

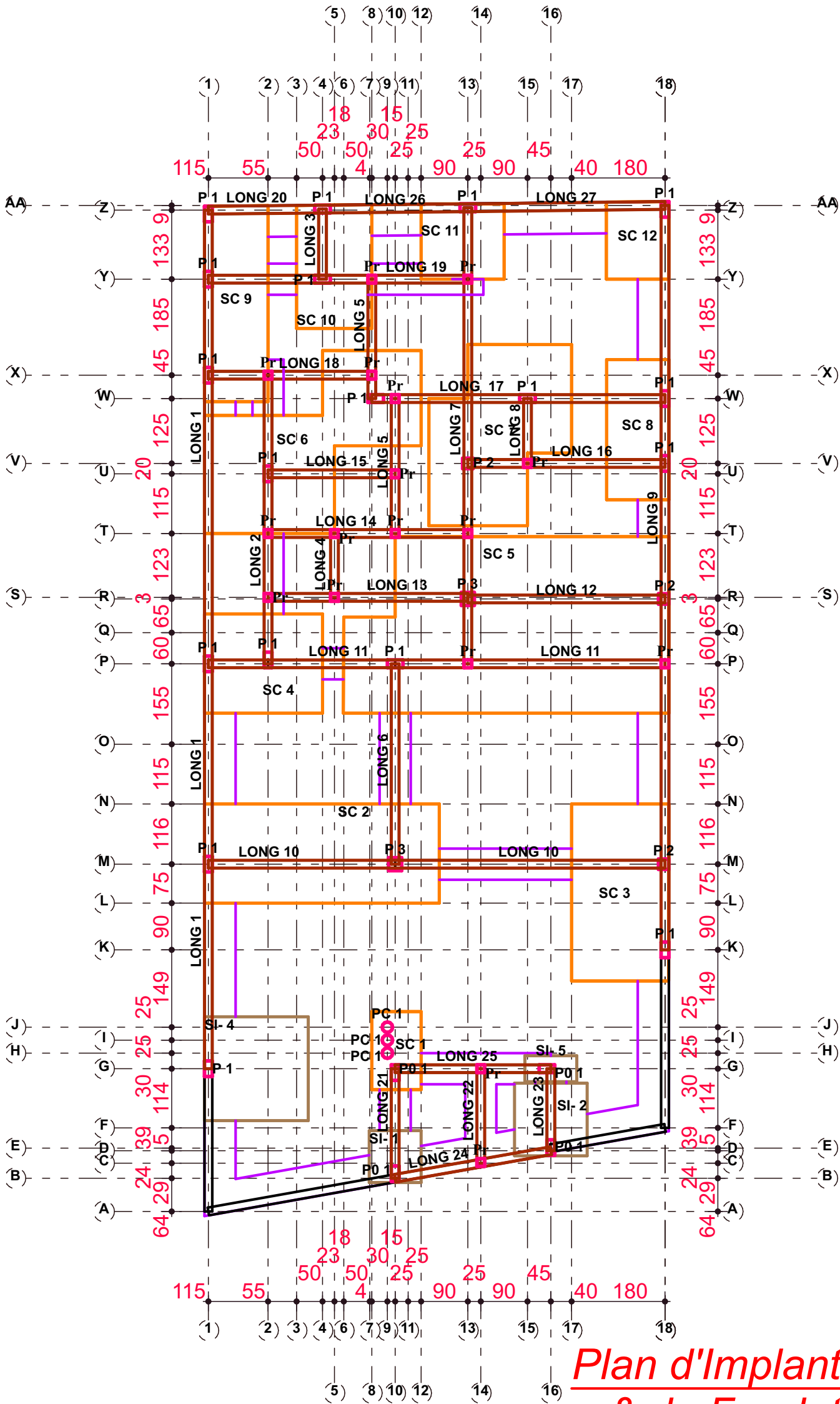
Légends

- Semelle Filante
- Semelle Isolée
- Semelle Isolée Continue
- Poteaux
- Longrine
- Mur de 15 Plein

Hypothese de calcul

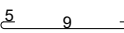
- 1°) Règle: Bael91 modif 99
- 2°) Matériaux :
  - a°) Béton: dosé à 350kg/m<sup>3</sup>; f<sub>c28</sub> = 25MPa
  - b°) Acier:
    - \* f<sub>e</sub> = 400 MPa
    - \* Fissuration Préjudiciable
  - c°) Enrobage:
    - \* fondation : 5 cm
- 3°) Sol : Contrainte 0,85 bar pour une profondeur de fouille de : 1,40m

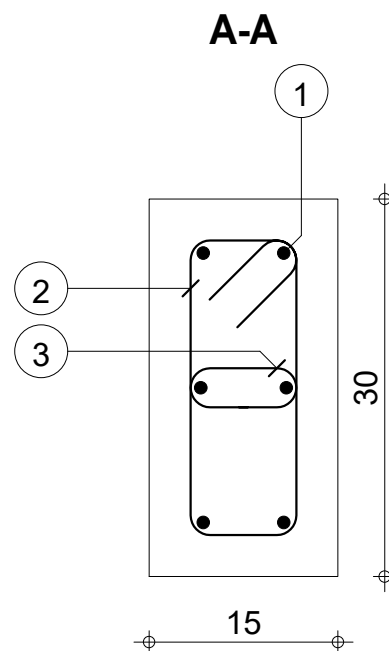
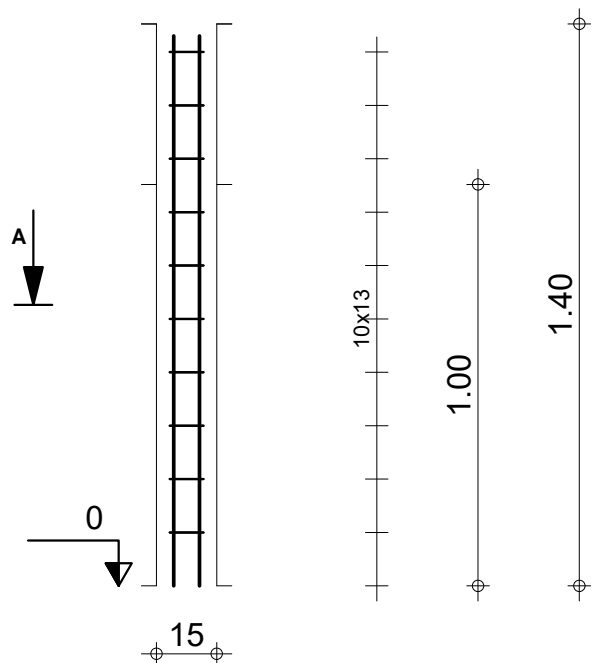
NB: -L'INGENIEUR DECLINE TOUTE RESPONSABILITE EN CAS DU NON RESPECT SCRUPULEUX DE LA STRUCTURE ET DU NON SUIVI CONTINU DES TRAVAUX PAR UN TECHNICIEN AGUERRI.



Plan d'implantation & de Fondation

Ech: 1 / 100

| Pos. | Armature      | Code | Forme                                                                               |
|------|---------------|------|-------------------------------------------------------------------------------------|
| ①    | 6HA 10 l=1.37 | 00   | 1.37                                                                                |
| ②    | 10HA 6 l=78   | 31   |  |
| ③    | 10HA 6 l=21   | 00   |  |



**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_P 1**

**Section 15x30**

Tél.

Fax

Acier HA 400 = 5.07 kg

Béton : BETON = 0.045 m3

Acier HA 400 = 2.19 kg

Surface du coffrage = 0.9 m2

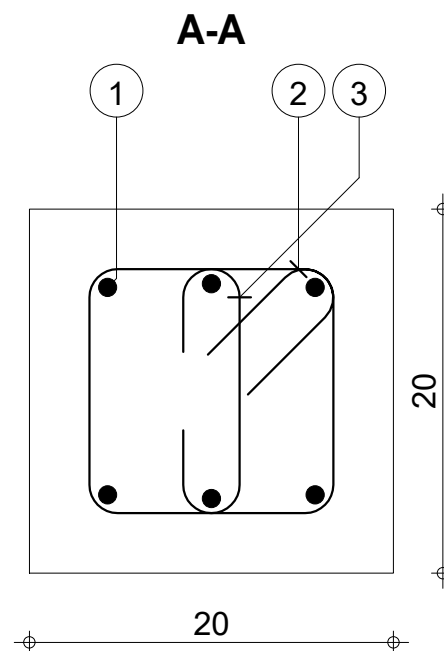
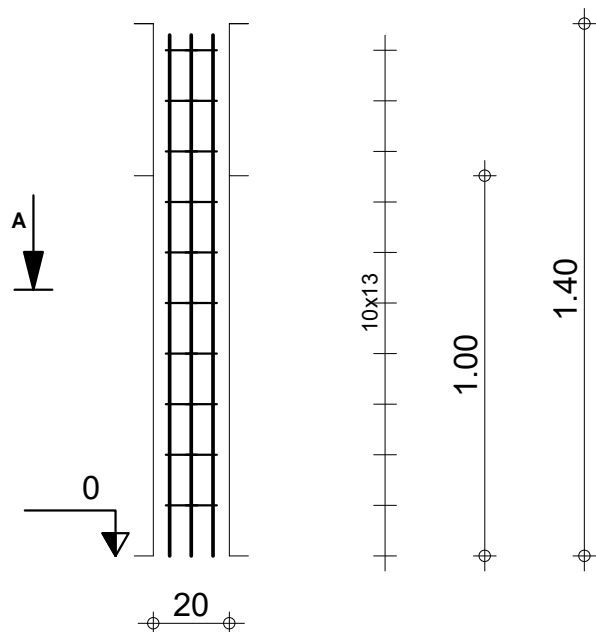
Enrobage 3 cm

Echelle pour la vue 5.31cm/m

Echelle pour la section 16.7cm/m

Page 1/1

| Pos. | Armature      | Code | Forme   |
|------|---------------|------|---------|
| ①    | 6HA 10 l=1.37 | 00   | 1.37    |
| ②    | 10HA 6 l=68   | 31   | 14<br>8 |
| ③    | 10HA 6 l=26   | 00   | 5 14    |



Tél.

Fax

Acier HA 400 = 5.07 kg

Béton : BETON = 0.04 m3

Acier HA 400 = 2.08 kg

Surface du coffrage = 0.8 m2

Enrobage 3 cm

Echelle pour la vue 5.03cm/m

Echelle pour la section 24.1cm/m

Page 1/1

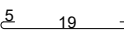


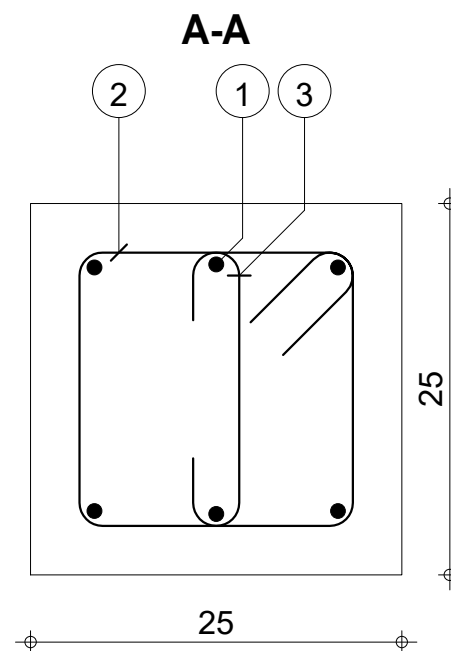
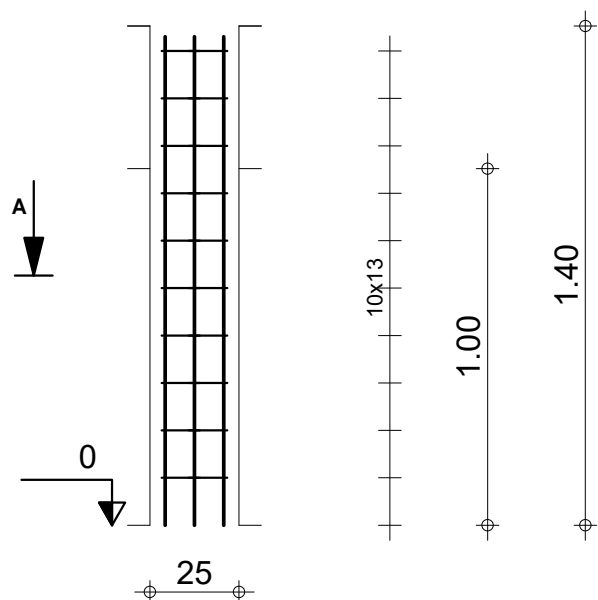
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_P 2**

**Section 20x20**

| Pos. | Armature      | Code | Forme                                                                               |
|------|---------------|------|-------------------------------------------------------------------------------------|
| ①    | 6HA 10 l=1.37 | 00   | 1.37                                                                                |
| ②    | 10HA 6 l=88   | 31   |  |
| ③    | 10HA 6 l=31   | 00   |  |



Tél.

Fax

Acier HA 400 = 5.07 kg

Béton : BETON = 0.0625 m3

Acier HA 400 = 2.64 kg

Surface du coffrage = 1 m2

Enrobage 3 cm

Echelle pour la vue 4.72cm/m

Echelle pour la section 19.7cm/m

Page 1/1



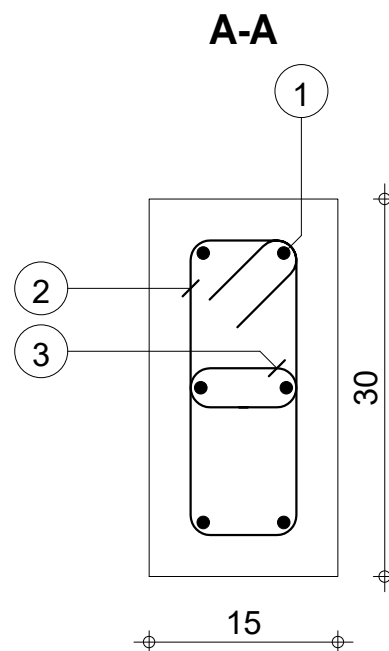
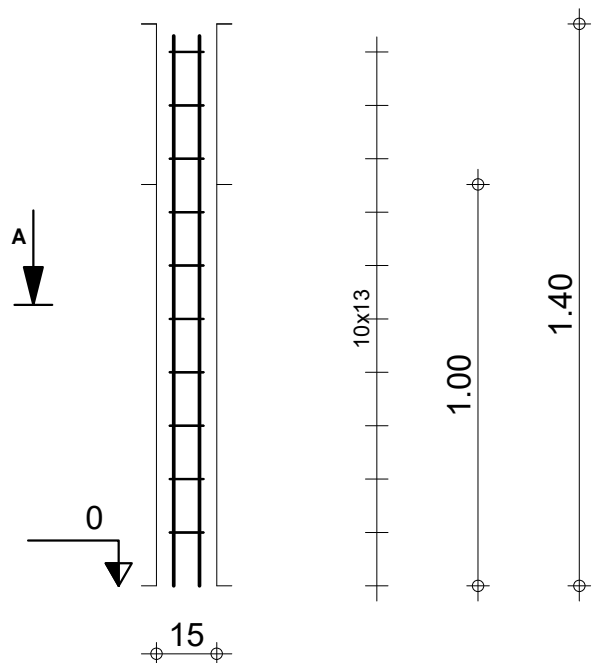
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_P 3**

**Section 25x25**

| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=1.37 | 00   | 1.37  |
| ②    | 10HA 6 l=78   | 31   |       |
| ③    | 10HA 6 l=21   | 00   |       |



Tél.

Fax

Acier HA 400 = 5.07 kg

Béton : BETON = 0.045 m3

Acier HA 400 = 2.19 kg

Surface du coffrage = 0.9 m2

Enrobage 3 cm

Echelle pour la vue 5.31cm/m

Echelle pour la section 16.7cm/m

Page 1/1



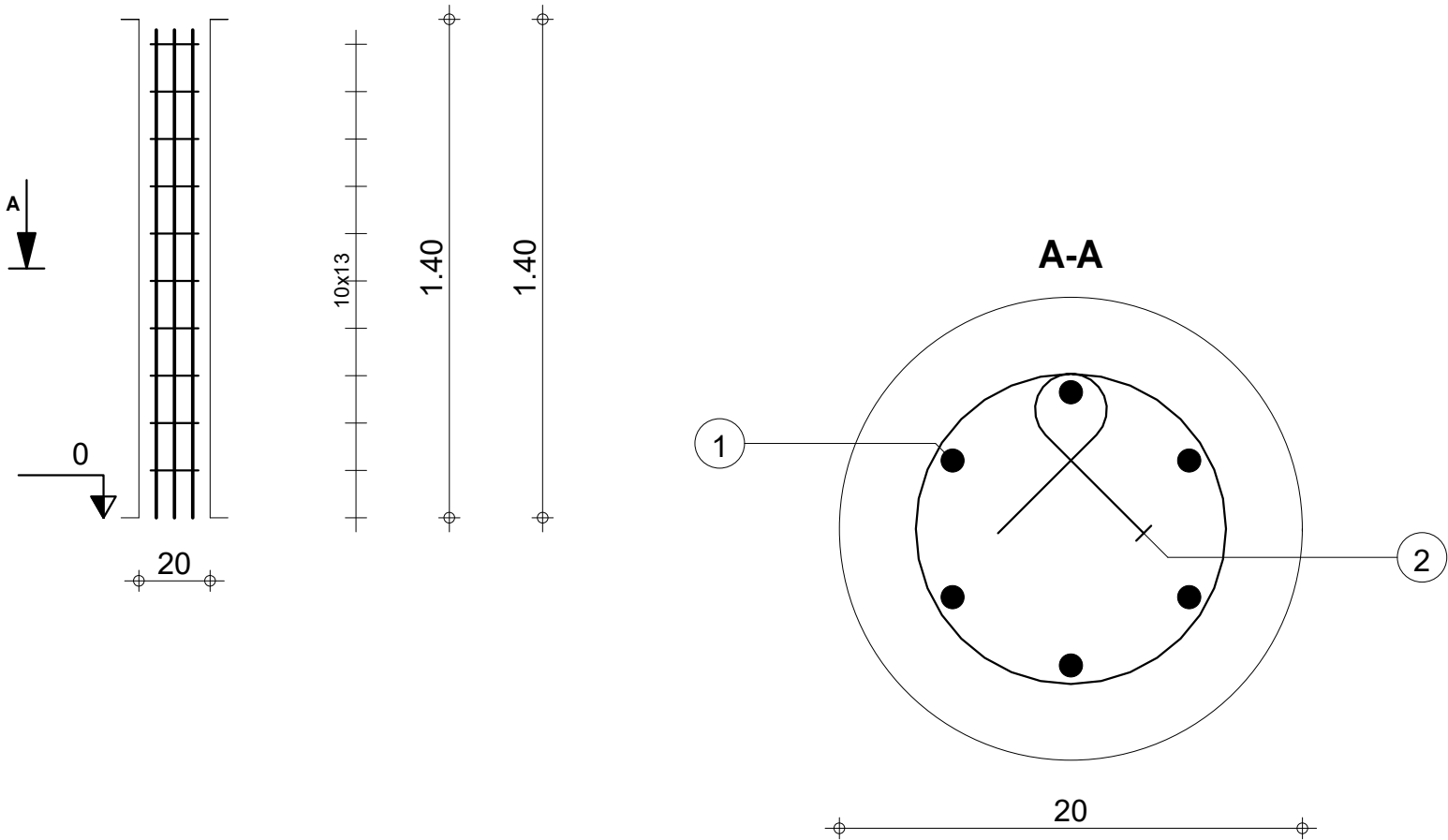
**SOUBASSEMENT**

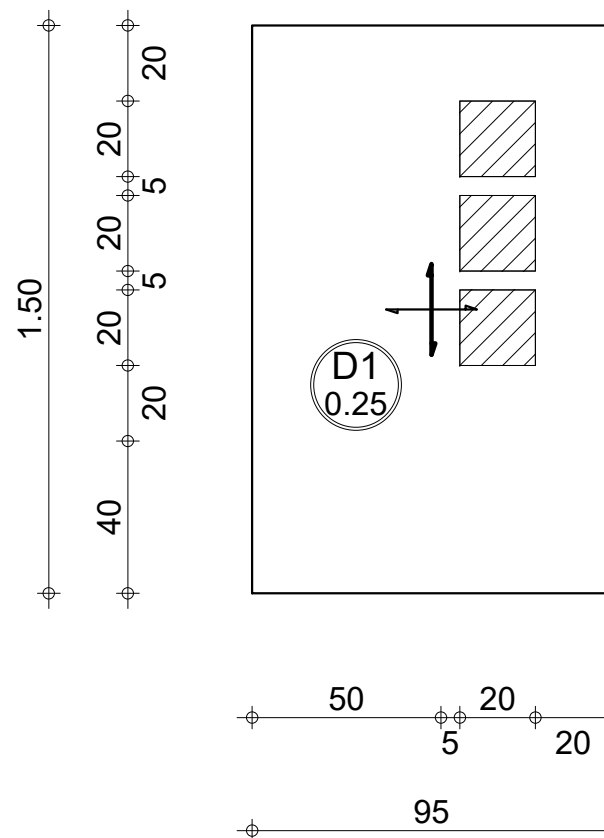
DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_P0 1**

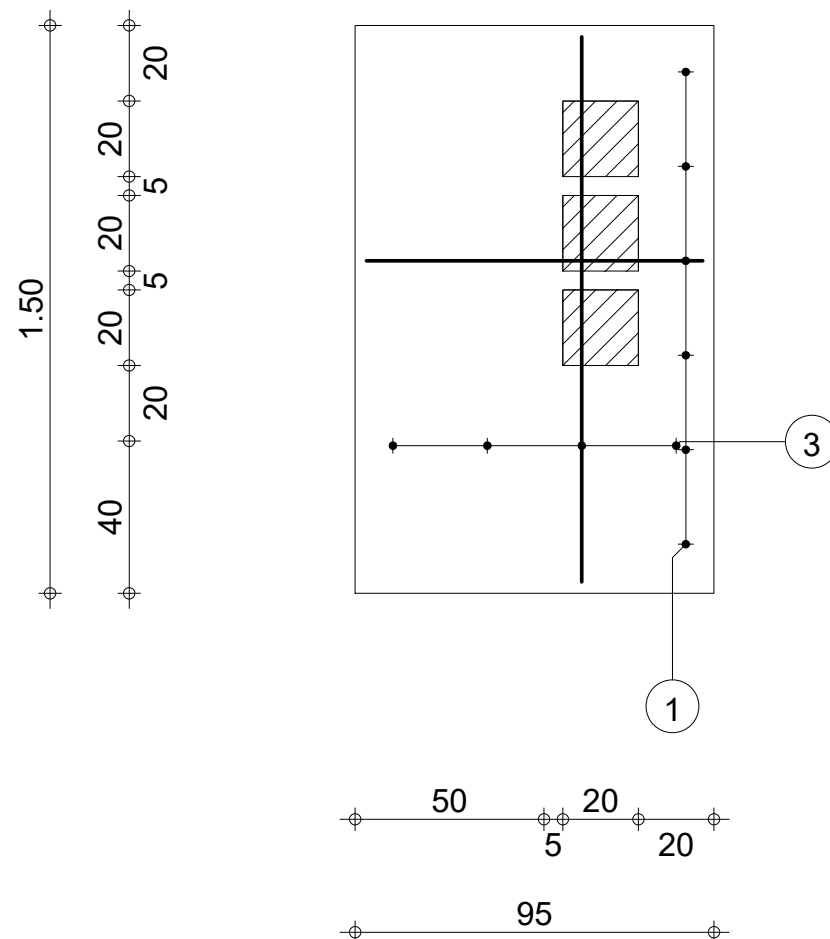
**Section 15x30**

| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=1.37 | 00   | 1.37  |
| ②    | 10HA 6 l=61   |      | 13    |





|                                                                                           |        |                                       |                 |                      |                               |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|---------------------------------------|-----------------|----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                       | Tél.            | Fax                  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                          | Elément: 1_SC 1 |                      | Surface du coffrage = 1.43 m2 |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC1 | Dessin:         | COFFRAGE DE LA DALLE |                               |  | Echelle : 1/20                                   | Date : 22/11/25 |

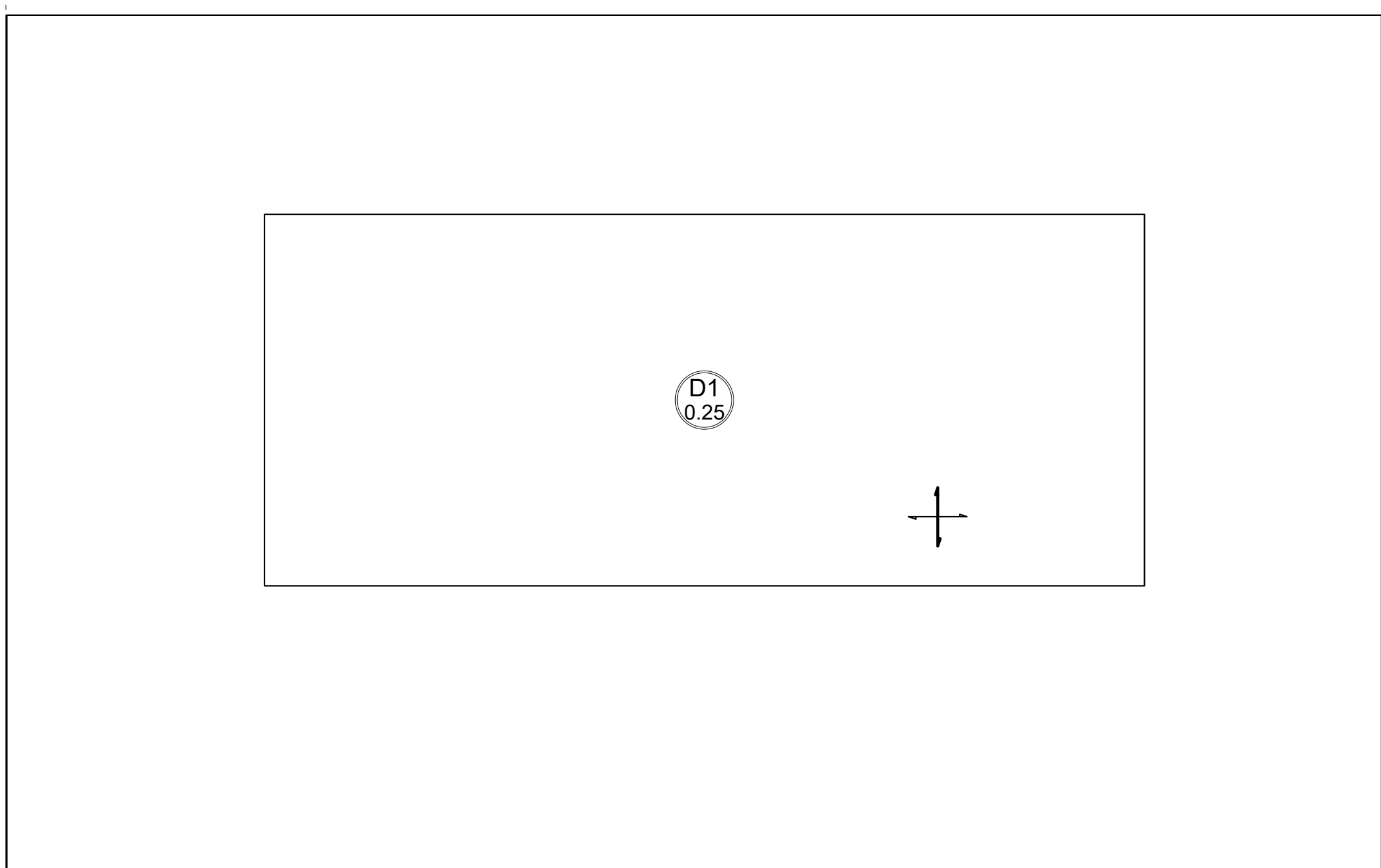


|                                                                                           |        |                                       |          |     |                       |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|---------------------------------------|----------|-----|-----------------------|--|--------------------------------------------------|-----------------|
| <br>PRO | , ,    |                                       | Tél.     | Fax |                       |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                          | Elément: |     | 1_SC 1                |  | Ferrailage : HA 400 = 30.8 kg                    |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC1 | Dessin:  |     | FERRAILLAGE INFERIEUR |  | Echelle : 1/20                                   | Date : 22/11/25 |

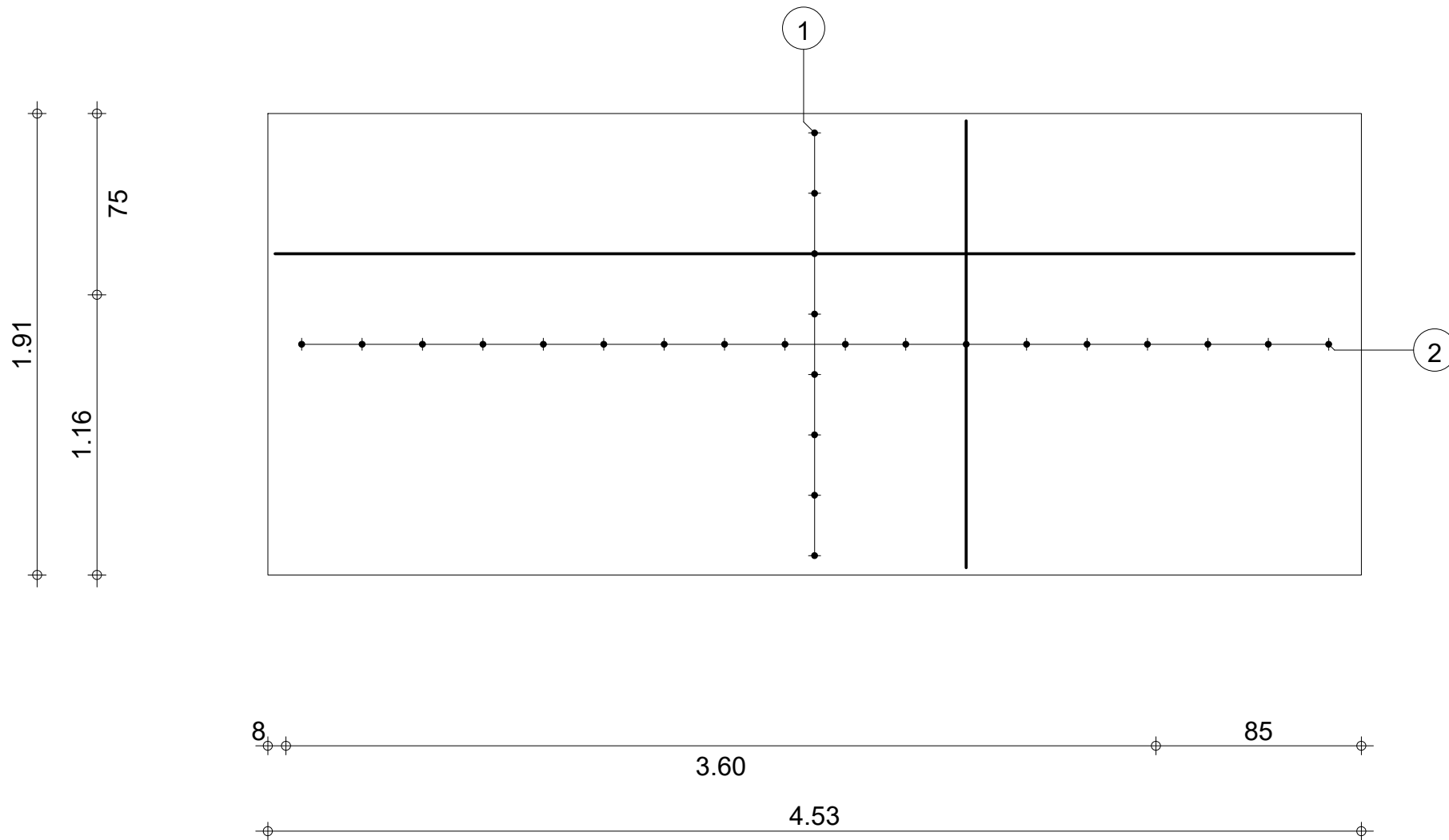


|                                                                    |
|--------------------------------------------------------------------|
| <p><b>Enrobage</b><br/> supérieur = 3 cm<br/> inférieur = 3 cm</p> |
| <p>Page 3/4</p>                                                    |

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 19HA 12  | l=89   | 00   | 89    |
| ②    | 8HA 12   | l=78   | 00   | 78    |
| ③    | 8HA 12   | l=1.44 | 00   | 1.44  |

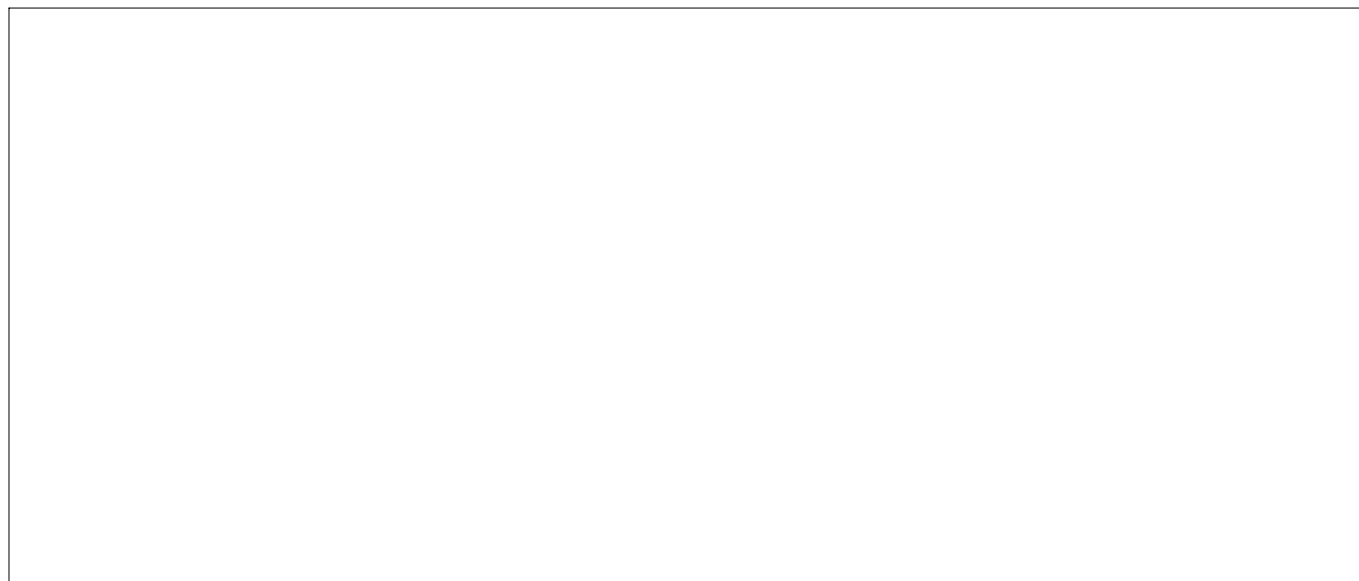


|                                                                                    |        |                                        |          |                      |                               |                                                  |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|----------------------|-------------------------------|--------------------------------------------------|
|  | Tél.   |                                        | Fax      |                      | Surface du coffrage = 8.64 m2 | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    | Niveau | SOUBASSEMENT                           | Elément: | 1_SC 2               |                               |                                                  |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 2 | Dessin:  | COFFRAGE DE LA DALLE | Echelle : 1/25                | Date : 22/11/25                                  |
|                                                                                    |        |                                        |          |                      | Page 1/4                      |                                                  |



|                                                                                    |        |                                        |          |                              |                                                  |                 |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|--------------------------------------------------|-----------------|
|  |        |                                        | Tél.     | Fax                          |                                                  |                 |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 2                       | Ferrailage : HA 400 = 61.3 kg                    |                 |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 2 | Dessin:  | <b>FERRAILLAGE INFERIEUR</b> | Echelle : 1/25                                   | Date : 22/11/25 |
|                                                                                    |        |                                        |          |                              | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                    |        |                                        |          |                              | Page 2/4                                         |                 |

1.91  
1.16  
75

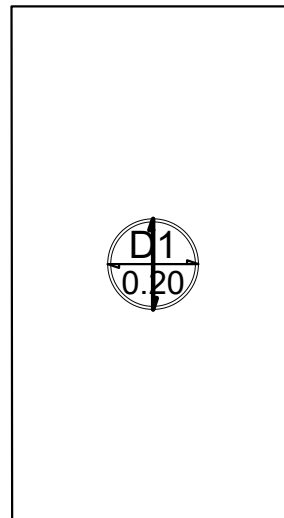


8 3.60 85  
4.53

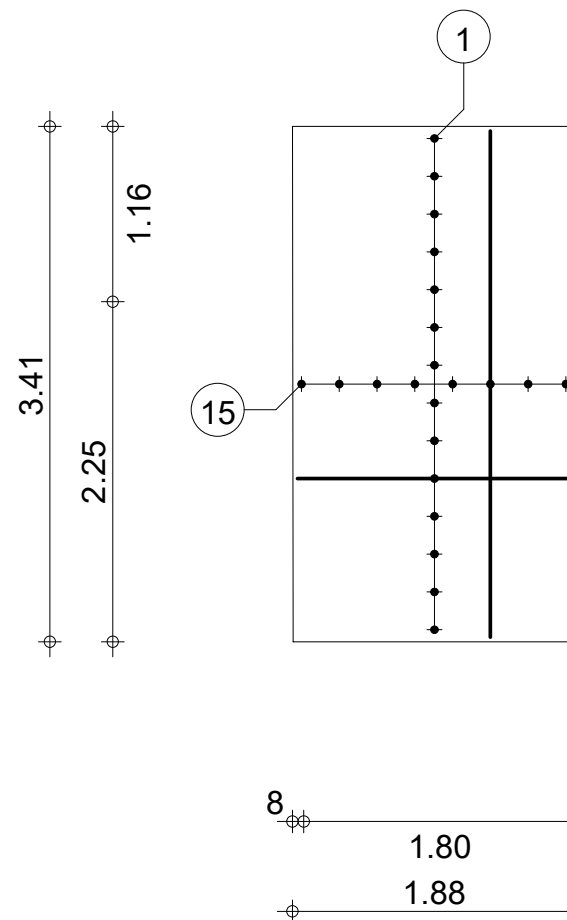
|                                                                                    |          |                                        |                                                  |                              |
|------------------------------------------------------------------------------------|----------|----------------------------------------|--------------------------------------------------|------------------------------|
|  | Tél. Fax |                                        | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                              |
|                                                                                    | Niveau   | <b>SOUBASSEMENT</b>                    | Elément:                                         | 1_SC 2                       |
|                                                                                    | Sujet:   | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 2 | Dessin:                                          | <b>FERRAILLAGE SUPERIEUR</b> |
| Ferrailage : HA 400 = 61.3 kg                                                      |          | Echelle : 1/25                         | Date : 22/11/25                                  | Page 3/4                     |

| Pos. | Armature |        | Code | Forme       |
|------|----------|--------|------|-------------|
| ①    | 8HA 12   | l=4.46 | 00   | <u>4.47</u> |
| ②    | 18HA 12  | l=1.85 | 00   | <u>1.85</u> |

