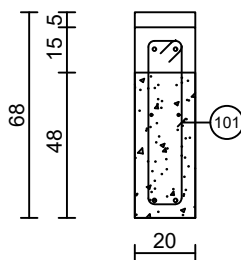
Coupe B-B
Echelle=1/25



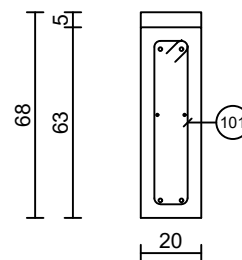
Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



	Barre	Lg	Forme
89	2HA12	625	625
* 90	2HA12	171	13 20 155 90°
* 91	2HA12	171	20 13 155 90°
* 92	2HA12	171	13 20 155 90°
93	2HA10	426	40 13 391 90°
94	2HA10	325	325
95	2HA10	72	13 40 37 90°
96	2HA8	150	150
97	2HA8	505	505
* 98	2HA12	171	20 13 155 90°
* 99	2HA12	171	13 20 155 90°
100	15HA8	153	60 12
101	6HA8	143	55 12
✗ A	2HA12	65	50 15
B	2HA12 (Acier doux)	263	75 53 53
Barre		Lg/Poids	
HA8		44.6/17.6	
HA12		46.1/40.9	

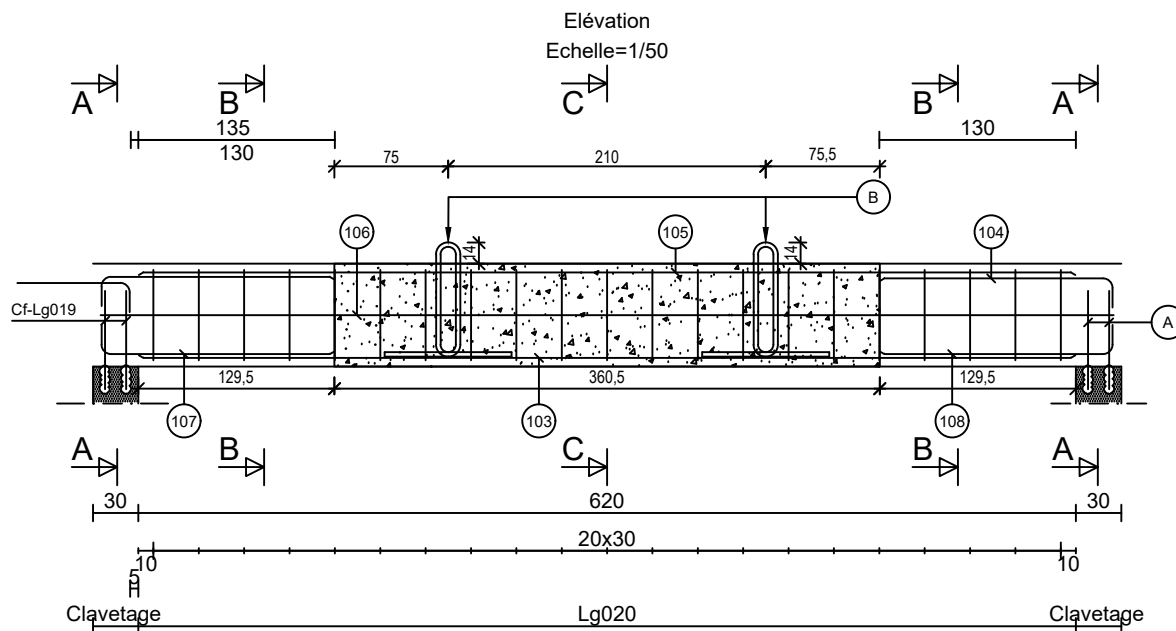
* Aciers non soudés

Scelllements (Résine HIT HY 200)

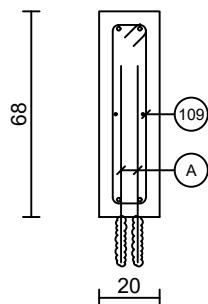
Béton C30/37

Poids Préfa 1078 Kg

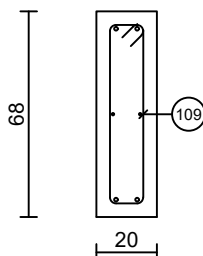
Zone Préfa



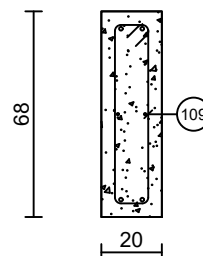
Coupe A-A
Echelle=1/25



Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



	Barre	Lg	Forme
103	2HA12	620	620
* 104	2HA12	171	20 13 90° 155
105	2HA10	620	620
106	2HA8	670	670
* 107	2HA12	171	20 13 90° 155
* 108	2HA12	171	13 20 155 90°
109	21HA8	153	60 12
A	2HA12	65	50 15
B	2HA12 (Acier doux)	263	75 53 53
Barre		Lg/Poids	
HA8		45.5/18.0	
HA12		35.0/31.1	