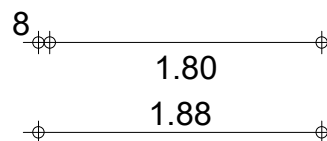
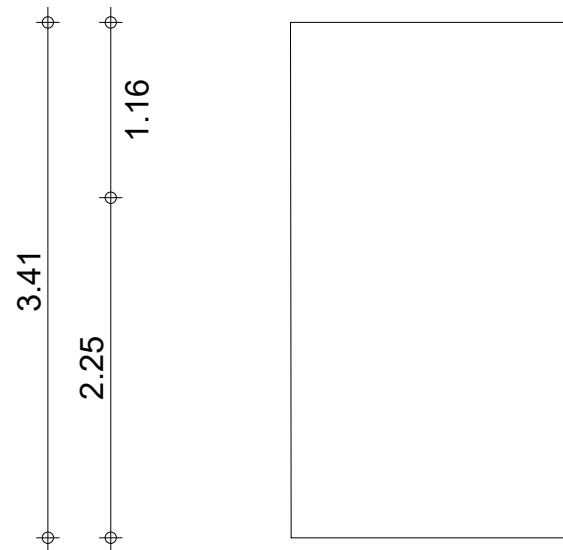
|                                                                                    |        |                                        |          |                     |                               |                                                              |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|---------------------|-------------------------------|--------------------------------------------------------------|
|  |        |                                        | Tél.     | Fax                 |                               |                                                              |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 2              | Ferrailage : HA 400 = 61.3 kg |                                                              |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 2 | Dessin:  | <b>NOMENCLATURE</b> | Date : 22/11/25               | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm<br>Page 4/4 |



|                                                                                           |        |                                        |                 |                      |                               |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 3 |                      | Surface du coffrage = 6.39 m2 |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 3 | Dessin:         | COFFRAGE DE LA DALLE |                               |  | Echelle : 1/50                                   | Date : 22/11/25 |



|                                                                                    |                                                                                    |                                                                |                               |                                      |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------|--------------------------------------|
|  |                                                                                    | Tél. Fax                                                       |                               | Enrobage                             |
|                                                                                    | <b>Niveau</b> SOUBASSEMENT<br><b>Sujet:</b> DETAILS DE STRUCTURE DUO 2 TOGBIN SC 3 | <b>Elément:</b> 1_SC 3<br><b>Dessin:</b> FERRAILLAGE INFERIEUR | Ferrailage : HA 400 = 46.3 kg | supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    |                                                                                    |                                                                | Echelle : 1/50                | Date : 22/11/25                      |



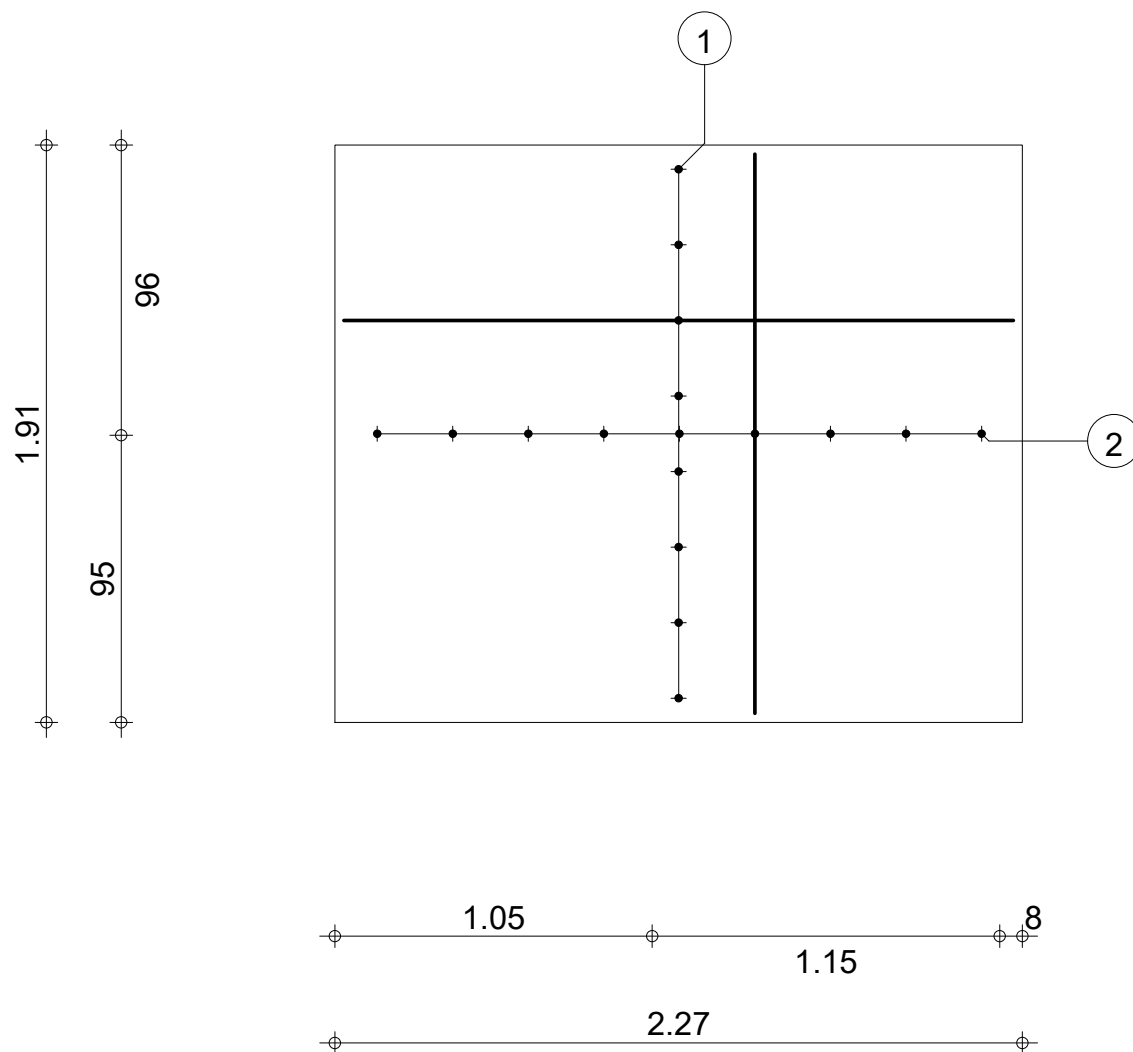
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|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|-----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                   |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 3 |                       | Ferrailage : HA 400 = 46.3 kg |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 3 | Dessin:         | FERRAILLAGE SUPERIEUR |                               |  | Echelle : 1/50                                   | Date : 22/11/25 |

| Pos. | Armature |         | Code | Forme |
|------|----------|---------|------|-------|
| ①    | 14HA 12  | l=1.81* | 00   | 1.81  |
| ⑮    | 8HA 12   | l=3.35  | 00   | 3.35  |

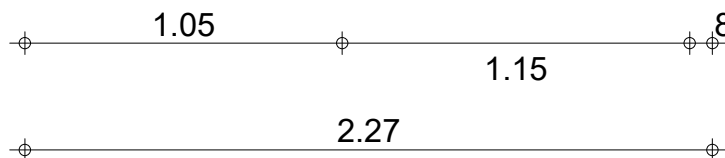
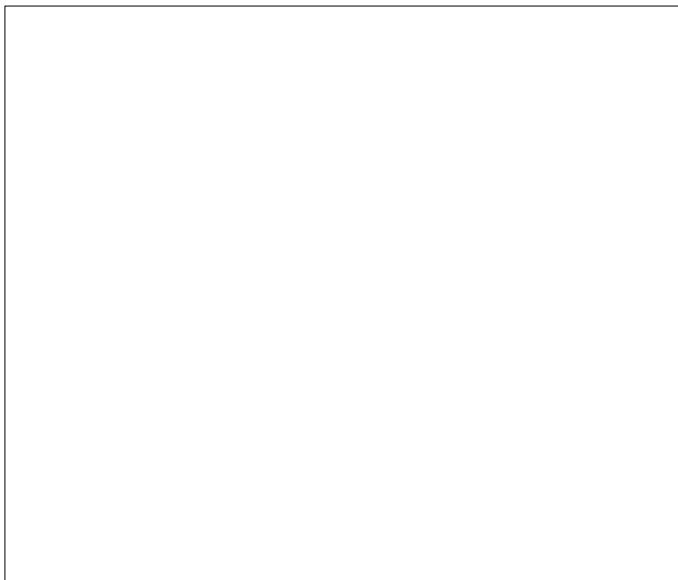
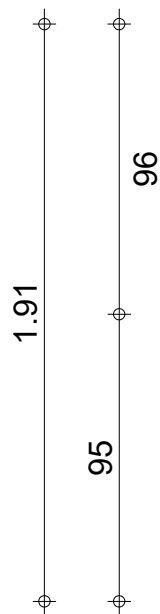
|                                                                                    |        |                                        |          |                     |                               |                                                              |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|---------------------|-------------------------------|--------------------------------------------------------------|
|  |        |                                        | Tél.     | Fax                 |                               |                                                              |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 3              | Ferrailage : HA 400 = 46.3 kg |                                                              |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 3 | Dessin:  | <b>NOMENCLATURE</b> | Date : 22/11/25               | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm<br>Page 4/4 |



|                                                                                           |        |                                        |                              |     |  |                |                                                  |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|------------------------------|-----|--|----------------|--------------------------------------------------|
| <br>PRO |        |                                        | Tél.                         | Fax |  |                | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 4              |     |  |                | Surface du coffrage = 4.35 m2                    |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 4 | Dessin: COFFRAGE DE LA DALLE |     |  | Echelle : 1/25 | Date : 22/11/25                                  |



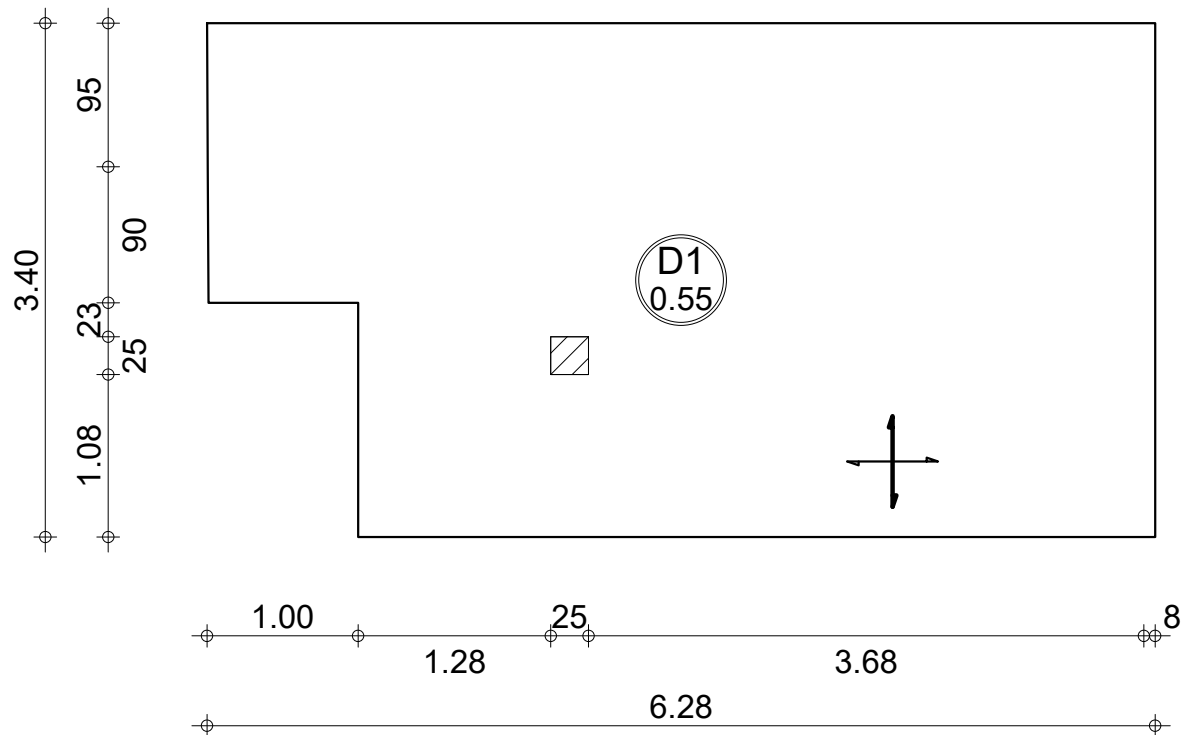
|                                                                                           |        |                                        |                 |                       |                               |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|-----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                   |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 4 |                       | Ferrailage : HA 400 = 30.5 kg |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 4 | Dessin:         | FERRAILLAGE INFERIEUR |                               |  | Echelle : 1/25                                   | Date : 22/11/25 |



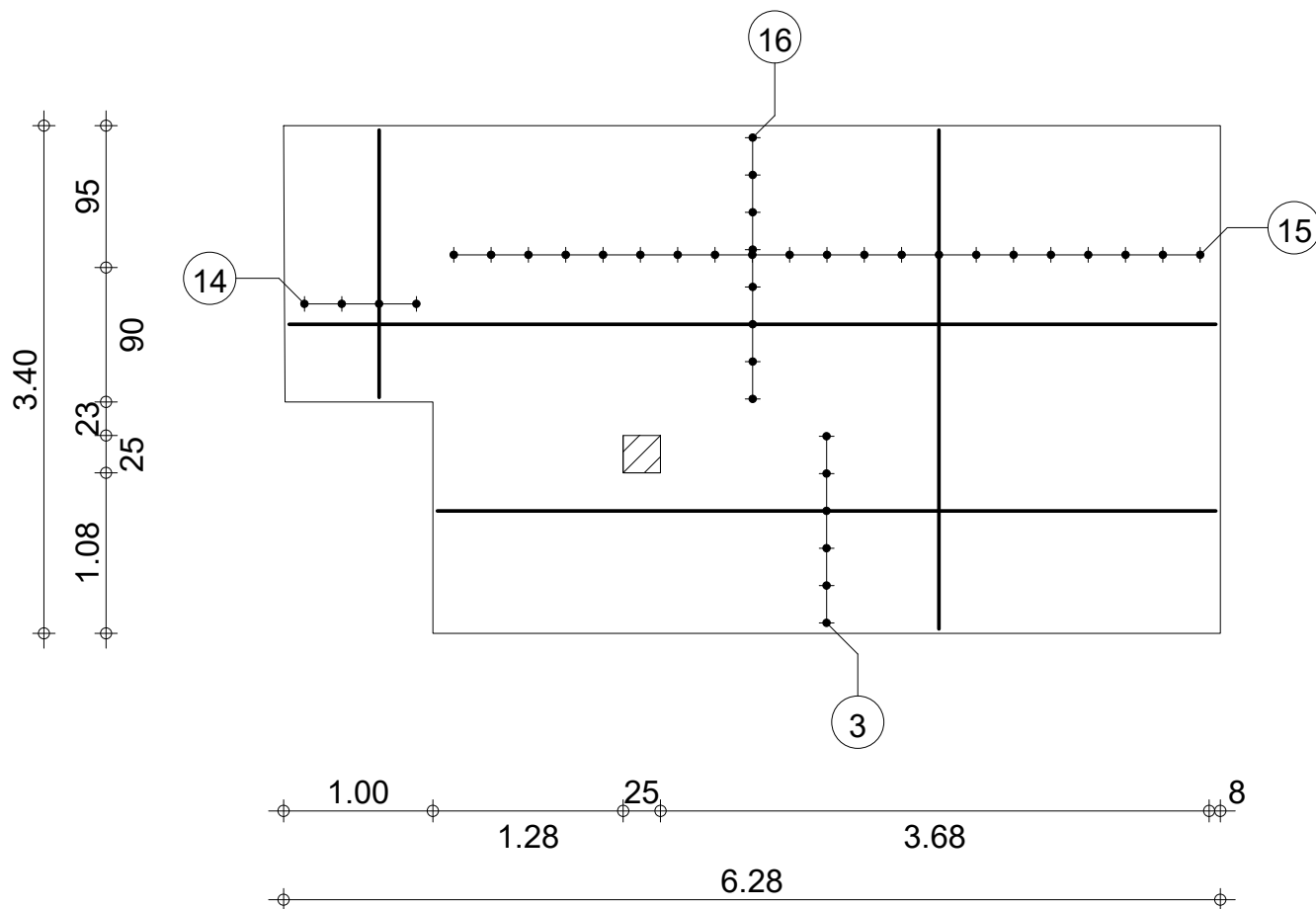
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|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|--------------------------------------------------|-----------------------------|
|  |        |                                        | Tél.     | Fax                          |                                                  |                             |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 4                       | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                             |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 4 | Dessin:  | <b>FERRAILLAGE SUPERIEUR</b> | Echelle : 1/25                                   | Date : 22/11/25<br>Page 3/4 |

Ferrailage : HA 400 = 30.5 kg

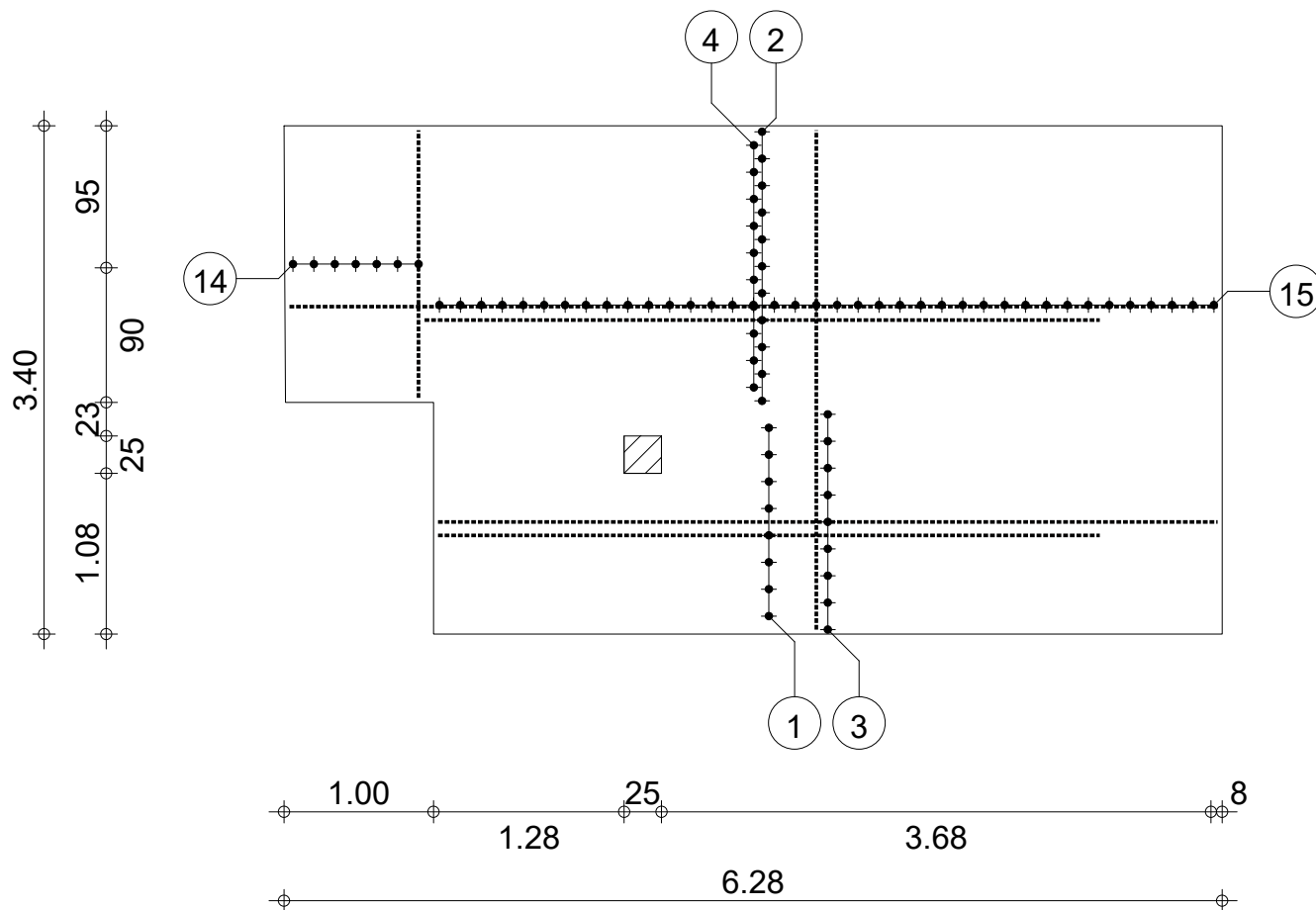
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 8HA 12   | l=2.21 | 00   | 2.22  |
| ②    | 9HA 12   | l=1.85 | 00   | 1.85  |



|                                                                                    |          |                                        |                               |                      |                                                  |
|------------------------------------------------------------------------------------|----------|----------------------------------------|-------------------------------|----------------------|--------------------------------------------------|
|  | Tél. Fax |                                        | Surface du coffrage = 19.8 m2 |                      | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    | Niveau   | SOUBASSEMENT                           | Elément:                      | 1_SC 5               |                                                  |
|                                                                                    | Sujet:   | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 5 | Dessin:                       | COFFRAGE DE LA DALLE | Echelle : 1/50 Date : 22/11/25 Page 1/4          |

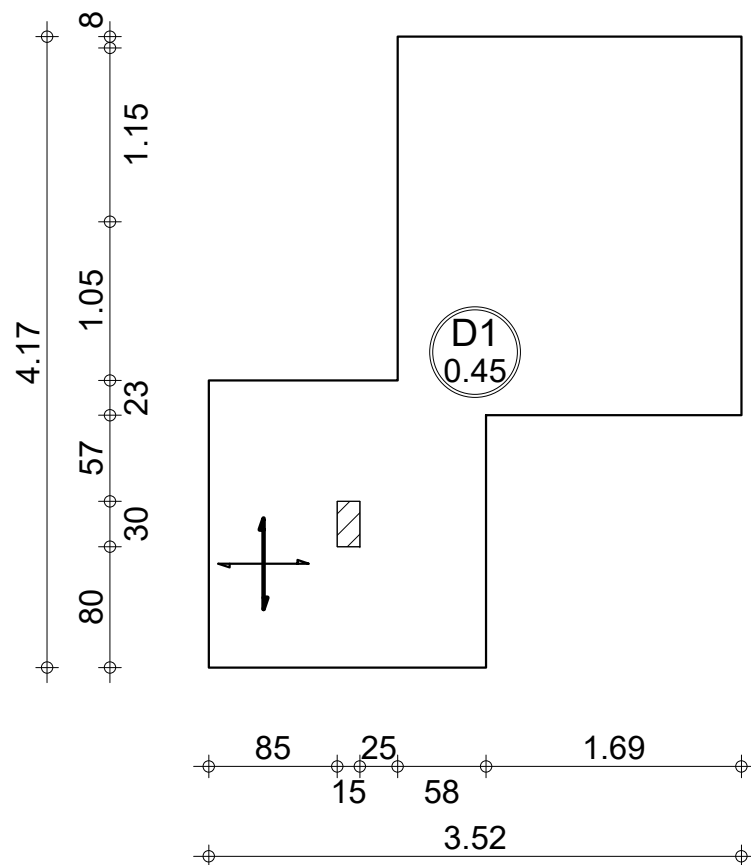


|                                                                                    |        |                                        |          |                              |                                                  |                 |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|--------------------------------------------------|-----------------|
|  |        |                                        | Tél.     | Fax                          |                                                  |                 |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | <b>1_SC 5</b>                | Ferrailage : HA 400 = 437 kg                     |                 |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 5 | Dessin:  | <b>FERRAILLAGE INFERIEUR</b> | Echelle : 1/50                                   | Date : 22/11/25 |
|                                                                                    |        |                                        |          |                              | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                    |        |                                        |          |                              | Page 2/4                                         |                 |

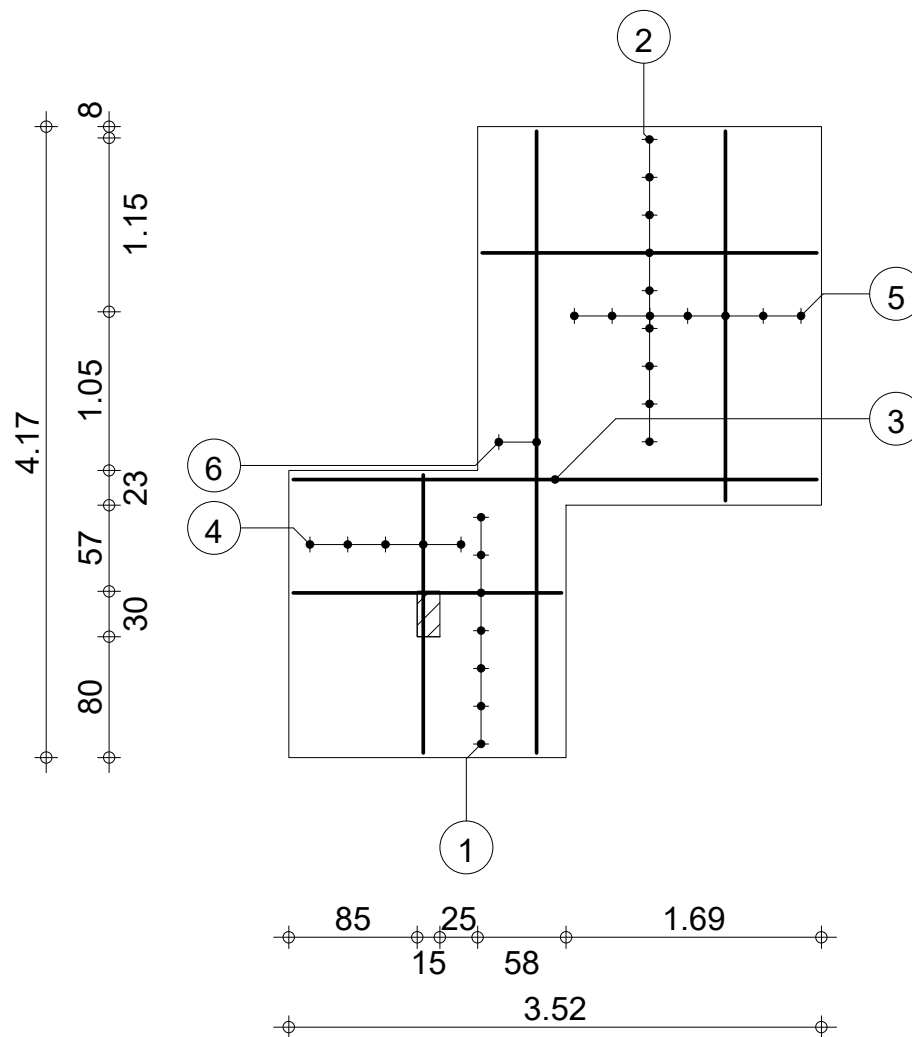


|                                                                                           |        |                                        |                 |                       |  |                              |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|-----------------------|--|------------------------------|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                   |  |                              | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 5 |                       |  | Ferrailage : HA 400 = 437 kg |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 5 | Dessin:         | FERRAILLAGE SUPERIEUR |  |                              | Echelle : 1/50                                   | Date : 22/11/25 |

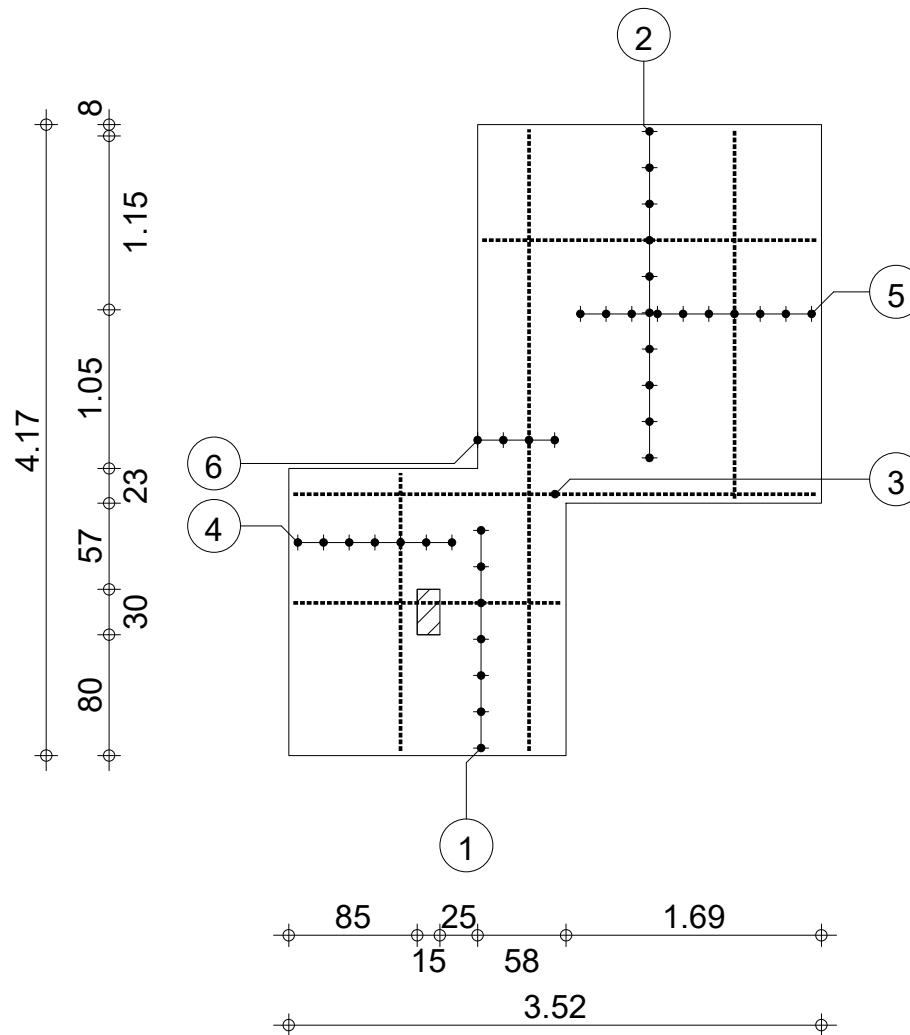
| Pos. | Armature |         | Code | Forme |
|------|----------|---------|------|-------|
| ①    | 8HA 12   | l=4.43  | 00   | 4.43  |
| ②    | 11HA 12  | l=4.52  | 00   | 4.52  |
| ③    | 15HA 12  | l=5.21  | 00   | 5.22  |
| ④    | 10HA 12  | l=6.21* | 00   | 6.21  |
| ⑭    | 11HA 12  | l=1.79  | 00   | 1.79  |
| ⑮    | 59HA 12  | l=3.34  | 00   | 3.34  |
| ⑯    | 8HA 12   | l=6.21* | 00   | 6.21  |



|                                                                                    |                                               |                                     |                               |                                      |
|------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------|-------------------------------|--------------------------------------|
|  |                                               | Tél. Fax                            |                               | Enrobage                             |
|                                                                                    | Niveau <b>SOUBASSEMENT</b>                    | Elément: <b>1_SC 6</b>              | Surface du coffrage = 9.05 m2 | supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    | Sujet: DETAILS DE STRUCTURE DUO 2 TOGBIN SC 6 | Dessin: <b>COFFRAGE DE LA DALLE</b> |                               | Page 1/4                             |
|                                                                                    |                                               |                                     | Echelle : 1/50                | Date : 22/11/25                      |

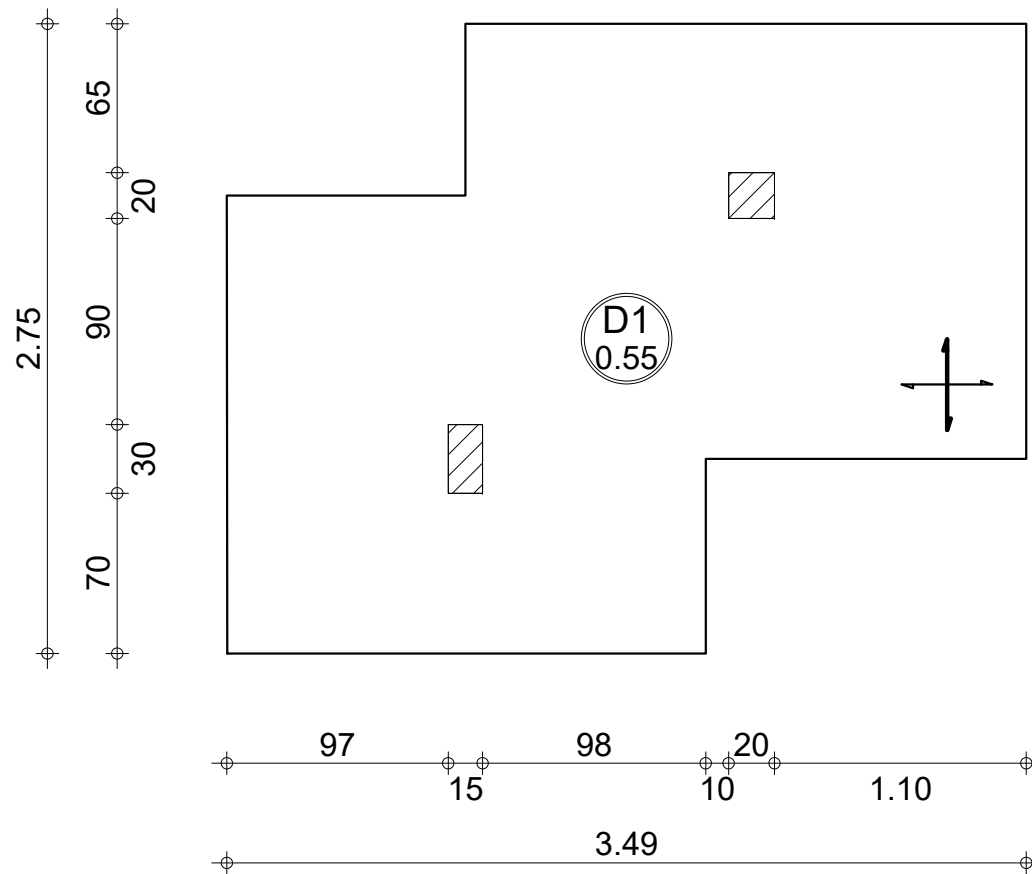


|                                                                                    |                                      |                        |                              |  |                                      |                 |                                               |  |
|------------------------------------------------------------------------------------|--------------------------------------|------------------------|------------------------------|--|--------------------------------------|-----------------|-----------------------------------------------|--|
|  | Tél. Fax                             |                        |                              |  |                                      |                 | Enrobage                                      |  |
|                                                                                    | Niveau <b>SOUBASSEMENT</b>           | Elément: <b>1_SC 6</b> | Ferrailage : HA 400 = 144 kg |  | supérieur = 3 cm<br>inférieur = 3 cm |                 | Sujet: DETAILS DE STRUCTURE DUO 2 TOGBIN SC 6 |  |
|                                                                                    | Dessin: <b>FERRAILLAGE INFERIEUR</b> |                        |                              |  | Echelle : 1/50                       | Date : 22/11/25 |                                               |  |

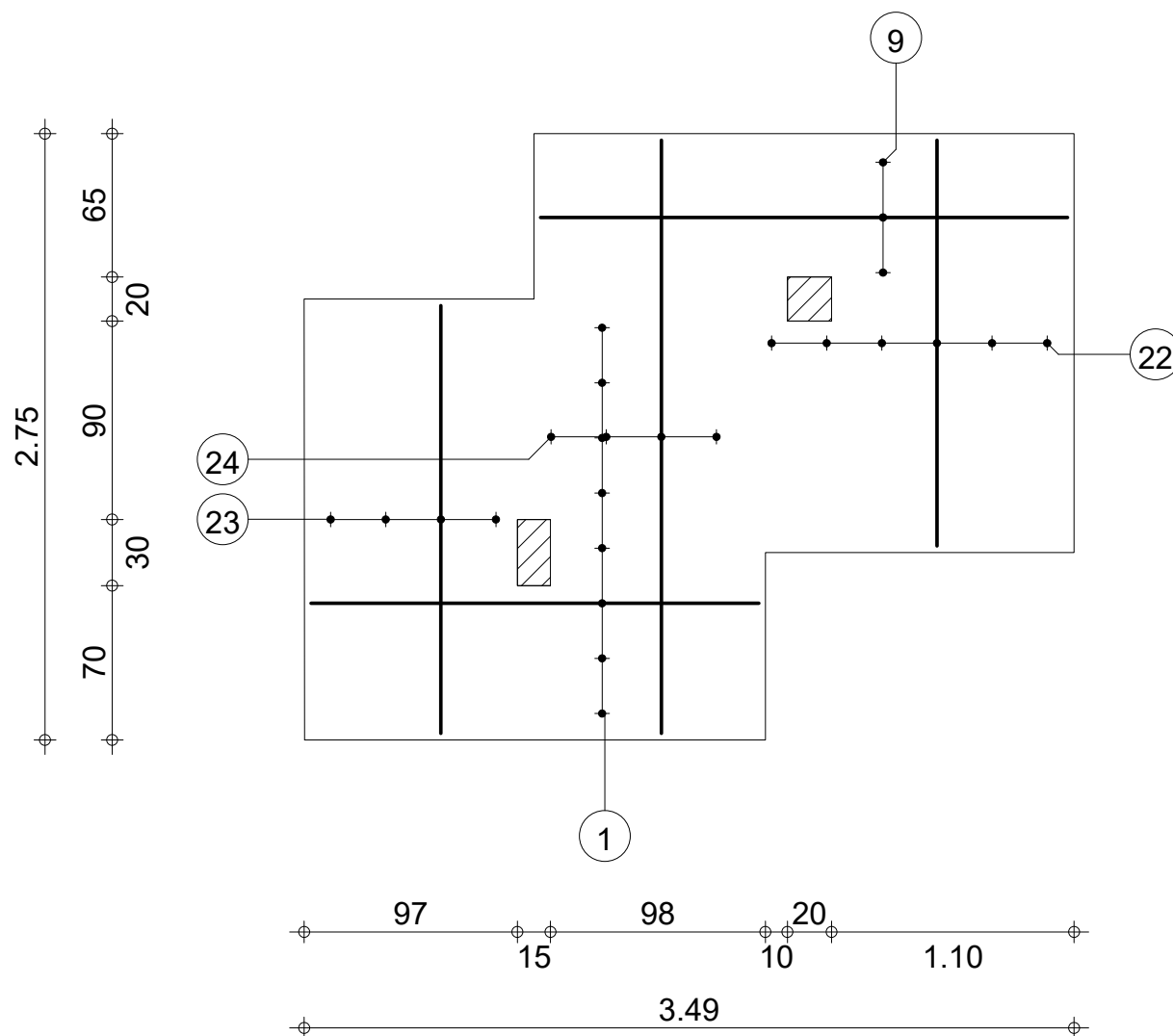


|                                                                                    |        |                                        |          |                              |                                                  |                 |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|--------------------------------------------------|-----------------|
|  |        |                                        | Tél. Fax |                              |                                                  |                 |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | <b>1_SC 6</b>                | Ferrailage : HA 400 = 144 kg                     |                 |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 6 | Dessin:  | <b>FERRAILLAGE SUPERIEUR</b> | Echelle : 1/50                                   | Date : 22/11/25 |
|                                                                                    |        |                                        |          |                              | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                    |        |                                        |          |                              | Page 3/4                                         |                 |

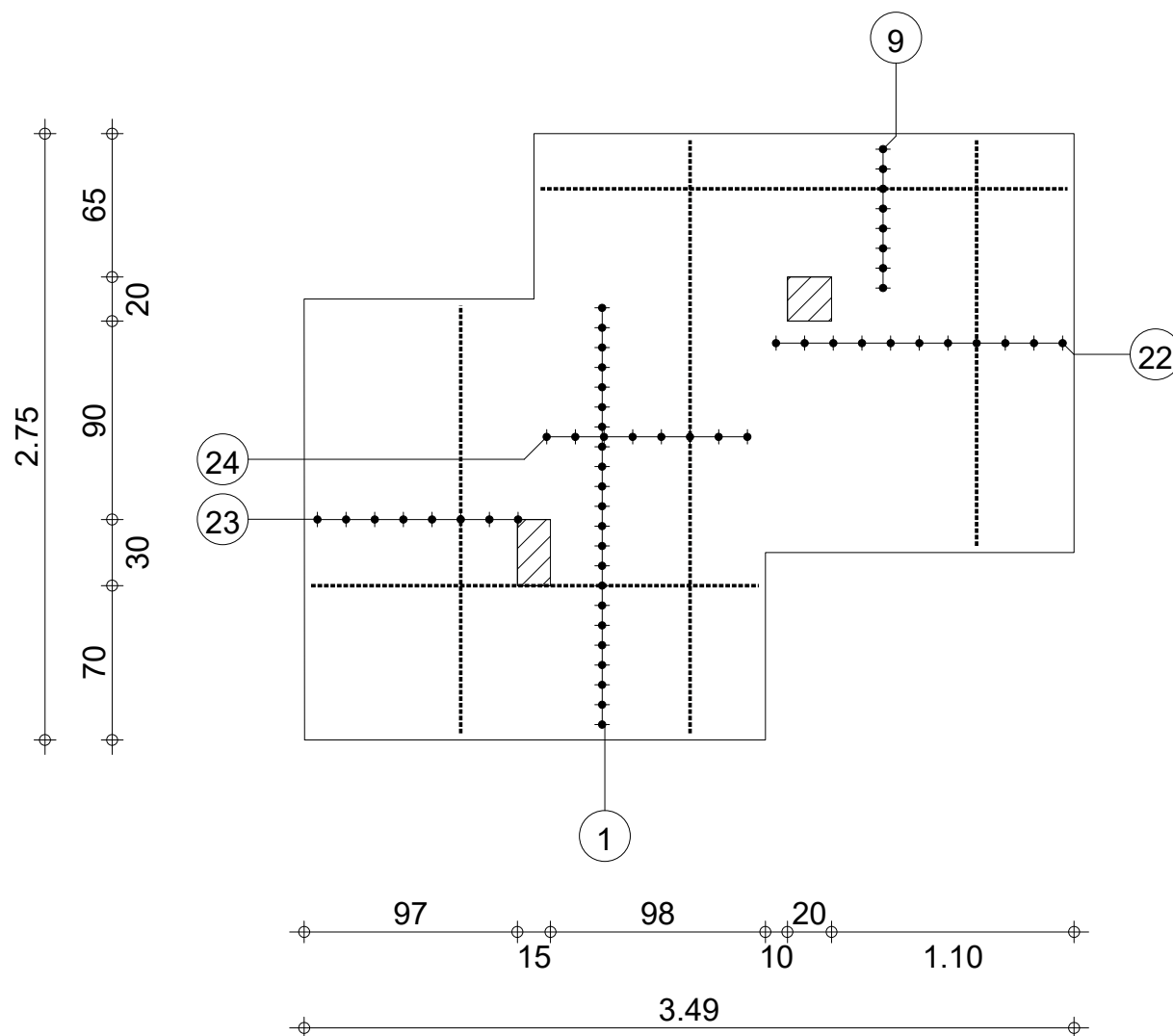
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 14HA 12  | l=1.78 | 00   | 1.77  |
| ②    | 19HA 12  | l=2.21 | 00   | 2.21  |
| ③    | 2HA 12   | l=3.46 | 00   | 3.46  |
| ④    | 12HA 12  | l=1.84 | 00   | 1.84  |
| ⑤    | 17HA 12  | l=2.44 | 00   | 2.45  |
| ⑥    | 6HA 12   | l=4.12 | 00   | 4.12  |



|                                                                                           |        |                                        |                 |                      |                               |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 7 |                      | Surface du coffrage = 7.63 m2 |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 7 | Dessin:         | COFFRAGE DE LA DALLE |                               |  | Echelle : 1/33                                   | Date : 22/11/25 |

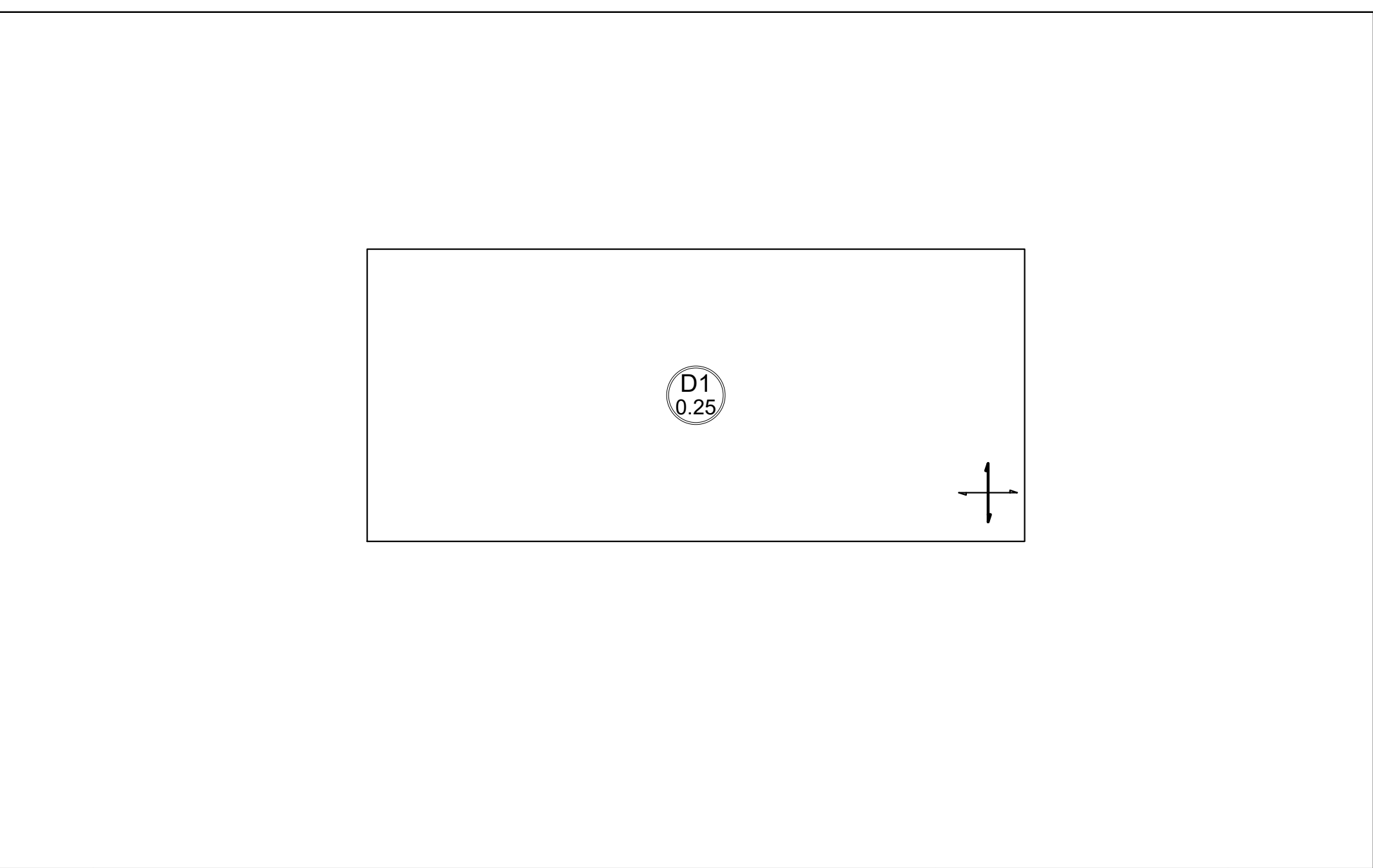


|                                                                                           |        |                                        |      |          |     |                       |  |                              |                 |                  |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|------|----------|-----|-----------------------|--|------------------------------|-----------------|------------------|
| <br>PRO |        |                                        | Tél. |          | Fax |                       |  |                              | Enrobage        |                  |
|                                                                                           | Niveau | SOUBASSEMENT                           |      | Elément: |     | 1_SC 7                |  | Ferrailage : HA 400 = 177 kg |                 | supérieur = 3 cm |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 7 |      | Dessin:  |     | FERRAILLAGE INFERIEUR |  | Echelle : 1/33               | Date : 22/11/25 | inférieur = 3 cm |
|                                                                                           |        |                                        |      |          |     |                       |  |                              | Page 2/4        |                  |

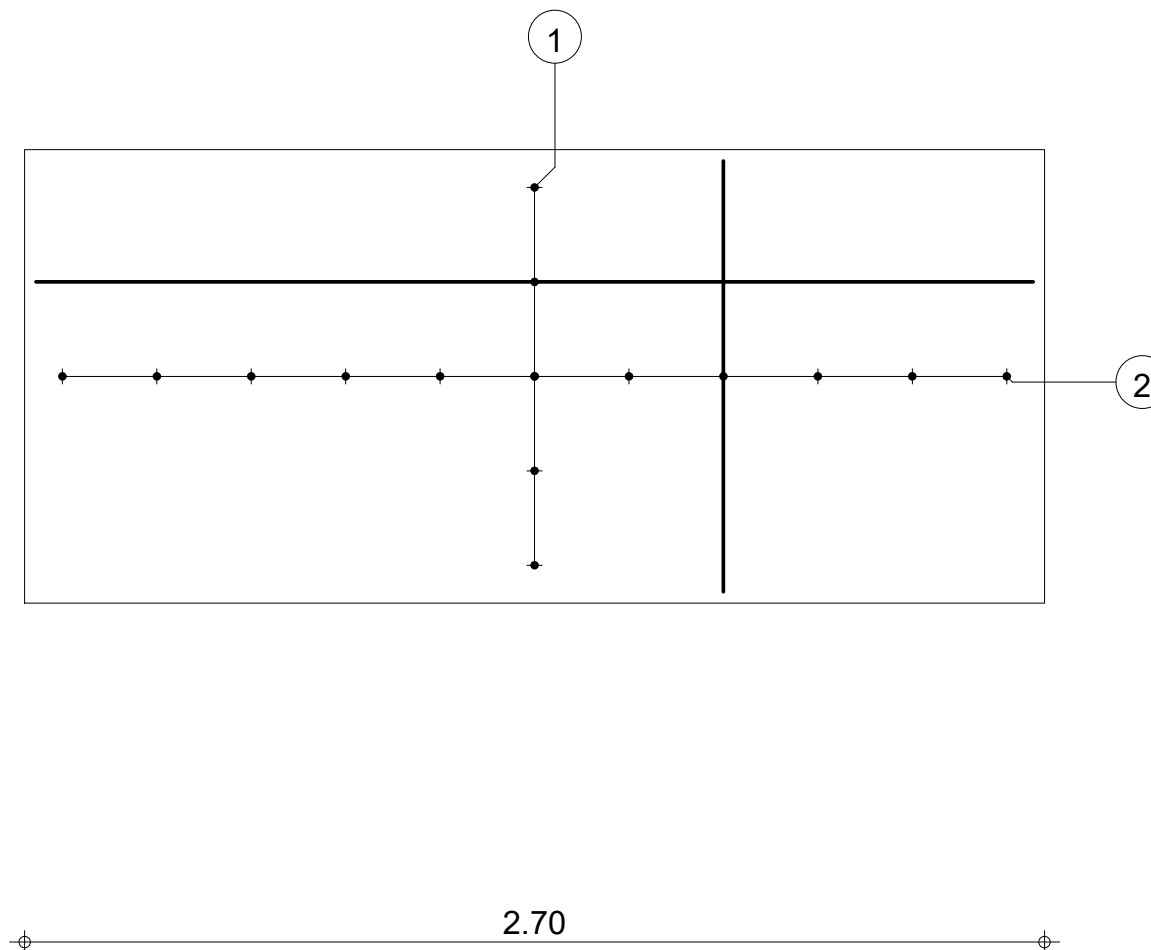
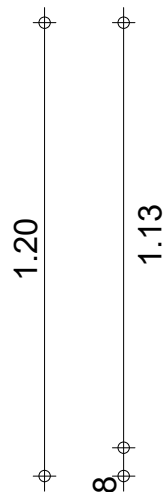


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|-------------------------------------------------------------------------------------------|--------|----------------------------------------|----------|-----------------------|-----|--|--|--|--------------------------------------------------|--|------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.     |                       | Fax |  |  |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |  |                              |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: | 1_SC 7                |     |  |  |  |                                                  |  | Ferrailage : HA 400 = 177 kg |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 7 | Dessin:  | FERRAILLAGE SUPERIEUR |     |  |  |  |                                                  |  | Echelle : 1/33               | Date : 22/11/25 |

| Pos. | Armature |         | Code | Forme |
|------|----------|---------|------|-------|
| ①    | 30HA 12  | l=2.87* | 00   | 2.03  |
| ⑨    | 11HA 12  | l=2.39  | 00   | 2.39  |
| ②②   | 17HA 12  | l=1.84  | 00   | 1.84  |
| ②③   | 12HA 12  | l=1.94  | 00   | 1.94  |
| ②④   | 12HA 12  | l=2.69  | 00   | 2.69  |

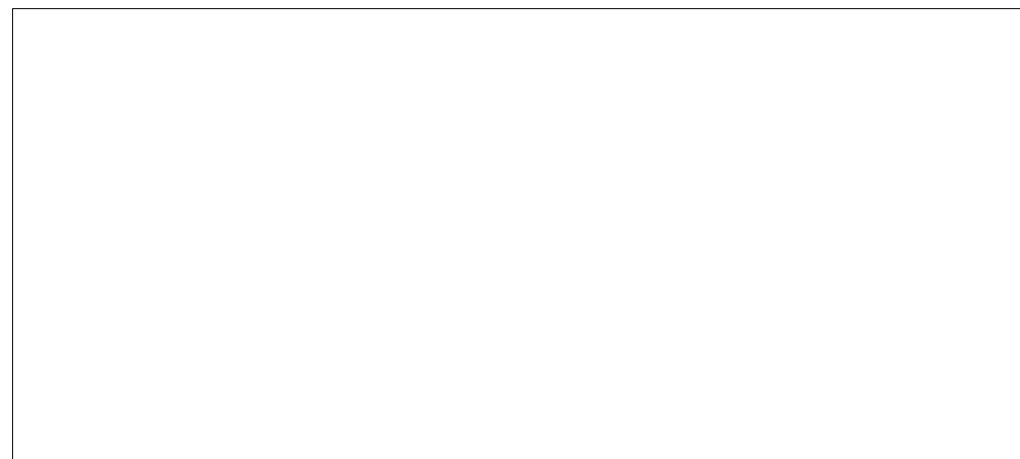


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|-------------------------------------------------------------------------------------------|--------|----------------------------------------|----------|--|----------------------|--|-------------------------------|--|--------------------------------------------------|--|
| <br>PRO |        |                                        | Tél.     |  | Fax                  |  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |  |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: |  | 1_SC 8               |  | Surface du coffrage = 3.24 m2 |  |                                                  |  |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 8 | Dessin:  |  | COFFRAGE DE LA DALLE |  | Echelle : 1/20                |  | Date : 22/11/25                                  |  |
|                                                                                           |        |                                        |          |  |                      |  |                               |  | Page 1/4                                         |  |



|                                                                                    |        |                                        |          |                       |     |                               |  |                 |          |                  |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|-----------------------|-----|-------------------------------|--|-----------------|----------|------------------|
|  |        |                                        | Tél.     |                       | Fax |                               |  |                 | Enrobage |                  |
|                                                                                    | Niveau | SOUBASSEMENT                           | Elément: | 1_SC 8                |     | Ferrailage : HA 400 = 22.9 kg |  |                 |          | supérieur = 3 cm |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 8 | Dessin:  | FERRAILLAGE INFERIEUR |     | Echelle : 1/20                |  | Date : 22/11/25 |          | inférieur = 3 cm |
|                                                                                    |        |                                        |          |                       |     |                               |  |                 |          | Page 2/4         |

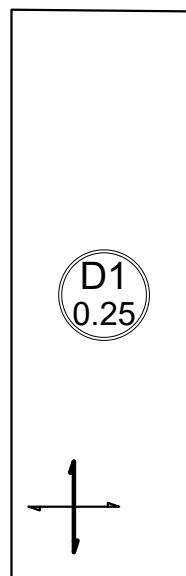
1.20  
1.13  
8



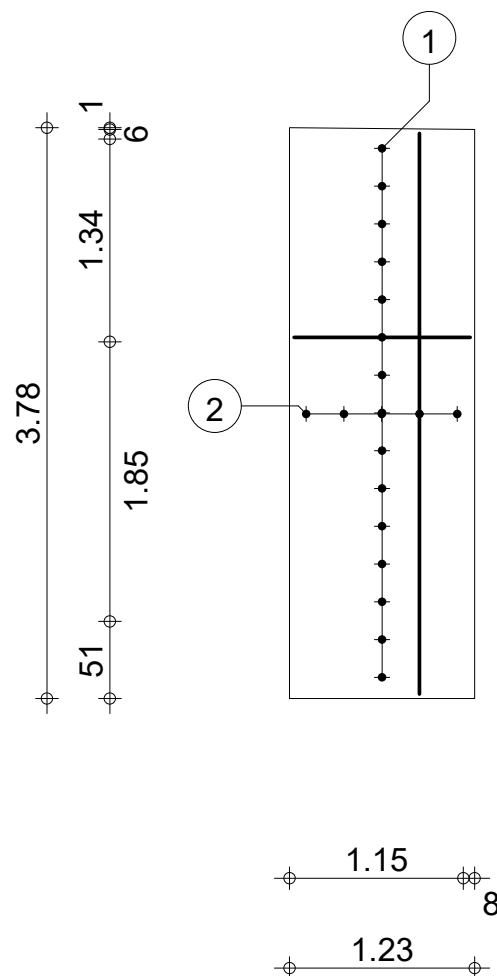
2.70

|                                                                                    |          |                                        |                                                  |          |
|------------------------------------------------------------------------------------|----------|----------------------------------------|--------------------------------------------------|----------|
|  | Tél. Fax |                                        | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |          |
|                                                                                    | Niveau   | SOUBASSEMENT                           | Elément: 1_SC 8                                  |          |
|                                                                                    | Sujet:   | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 8 | Dessin: FERRAILLAGE SUPERIEUR                    |          |
| Ferrailage : HA 400 = 22.9 kg                                                      |          | Echelle : 1/20                         | Date : 22/11/25                                  | Page 3/4 |

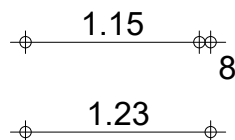
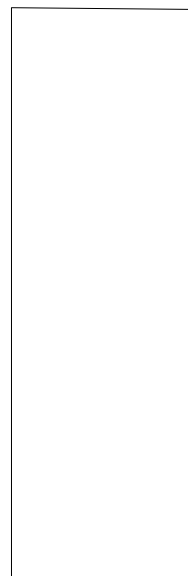
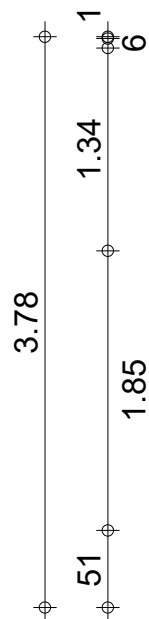
| Pos. | Armature       | Code | Forme |
|------|----------------|------|-------|
| ①    | 5HA 12 l=2.64  | 00   | 2.64  |
| ②    | 11HA 12 l=1.14 | 00   | 1.14  |



|                                                                                           |        |                                        |                 |                      |                               |  |                                                  |                 |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|----------------------|-------------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 9 |                      | Surface du coffrage = 4.62 m2 |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 9 | Dessin:         | COFFRAGE DE LA DALLE |                               |  | Echelle : 1/50                                   | Date : 22/11/25 |



|                                                                                           |        |                                        |          |                       |  |                             |                                                  |          |
|-------------------------------------------------------------------------------------------|--------|----------------------------------------|----------|-----------------------|--|-----------------------------|--------------------------------------------------|----------|
| <br>PRO |        |                                        | Tél.     | Fax                   |  |                             | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |          |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: | 1_SC 9                |  | Ferrailage : HA 400 = 32 kg |                                                  |          |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 9 | Dessin:  | FERRAILLAGE INFERIEUR |  | Echelle : 1/50              | Date : 22/11/25                                  | Page 2/4 |
|                                                                                           |        |                                        |          |                       |  |                             |                                                  |          |

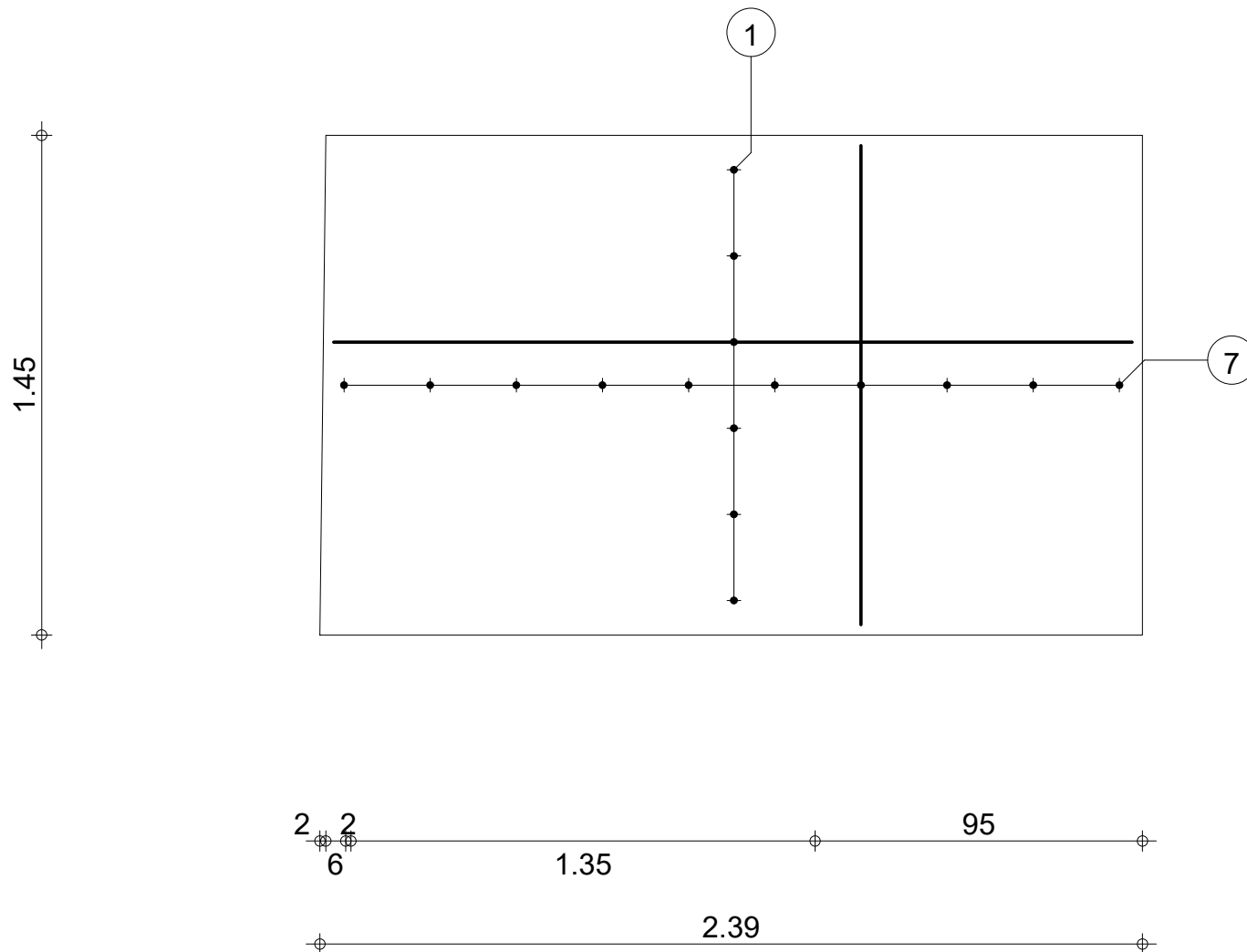


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|-------------------------------------------------------------------------------------------|--------|----------------------------------------|-----------------|-----------------------|-----------------------------|--|--------------------------------------------------|-----------------|
| <br>PRO |        |                                        | Tél.            | Fax                   |                             |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                           | Niveau | SOUBASSEMENT                           | Elément: 1_SC 9 |                       | Ferrailage : HA 400 = 32 kg |  |                                                  |                 |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 9 | Dessin:         | FERRAILLAGE SUPERIEUR |                             |  | Echelle : 1/50                                   | Date : 22/11/25 |

| Pos. | Armature |         | Code | Forme |
|------|----------|---------|------|-------|
| ①    | 15HA 12  | l=1.17  | 00   | 1.17  |
| ②    | 5HA 12   | l=3.71* | 00   | 3.71  |

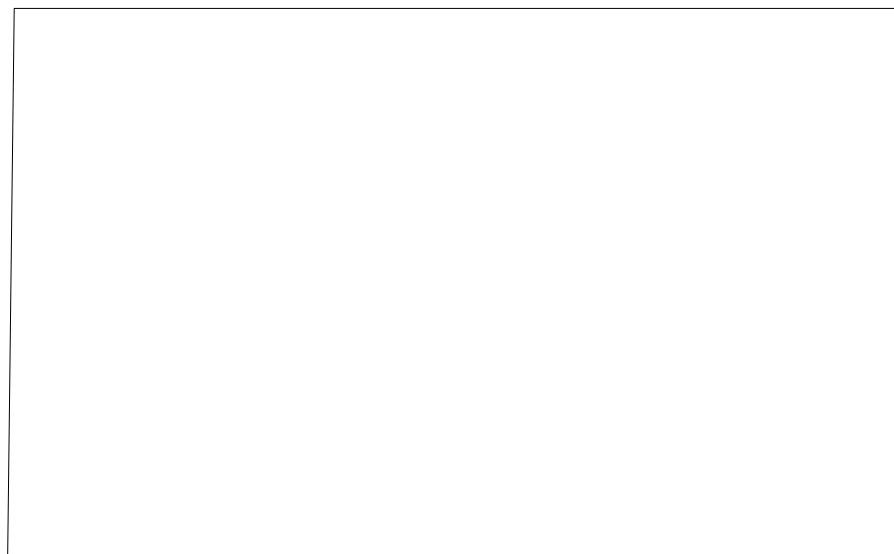


|                                                                                           |        |                                         |                              |     |                               |                 |                                                  |
|-------------------------------------------------------------------------------------------|--------|-----------------------------------------|------------------------------|-----|-------------------------------|-----------------|--------------------------------------------------|
| <br>PRO |        |                                         | Tél.                         | Fax |                               |                 | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                           | Niveau | SOUBASSEMENT                            | Elément: 1_SC 10             |     | Surface du coffrage = 3.45 m2 |                 |                                                  |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 10 | Dessin: COFFRAGE DE LA DALLE |     | Echelle : 1/20                | Date : 22/11/25 | Page 1/4                                         |



|                                                                                    |        |                                         |          |                             |                               |                                                  |
|------------------------------------------------------------------------------------|--------|-----------------------------------------|----------|-----------------------------|-------------------------------|--------------------------------------------------|
|  |        |                                         | Tél.     | Fax                         |                               |                                                  |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                     | Elément: | <b>1_SC 10</b>              | Ferrailage : HA 400 = 24.7 kg | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 10 | Dessin:  | <b>FERRAILAGE INFERIEUR</b> | Echelle : 1/20                | Date : 22/11/25                                  |
|                                                                                    |        |                                         |          |                             |                               | Page 2/4                                         |

1.45



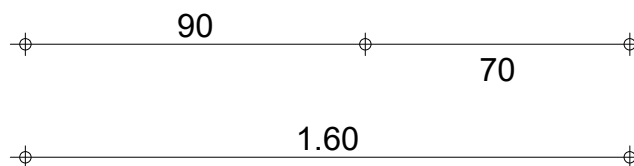
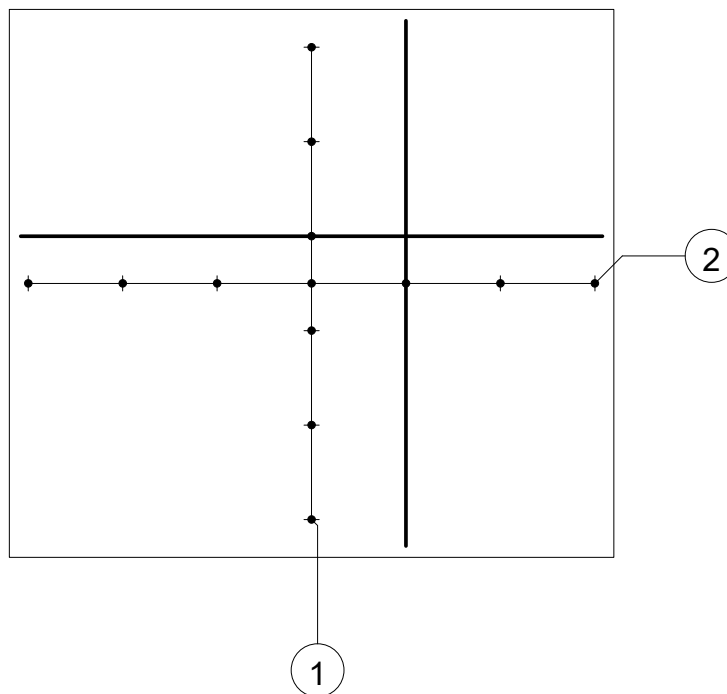
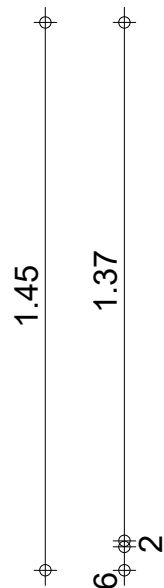
2 2  
6 1.35 95  
2.39

|                                                                                           |        |                                         |          |  |                       |  |                               |  |                                                  |          |
|-------------------------------------------------------------------------------------------|--------|-----------------------------------------|----------|--|-----------------------|--|-------------------------------|--|--------------------------------------------------|----------|
| <br>PRO |        |                                         | Tél.     |  | Fax                   |  |                               |  | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |          |
|                                                                                           | Niveau | SOUBASSEMENT                            | Elément: |  | 1_SC 10               |  | Ferrailage : HA 400 = 24.7 kg |  |                                                  |          |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 10 | Dessin:  |  | FERRAILLAGE SUPERIEUR |  | Echelle : 1/20                |  | Date : 22/11/25                                  | Page 3/4 |

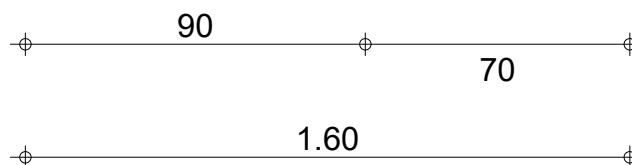
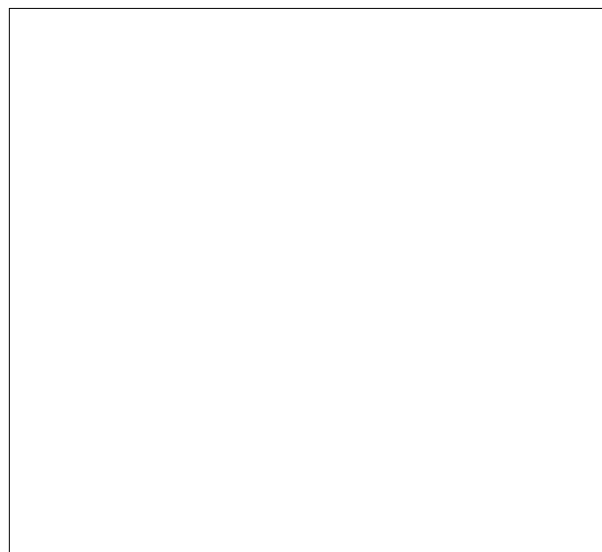
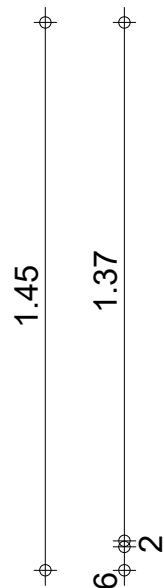
| Pos. | Armature |         | Code | Forme       |
|------|----------|---------|------|-------------|
| ①    | 6HA 12   | l=2.32* | 00   | <u>2.31</u> |
| ⑦    | 10HA 12  | l=1.39  | 00   | <u>1.39</u> |



|                                                                                           |        |                                         |                  |                      |                               |                |                                                  |
|-------------------------------------------------------------------------------------------|--------|-----------------------------------------|------------------|----------------------|-------------------------------|----------------|--------------------------------------------------|
| <br>PRO | , ,    |                                         | Tél.             | Fax                  | Surface du coffrage = 2.32 m2 |                | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                           | Niveau | SOUBASSEMENT                            | Elément: 1_SC 11 |                      |                               |                |                                                  |
|                                                                                           | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 11 | Dessin:          | COFFRAGE DE LA DALLE |                               | Echelle : 1/20 | Date : 22/11/25                                  |



|                                                                                    |        |                                        |          |                              |                                                  |                 |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|--------------------------------------------------|-----------------|
|  |        |                                        | Tél. Fax |                              |                                                  |                 |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 11                      | Ferrailage : HA 400 = 16.8 kg                    |                 |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 1 | Dessin:  | <b>FERRAILLAGE INFERIEUR</b> | Echelle : 1/20                                   | Date : 22/11/25 |
|                                                                                    |        |                                        |          |                              | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                    |        |                                        |          |                              | Page 2/4                                         |                 |



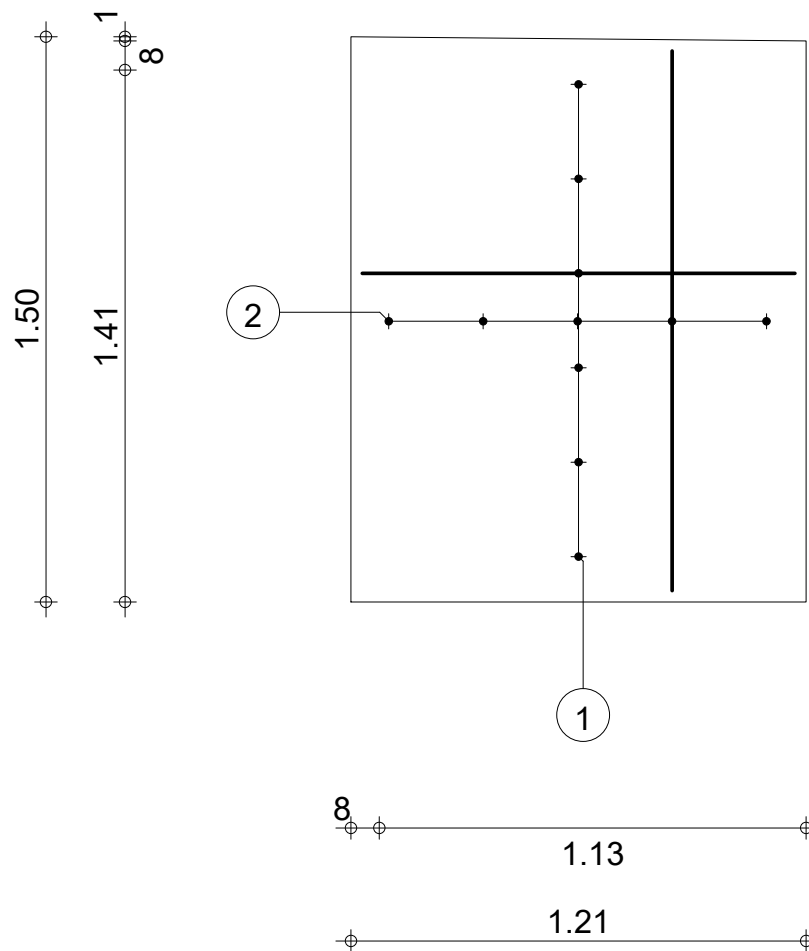
|                                                                                    |        |                                        |          |                              |                               |                 |                  |
|------------------------------------------------------------------------------------|--------|----------------------------------------|----------|------------------------------|-------------------------------|-----------------|------------------|
|  | ,      |                                        | Tél.     | Fax                          |                               |                 | Enrobage         |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                    | Elément: | 1_SC 11                      | Ferrailage : HA 400 = 16.8 kg |                 | supérieur = 3 cm |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 1 | Dessin:  | <b>FERRAILLAGE SUPERIEUR</b> | Echelle : 1/20                | Date : 22/11/25 | inférieur = 3 cm |
|                                                                                    |        |                                        |          |                              |                               |                 | Page 3/4         |

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 6HA 12   | l=1.54 | 00   | 1.54  |
| ②    | 7HA 12   | l=1.39 | 00   | 1.39  |

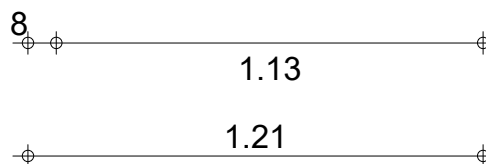
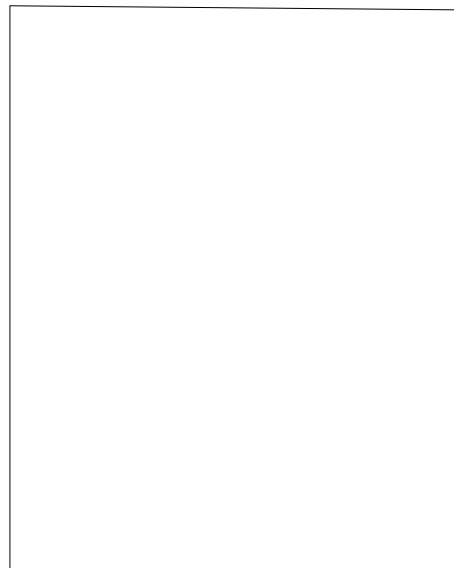
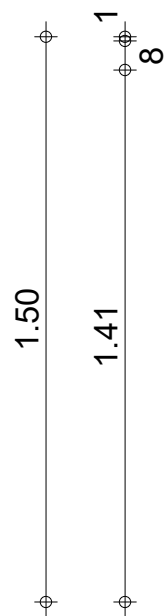
|                                                                                    |        |                                         |          |                     |                                                  |          |
|------------------------------------------------------------------------------------|--------|-----------------------------------------|----------|---------------------|--------------------------------------------------|----------|
|  |        |                                         | Tél.     | Fax                 |                                                  |          |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                     | Elément: | 1_SC 11             | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |          |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 11 | Dessin:  | <b>NOMENCLATURE</b> | Ferrailage : HA 400 = 16.8 kg<br>Date : 22/11/25 | Page 4/4 |



|                                                                                    |        |                                         |          |                             |                                                  |                 |
|------------------------------------------------------------------------------------|--------|-----------------------------------------|----------|-----------------------------|--------------------------------------------------|-----------------|
|  |        |                                         | Tél. Fax |                             |                                                  |                 |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                     | Elément: | 1_SC 12                     | Surface du coffrage = 1.8 m2                     |                 |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 12 | Dessin:  | <b>COFFRAGE DE LA DALLE</b> | Echelle : 1/20                                   | Date : 22/11/25 |
|                                                                                    |        |                                         |          |                             | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |                 |
|                                                                                    |        |                                         |          |                             | Page 1/4                                         |                 |