LE HAVRE CROISIERES
FONDATION - T23

Lg028

Béton=0.20 m3
Acier=6.5 kg d=33.0 kg/m3
Fi=8.0 mm Cof=1.6 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

14
14

Section : 20 x 68ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

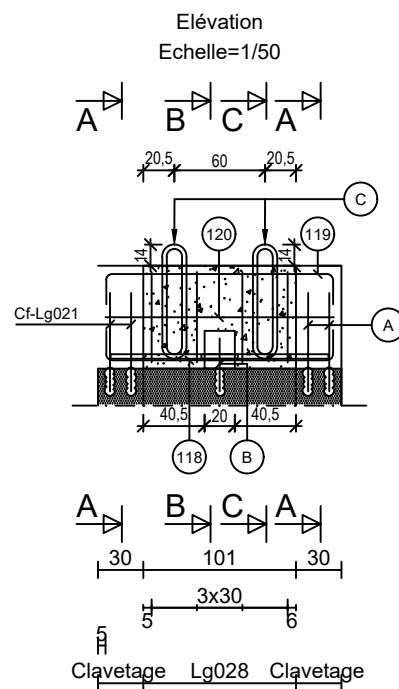
Scelllements (Résine
HIT HY 200)

Béton
C30/37

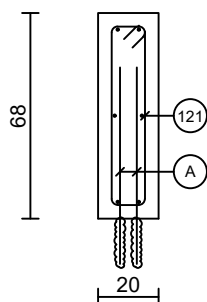
Poids Préfa
309 Kg

Zone Préfa

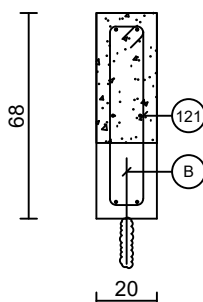
NOTA : Empochement à rigidifier avec un bastaing chevillé



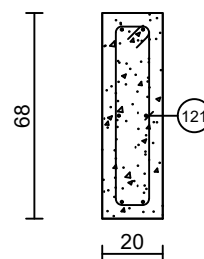
Coupe A-A
Echelle=1/25



Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



Barre		Lg	Forme
118	2HA8	187	
119	2HA8	187	
120	2HA8	151	
121	4HA8	153	
A	2HA12	65	
B	1HA12	35	
C	2HA12 (Acier doux)	263	
Barre		Lg/Poids	
HA8		16.6/6.5	



LE HAVRE CROISIERE
FONDATION - T23

Lg142

Béton=1.01 m3
Acier=40.9 kg d=40.3 kg/m3
Fi=8.2 mm Cof=10.9 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

1
3

Section : 20 x 78ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

Scellemets (Résine
HIT HY 200)