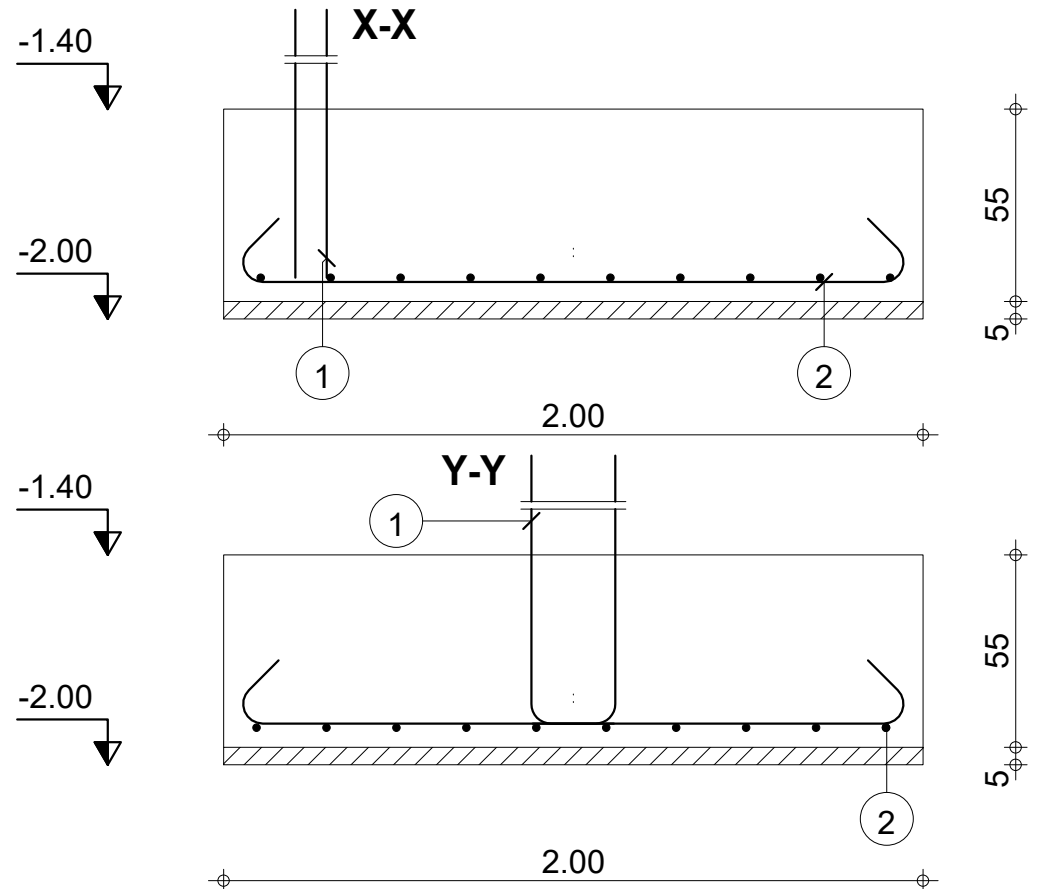
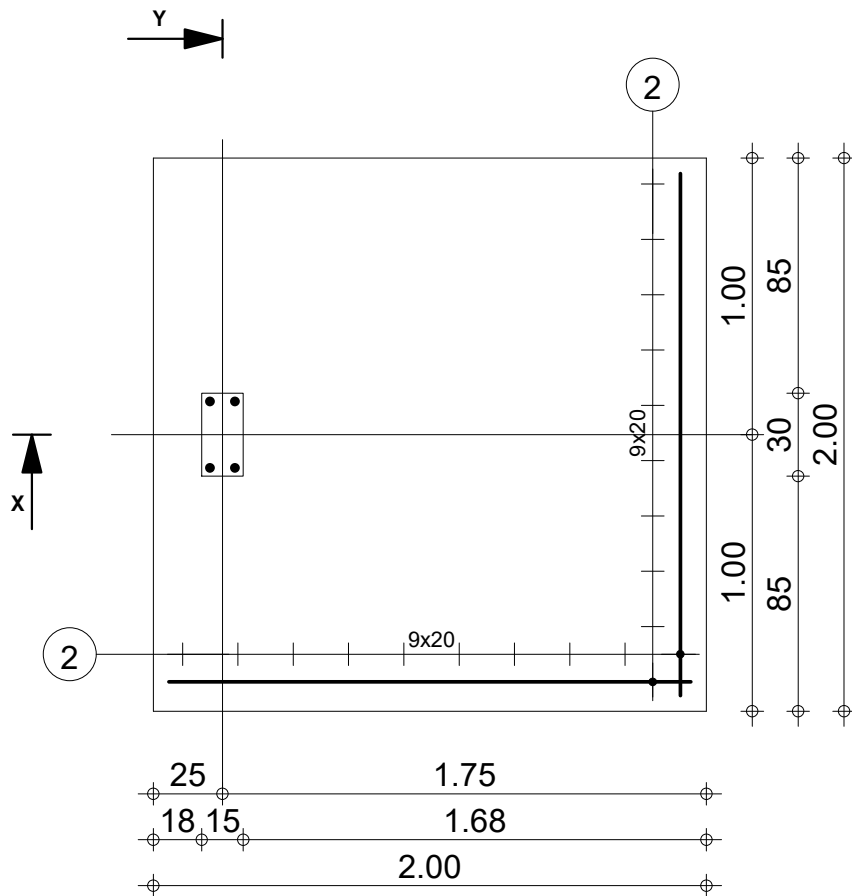


|                                                                                    |                |                 |                                                |                                                   |                               |                                                  |
|------------------------------------------------------------------------------------|----------------|-----------------|------------------------------------------------|---------------------------------------------------|-------------------------------|--------------------------------------------------|
|  |                |                 | Tél. Fax                                       |                                                   |                               | Enrobage<br>supérieur = 3 cm<br>inférieur = 3 cm |
|                                                                                    | Niveau         | Soubassement    | Sujet: DETAILS DE STRUCTURE DUO 2 TOGBIN SC 12 | Elément: 1_SC 12<br>Dessin: FERRAILLAGE INFÉRIEUR | Ferrailage : HA 400 = 12.4 kg |                                                  |
|                                                                                    | Echelle : 1/20 | Date : 22/11/25 | Page 2/4                                       |                                                   |                               |                                                  |



|                                                                                    |        |                                         |                                      |     |                               |                 |                  |
|------------------------------------------------------------------------------------|--------|-----------------------------------------|--------------------------------------|-----|-------------------------------|-----------------|------------------|
|  |        |                                         | Tél.                                 | Fax |                               |                 | Enrobage         |
|                                                                                    | Niveau | <b>SOUBASSEMENT</b>                     | Elément: 1_SC 12                     |     | Ferrailage : HA 400 = 12.4 kg |                 | supérieur = 3 cm |
|                                                                                    | Sujet: | DETAILS DE STRUCTURE DUO 2 TOGBIN SC 12 | Dessin: <b>FERRAILLAGE SUPERIEUR</b> |     | Echelle : 1/20                | Date : 22/11/25 | inférieur = 3 cm |
|                                                                                    |        |                                         |                                      |     |                               |                 | Page 3/4         |

| Pos. | Armature       | Code | Forme |
|------|----------------|------|-------|
| ①    | 6HA 12 l=1.15  | 00   | 1.14  |
| ②    | 5HA 12 l=1.43* | 00   | 1.43  |



| Pos. | Armature       | Code | Forme |
|------|----------------|------|-------|
| ①    | 4HA 12 l=1.13  | 00   |       |
| ②    | 20HA 12 l=2.28 | 00   |       |

|                                                                                    |                    |                           |          |                              |  |                               |
|------------------------------------------------------------------------------------|--------------------|---------------------------|----------|------------------------------|--|-------------------------------|
|                                                                                    |                    | Tél.                      | Fax      |                              |  | Acier HA 400 = 44.5 kg        |
|                                                                                    |                    | Fissuration préjudiciable |          | Béton : BETON = 2.2 m3       |  |                               |
|  | DETAILS FONDATIONS | sel_1_SI- 4               | Nombre 1 | Surface du coffrage = 4.4 m2 |  | Enrobage c1 = 5 cm, c2 = 3 cm |
|                                                                                    |                    |                           |          | Densité = 20.23 kg/ m3       |  |                               |
|                                                                                    |                    |                           |          |                              |  | Echelle pour la vue 3.66cm/m  |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |                    |                           |          |                              |  |                               |



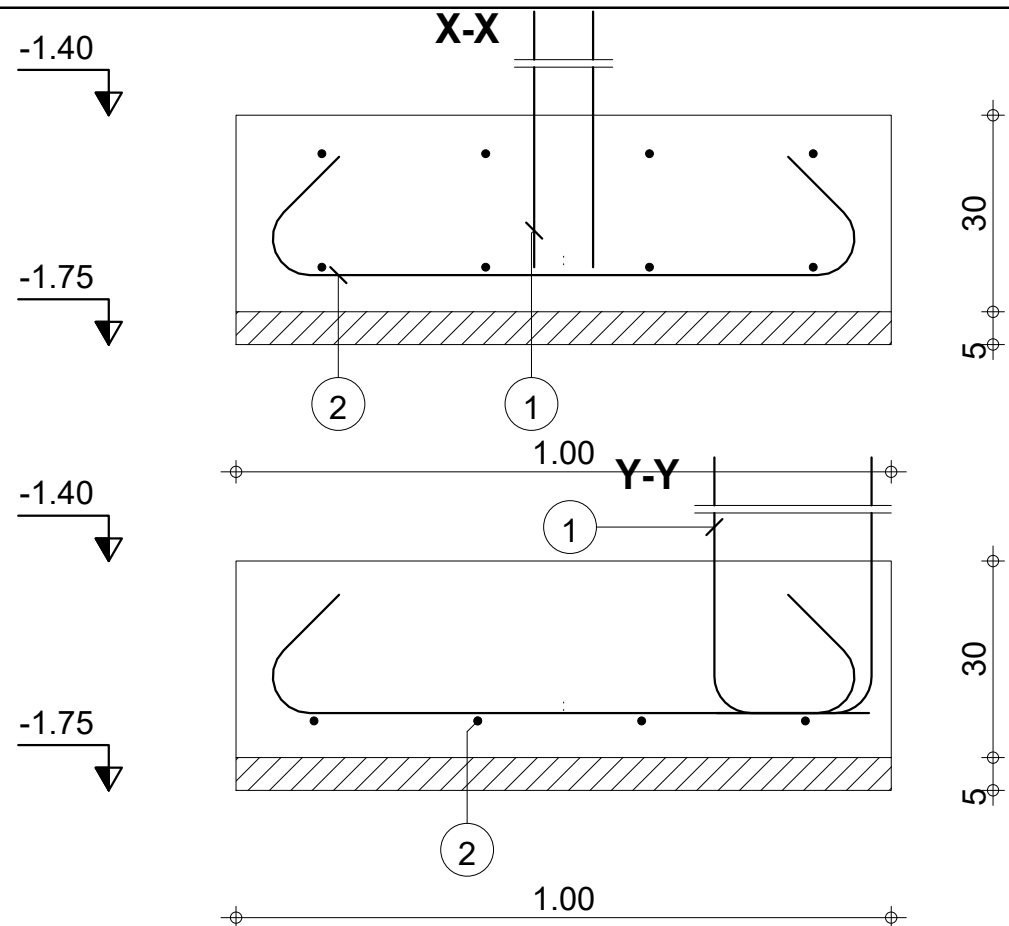
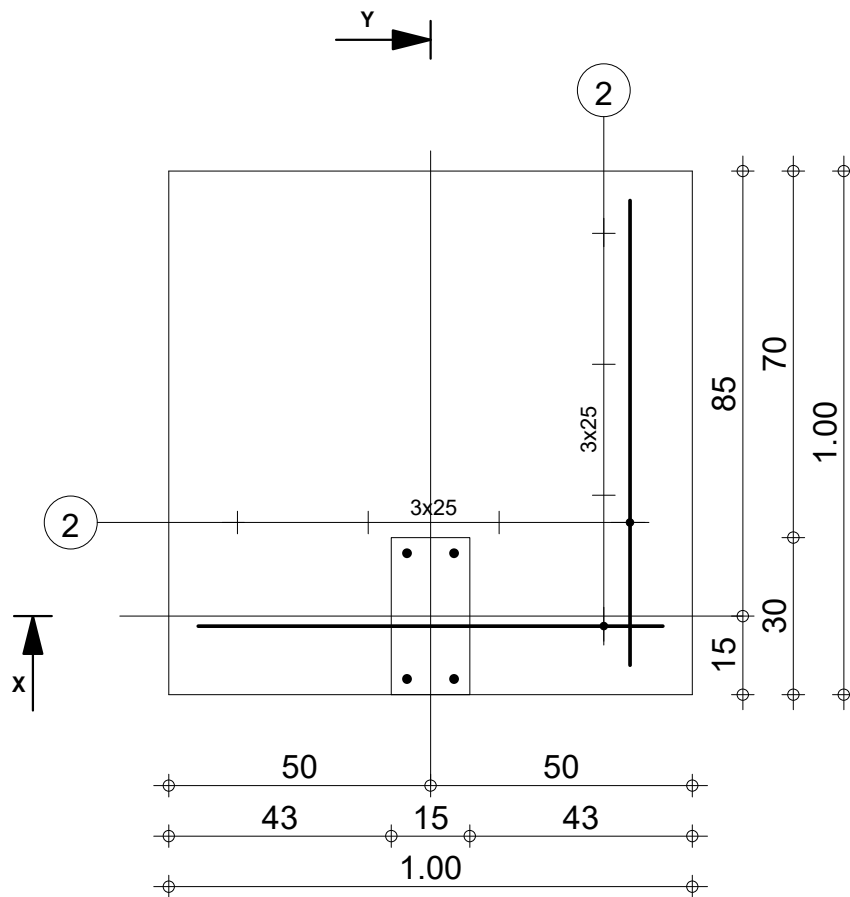
**DETAILS FONDATIONS**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**sel\_1\_SI- 4**

Nombre 1

Page 1/4



| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 4HA 12 l=88   | 00   |       |
| ②    | 8HA 12 l=1.28 | 00   |       |

|                                                                                    |                    |             |          |                              |  |                               |
|------------------------------------------------------------------------------------|--------------------|-------------|----------|------------------------------|--|-------------------------------|
|                                                                                    |                    | Tél.        | Fax      |                              |  | Acier HA 400 = 12.2 kg        |
| Fissuration préjudiciable                                                          |                    |             |          | Béton : BETON = 0.3 m3       |  | Enrobage c1 = 5 cm, c2 = 3 cm |
|  | DETAILS FONDATIONS | sel_1_SI- 1 | Nombre 1 | Surface du coffrage = 1.2 m2 |  |                               |
|                                                                                    |                    |             |          | Densité = 40.67 kg/ m3       |  |                               |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |                    |             |          | Echelle pour la vue 6.93cm/m |  | Page 2/4                      |



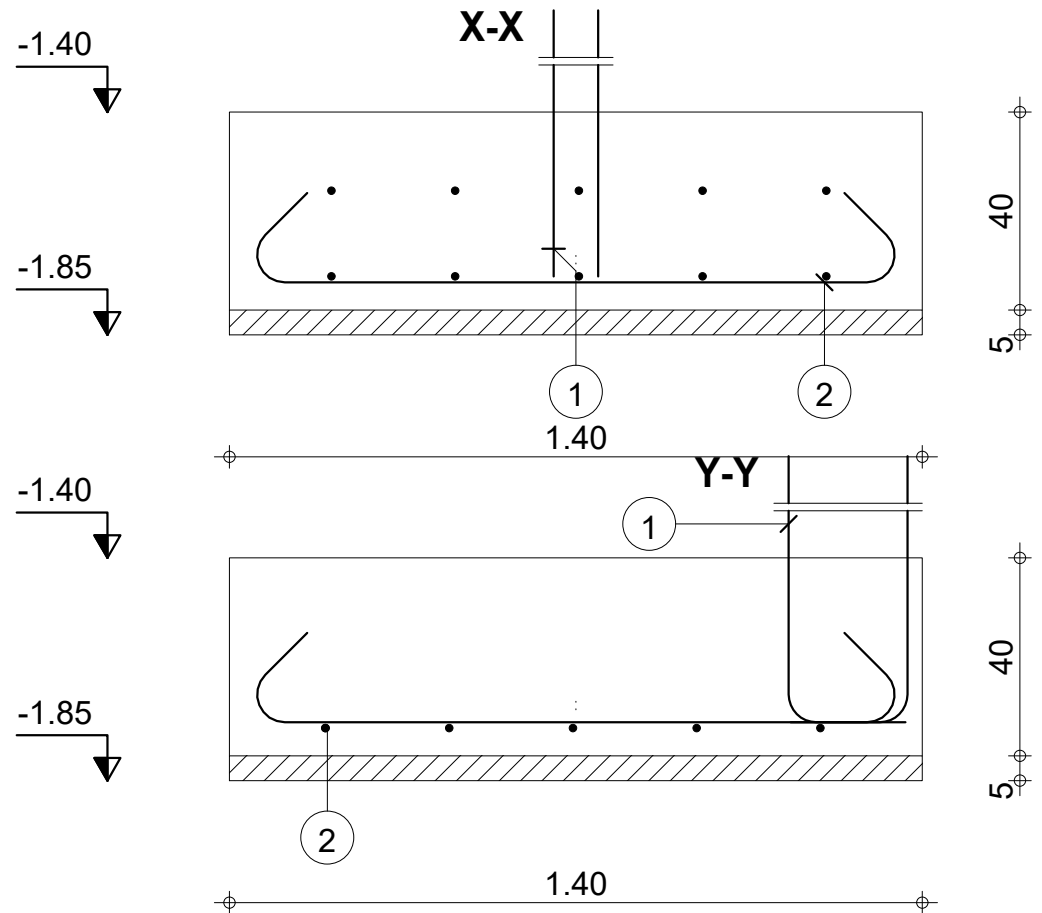
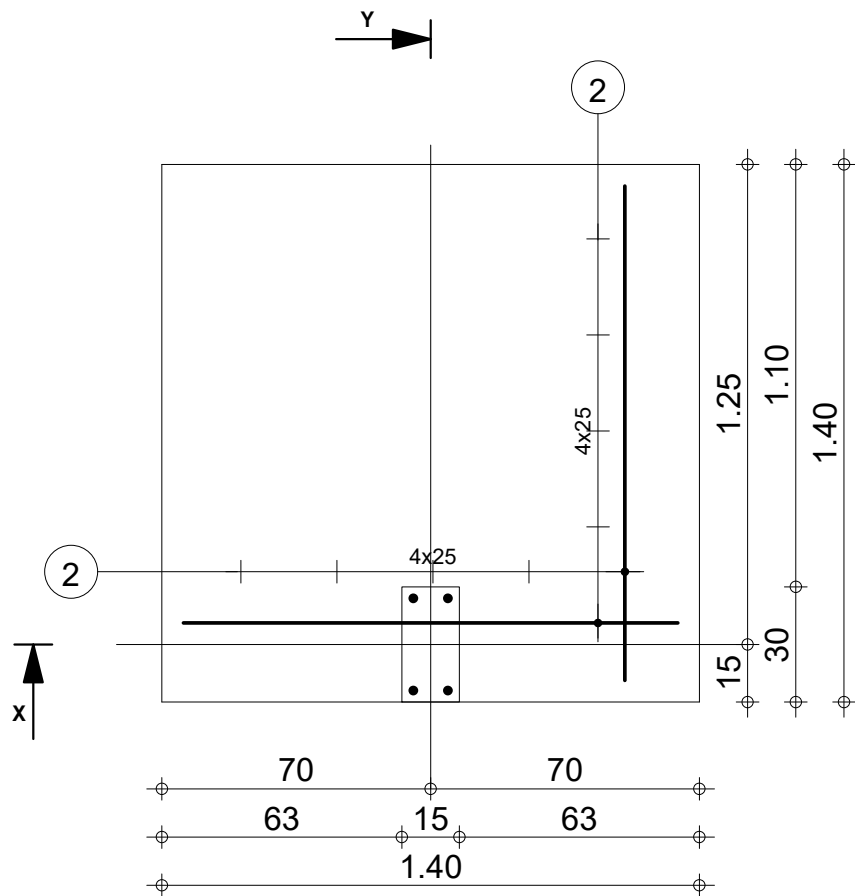
**DETAILS FONDATIONS**

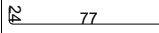
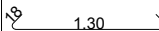
DETAILS DE STRUCTURE DUO 2 TOGBIN

**sel\_1\_SI- 1**

Nombre 1

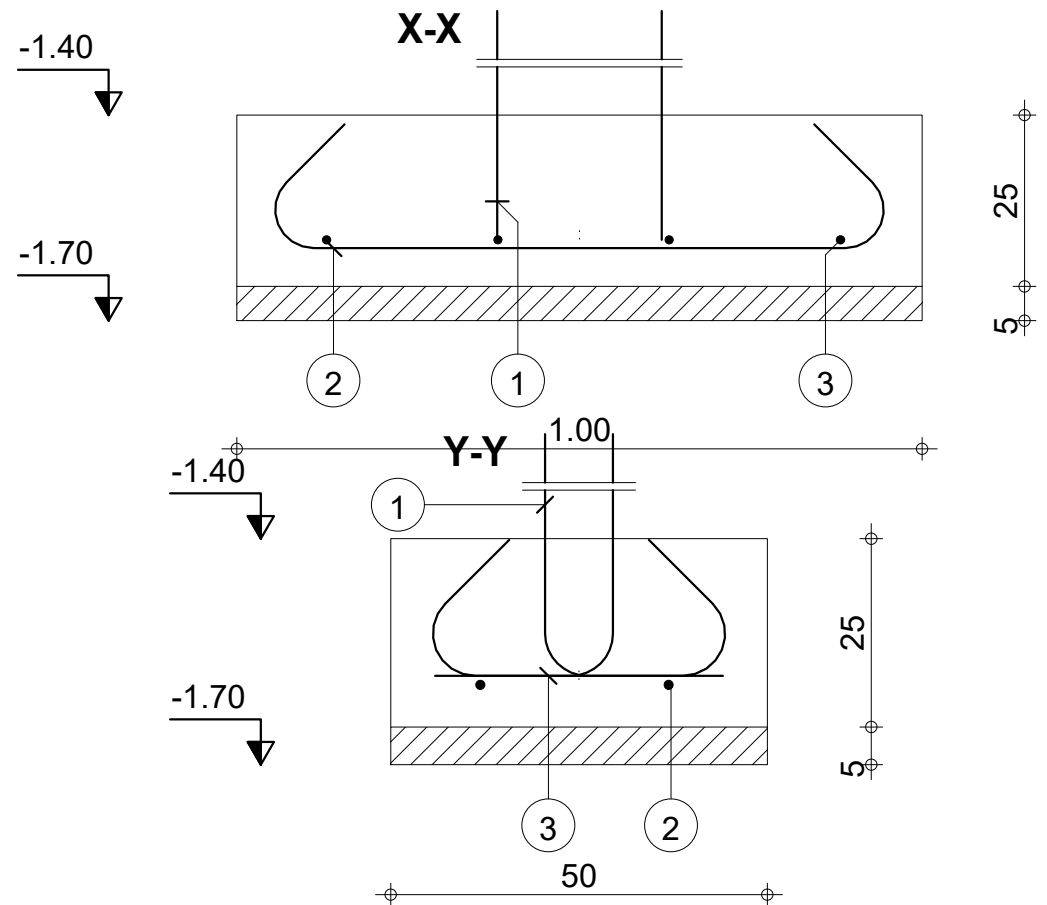
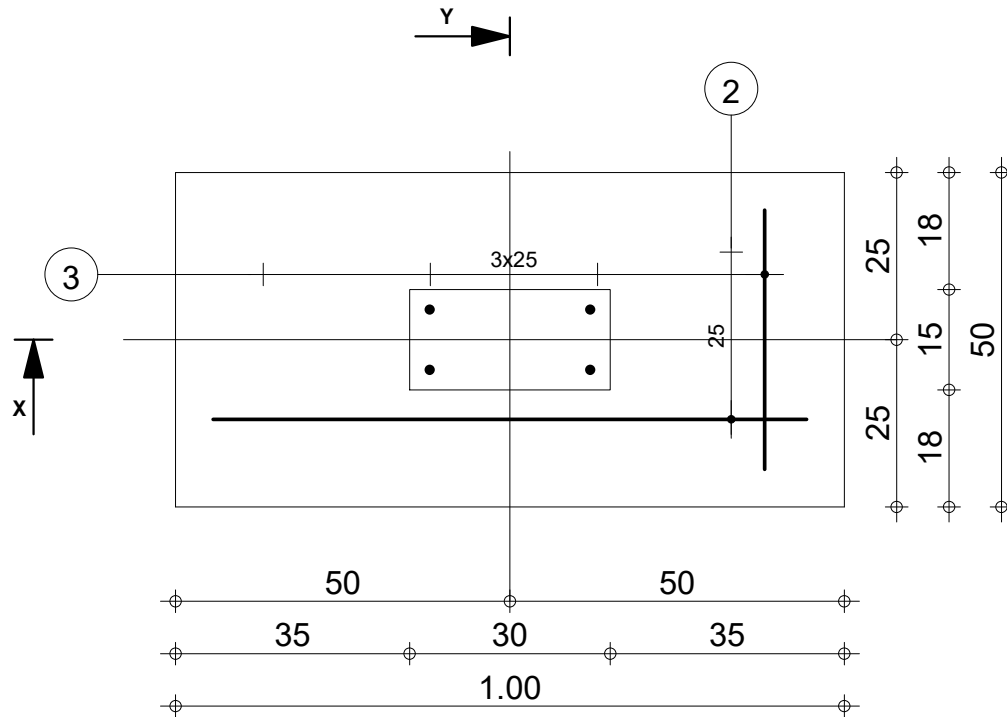
Page 2/4



| Pos. | Armature       | Code | Forme                                                                               |
|------|----------------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12 l=98    | 00   |  |
| ②    | 10HA 12 l=1.68 | 00   |  |

|                                                                                    |                           |                                   |  |                    |  |                          |  |                               |  |                               |  |  |
|------------------------------------------------------------------------------------|---------------------------|-----------------------------------|--|--------------------|--|--------------------------|--|-------------------------------|--|-------------------------------|--|--|
|                                                                                    |                           | Tél.                              |  | Fax                |  |                          |  | Acier HA 400 = 18.4 kg        |  |                               |  |  |
|                                                                                    |                           | Fissuration préjudiciable         |  |                    |  | Béton : BETON = 0.784 m3 |  |                               |  |                               |  |  |
|  | <b>DETAILS FONDATIONS</b> |                                   |  | <b>sel_1_SI- 2</b> |  | Nombre 1                 |  | Surface du coffrage = 2.24 m2 |  | Enrobage c1 = 5 cm, c2 = 3 cm |  |  |
|                                                                                    |                           |                                   |  |                    |  |                          |  | Densité = 23.47 kg/ m3        |  |                               |  |  |
|                                                                                    |                           |                                   |  |                    |  |                          |  | Echelle pour la vue 5.08cm/m  |  | Page 3/4                      |  |  |
|                                                                                    |                           | DETAILS DE STRUCTURE DUO 2 TOGBIN |  |                    |  |                          |  |                               |  |                               |  |  |





| Pos. | Armature         | Code | Forme |
|------|------------------|------|-------|
| ①    | 4HA 12<br>l=83   | 00   |       |
| ②    | 2HA 12<br>l=1.28 | 00   |       |
| ③    | 4HA 12<br>l=78   | 00   |       |

|                                                                                    |                                   |                           |                    |     |                 |                               |  |                               |  |
|------------------------------------------------------------------------------------|-----------------------------------|---------------------------|--------------------|-----|-----------------|-------------------------------|--|-------------------------------|--|
|                                                                                    |                                   | Tél.                      |                    | Fax |                 |                               |  | Acier HA 400 = 7.98 kg        |  |
|                                                                                    |                                   | Fissuration préjudiciable |                    |     |                 | Béton : BETON = 0.125 m3      |  |                               |  |
|  | <b>DETAILS FONDATIONS</b>         |                           | <b>sel_1_SI- 5</b> |     | <b>Nombre 1</b> | Surface du coffrage = 0.75 m2 |  | Enrobage c1 = 5 cm, c2 = 3 cm |  |
|                                                                                    |                                   |                           |                    |     |                 | Densité = 63.84 kg/ m3        |  |                               |  |
|                                                                                    | DETAILS DE STRUCTURE DUO 2 TOGBIN |                           |                    |     |                 |                               |  | Echelle pour la vue 8.85cm/m  |  |
|                                                                                    |                                   |                           |                    |     |                 |                               |  | Page 4/4                      |  |



**DETAILS FONDATIONS**

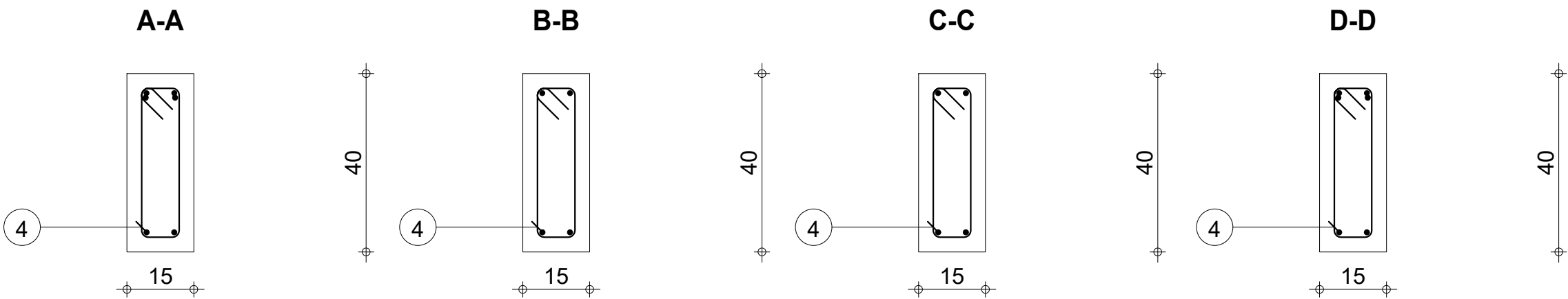
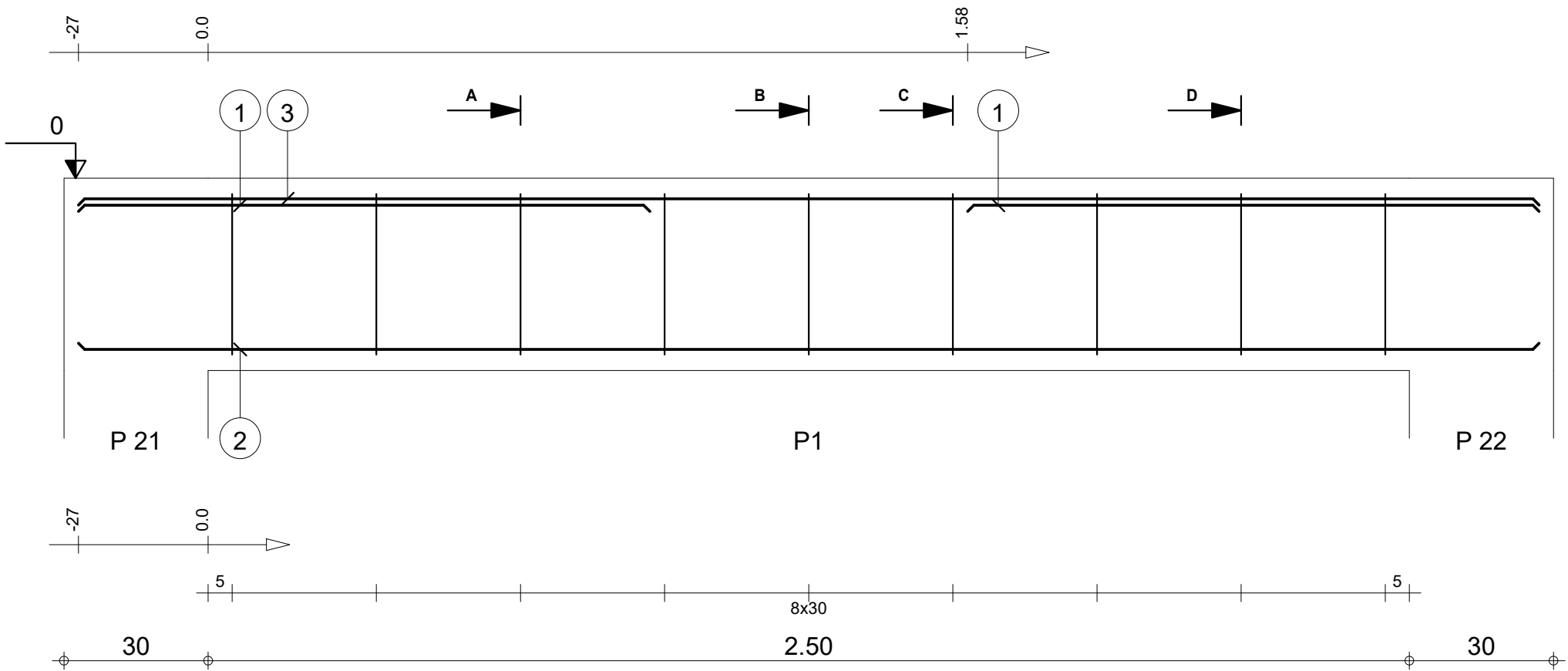
DETAILS DE STRUCTURE DUO 2 TOGBIN

**sel\_1\_SI- 5**

Nombre 1

Page 4/4

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.19 | 00   | 1.19  |
| ②    | 2HA 12   | l=3.04 | 00   | 3.04  |
| ③    | 2HA 10   | l=3.04 | 00   | 3.04  |
| ④    | 9HA 6    | l=98   | 31   |       |



|                                                                                    |              |                           |          |                                                   |                                                                  |          |
|------------------------------------------------------------------------------------|--------------|---------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|----------|
| Tél.                                                                               |              | Fax                       |          | Béton : BETON = 0.186 m3                          | Acier HA 400 = 13.4 kg                                           |          |
| Tenue au feu 0h                                                                    |              | Fissuration préjudiciable |          |                                                   | Acier HA 400 = 1.95 kg                                           |          |
|  | SOUBASSEMENT | 1_LONG 26 : P1            | Nombre 1 | Surface du coffrage = 2.98 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |          |
|                                                                                    |              |                           |          | Densité = 82.26 kg/ m3<br>Diamètre moyen = 9.47mm | Echelle pour la vue 8.25cm/m<br>Echelle pour la section 8.56cm/m | Page 1/6 |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |              | Section 15x40             |          |                                                   |                                                                  |          |



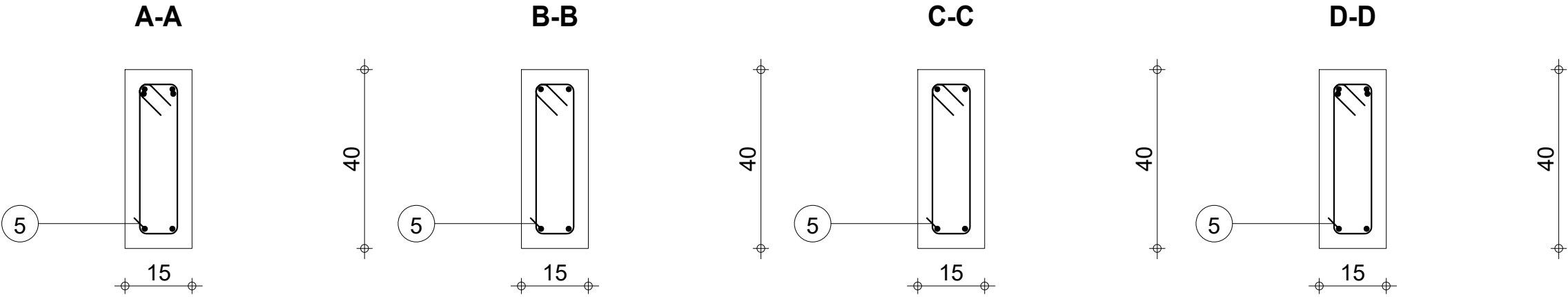
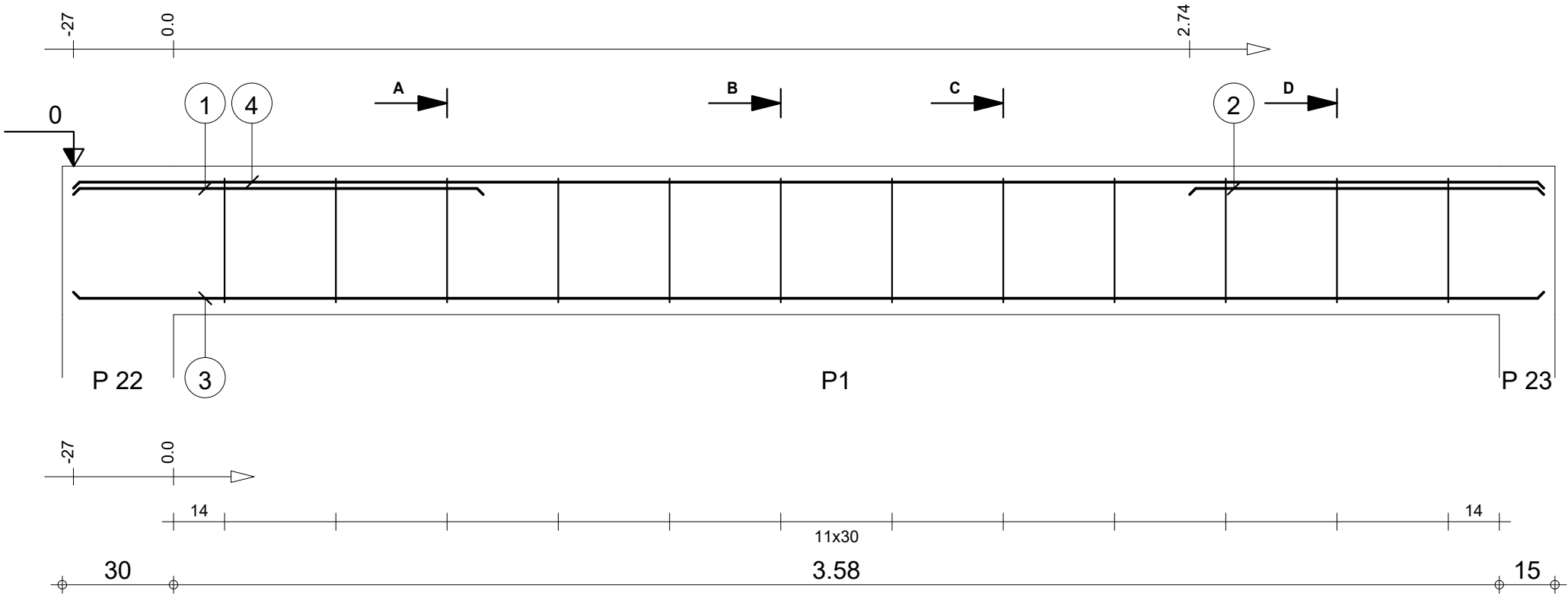
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