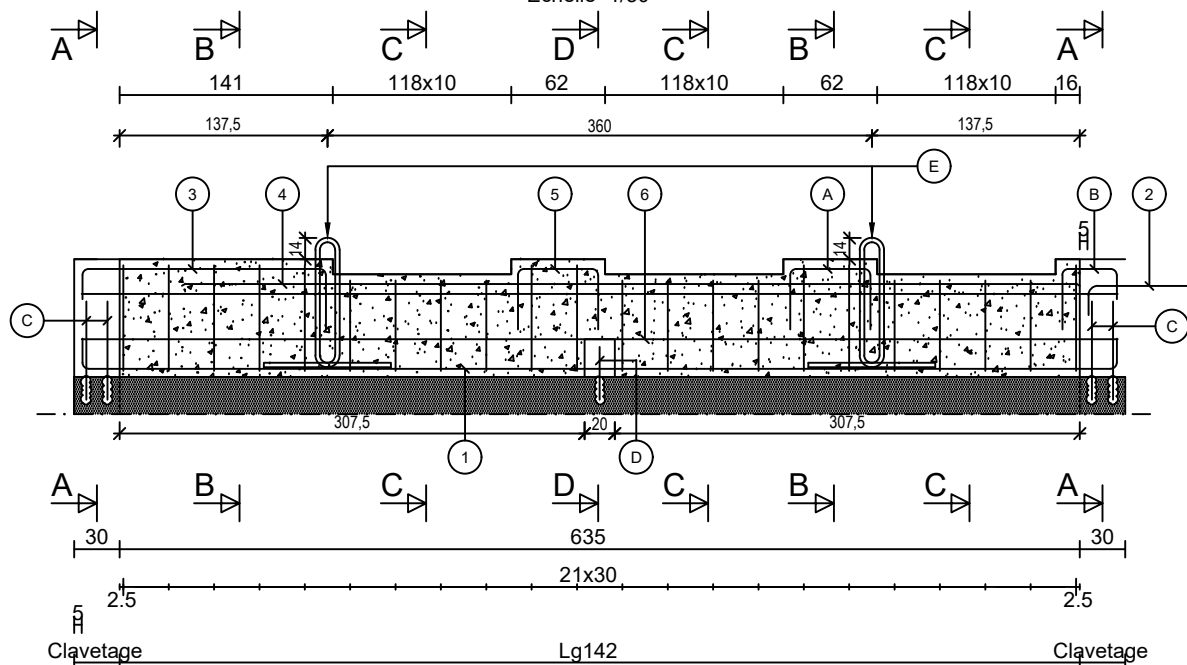
Béton
C30/37

Poids Préfa
2221 Kg

Zone Préfa

NOTA : Empochement à rigidifier avec un bastaing chevillé

Elévation
Echelle=1/50





LE HAVRE CROISIERE
FONDATION - T23

Lg144

Béton=1.36 m3
Acier=66.4 kg d=49.0 kg/m3
Fi=9.7 mm Cof=14.5 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

2
3

Section : 20 x 100ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

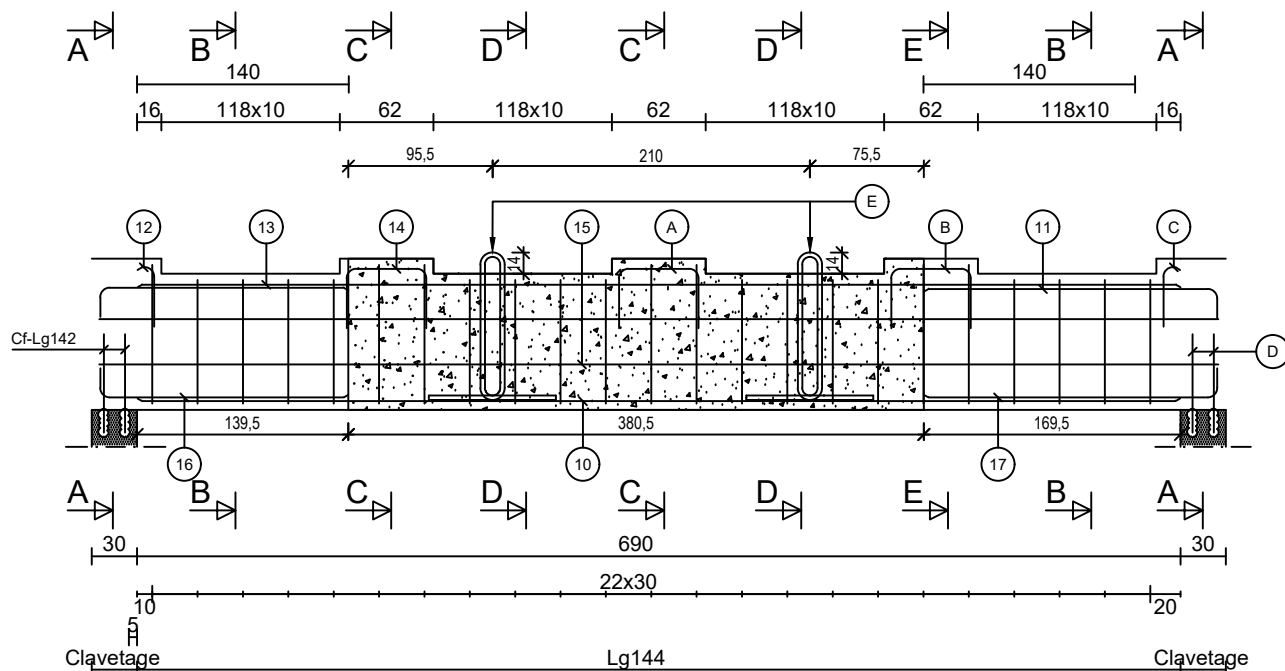
Scelléments (Résine
HIT HY 200)

Béton
C30/37

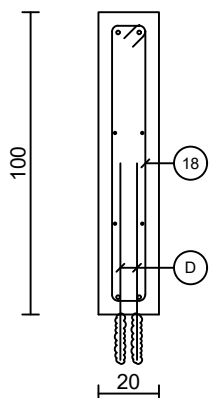
Poids Préfa
1739 Kg

Zone Préfa

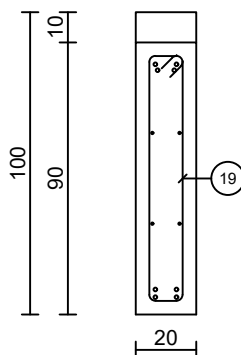
Élévation
Echelle=1/50



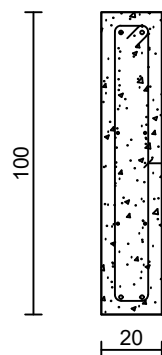
Coupe A-A
Echelle=1/25



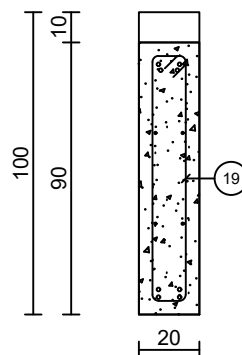
Coupe B-B
Echelle=1/25



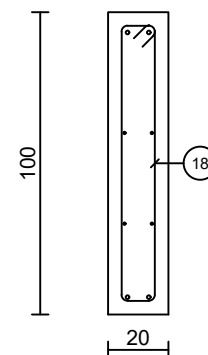
Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



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*

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□

Barre	Lg	Forme
10	2HA12	690
11	2HA12	181
12	2HA10	48
13	2HA10	690
14	2HA10	134
15	4HA8	710
16	2HA12	181
17	2HA12	181
18	7HA8	217
19	16HA8	197
A	2HA10	134
B	2HA10	134
C	2HA10	48
D	2HA12	65
E	2HA12 (Acier doux)	327
Barre		Lg/Poids
HA8		75.3/29.7
HA12		41.4/36.7



LE HAVRE CROISIERE
FONDATION - T23

Lg143

Béton=0.98 m3
Acier=36.0 kg d=36.6 kg/m3
Fi=8.2 mm Cof=10.6 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

3

3

Section : 20 x 78ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

Scelllements (Résine
HIT HY 200)