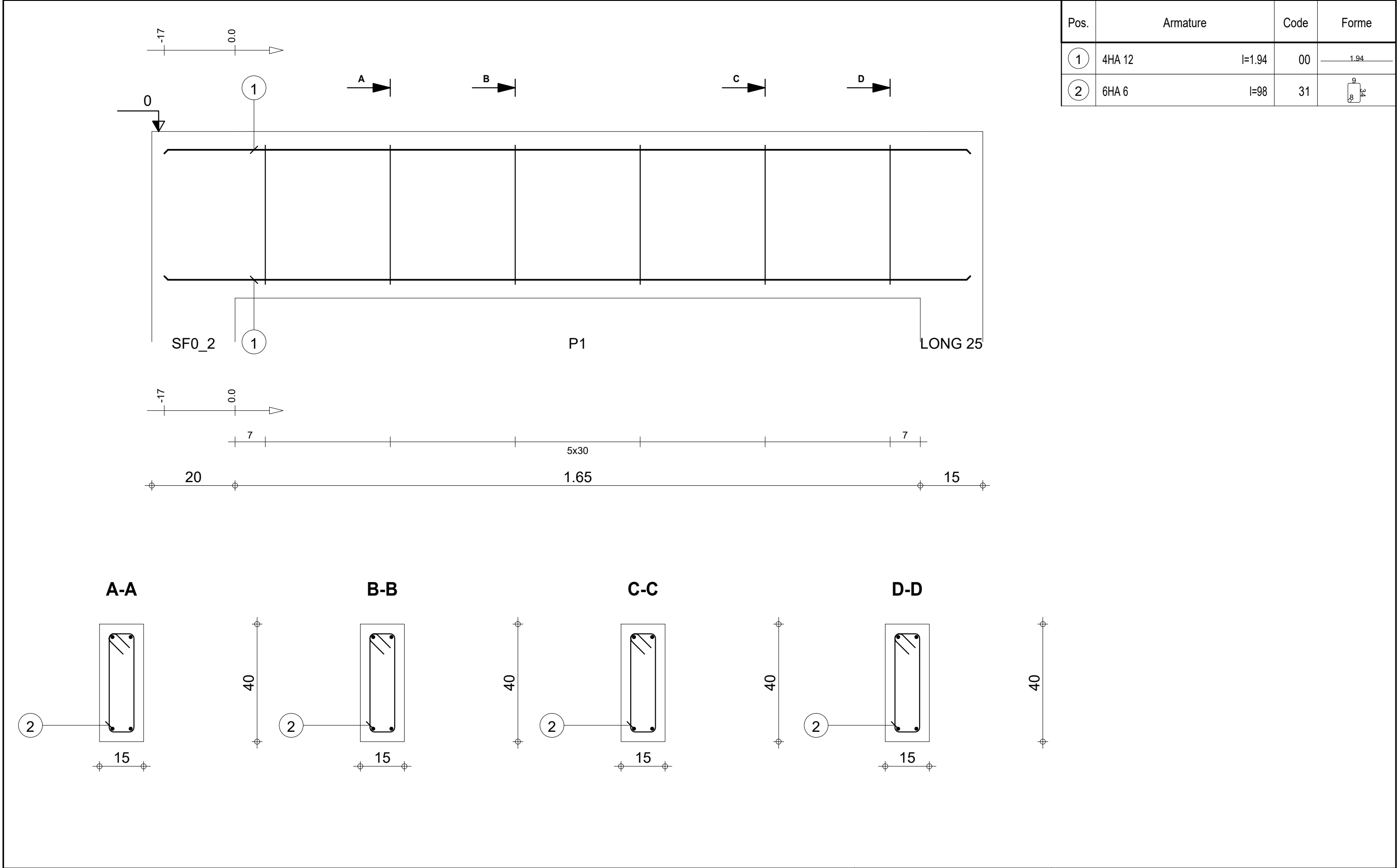
**1\_LONG 26 : P1**

**Section 15x40**

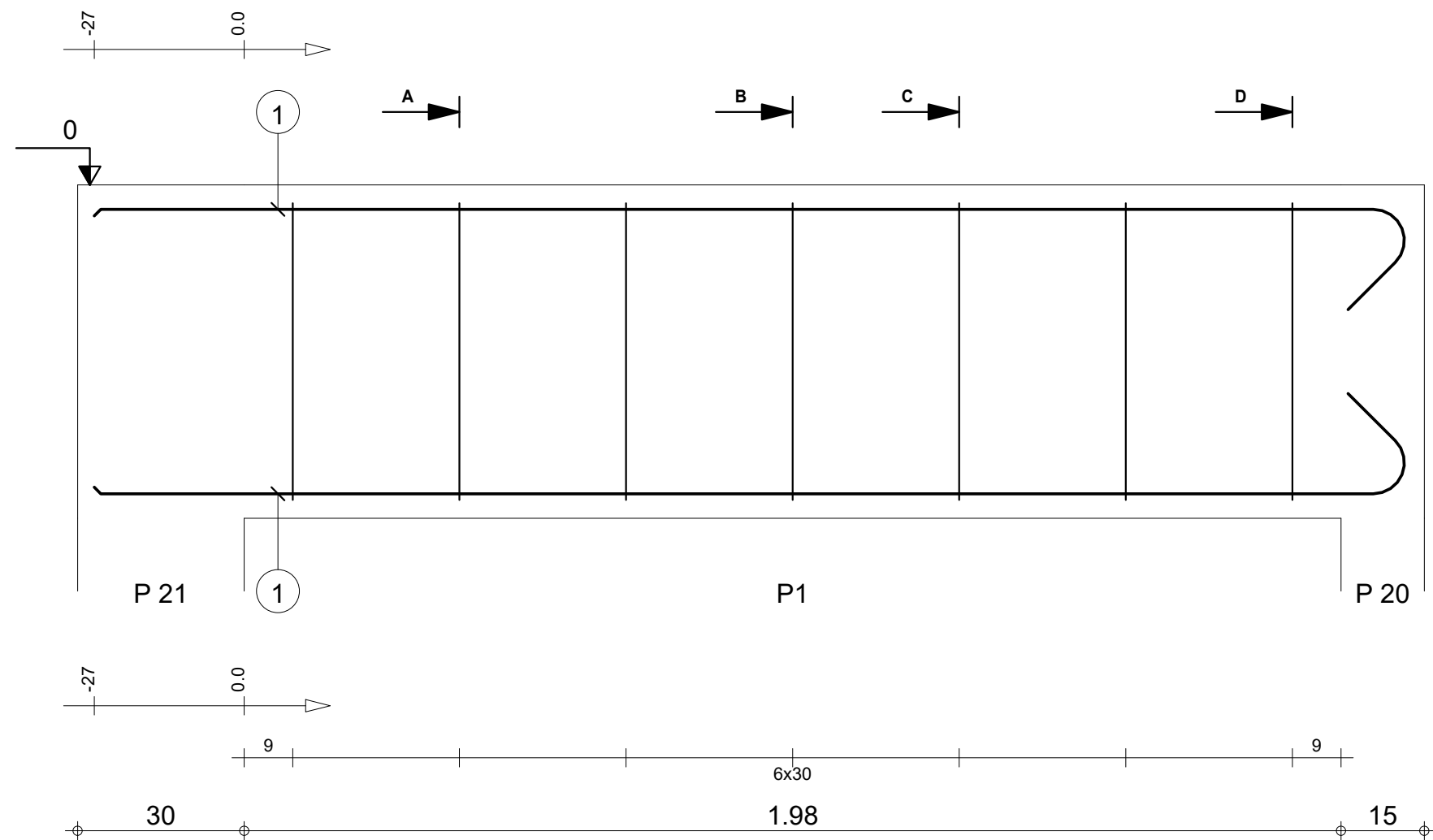
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.11 | 00   | 1.11  |
| ②    | 2HA 12   | l=96   | 00   | 96    |
| ③    | 2HA 12   | l=3.97 | 00   | 3.97  |
| ④    | 2HA 10   | l=3.97 | 00   | 3.97  |
| ⑤    | 12HA 6   | l=98   | 31   |       |



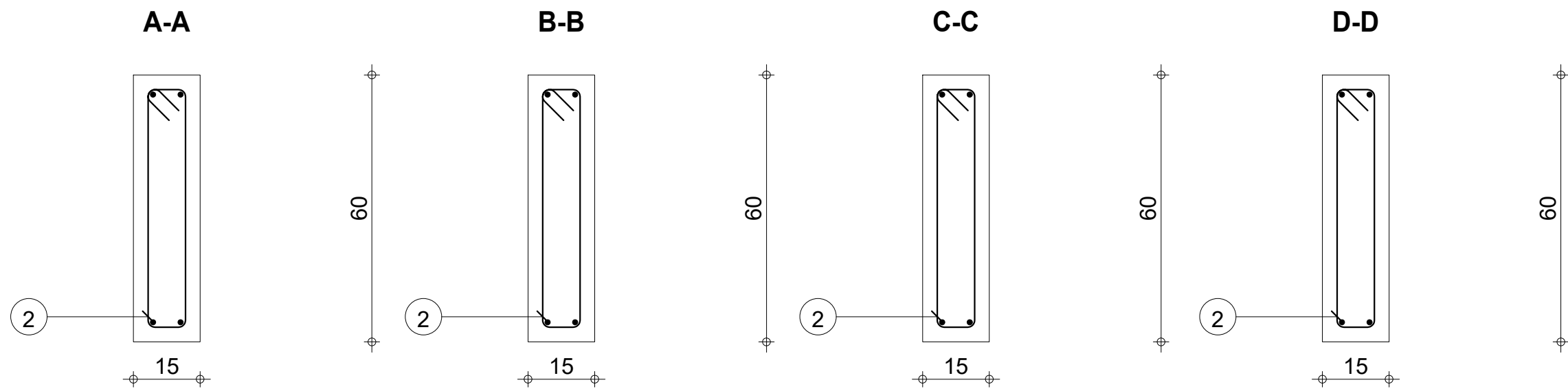
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                                                    |                               |  |                              |  |                         |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|----------------------------------------------------|-------------------------------|--|------------------------------|--|-------------------------|--|
| Tél.                                                                               |                                                                     | Fax                       |                                                   |                            |                 | Acier HA 400 = 15.6 kg                             |                               |  |                              |  |                         |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.242 m3<br>Acier HA 400 = 2.61 kg |                               |  |                              |  |                         |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 27 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> |                                                    | Surface du coffrage = 3.88 m2 |  | Enrobage inférieur 3 cm      |  | Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                                                    | Densité = 75.21 kg/ m3        |  | Echelle pour la vue 6.45cm/m |  | Page 2/6                |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                                                    | Diamètre moyen = 9.28mm       |  | Enrobage latéral 3 cm        |  |                         |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                                                    |                               |  |                              |  |                         |  |



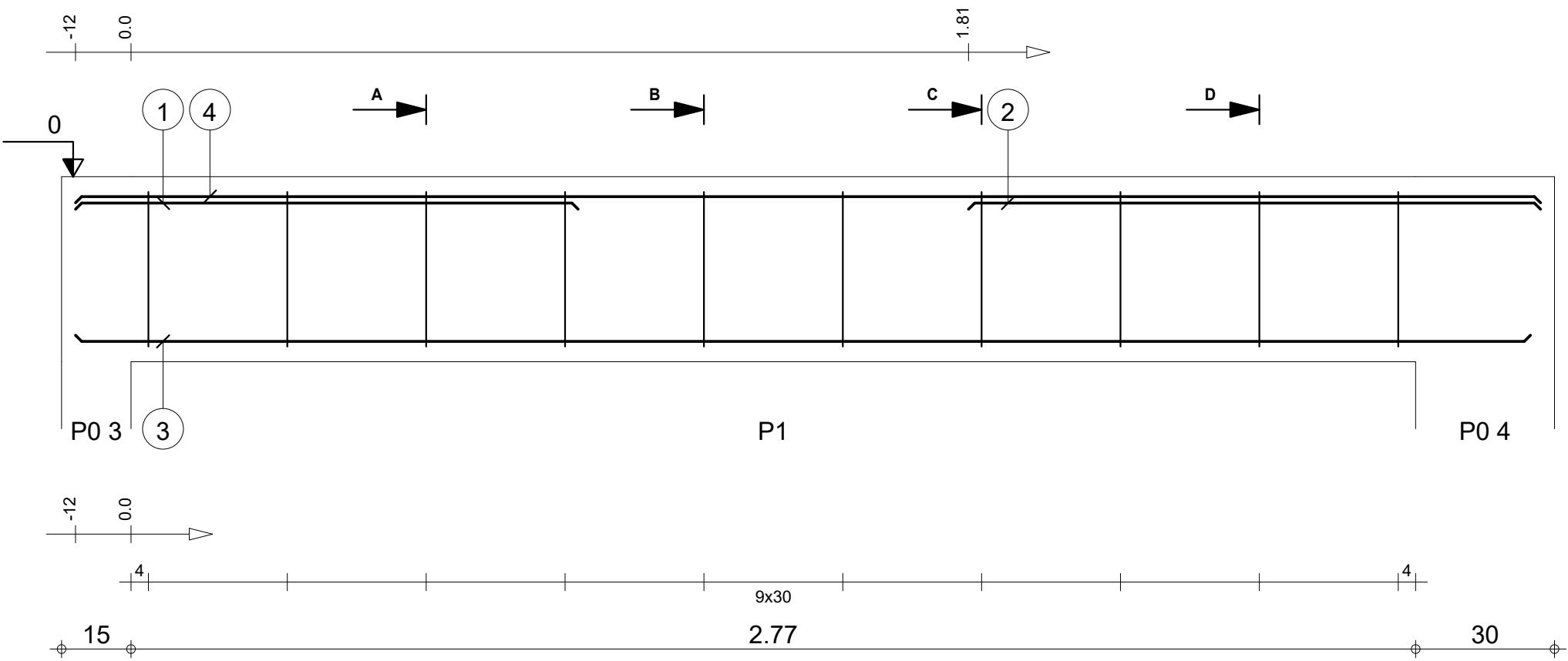
|                                                                                    |                                                       |                                     |                            |                                                   |                                                                             |                       |
|------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|-----------------------|
|                                                                                    |                                                       | Tél.                                | Fax                        |                                                   | Acier HA 400 = 6.87 kg                                                      |                       |
| Tenue au feu 0h                                                                    |                                                       | Fissuration préjudiciable           | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.12 m3                                                     | Acier HA 400 = 1.3 kg |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 1_LONG 22 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 1.96 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                       |
|                                                                                    |                                                       |                                     |                            | Densité = 68.08 kg/ m3<br>Diamètre moyen = 9.41mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m            | Page 3/6              |



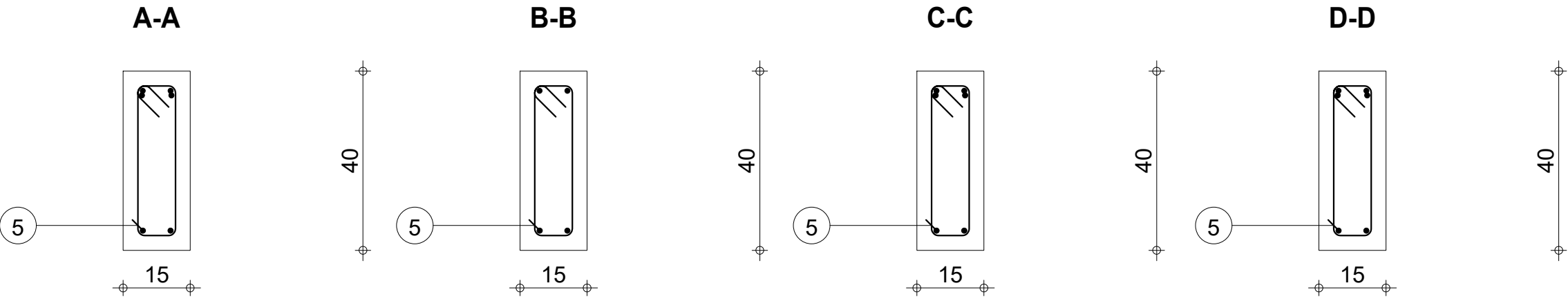
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=2.56 | 00   | 2.37  |
| ②    | 7HA 6    | l=1.38 | 31   | 5.4   |



|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          |                                                   |                        |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|--------------------------|---------------------------------------------------|------------------------|-----------------------------------------------------------------------------|--|
|                                                                                    |                                                                     | Tél.                      |                                                   | Fax                        |                 |                          |                                                   | Acier HA 400 = 9.07 kg |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.218 m3 |                                                   | Acier HA 400 = 2.14 kg |                                                                             |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 20 : P1</b><br><br><b>Section 15x60</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 3.39 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          | Densité = 51.38 kg/ m3<br>Diamètre moyen = 9.09mm |                        | Echelle pour la vue 9.05cm/m<br>Echelle pour la section 8.56cm/m            |  |



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.09 | 00   | 1.09  |
| ②    | 2HA 12   | l=1.24 | 00   | 1.24  |
| ③    | 2HA 12   | l=3.14 | 00   | 3.14  |
| ④    | 2HA 10   | l=3.17 | 00   | 3.17  |
| ⑤    | 10HA 6   | l=98   | 31   |       |



|                                                                                    |              |                           |          |                                                   |                                                                  |          |
|------------------------------------------------------------------------------------|--------------|---------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|----------|
| Tél.                                                                               |              | Fax                       |          | Béton : BETON = 0.194 m3                          | Acier HA 400 = 13.6 kg                                           |          |
| Tenue au feu 0h                                                                    |              | Fissuration préjudiciable |          |                                                   | Acier HA 400 = 2.17 kg                                           |          |
|  | SOUBASSEMENT | 1_LONG 25 : P1            | Nombre 1 | Surface du coffrage = 3.12 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |          |
|                                                                                    |              |                           |          | Densité = 81.44 kg/ m3<br>Diamètre moyen = 9.36mm | Echelle pour la vue 7.95cm/m<br>Echelle pour la section 8.56cm/m | Page 5/6 |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |              | Section 15x40             |          |                                                   |                                                                  |          |

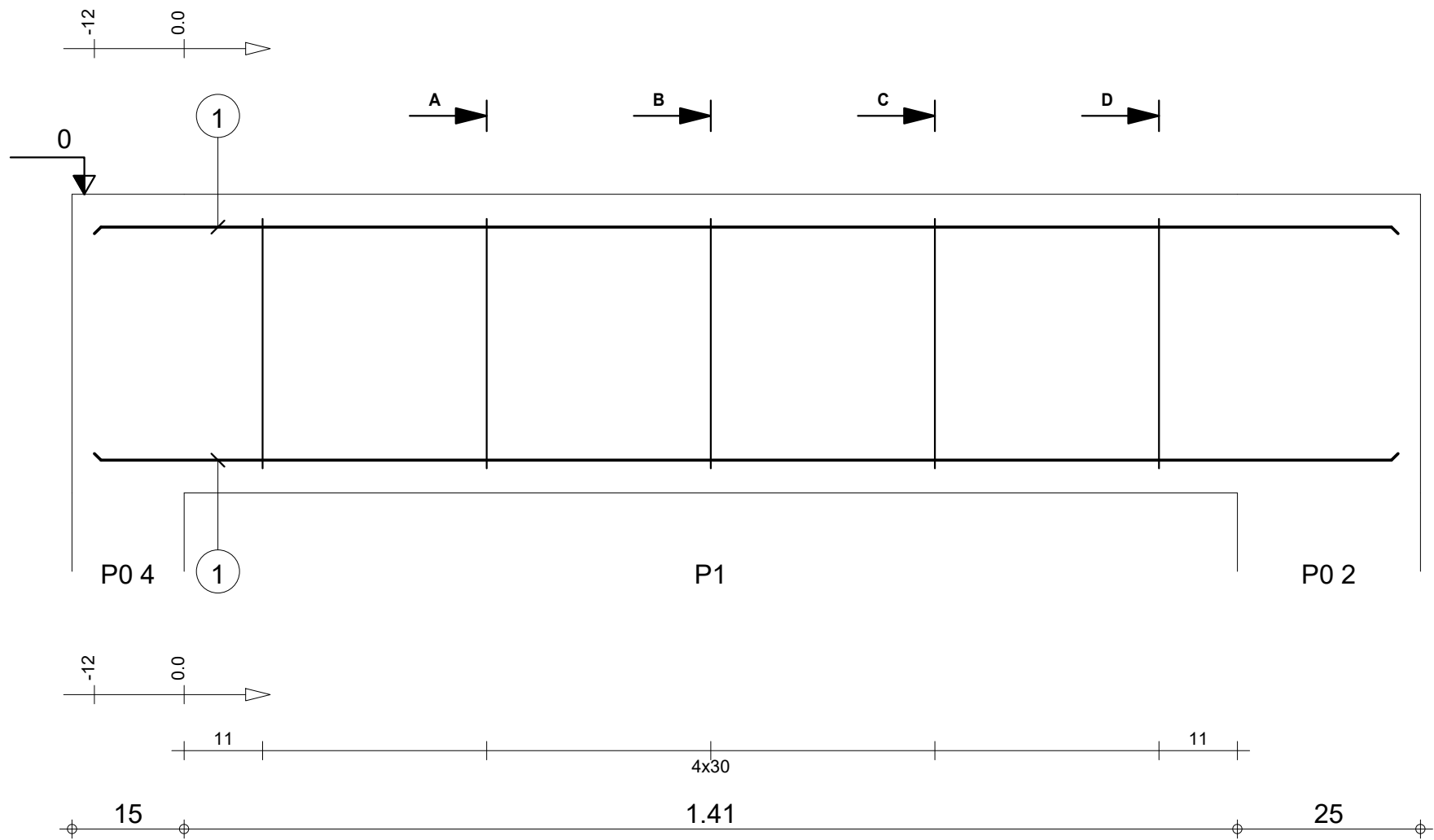


**SOUBASSEMENT**

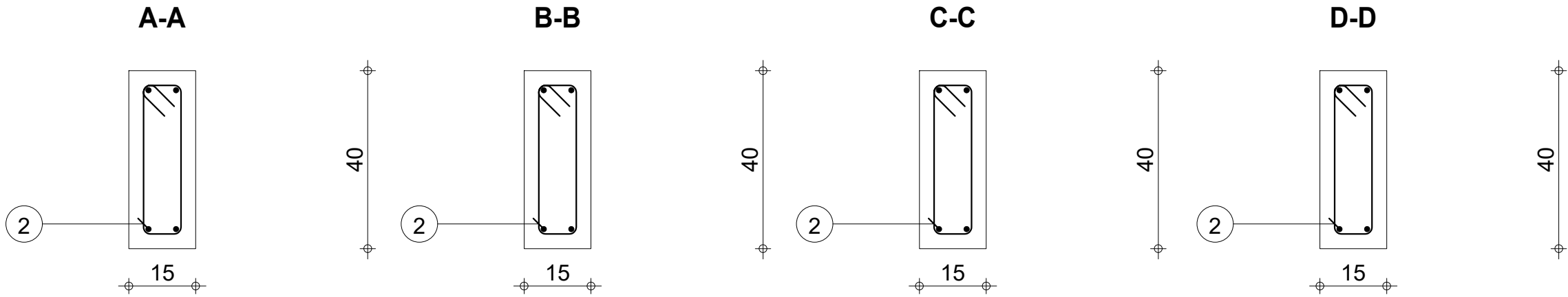
DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 25 : P1**

**Section 15x40**



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.75 | 00   | 1.75  |
| ②    | 5HA 6    | l=98   | 31   |       |



|                                                                                    |                                                       |                                     |                            |                                                   |                                                                             |          |
|------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|----------|
|                                                                                    |                                                       | Tél.                                | Fax                        |                                                   | Acier HA 400 = 6.2 kg                                                       |          |
| Tenue au feu 0h                                                                    |                                                       | Fissuration préjudiciable           | Reprise de bétonnage : Non | Béton : BETON = 0.108 m3                          | Acier HA 400 = 1.09 kg                                                      |          |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 1_LONG 23 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 1.78 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |          |
|                                                                                    |                                                       |                                     |                            | Densité = 67.41 kg/ m3<br>Diamètre moyen = 9.53mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m            | Page 6/6 |



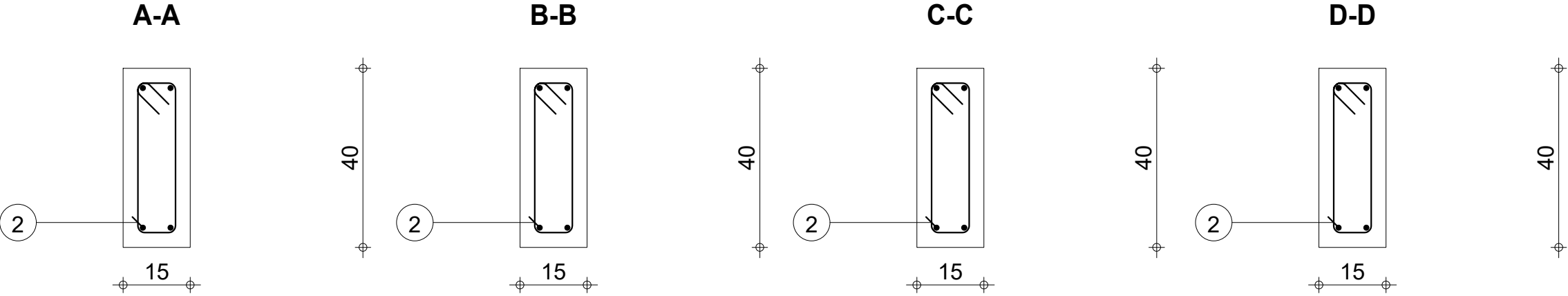
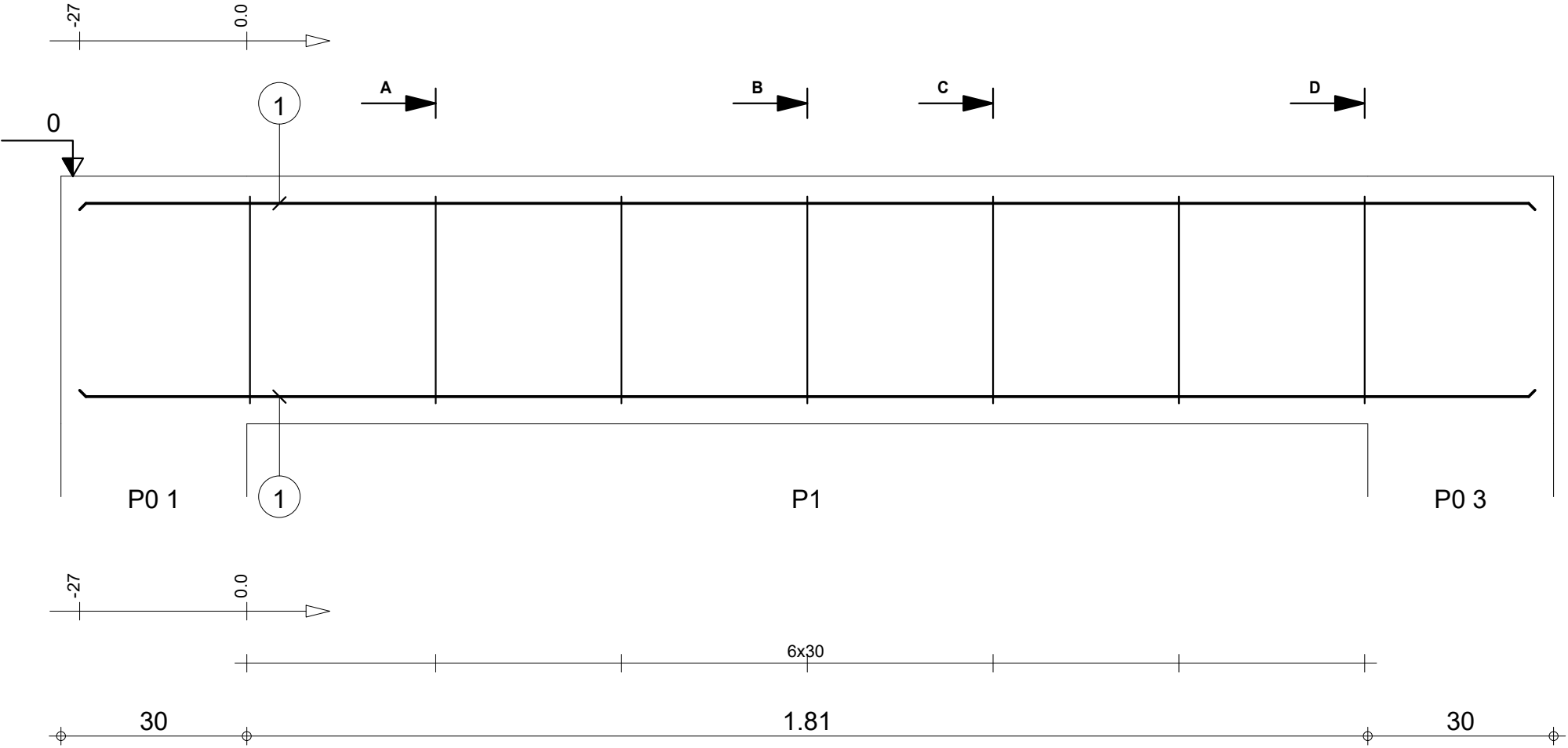
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 23 : P1**

**Section 15x40**

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=2.35 | 00   | 2.35  |
| ②    | 7HA 6    | l=98   | 31   |       |



|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          |                                                   |                        |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|--------------------------|---------------------------------------------------|------------------------|-----------------------------------------------------------------------------|--|
| Tél.                                                                               |                                                                     | Fax                       |                                                   |                            |                 | Acier HA 400 = 8.35 kg   |                                                   |                        |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.145 m3 |                                                   | Acier HA 400 = 1.52 kg |                                                                             |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 21 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 2.32 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          | Densité = 68.07 kg/ m3<br>Diamètre moyen = 9.47mm |                        | Echelle pour la vue 10.4cm/m<br>Echelle pour la section 8.56cm/m            |  |



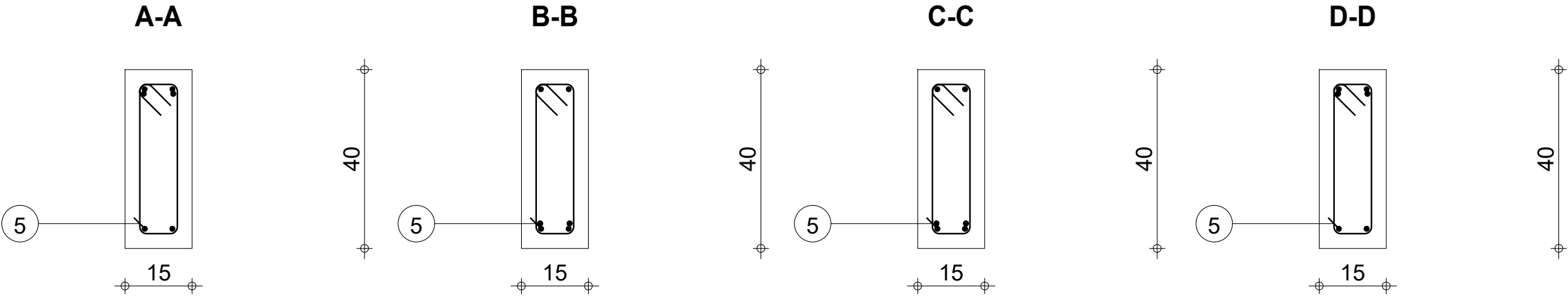
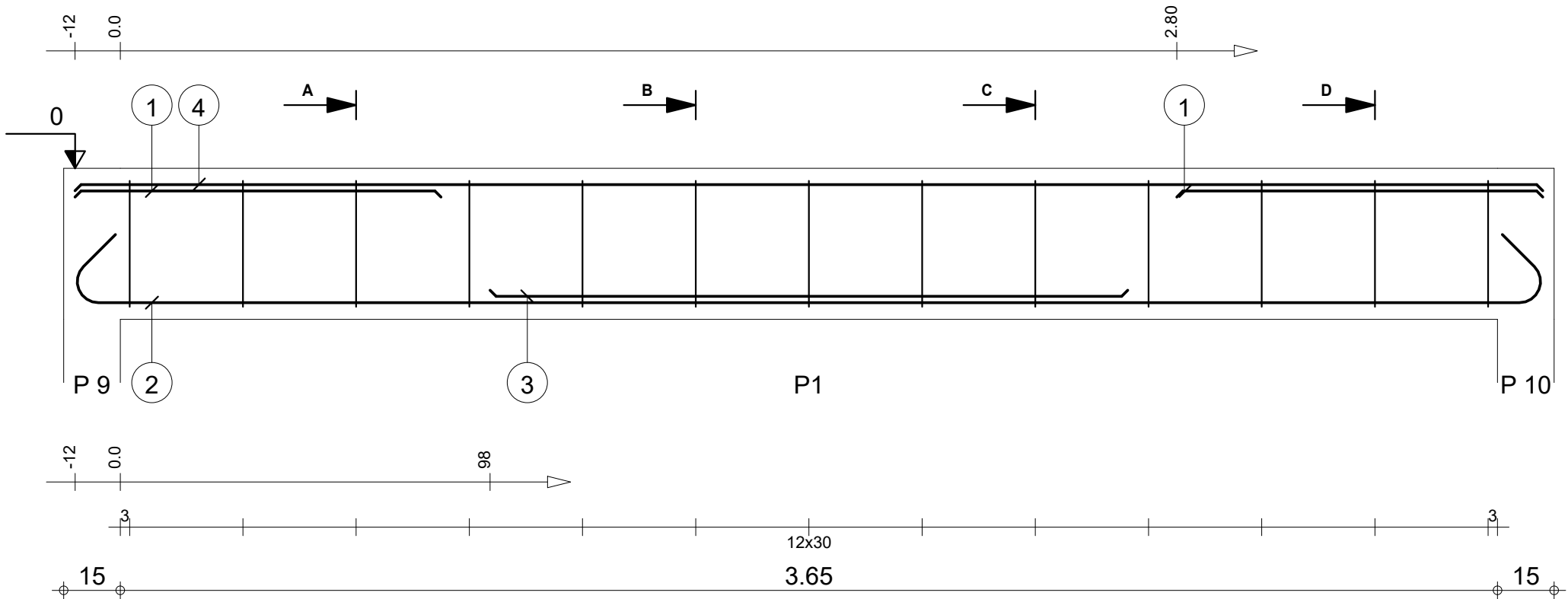
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 21 : P1**

**Section 15x40**

| Pos. | Armature |        | Code | Forme            |
|------|----------|--------|------|------------------|
| ①    | 4HA 12   | l=97   | 00   | _____97_____     |
| ②    | 2HA 12   | l=4.27 | 00   | ⤴_____3.89_____⤵ |
| ③    | 2HA 12   | l=1.69 | 00   | _____1.69_____   |
| ④    | 2HA 10   | l=3.89 | 00   | _____3.89_____   |
| ⑤    | 13HA 6   | l=98   | 31   | ⌈9⌋<br>⌋8⌋       |



|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          |                                                   |                        |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|--------------------------|---------------------------------------------------|------------------------|-----------------------------------------------------------------------------|--|
| Tél.                                                                               |                                                                     | Fax                       |                                                   |                            |                 | Acier HA 400 = 18.8 kg   |                                                   |                        |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.237 m3 |                                                   | Acier HA 400 = 2.82 kg |                                                                             |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 12 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 3.83 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          | Densité = 91.14 kg/ m3<br>Diamètre moyen = 9.47mm |                        | Echelle pour la vue 6.56cm/m<br>Echelle pour la section 8.56cm/m            |  |

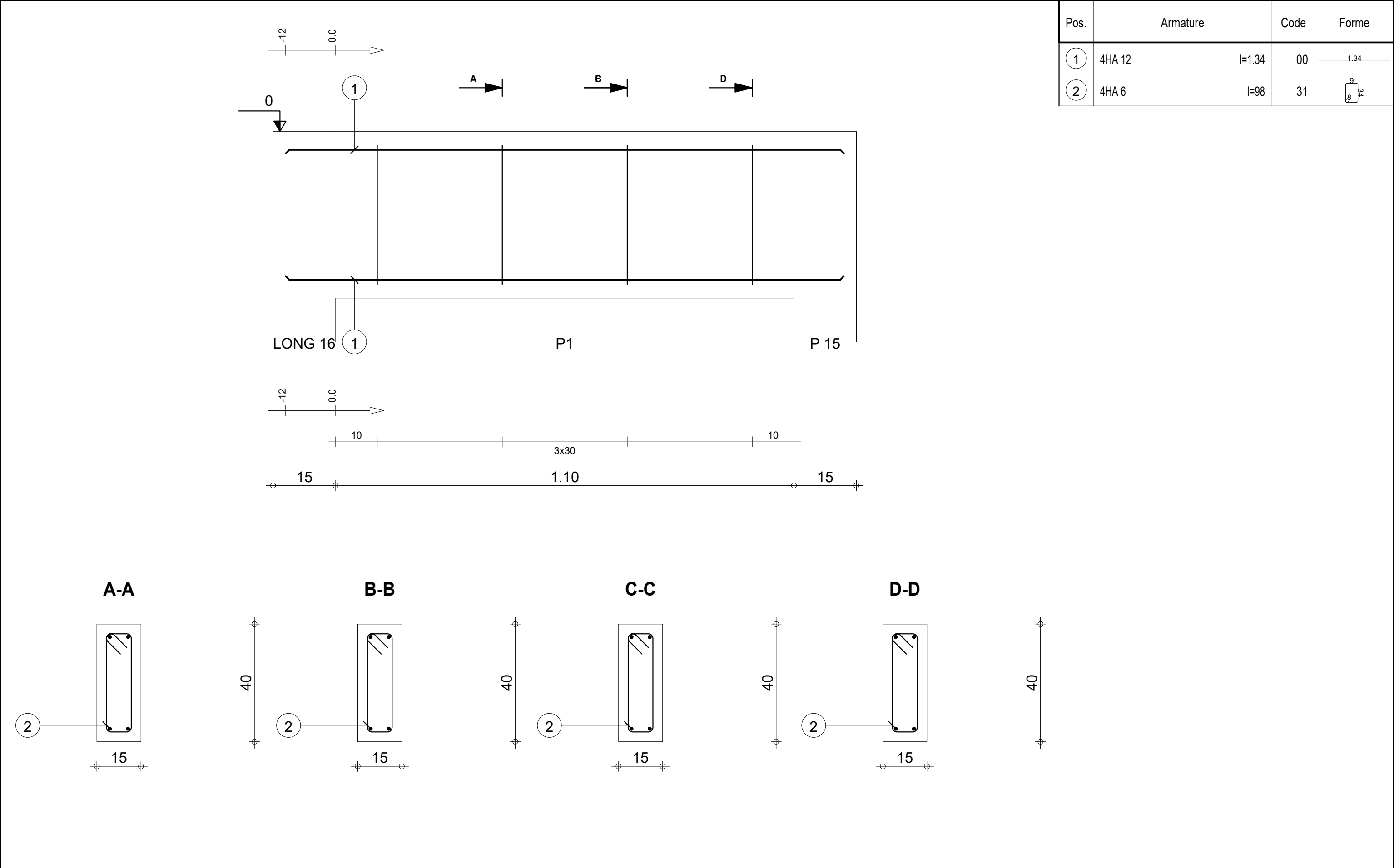


**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 12 : P1**

**Section 15x40**



|                                                                                    |                                                       |                                    |          |                                                   |                                                                  |           |
|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|-----------|
| Tél.                                                                               |                                                       | Fax                                |          | Béton : BETON = 0.084 m3                          | Acier HA 400 = 4.76 kg                                           |           |
| Tenue au feu 0h                                                                    |                                                       | Reprise de bétonnage : Non         |          |                                                   | Acier HA 400 = 0.868 kg                                          |           |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 1_LONG 8 : P1<br><br>Section 15x40 | Nombre 1 | Surface du coffrage = 1.41 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |           |
|                                                                                    |                                                       |                                    |          | Densité = 67.02 kg/ m3<br>Diamètre moyen = 9.47mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m | Page 3/21 |