Béton
C30/37

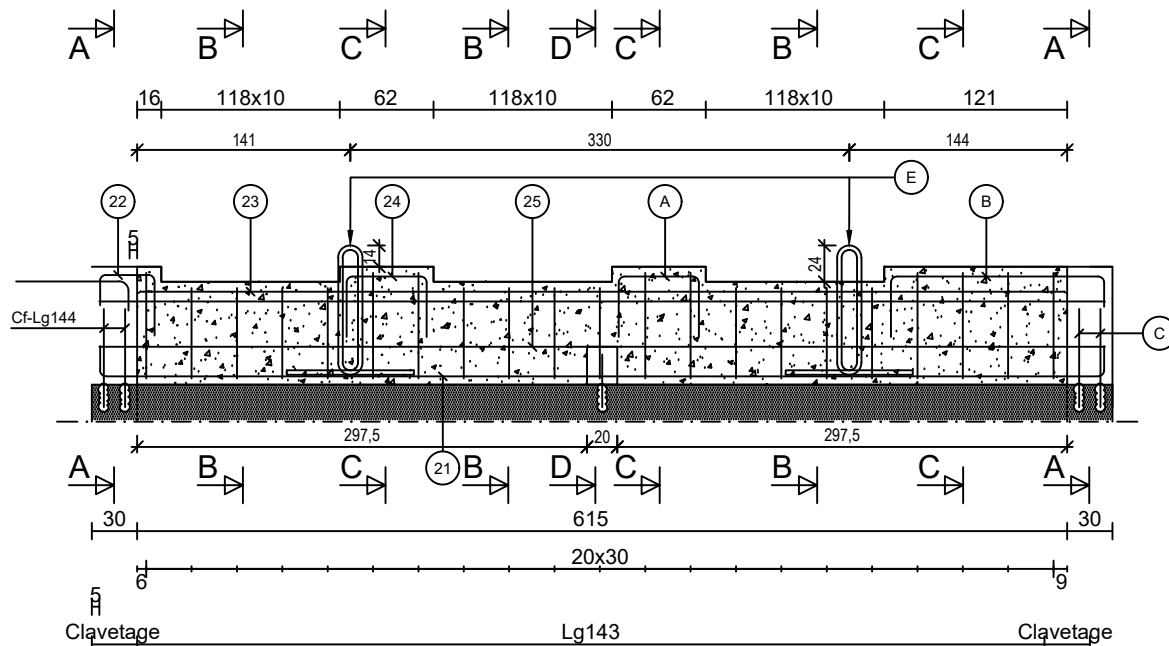
Poids Préfa
2147 Kg

Zone Préfa

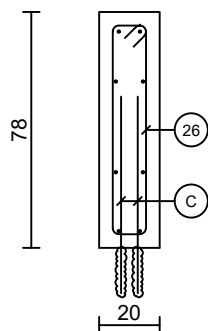


Elévation
Echelle=1/50

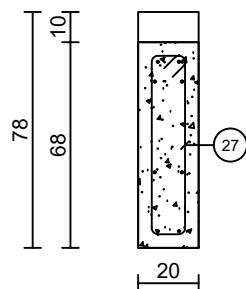
NOTA : Empochement à rigidifier avec un bastaing chevillé



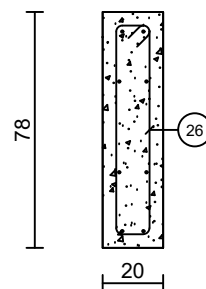
Coupe A-A
Echelle=1/25



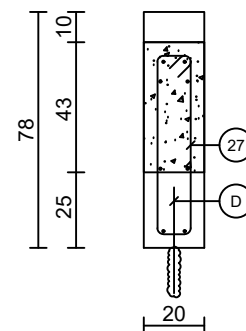
Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



22
23
24
25
A
E
B
C

Barre	Lg	Forme
21	2HA8	686
22	2HA8	93
23	2HA8	615
24	2HA8	134
25	4HA8	650
26	9HA8	173
27	12HA8	153
A	2HA8	134
B	2HA8	202
C	2HA12	65
D	1HA12	35
E	2HA12 (Acier doux)	283
Barre		Lg/Poids
HA8		91.2/36.0



LE HAVRE CROISIERES
FONDATION - T23

Lg146

Béton=0.38 m3
Acier=24.1 kg d=62.8 kg/m3
Fi=10.1 mm Cof=3.9 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
EI=4.0 cm

1
1

Section : 20 x 61ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

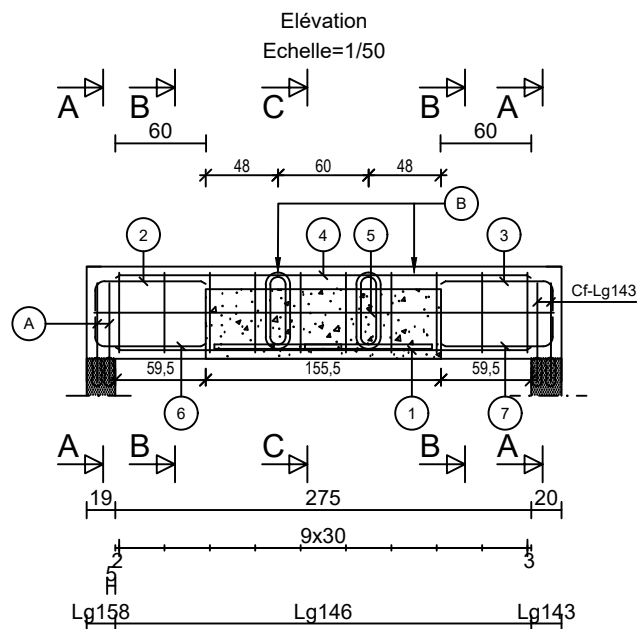
* Aciers non
soudés

☒ Scelléments (Résine
HIT HY 200)

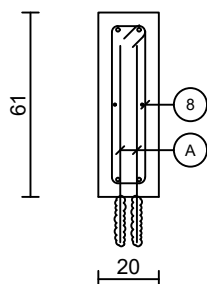
Béton
C30/37

Poids Préfa
442 Kg

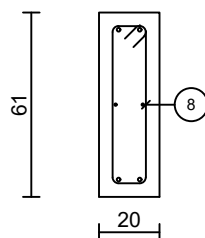
Zone Préfa

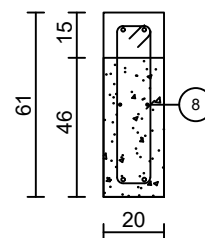
Coupe A-A
Echelle=1/25

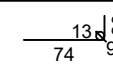
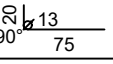
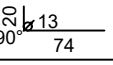
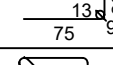





Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



Barre		Lg	Forme
1	2HA12	275	275
* 2	2HA12	90	
* 3	2HA12	91	
4	2HA10	275	275
5	2HA8	304	304
* 6	2HA12	90	
* 7	2HA12	91	
8	10HA8	139	
☒ A	2HA12	65	
B	2HA12 (Acier doux)	249	
Barre		Lg/Poids	
HA8		20.0/7.9	
HA12		18.2/16.2	

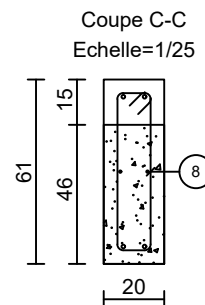
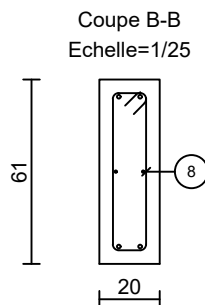
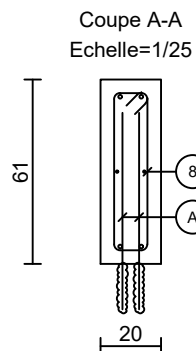
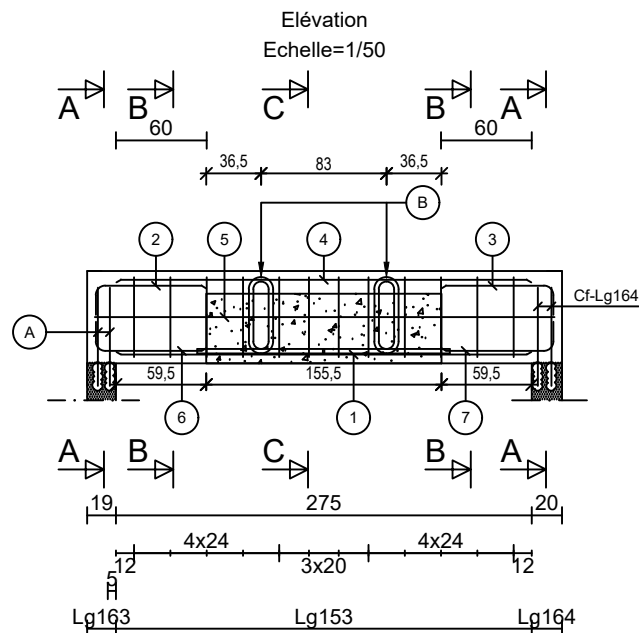
* Aciers non soudés

Scelléments (Résine HIT HY 200)

Béton
C30/37

Poids Préfa
339 Kg

Zone Préfa



	Barre	Lg	Forme
1	2HA12	275	275
* 2	2HA12	90	13 20 74 90°
* 3	2HA12	91	20 13 90° 75
4	2HA10	275	275
5	2HA8	304	304
* 6	2HA12	90	20 13 90° 74
* 7	2HA12	91	13 20 75 90°
8	12HA8	139	53 12
A	2HA12	65	50 15
B	2HA12 (Acier doux)	249	53 8 53
Barre		Lg/Poids	
HA8		22.7/9.0	
HA12		18.2/16.2	



LE HAVRE CROISIERES
FONDATION - T23

Lg155

Béton=1.27 m3
Acier=66.6 kg d=52.4 kg/m3
Fi=9.7 mm Cof=13.8 m²
Densité acier: 7850.00 kg / m3

Eb=4.0 cm
Eh=4.0 cm
El=4.0 cm

2
4

Section : 20 x 78ht

fck= 30 MPa fyk= 500 MPa Classe de ductilité B Coupe feu R 60 | Classe d'exposition: XF1

* Aciers non
soudés

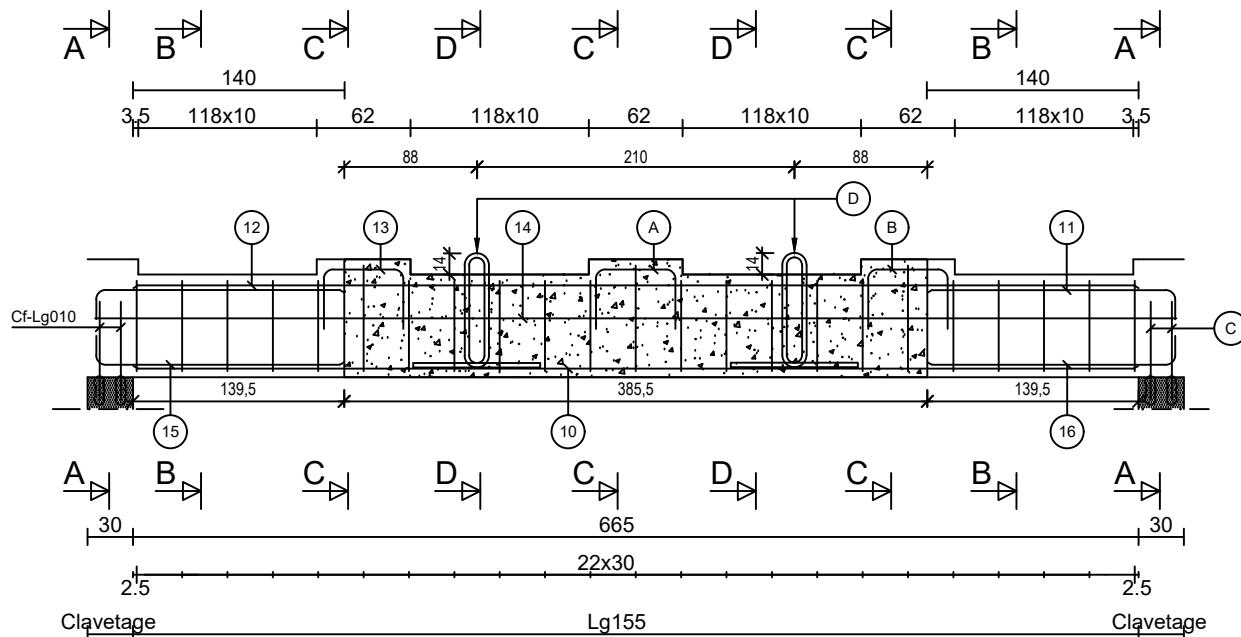
☒ Scelllements (Résine
HIT HY 200)

Béton
C30/37

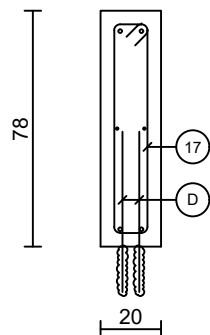
Poids Préfa
1390 Kg

Zone Préfa

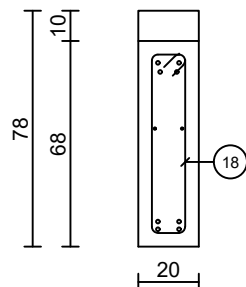
Elévation
Echelle=1/50



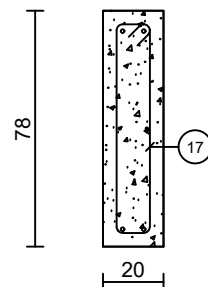
Coupe A-A
Echelle=1/25



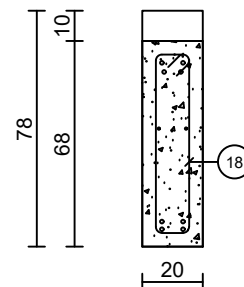
Coupe B-B
Echelle=1/25



Coupe C-C
Echelle=1/25



Coupe D-D
Echelle=1/25



*

*

*

☒

	Barre	Lg	Forme
10	2HA12	665	665
11	2HA12	181	20 13 90° 165
12	2HA10	665	665
13	2HA10	134	40 13 90° 54 13 40° 90°
14	2HA8	715	715
15	2HA12	181	20 13 90° 165
16	2HA12	181	13 20 165 90°
17	3HA8	173	70 12
18	20HA8	153	60 12
A	2HA10	134	40 13 90° 54 13 40° 90°
B	2HA10	134	40 13 90° 54 13 40° 90°
C	2HA12	65	50 15
D	2HA12 (Acier doux)	263	75 53 53
Barre		Lg/Poids	
HA8		74.1/29.2	
HA12		42.1/37.4	

* Aciers non soudés

Scelléments (Résine HIT HY 200)