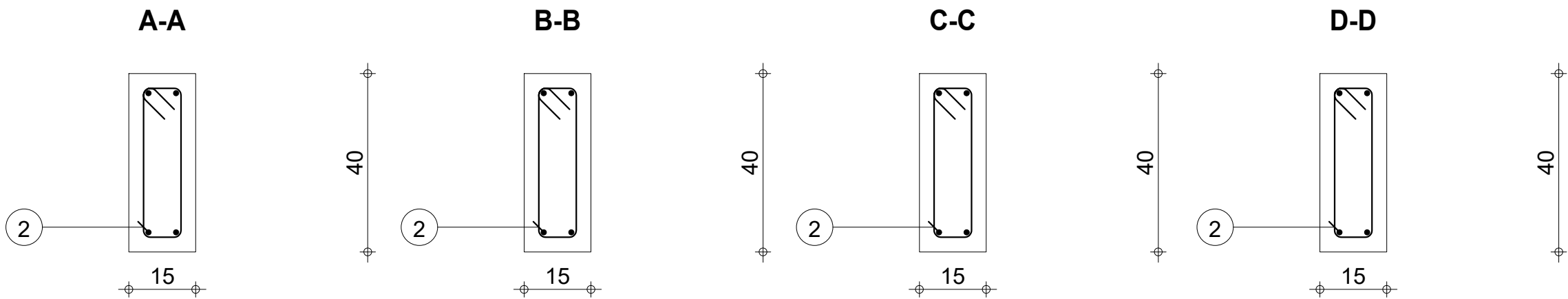
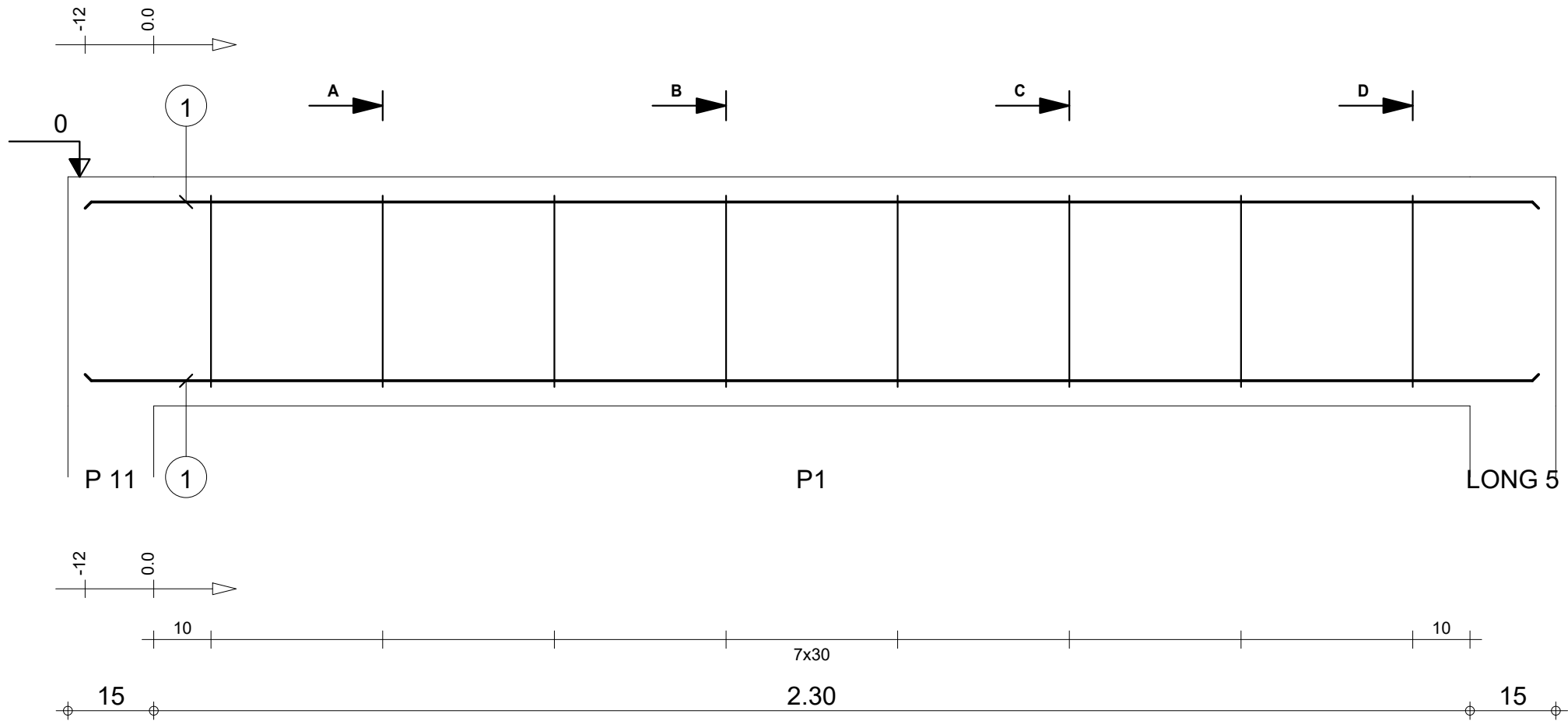
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

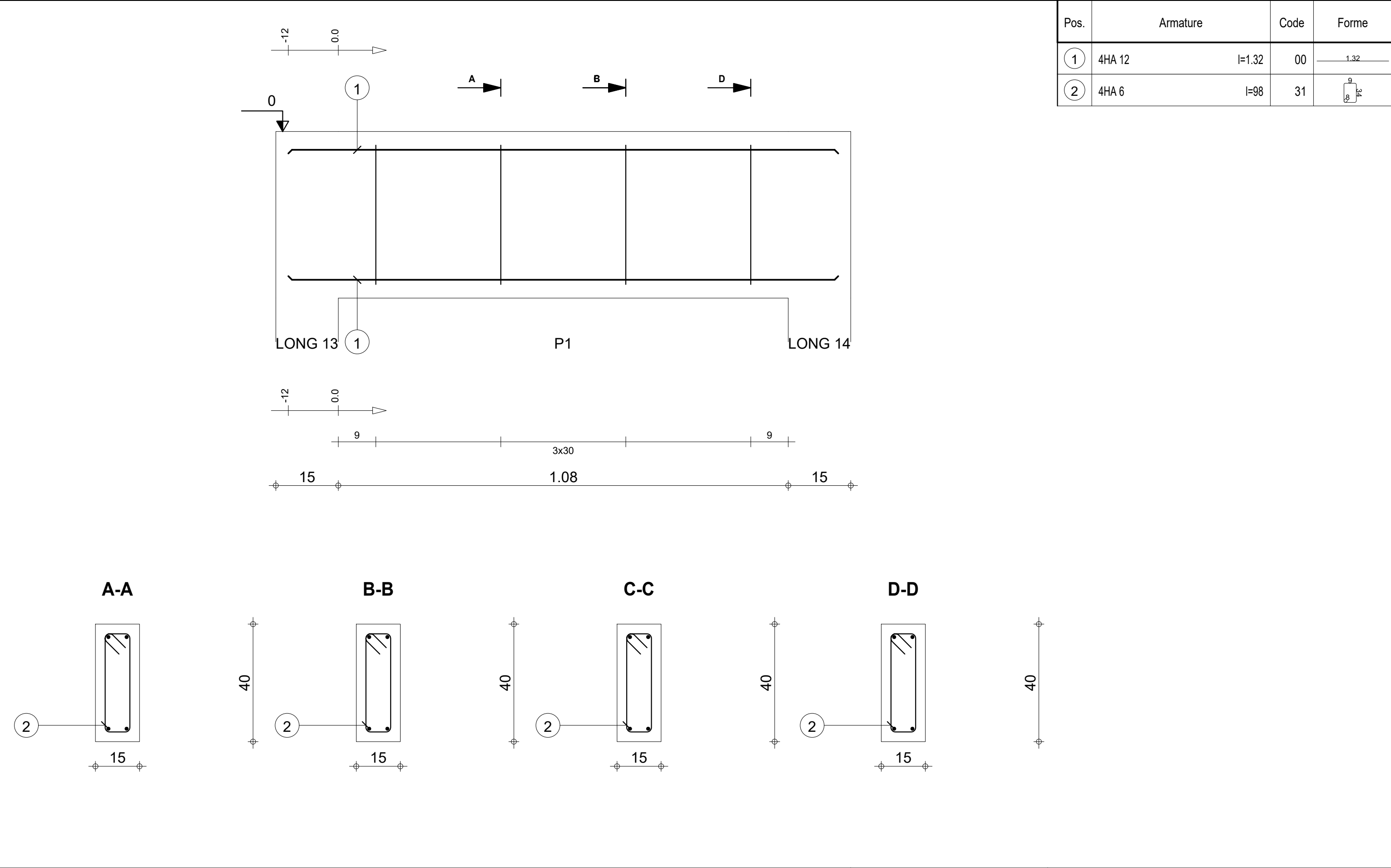
**1\_LONG 8 : P1**

**Section 15x40**

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=2.54 | 00   | 2.54  |
| ②    | 8HA 6    | l=98   | 31   |       |



|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          |                                                   |                        |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|--------------------------|---------------------------------------------------|------------------------|-----------------------------------------------------------------------------|--|
|                                                                                    |                                                                     | Tél.                      |                                                   | Fax                        |                 |                          |                                                   | Acier HA 400 = 9.02 kg |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.156 m3 |                                                   | Acier HA 400 = 1.74 kg |                                                                             |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 15 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 2.55 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          | Densité = 69.23 kg/ m3<br>Diamètre moyen = 9.39mm |                        | Echelle pour la vue 9.73cm/m<br>Echelle pour la section 8.56cm/m            |  |



|                                                                                    |                                                                     |                           |                                                  |                            |                 |                                                   |  |                                                                  |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|--------------------------------------------------|----------------------------|-----------------|---------------------------------------------------|--|------------------------------------------------------------------|--|
| Tél.                                                                               |                                                                     | Fax                       |                                                  |                            |                 | Acier HA 400 = 4.69 kg                            |  |                                                                  |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                  | Reprise de bétonnage : Non |                 | Béton : BETON = 0.0828 m3                         |  | Acier HA 400 = 0.868 kg                                          |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 4 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> | Surface du coffrage = 1.39 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage supérieur 3 cm               |  |
|                                                                                    |                                                                     |                           |                                                  |                            |                 | Densité = 67.15 kg/ m3<br>Diamètre moyen = 9.45mm |  | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m |  |



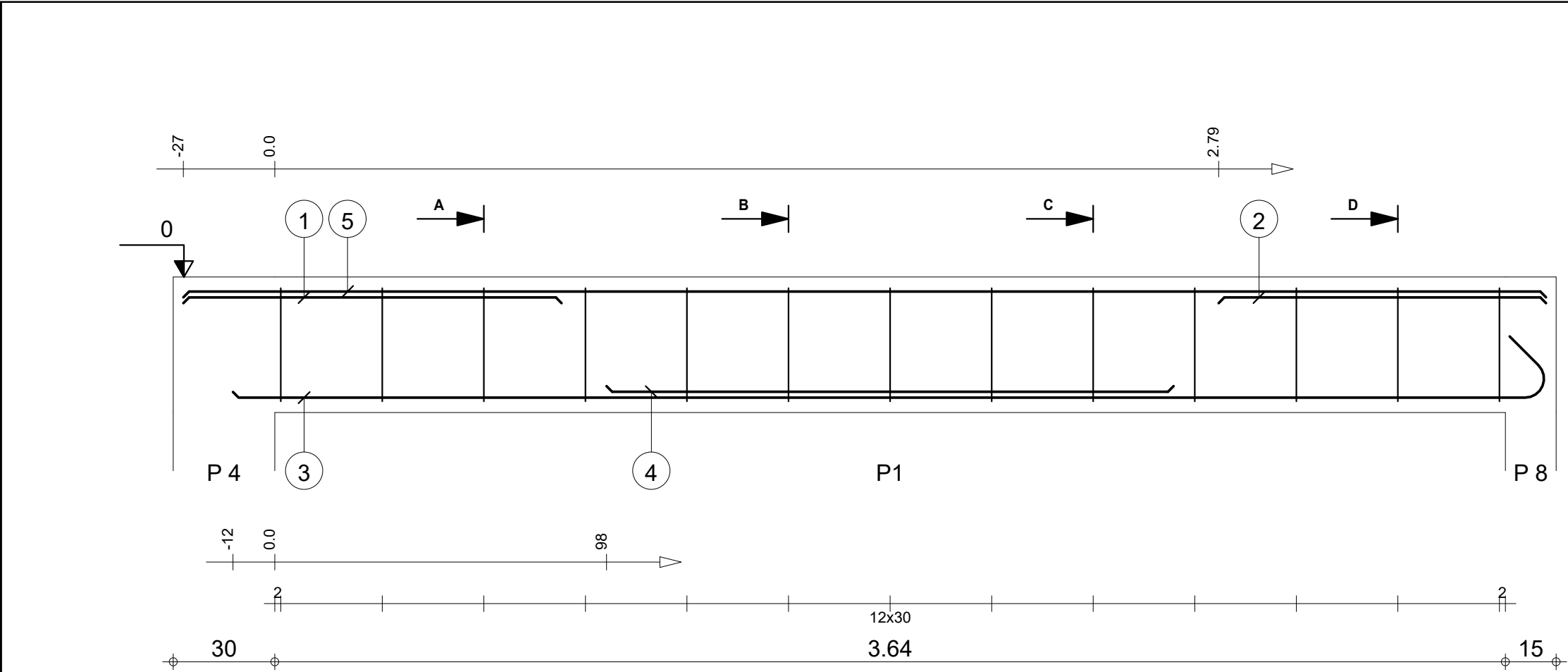
Soubassement

Details de structure duo 2 togbin

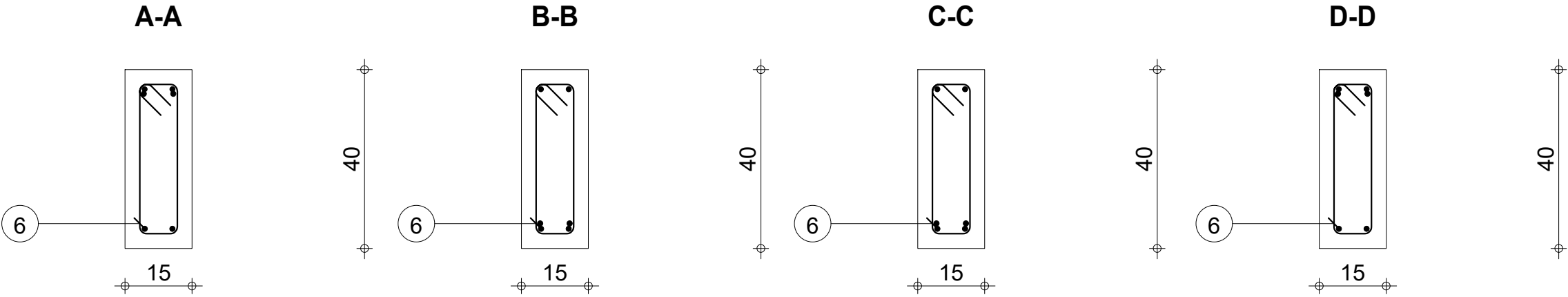
1\_LONG 4 : P1

Section 15x40

Nombre 1



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.12 | 00   | 1.12  |
| ②    | 2HA 12   | l=97   | 00   | 97    |
| ③    | 2HA 12   | l=4.07 | 00   | 3.88  |
| ④    | 2HA 12   | l=1.68 | 00   | 1.68  |
| ⑤    | 2HA 10   | l=4.03 | 00   | 4.03  |
| ⑥    | 13HA 6   | l=98   | 31   |       |



|                                                                                    |              |                           |          |                                                   |                                                                  |           |
|------------------------------------------------------------------------------------|--------------|---------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|-----------|
| Tél.                                                                               |              | Fax                       |          | Béton : BETON = 0.245 m3                          | Acier HA 400 = 18.9 kg                                           |           |
| Tenue au feu 0h                                                                    |              | Fissuration préjudiciable |          |                                                   | Acier HA 400 = 2.82 kg                                           |           |
|  | SOUBASSEMENT | 1_LONG 6 : P1             | Nombre 1 | Surface du coffrage = 3.93 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |           |
|                                                                                    |              |                           |          | Densité = 88.57 kg/ m3<br>Diamètre moyen = 9.46mm | Echelle pour la vue 6.36cm/m<br>Echelle pour la section 8.56cm/m | Page 6/21 |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |              | Section 15x40             |          |                                                   |                                                                  |           |

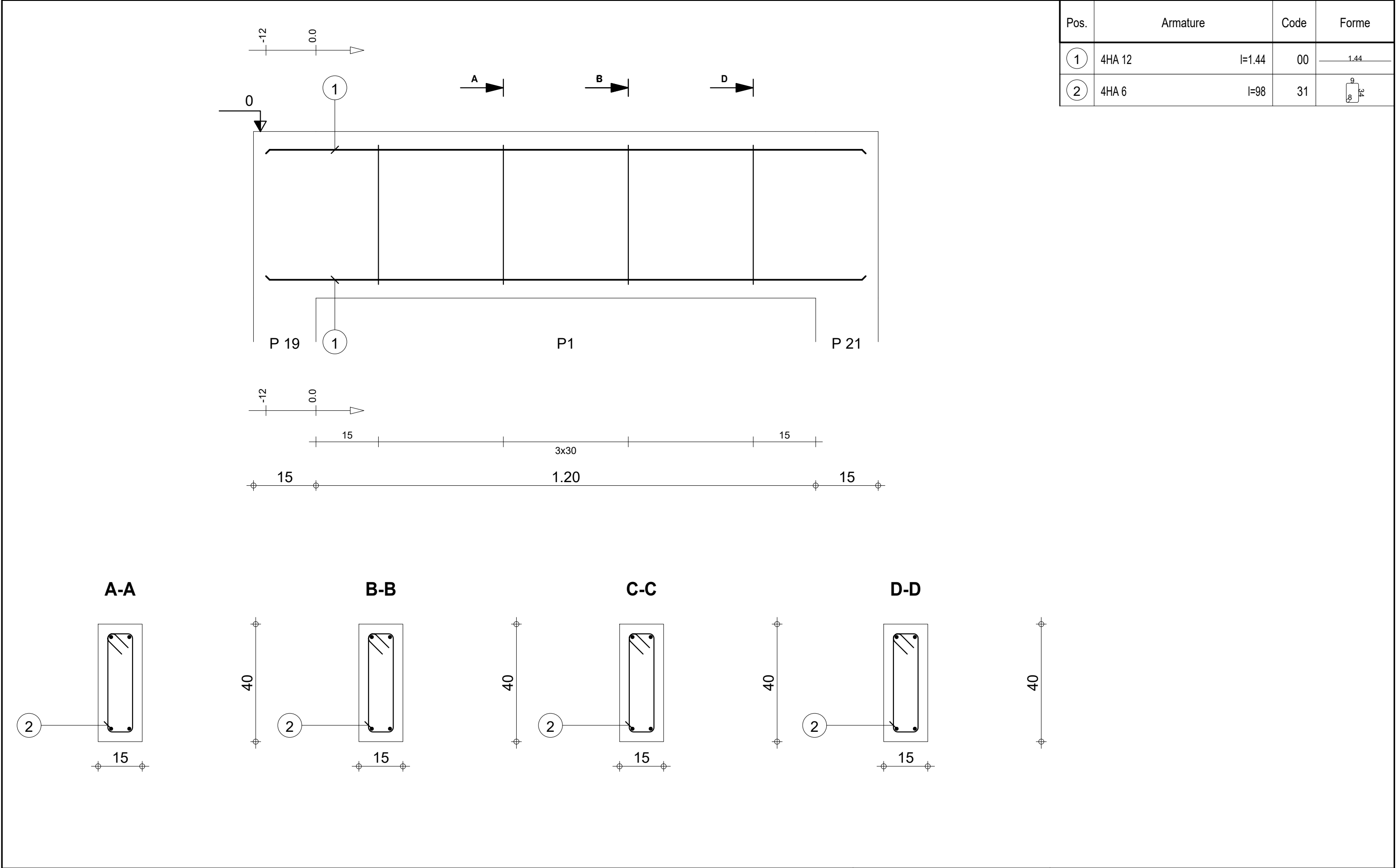


**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 6 : P1**

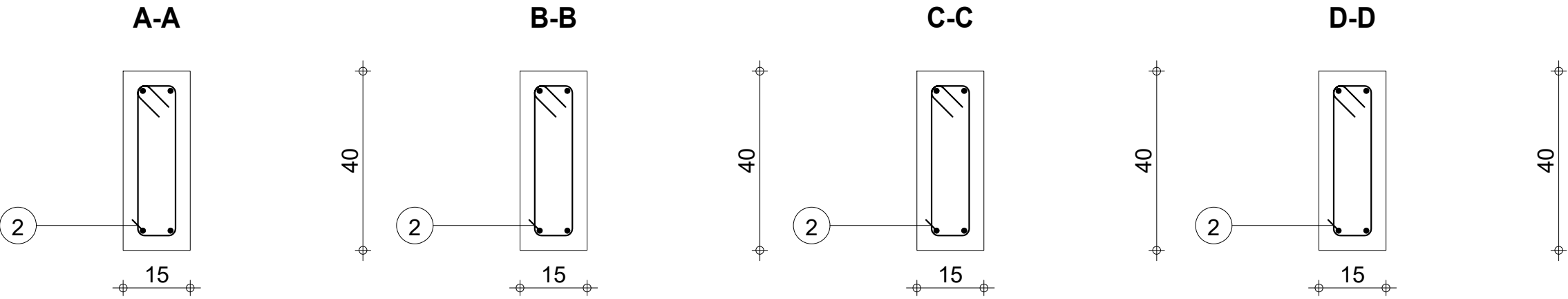
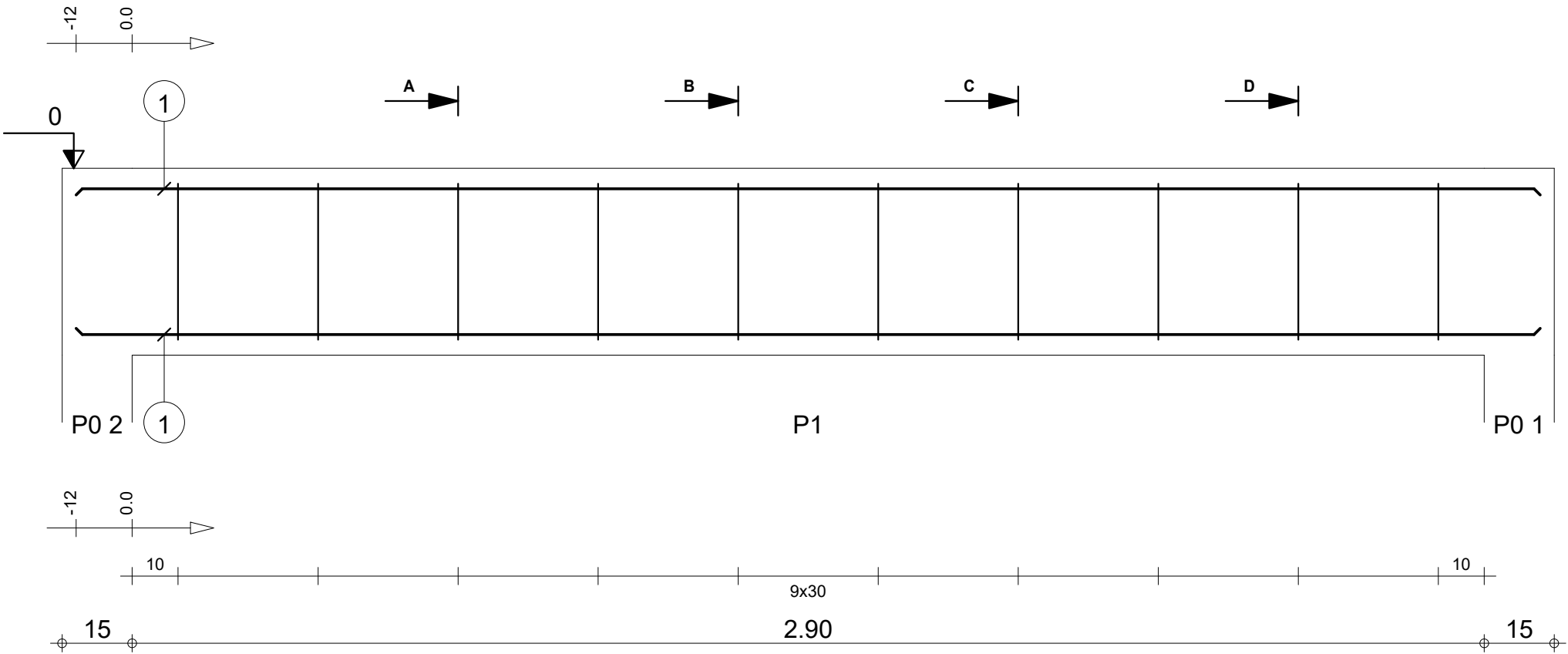
**Section 15x40**



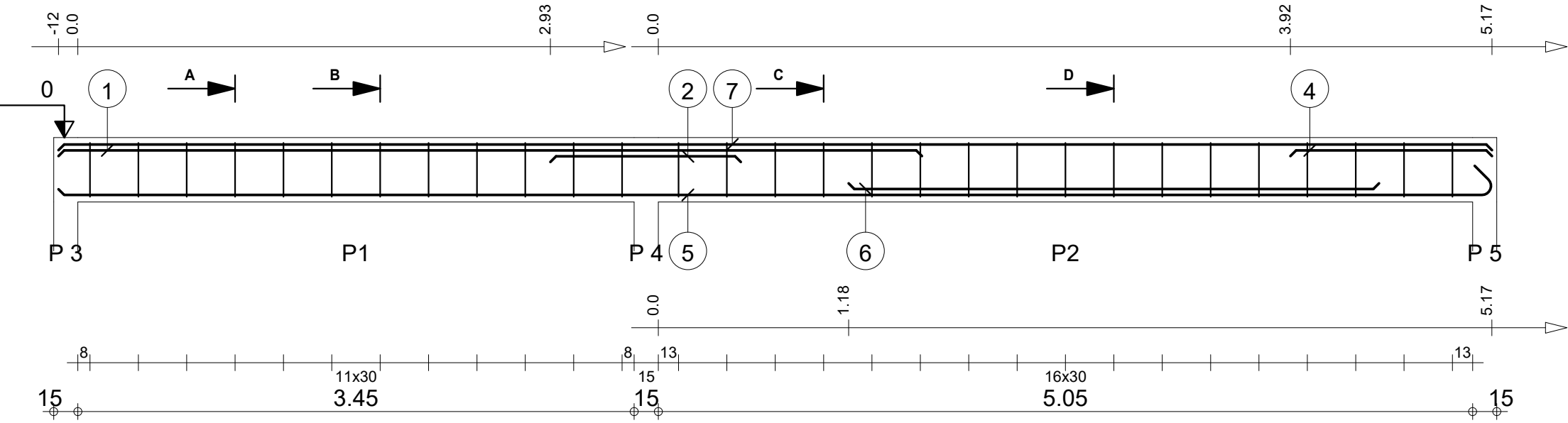
|                                                                                    |                                                       |                                    |                            |                                                   |                                                                             |                         |
|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|-------------------------|
|                                                                                    |                                                       | Tél.                               | Fax                        |                                                   | Acier HA 400 = 5.11 kg                                                      |                         |
| Tenue au feu 0h                                                                    |                                                       | Fissuration préjudiciable          | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.09 m3                                                     | Acier HA 400 = 0.868 kg |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 1_LONG 3 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 1.5 m2                      | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                         |
|                                                                                    |                                                       |                                    |                            | Densité = 66.44 kg/ m3<br>Diamètre moyen = 9.57mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m            | Page 7/21               |



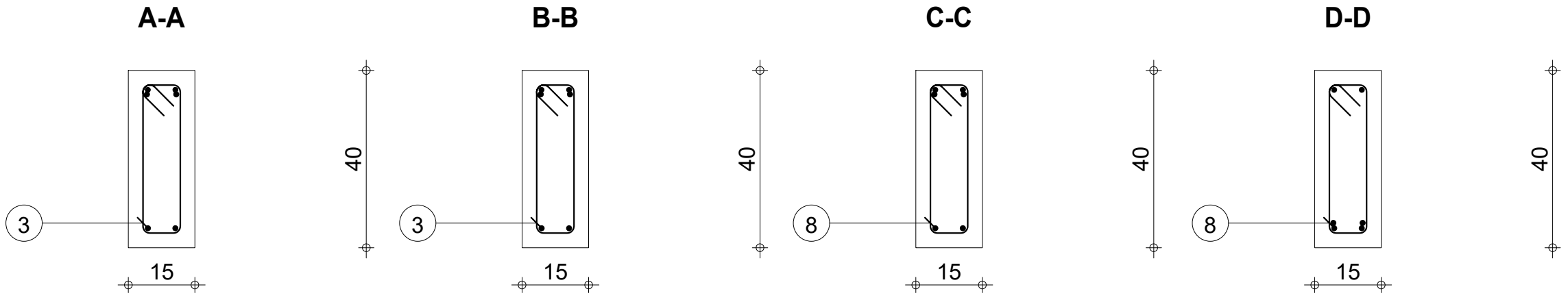
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=3.14 | 00   | 3.14                                                                                |
| ②    | 10HA 6   | l=98   | 31   |  |

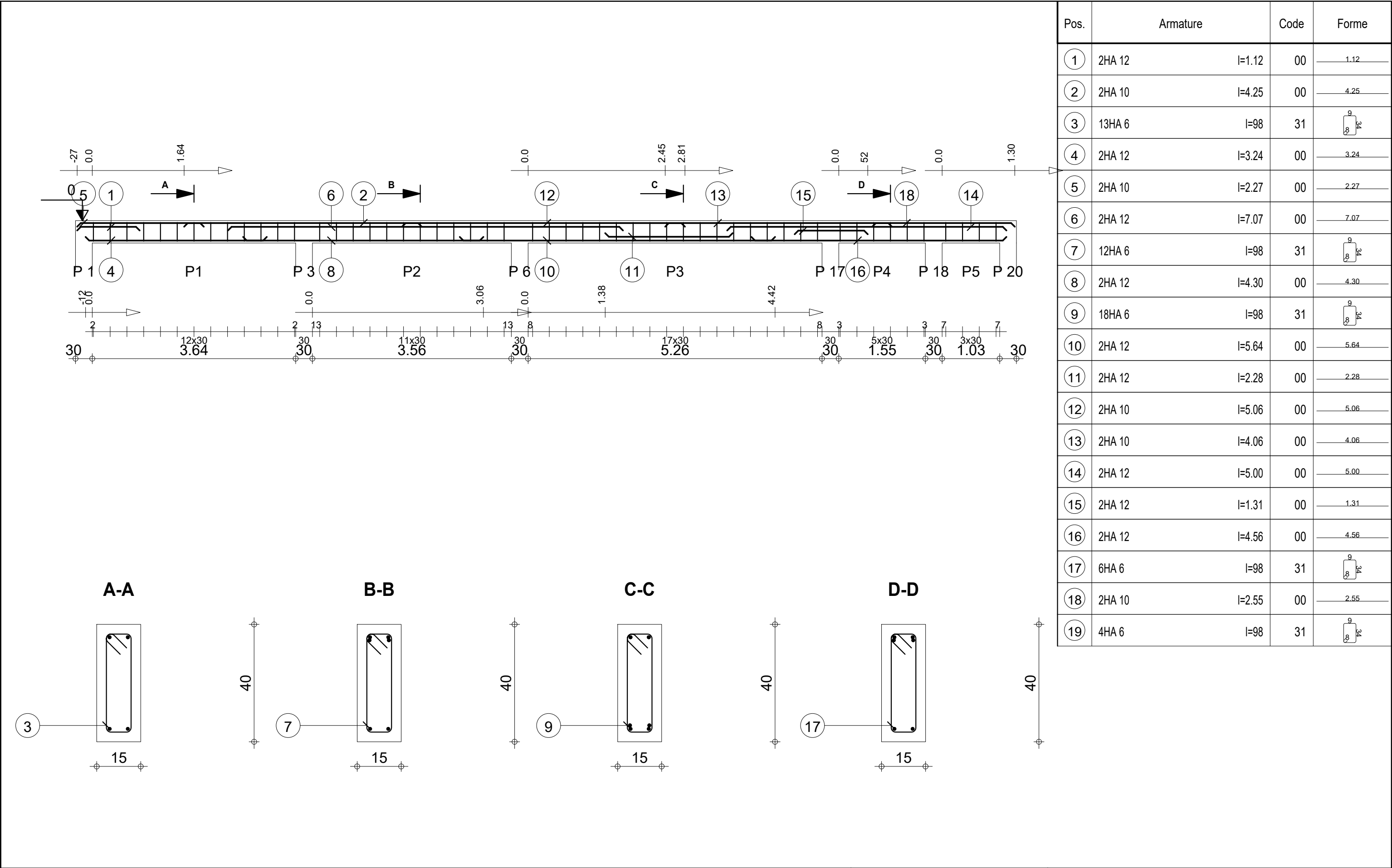


|                                                                                    |                                                       |                           |                                     |          |                                                   |                        |                                                                  |  |  |
|------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------|-------------------------------------|----------|---------------------------------------------------|------------------------|------------------------------------------------------------------|--|--|
| Tél.                                                                               |                                                       | Fax                       |                                     | Nombre 1 | Béton : BETON = 0.192 m3                          | Acier HA 400 = 11.1 kg |                                                                  |  |  |
| Tenue au feu 0h                                                                    |                                                       | Fissuration préjudiciable |                                     |          | Reprise de bétonnage : Non                        |                        | Acier HA 400 = 2.17 kg                                           |  |  |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN |                           | 1_LONG 24 : P1<br><br>Section 15x40 |          | Surface du coffrage = 3.11 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |  |  |
|                                                                                    |                                                       |                           |                                     |          | Densité = 69.27 kg/ m3<br>Diamètre moyen = 9.37mm |                        | Echelle pour la vue 8.01cm/m<br>Echelle pour la section 8.56cm/m |  |  |
|                                                                                    |                                                       |                           |                                     |          |                                                   |                        | Page 8/21                                                        |  |  |

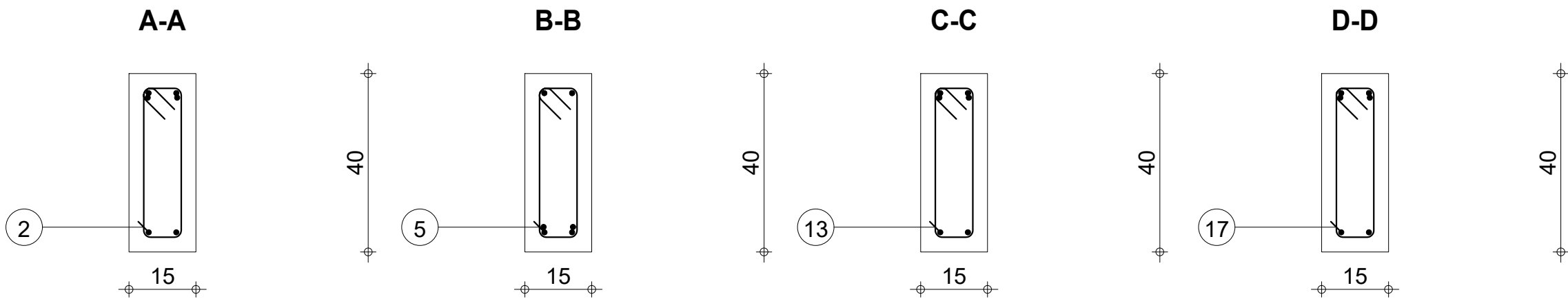
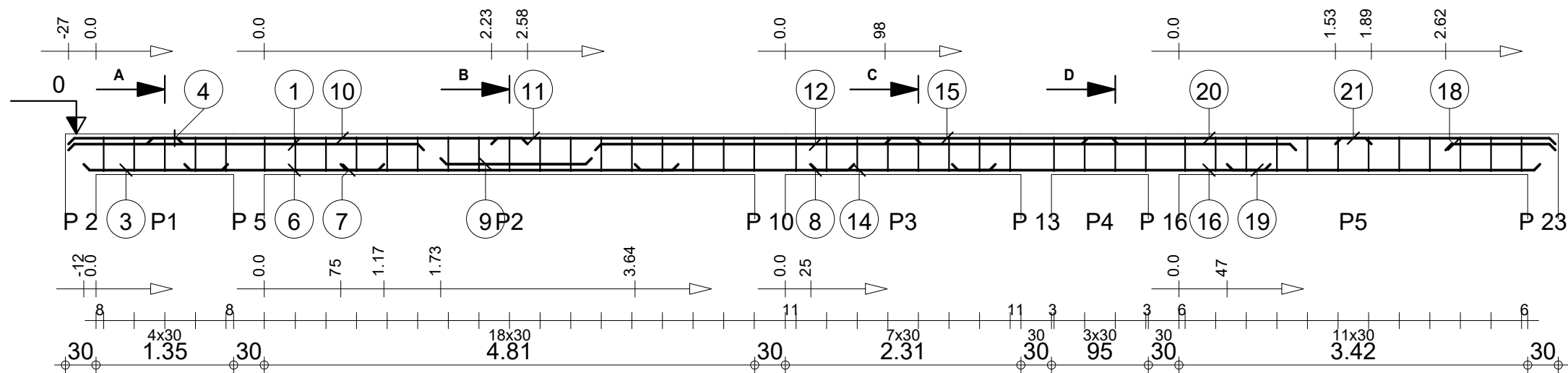


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=5.36 | 00   | 5.36  |
| ②    | 2HA 12   | l=1.18 | 00   | 1.18  |
| ③    | 12HA 6   | l=98   | 31   |       |
| ④    | 2HA 12   | l=1.25 | 00   | 1.25  |
| ⑤    | 2HA 12   | l=9.08 | 00   | 8.89  |
| ⑥    | 2HA 12   | l=3.29 | 00   | 3.29  |
| ⑦    | 2HA 10   | l=8.89 | 00   | 8.89  |
| ⑧    | 17HA 6   | l=98   | 31   |       |

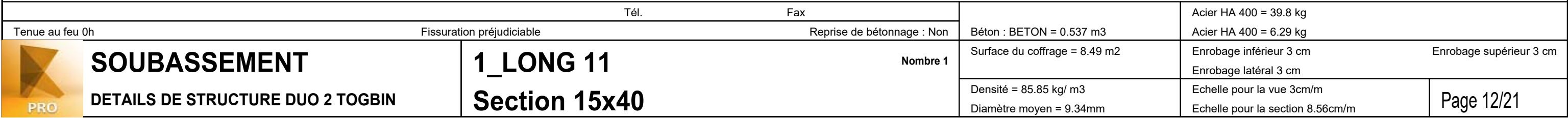
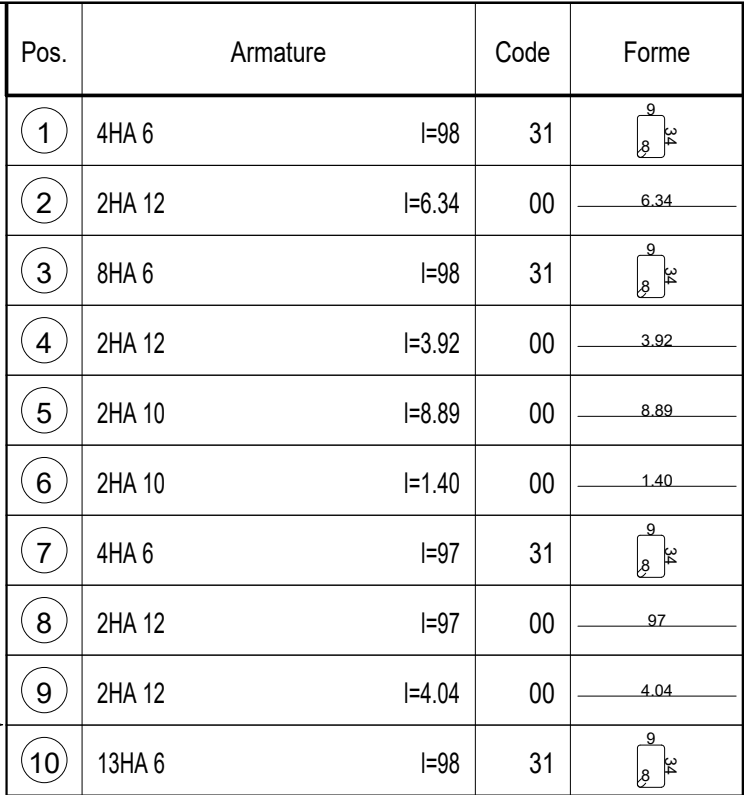


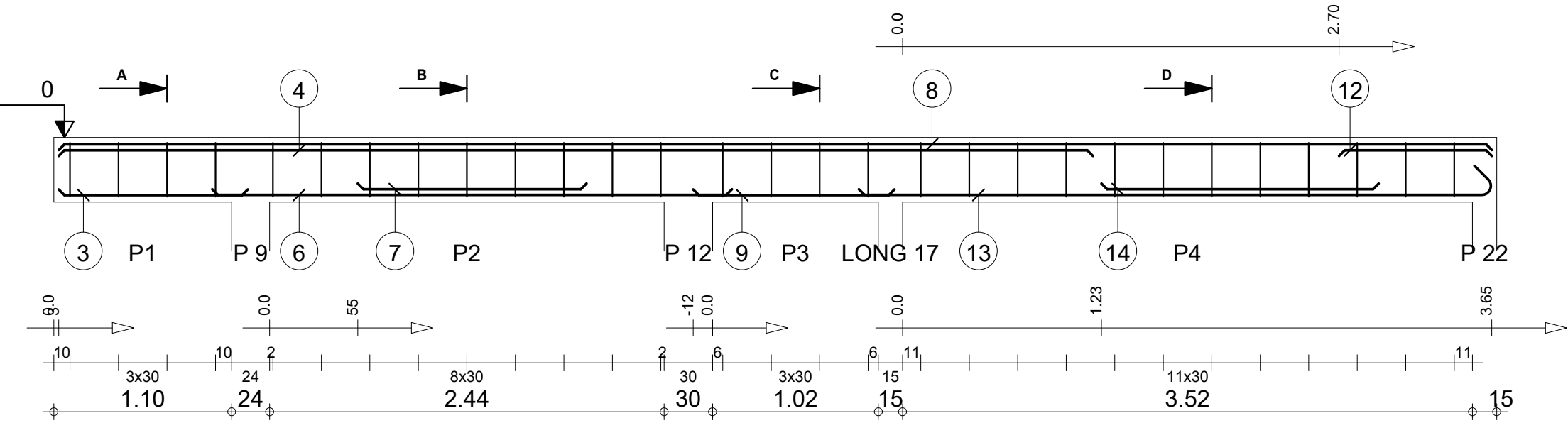


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.12 | 00   | 1.12  |
| ②    | 2HA 10   | l=4.25 | 00   | 4.25  |
| ③    | 13HA 6   | l=98   | 31   |       |
| ④    | 2HA 12   | l=3.24 | 00   | 3.24  |
| ⑤    | 2HA 10   | l=2.27 | 00   | 2.27  |
| ⑥    | 2HA 12   | l=7.07 | 00   | 7.07  |
| ⑦    | 12HA 6   | l=98   | 31   |       |
| ⑧    | 2HA 12   | l=4.30 | 00   | 4.30  |
| ⑨    | 18HA 6   | l=98   | 31   |       |
| ⑩    | 2HA 12   | l=5.64 | 00   | 5.64  |
| ⑪    | 2HA 12   | l=2.28 | 00   | 2.28  |
| ⑫    | 2HA 10   | l=5.06 | 00   | 5.06  |
| ⑬    | 2HA 10   | l=4.06 | 00   | 4.06  |
| ⑭    | 2HA 12   | l=5.00 | 00   | 5.00  |
| ⑮    | 2HA 12   | l=1.31 | 00   | 1.31  |
| ⑯    | 2HA 12   | l=4.56 | 00   | 4.56  |
| ⑰    | 6HA 6    | l=98   | 31   |       |
| ⑱    | 2HA 10   | l=2.55 | 00   | 2.55  |
| ⑲    | 4HA 6    | l=98   | 31   |       |

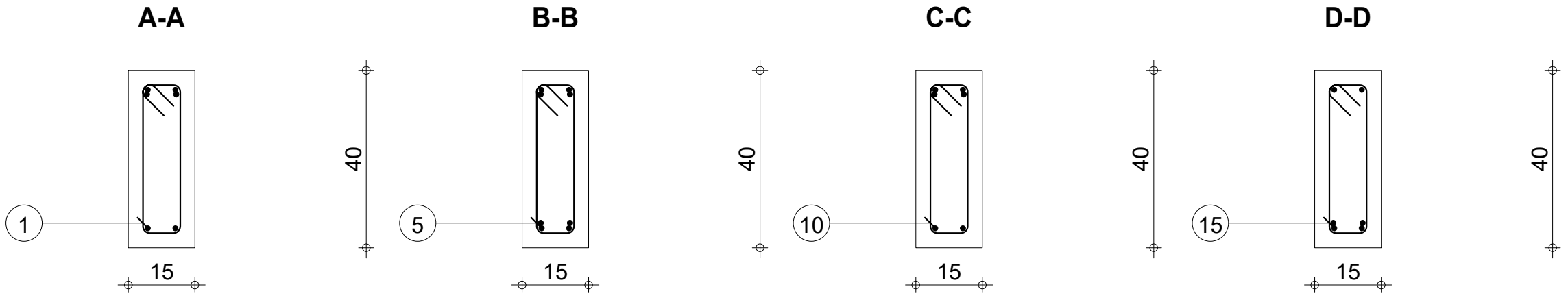


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=3.48 | 00   | 3.48  |
| ②    | 5HA 6    | l=98   | 31   |       |
| ③    | 2HA 12   | l=1.41 | 00   | 1.41  |
| ④    | 2HA 10   | l=1.12 | 00   | 1.12  |
| ⑤    | 17HA 6   | l=98   | 31   |       |
| ⑥    | 2HA 12   | l=1.96 | 00   | 1.96  |
| ⑦    | 2HA 12   | l=3.31 | 00   | 3.31  |
| ⑧    | 2HA 12   | l=2.15 | 00   | 2.15  |
| ⑨    | 2HA 12   | l=1.48 | 00   | 1.48  |
| ⑩    | 2HA 10   | l=3.73 | 00   | 3.73  |
| ⑪    | 2HA 10   | l=4.21 | 00   | 4.21  |
| ⑫    | 2HA 12   | l=6.87 | 00   | 6.87  |
| ⑬    | 8HA 6    | l=98   | 31   |       |
| ⑭    | 2HA 12   | l=1.81 | 00   | 1.81  |
| ⑮    | 2HA 10   | l=2.28 | 00   | 2.28  |
| ⑯    | 2HA 12   | l=3.12 | 00   | 3.12  |
| ⑰    | 4HA 6    | l=98   | 31   |       |
| ⑱    | 2HA 12   | l=1.07 | 00   | 1.07  |
| ⑲    | 2HA 12   | l=3.07 | 00   | 3.07  |
| ⑳    | 2HA 10   | l=2.84 | 00   | 2.84  |
| ㉑    | 2HA 10   | l=2.16 | 00   | 2.16  |
| ㉒    | 12HA 6   | l=98   | 31   |       |

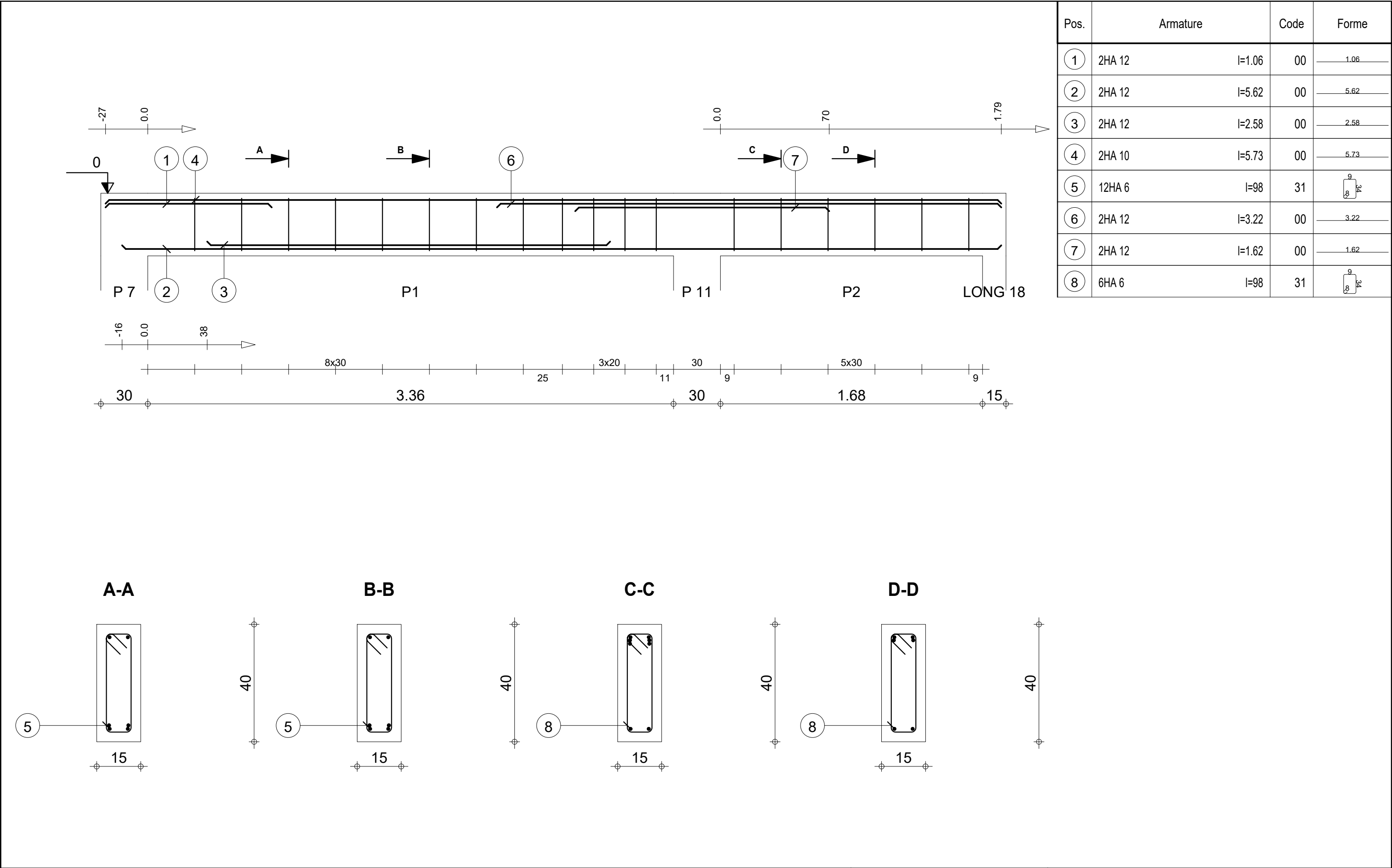




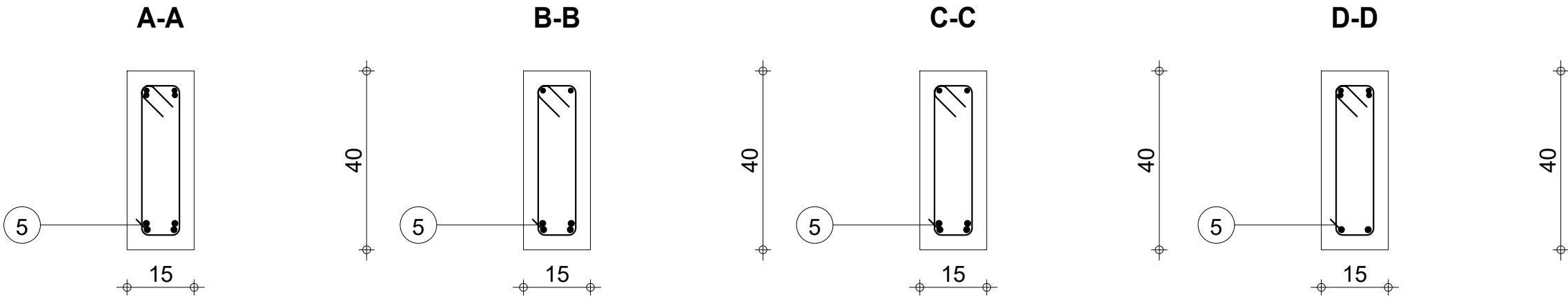
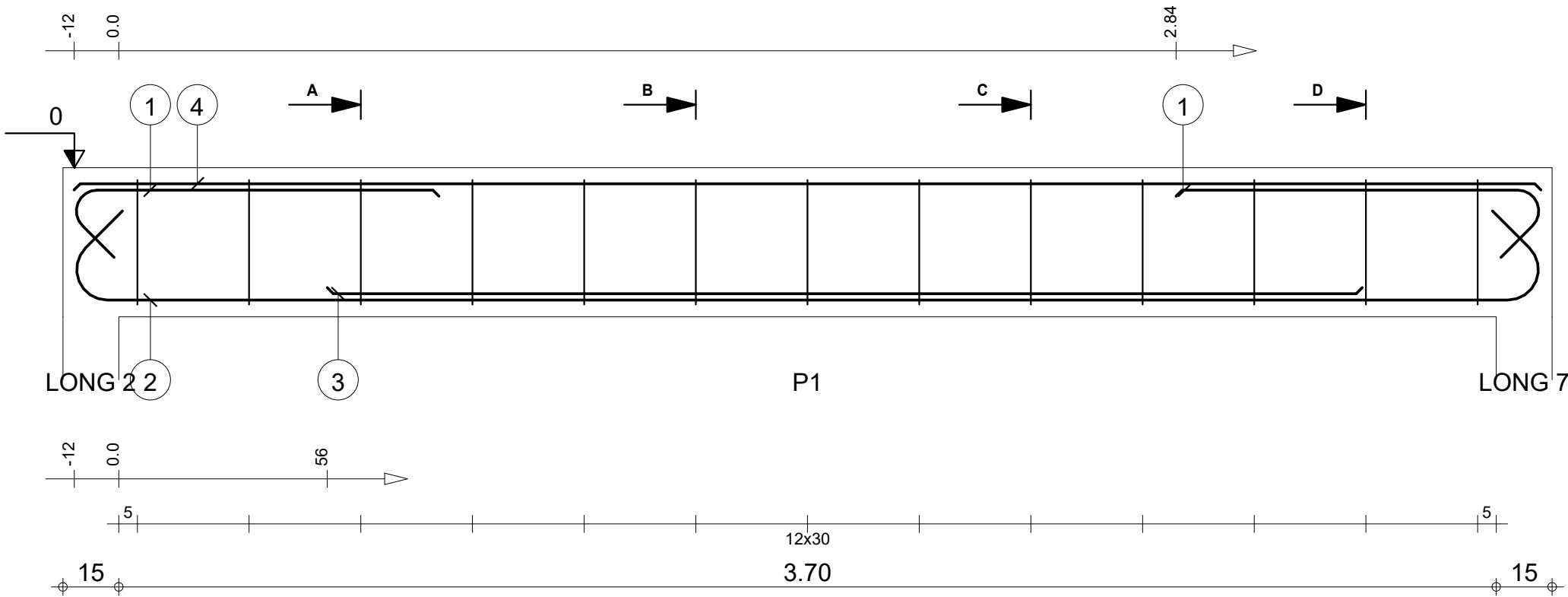
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 6    | l=98*  | 31   |       |
| ③    | 2HA 10   | l=1.17 | 00   |       |
| ④    | 2HA 12   | l=6.40 | 00   |       |
| ⑤    | 9HA 6    | l=98   | 31   |       |
| ⑥    | 2HA 12   | l=3.21 | 00   |       |
| ⑦    | 2HA 12   | l=1.42 | 00   |       |
| ⑧    | 2HA 10   | l=8.87 | 00   |       |
| ⑨    | 2HA 10   | l=1.25 | 00   |       |
| ⑩    | 4HA 6    | l=98*  | 31   |       |
| ⑫    | 2HA 12   | l=95   | 00   |       |
| ⑬    | 2HA 12   | l=4.11 | 00   |       |
| ⑭    | 2HA 12   | l=1.72 | 00   |       |
| ⑮    | 12HA 6   | l=98   | 31   |       |





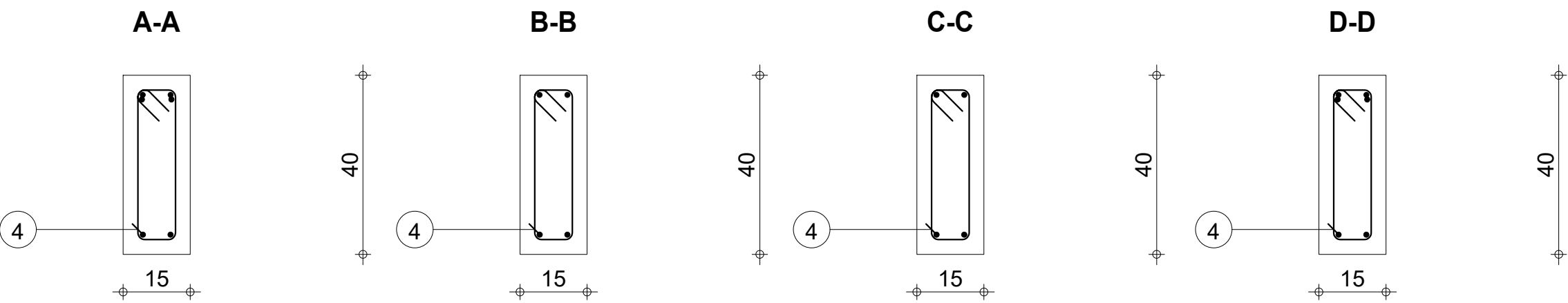
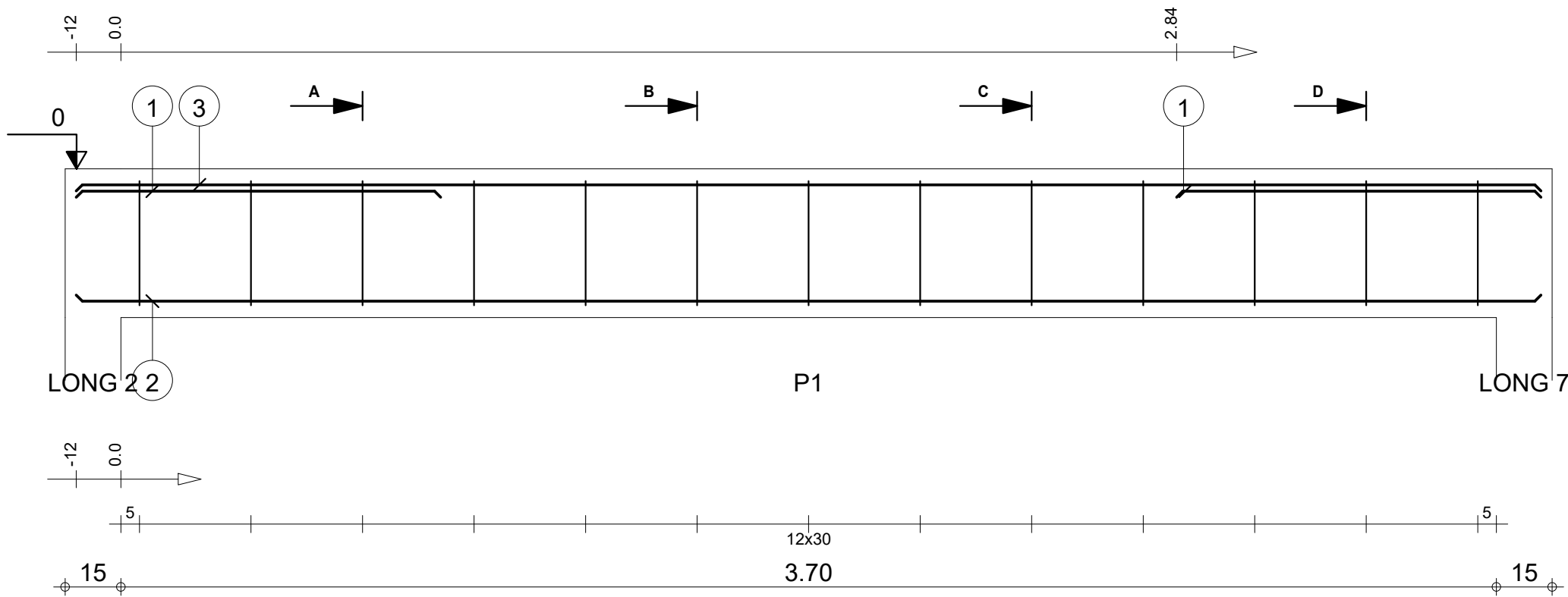


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.17 | 00   |       |
| ②    | 2HA 14   | l=4.43 | 00   |       |
| ③    | 2HA 14   | l=2.78 | 00   |       |
| ④    | 2HA 10   | l=3.94 | 00   |       |
| ⑤    | 13HA 6   | l=98   | 31   |       |



|                                                                                    |                                                                     |  |                                                   |  |  |                            |  |                        |                                                   |  |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|--|---------------------------------------------------|--|--|----------------------------|--|------------------------|---------------------------------------------------|--|-----------------------------------------------------------------------------|--|
| Tél.                                                                               |                                                                     |  | Fax                                               |  |  |                            |  | Acier HA 400 = 26.4 kg |                                                   |  |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     |  | Fissuration préjudiciable                         |  |  | Reprise de bétonnage : Non |  |                        | Béton : BETON = 0.24 m3                           |  | Acier HA 400 = 2.82 kg                                                      |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |  | <b>1_LONG 14 : P1</b><br><br><b>Section 15x40</b> |  |  | <b>Nombre 1</b>            |  |                        | Surface du coffrage = 3.88 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |  |                                                   |  |  |                            |  |                        | Densité = 122.1 kg/ m3<br>Diamètre moyen = 10.4mm |  | Echelle pour la vue 6.48cm/m<br>Echelle pour la section 8.56cm/m            |  |

| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=98   | 00   | 98                                                                                  |
| ②    | 2HA 12   | l=3.94 | 00   | 3.94                                                                                |
| ③    | 2HA 10   | l=3.94 | 00   | 3.94                                                                                |
| ④    | 13HA 6   | l=98   | 31   |  |



|                                                                                    |              |                           |          |                                                   |                                                                  |            |
|------------------------------------------------------------------------------------|--------------|---------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|------------|
| Tél.                                                                               |              | Fax                       |          | Béton : BETON = 0.24 m3                           | Acier HA 400 = 15.3 kg                                           |            |
| Tenue au feu 0h                                                                    |              | Fissuration préjudiciable |          |                                                   | Acier HA 400 = 2.82 kg                                           |            |
|  | SOUBASSEMENT | 1_LONG 13 : P1            | Nombre 1 | Surface du coffrage = 3.88 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |            |
|                                                                                    |              |                           |          | Densité = 75.83 kg/ m3<br>Diamètre moyen = 9.16mm | Echelle pour la vue 6.48cm/m<br>Echelle pour la section 8.56cm/m | Page 17/21 |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |              | Section 15x40             |          |                                                   |                                                                  |            |

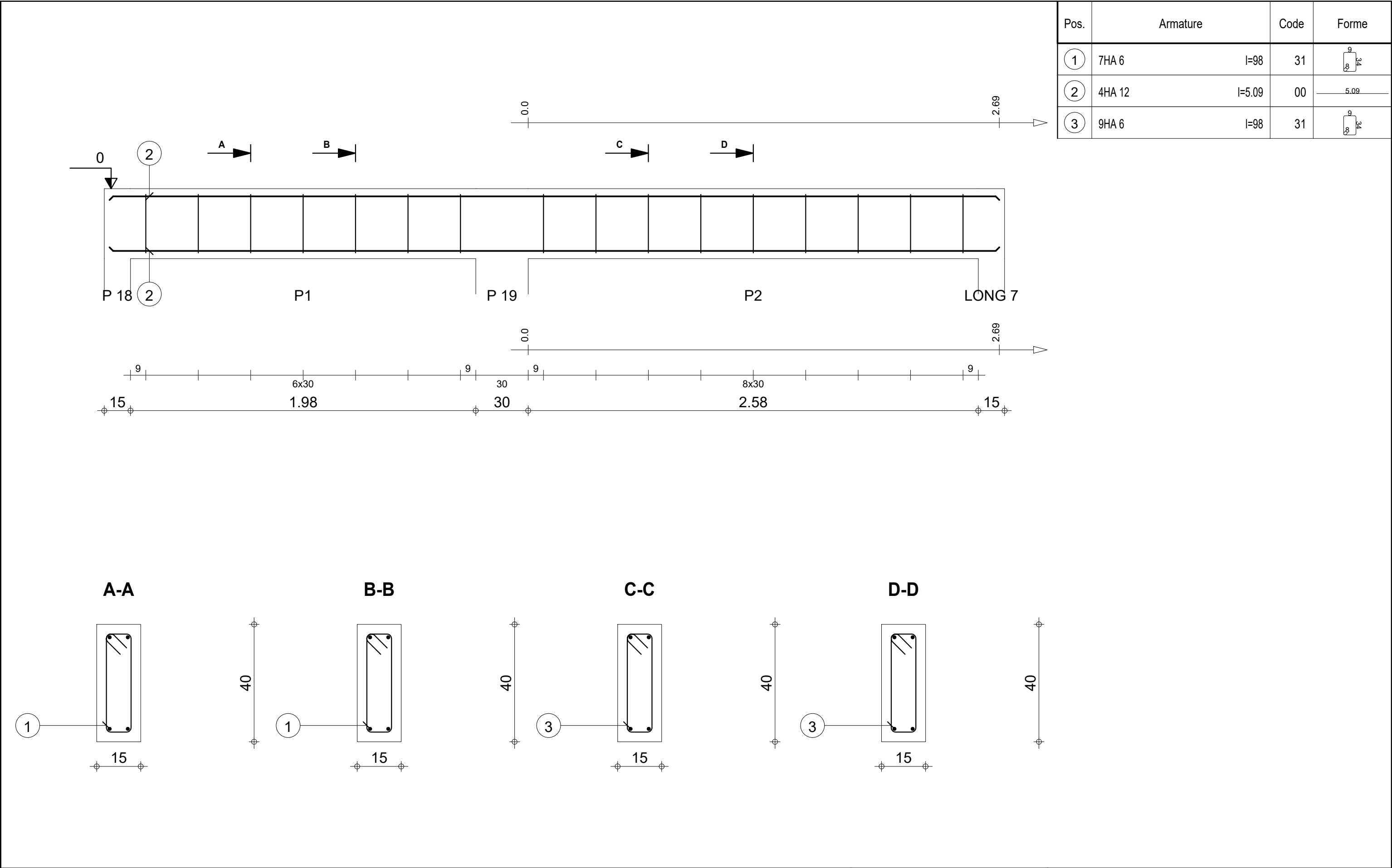


SOUBASSEMENT

DETAILS DE STRUCTURE DUO 2 TOGBIN

1\_LONG 13 : P1

Section 15x40



|                                                                                    |              |                                  |          |                               |                        |                             |                         |
|------------------------------------------------------------------------------------|--------------|----------------------------------|----------|-------------------------------|------------------------|-----------------------------|-------------------------|
|                                                                                    |              | Tél.                             | Fax      |                               | Acier HA 400 = 18.1 kg |                             |                         |
| Tenue au feu 0h                                                                    |              | Fissuration préjudiciable        |          | Reprise de bétonnage : Non    |                        | Acier HA 400 = 3.47 kg      |                         |
|  | SOUBASSEMENT | 1_LONG 19                        | Nombre 1 | Béton : BETON = 0.309 m3      |                        | Enrobage inférieur 3 cm     | Enrobage supérieur 3 cm |
|                                                                                    |              |                                  |          | Surface du coffrage = 4.92 m2 |                        |                             |                         |
|                                                                                    |              |                                  |          | Densité = 69.58 kg/ m3        |                        | Echelle pour la vue 5.1cm/m |                         |
| Diamètre moyen = 9.39mm                                                            |              | Echelle pour la section 8.56cm/m |          |                               |                        |                             |                         |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |              | Section 15x40                    |          |                               |                        |                             |                         |



SOUBASSEMENT

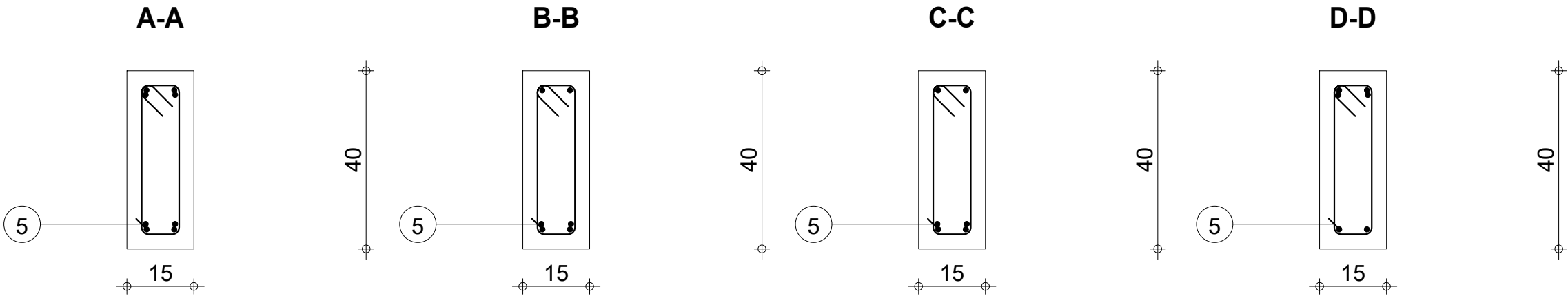
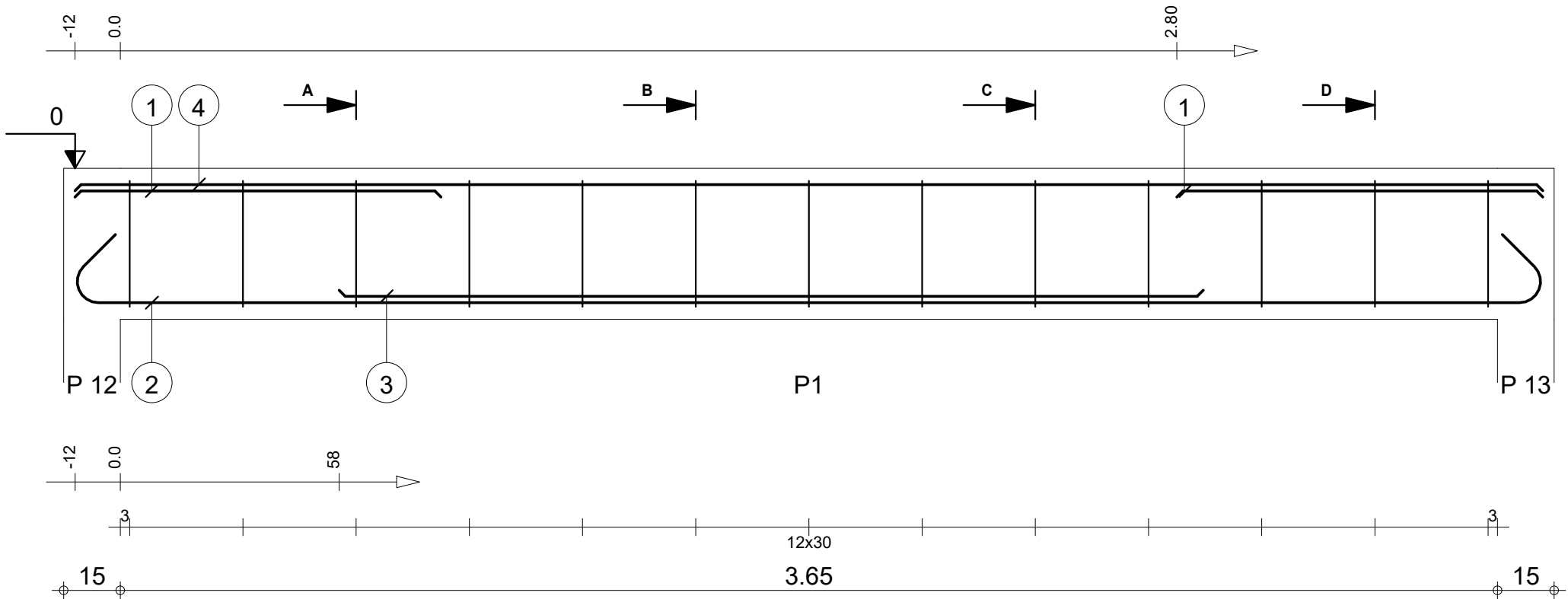
DETAILS DE STRUCTURE DUO 2 TOGBIN

1\_LONG 19

Section 15x40



| Pos. | Armature |        | Code | Forme           |
|------|----------|--------|------|-----------------|
| ①    | 4HA 12   | l=97   | 00   | _____97_____    |
| ②    | 2HA 12   | l=4.27 | 00   | ↗_____↘<br>3.89 |
| ③    | 2HA 12   | l=2.29 | 00   | _____2.29_____  |
| ④    | 2HA 10   | l=3.89 | 00   | _____3.89_____  |
| ⑤    | 13HA 6   | l=98   | 31   | ⌈<br>9<br>8     |



|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          |                                                   |                        |                                                                             |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------|---------------------------------------------------|----------------------------|-----------------|--------------------------|---------------------------------------------------|------------------------|-----------------------------------------------------------------------------|--|
| Tél.                                                                               |                                                                     | Fax                       |                                                   |                            |                 | Acier HA 400 = 19.9 kg   |                                                   |                        |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                                     | Fissuration préjudiciable |                                                   | Reprise de bétonnage : Non |                 | Béton : BETON = 0.237 m3 |                                                   | Acier HA 400 = 2.82 kg |                                                                             |  |
|  | <b>SOUBASSEMENT</b><br><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |                           | <b>1_LONG 16 : P1</b><br><br><b>Section 15x40</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 3.83 m2                     |                        | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                                     |                           |                                                   |                            |                 |                          | Densité = 95.78 kg/ m3<br>Diamètre moyen = 9.55mm |                        | Echelle pour la vue 6.56cm/m<br>Echelle pour la section 8.56cm/m            |  |

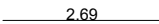
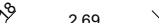


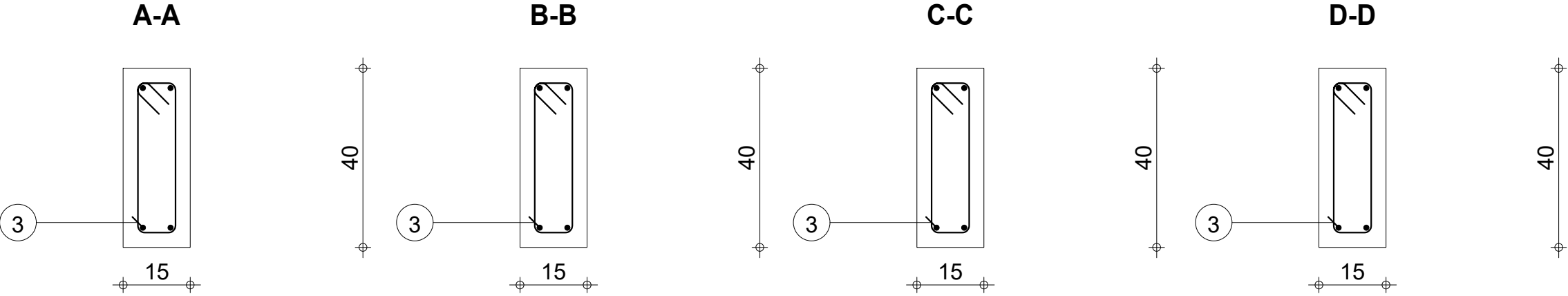
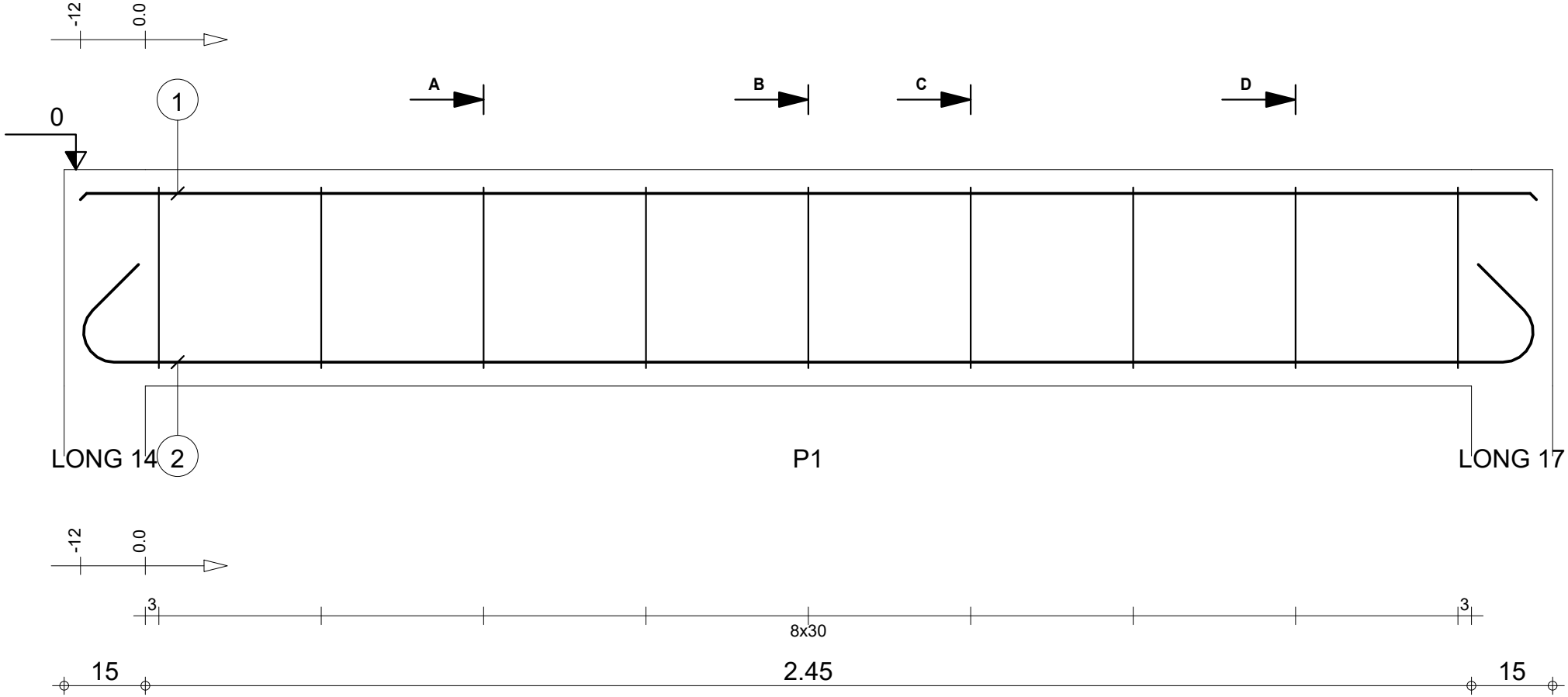
**SOUBASSEMENT**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**1\_LONG 16 : P1**