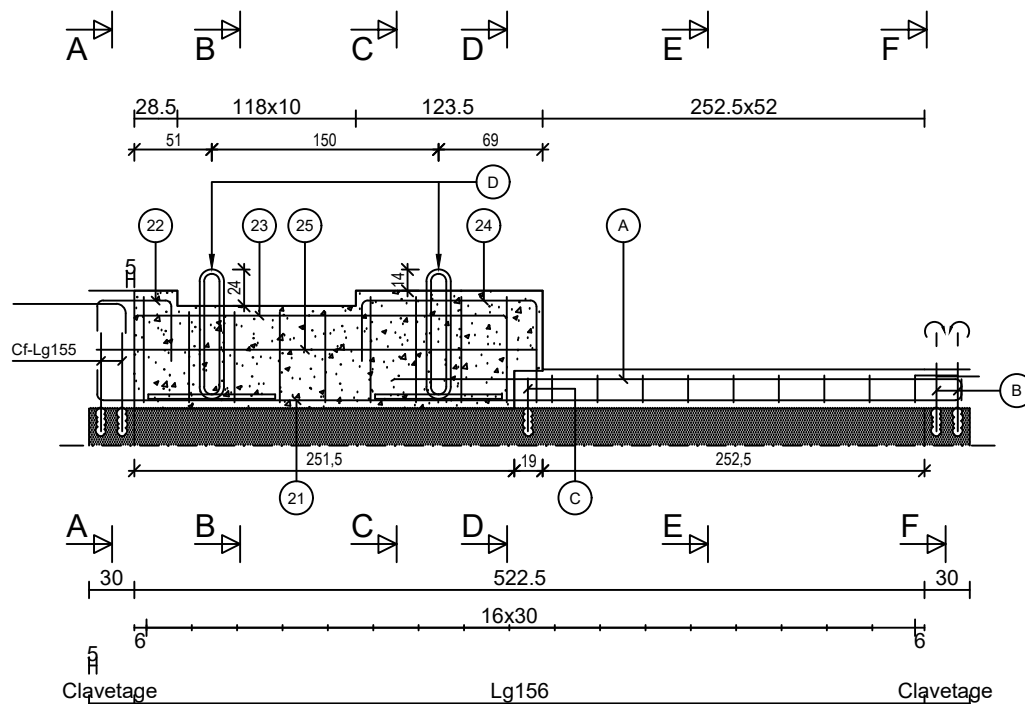
Béton C30/37

Poids Préfa 952 Kg

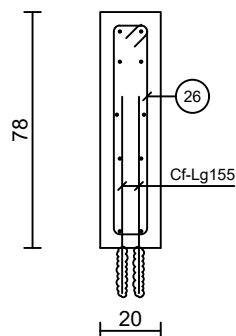
Zone Préfa

NOTA : Empochement à rigidifier avec un bastaing chevillé

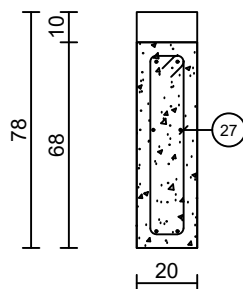
Elévation
Echelle=1/50



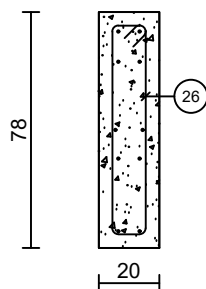
Coupe A-A
Echelle=1/25



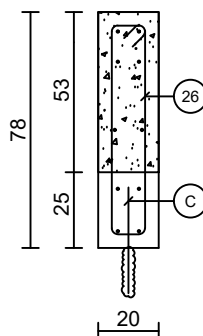
Coupe B-B
Echelle=1/25



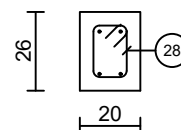
Coupe C-C
Echelle=1/25



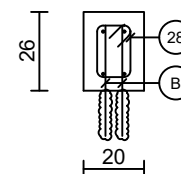
Coupe D-D
Echelle=1/25



Coupe E-E
Echelle=1/25



Coupe F-F
Echelle=1/25



	Barre	Lg	Forme
21	2HA8	605	
22	2HA8	105	
23	2HA8	246	
24	2HA8	224	
25	2HA8	291	
26	5HA8	173	
27	4HA8	153	
28	9HA8	69	
A	2HA8	395	
B	2HA12 à plier	65	
C	1HA12	35	
D	2HA12 (Acier doux)	283	
Barre		Lg/Poids	
HA8		64.0/25.2	