**Section 15x40**

| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 2HA 12   | l=2.69 | 00   |  |
| ②    | 2HA 12   | l=3.07 | 00   |  |
| ③    | 9HA 6    | l=98   | 31   |  |



|                                                                                    |                                                       |                                    |                            |                                                  |                                                                             |            |
|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------|----------------------------|--------------------------------------------------|-----------------------------------------------------------------------------|------------|
|                                                                                    |                                                       | Tél.                               | Fax                        |                                                  | Acier HA 400 = 10.2 kg                                                      |            |
| Tenue au feu 0h                                                                    |                                                       | Fissuration préjudiciable          | Reprise de bétonnage : Non | Béton : BETON = 0.165 m3                         | Acier HA 400 = 1.95 kg                                                      |            |
|  | SOUBASSEMENT<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 1_LONG 5 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 2.69 m2                    | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |            |
|                                                                                    |                                                       |                                    |                            | Densité = 73.94 kg/ m3<br>Diamètre moyen = 9.4mm | Echelle pour la vue 9.23cm/m<br>Echelle pour la section 8.56cm/m            | Page 21/21 |

Hypotheses de calcul

Légends

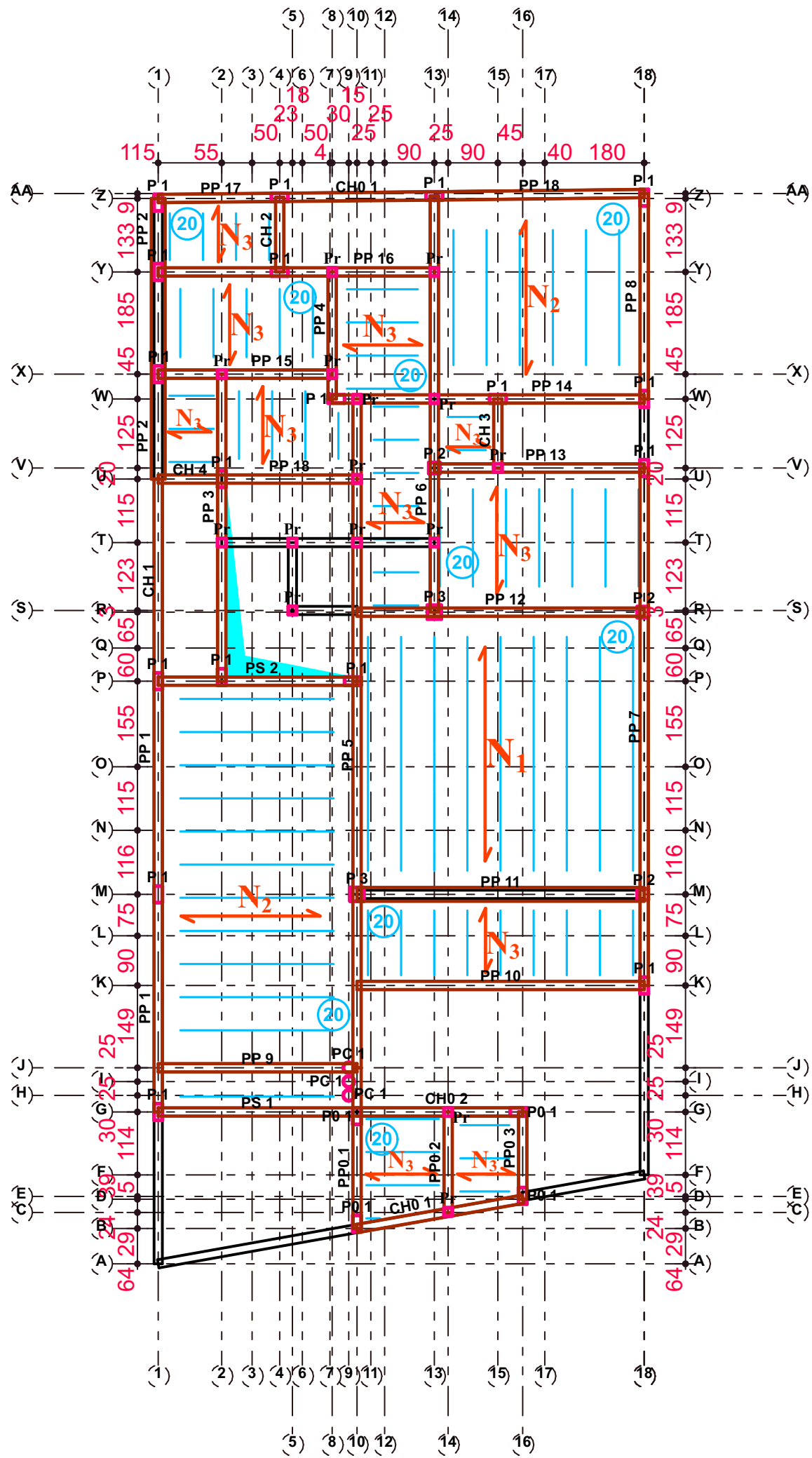
-  Poteaux
-  Poutre
-  Mur de 15 Creux

- 1°) Règle: Bael91 modif 99
- 2°) Matériaux :
  - a°) Béton: dosé à 350kg/m<sup>3</sup>;  $f_{c28} = 25\text{MPa}$
  - b°) Acier:
    - \*  $f_e = 400\text{ MPa}$
    - \* Fissuration Préjudiciable
  - c°) Enrobage:
    - \* Poteau, Poutres : 3 cm

NB: -L'INGENIEUR DECLINE TOUTE RESPONSABILITE EN CAS  
DU NON RESPECT SCRUPULEUX DE LA STRUCTURE ET DU  
NON SUIVI CONTINU DES TRAVAUX  
PAR UN TECHNICIEN AGUERRI.

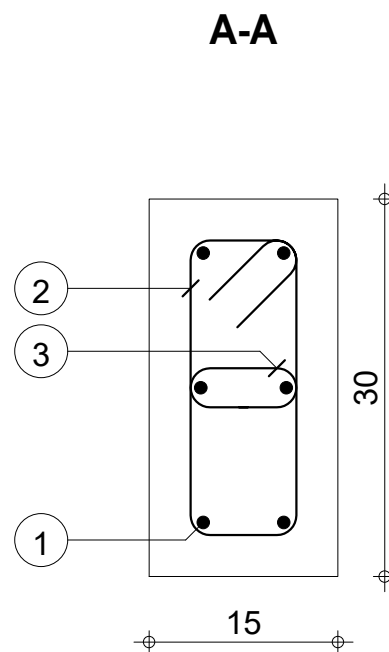
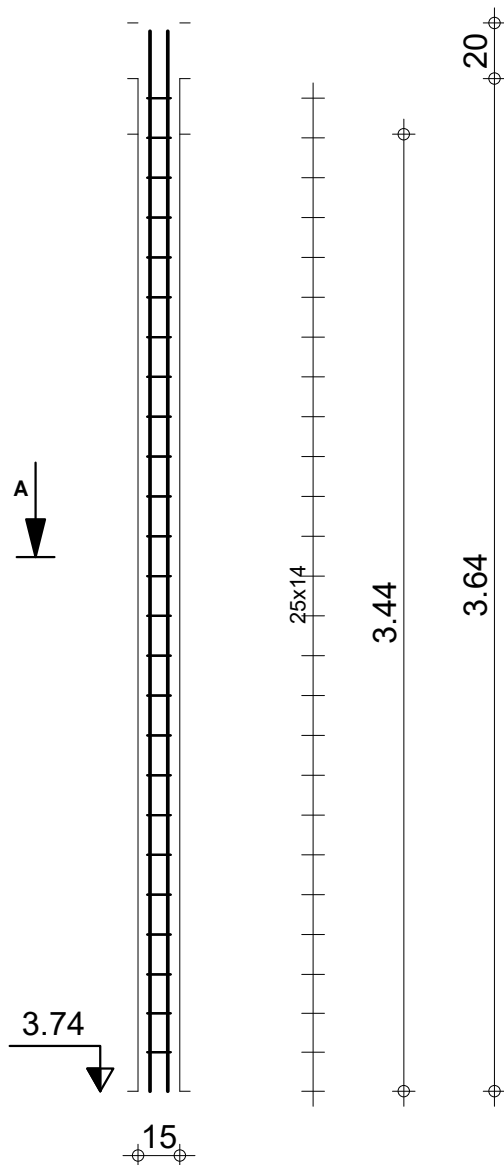
CHAPEAUX

 HA 10 x var  $\geq 200$



Plan de Poutraison N° 1  
(Couverture RDC)

Ech: 1 / 100



| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=3.81 | 00   | 3.81  |
| ②    | 25HA 6 l=78   | 31   | 9 2 8 |
| ③    | 25HA 6 l=21   | 00   | 5 9   |



**EDC**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**2\_P 1**

**Section 15x30**

Tél.

Fax

Acier HA 400 = 14.1 kg

Béton : BETON = 0.155 m3

Acier HA 400 = 5.48 kg

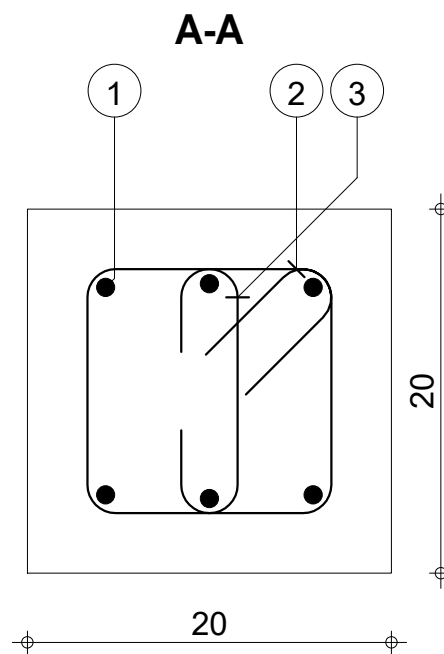
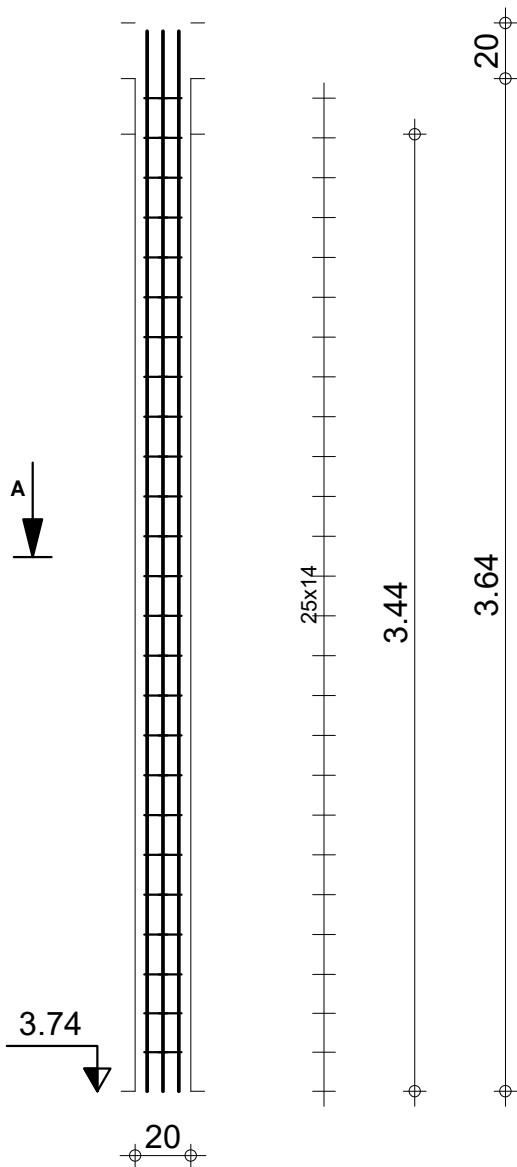
Surface du coffrage = 3.1 m2

Enrobage 3 cm

Echelle pour la vue 3.68cm/m

Echelle pour la section 16.7cm/m

**Page 1/1**



| Pos. | Armature      | Code | Forme   |
|------|---------------|------|---------|
| ①    | 6HA 10 l=3.81 | 00   | 3.81    |
| ②    | 25HA 6 l=68   | 31   | 14<br>8 |
| ③    | 25HA 6 l=26   | 00   | 5 14    |

Tél.

Fax

Acier HA 400 = 14.1 kg

Béton : BETON = 0.138 m3

Acier HA 400 = 5.21 kg

Surface du coffrage = 2.75 m2

Enrobage 3 cm

Echelle pour la vue 3.68cm/m

Echelle pour la section 24.1cm/m

Page 1/1

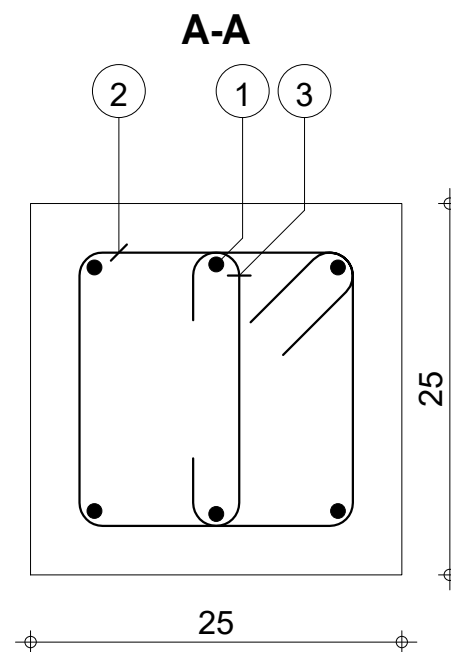
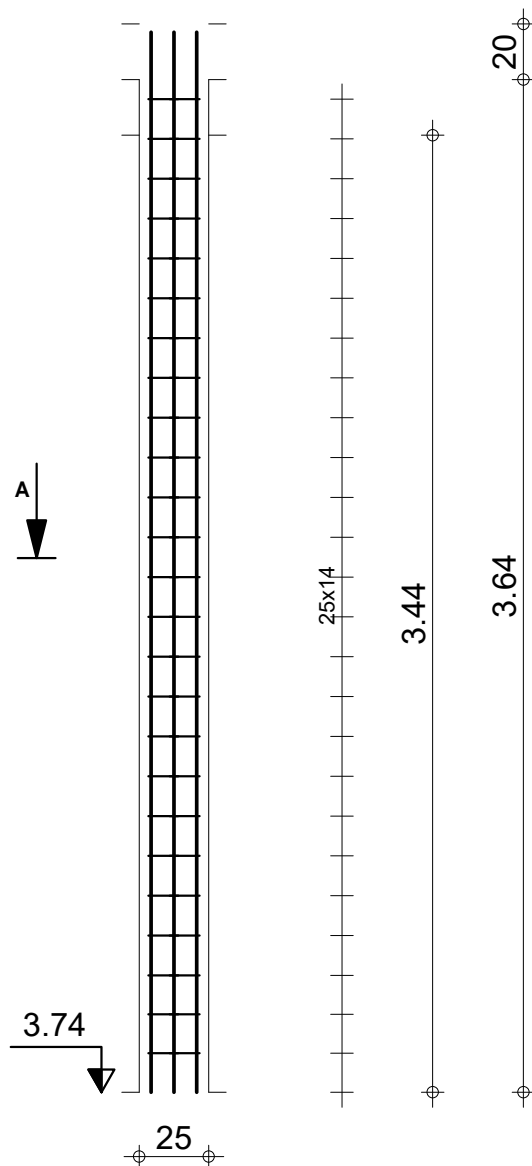


**EDC**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**2\_P 2**

**Section 20x20**



| Pos. | Armature      | Code | Forme     |
|------|---------------|------|-----------|
| ①    | 6HA 10 l=3.81 | 00   | 3.81      |
| ②    | 25HA 6 l=88   | 31   | 19<br>8 6 |
| ③    | 25HA 6 l=31   | 00   | 5 19      |

Tél.

Fax

Acier HA 400 = 14.1 kg

Béton : BETON = 0.215 m3

Acier HA 400 = 6.59 kg

Surface du coffrage = 3.44 m2

Enrobage 3 cm

Echelle pour la vue 3.68cm/m

Echelle pour la section 19.7cm/m

Page 1/1

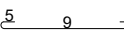


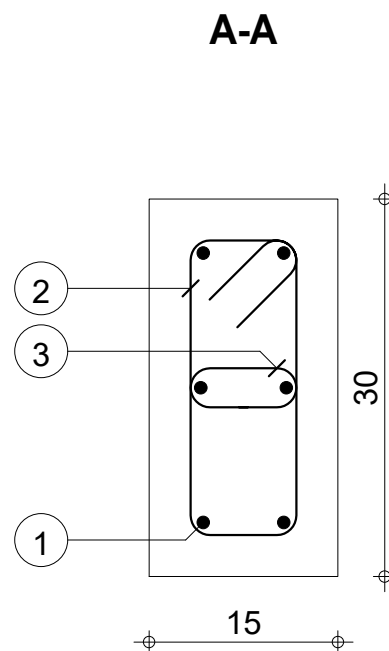
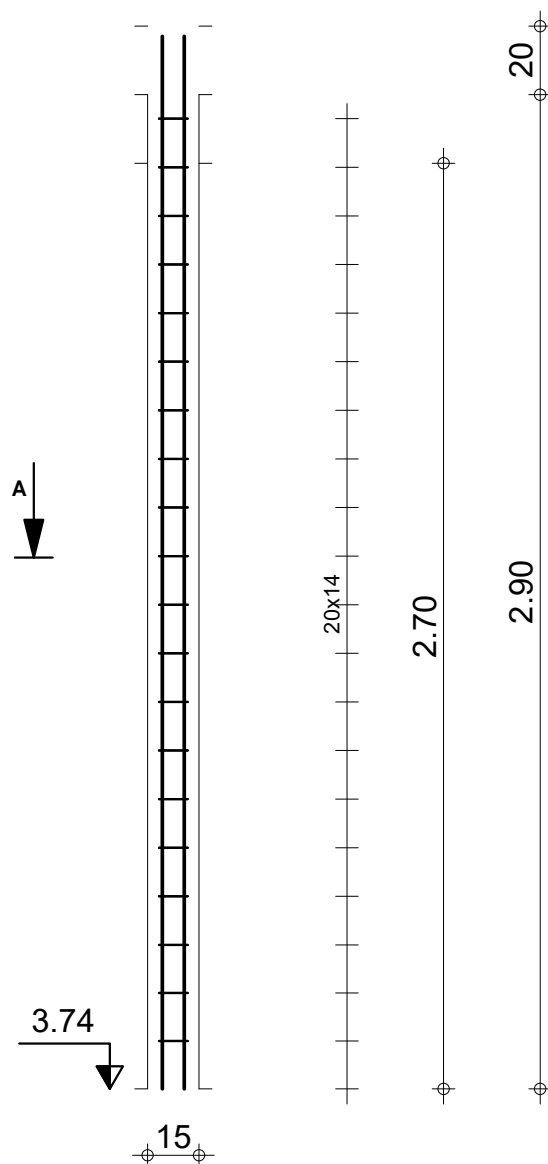
**EDC**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**2\_P 3**

**Section 25x25**

| Pos. | Armature      | Code | Forme                                                                               |
|------|---------------|------|-------------------------------------------------------------------------------------|
| ①    | 6HA 10 l=3.07 | 00   | 3.07                                                                                |
| ②    | 20HA 6 l=78   | 31   |  |
| ③    | 20HA 6 l=21   | 00   |  |



**EDC**

DETAILS DE STRUCTURE DUO 2 TOGBIN

**2\_P0 1**

**Section 15x30**

Tél.

Fax

Acier HA 400 = 11.4 kg

Béton : BETON = 0.122 m3

Acier HA 400 = 4.39 kg

Surface du coffrage = 2.43 m2

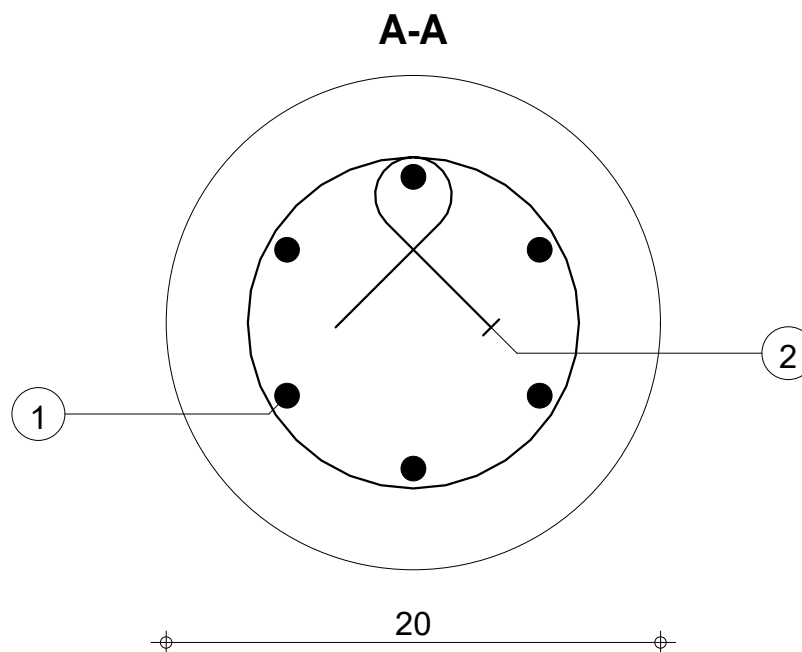
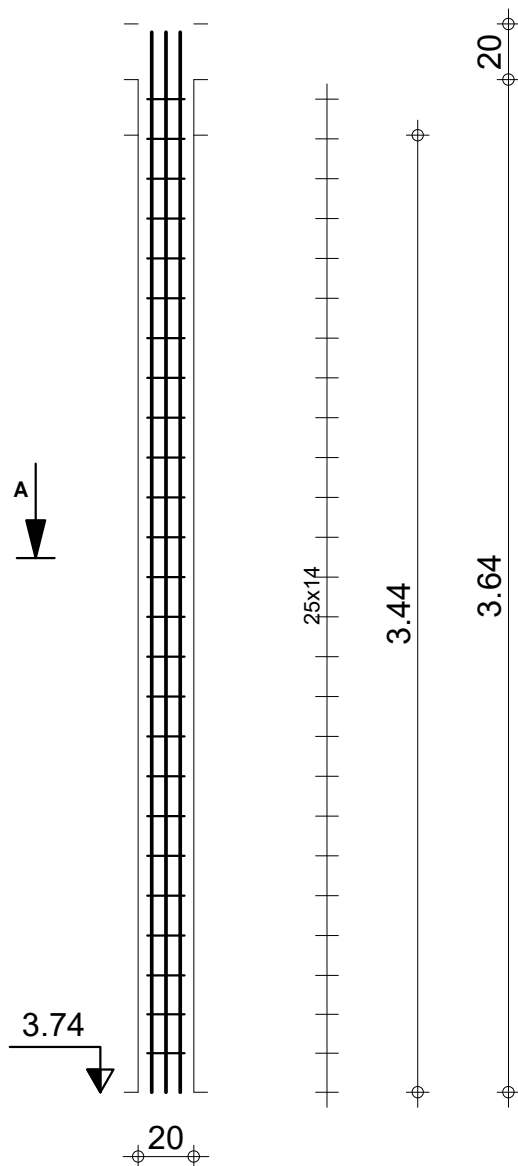
Enrobage 3 cm

Echelle pour la vue 4.54cm/m

Echelle pour la section 16.7cm/m

Page 1/1

| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=3.81 | 00   | 3.81  |
| ②    | 25HA 6 l=61   |      | 13    |



**EDC**

**DETAILS DE STRUCTURE DUO 2 TOGBIN**

**2\_PC 1**

Tél.

Fax

Acier HA 400 = 14.1 kg

Béton : BETON = 0.108 m3

Acier HA 400 = 3.41 kg

Surface du coffrage = 2.16 m2

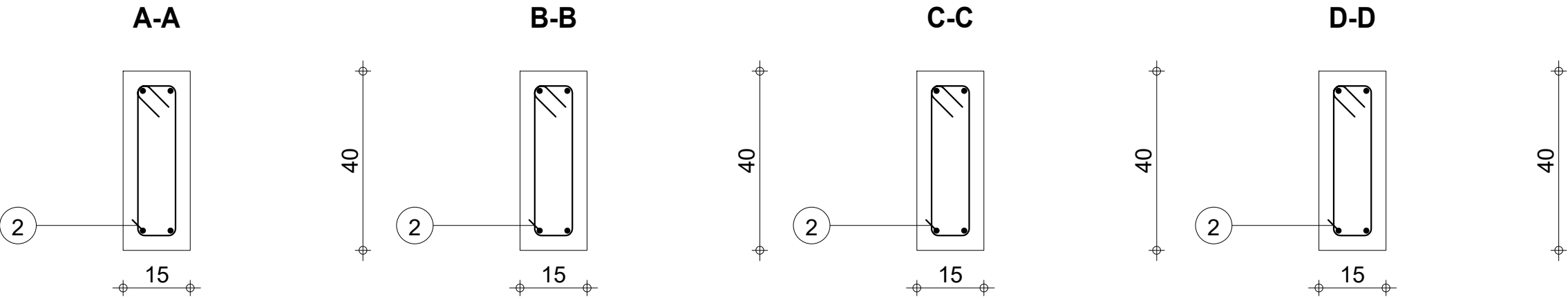
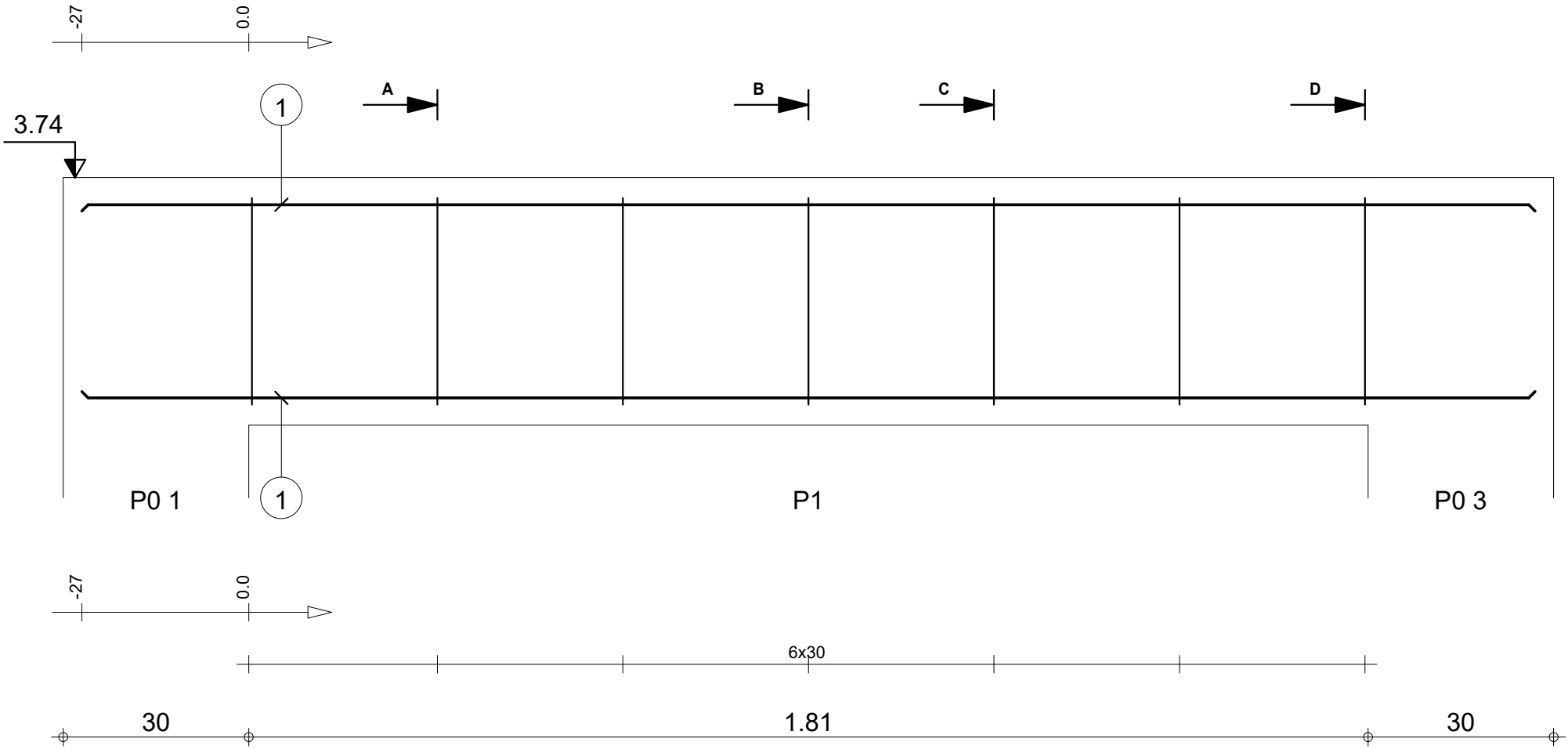
Enrobage 3 cm

Echelle pour la vue 3.68cm/m

Echelle pour la section 32.7cm/m

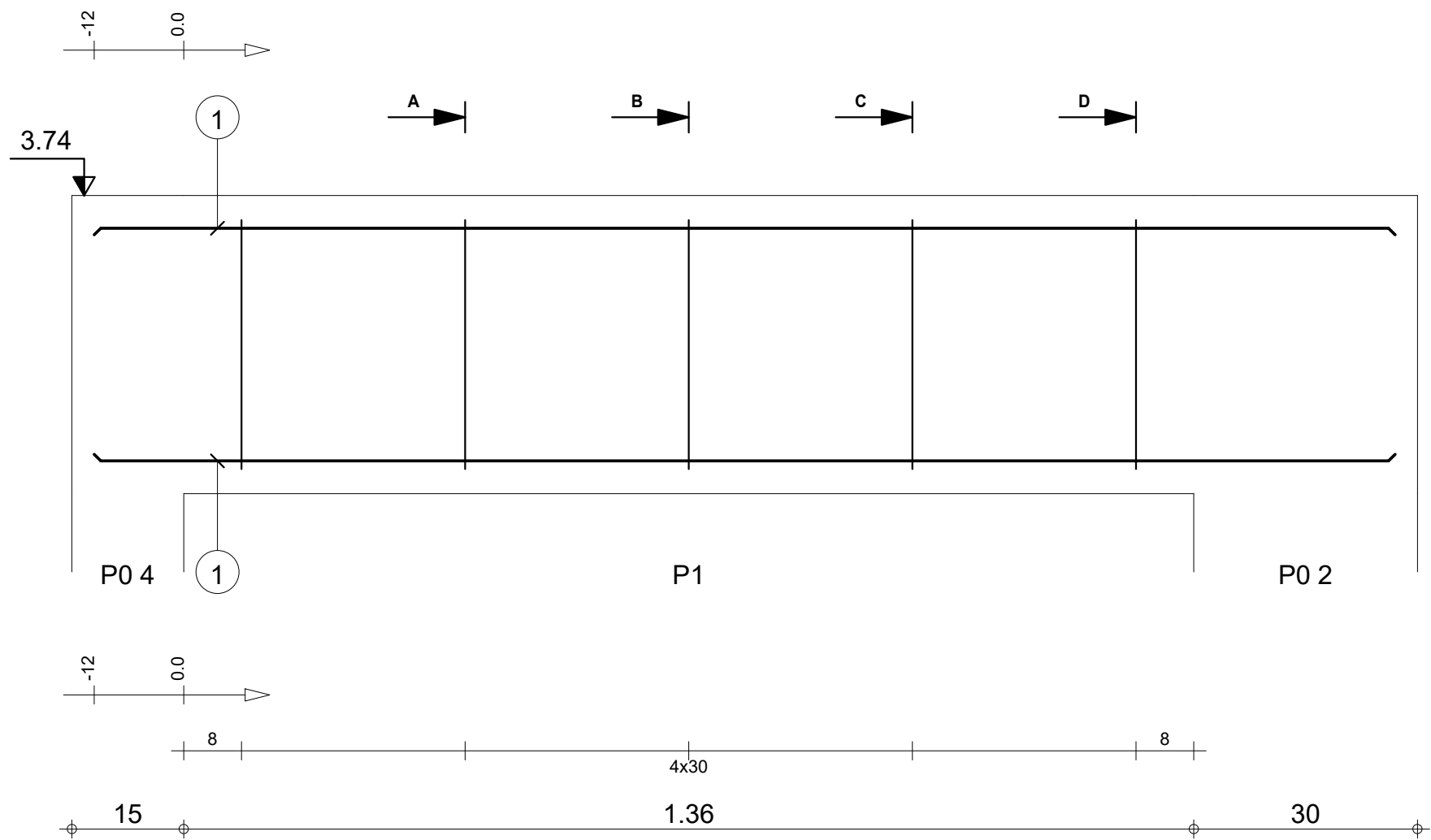
**Page 1/1**

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=2.35 | 00   | 2.35  |
| ②    | 7HA 6    | l=98   | 31   |       |

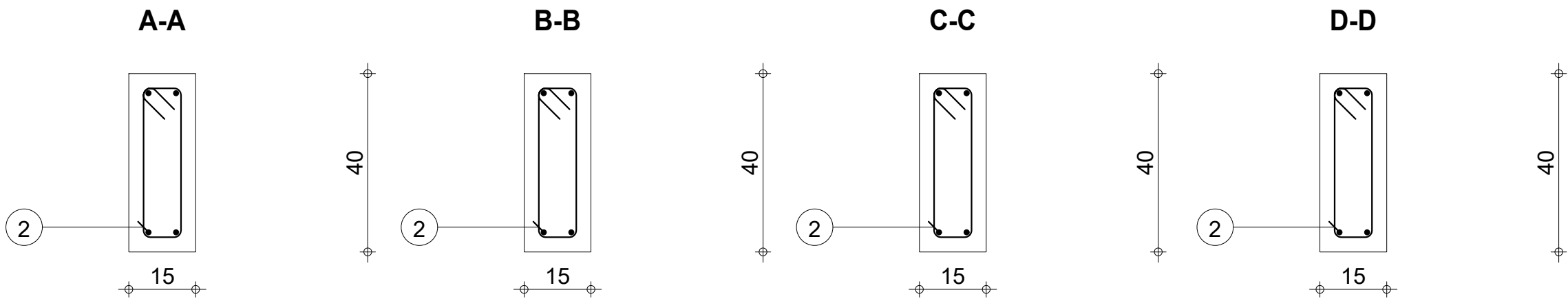


|                                                                                    |                                              |                                   |     |                            |                                                                                       |                                                    |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 8.35 kg                                                                |                                                    |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                                                       | Béton : BETON = 0.145 m3<br>Acier HA 400 = 1.52 kg |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP0 1 : P1<br><br>Section 15x40 |     | Nombre 1                   | Surface du coffrage = 2.32 m2<br><br>Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm |                                                    |
|                                                                                    |                                              |                                   |     |                            | Densité = 68.07 kg/ m3<br>Diamètre moyen = 9.47mm                                     |                                                    |
|                                                                                    |                                              |                                   |     |                            | Echelle pour la vue 10.4cm/m<br>Echelle pour la section 8.56cm/m                      |                                                    |
|                                                                                    |                                              |                                   |     |                            | Page 1/29                                                                             |                                                    |

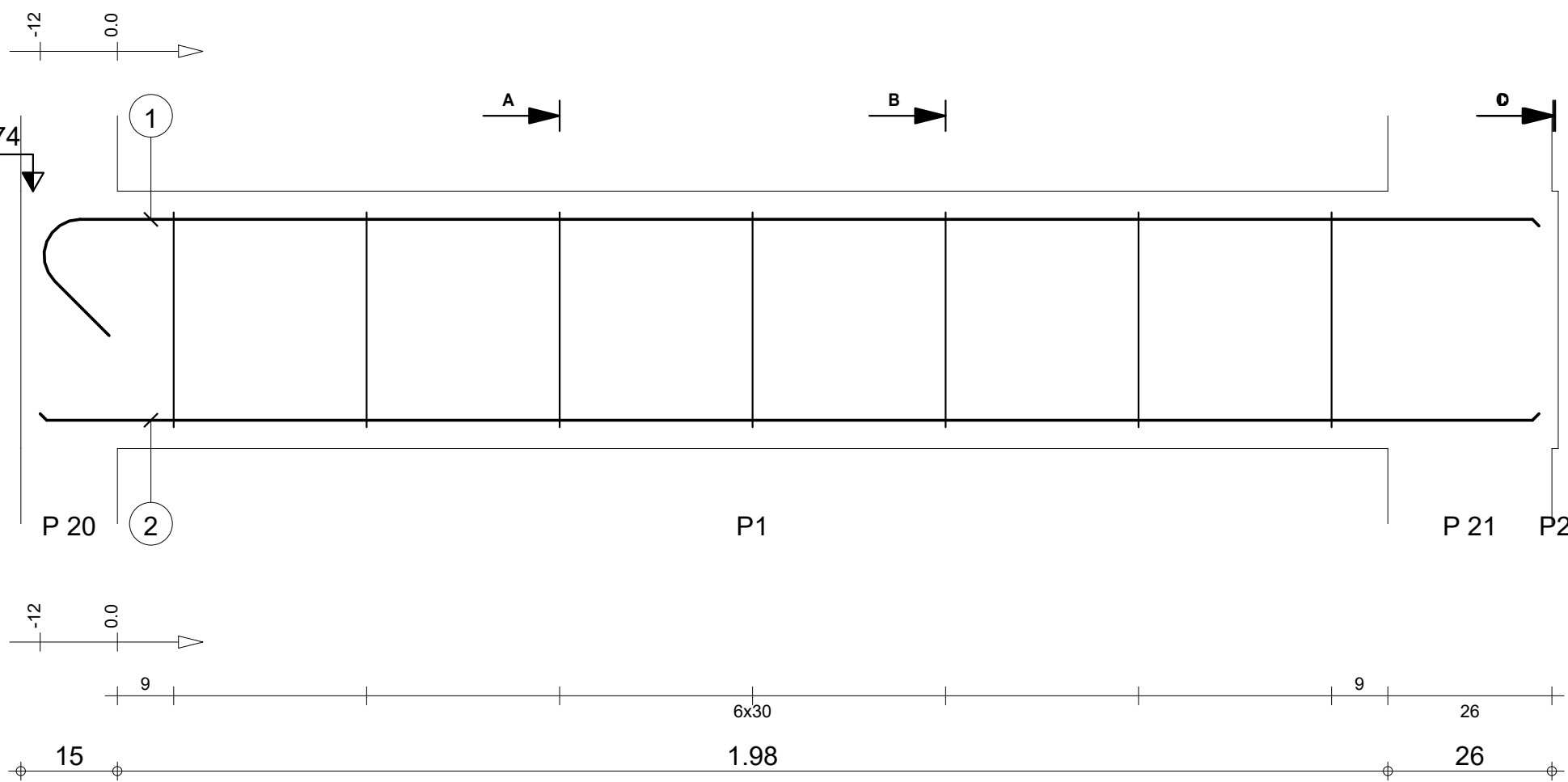




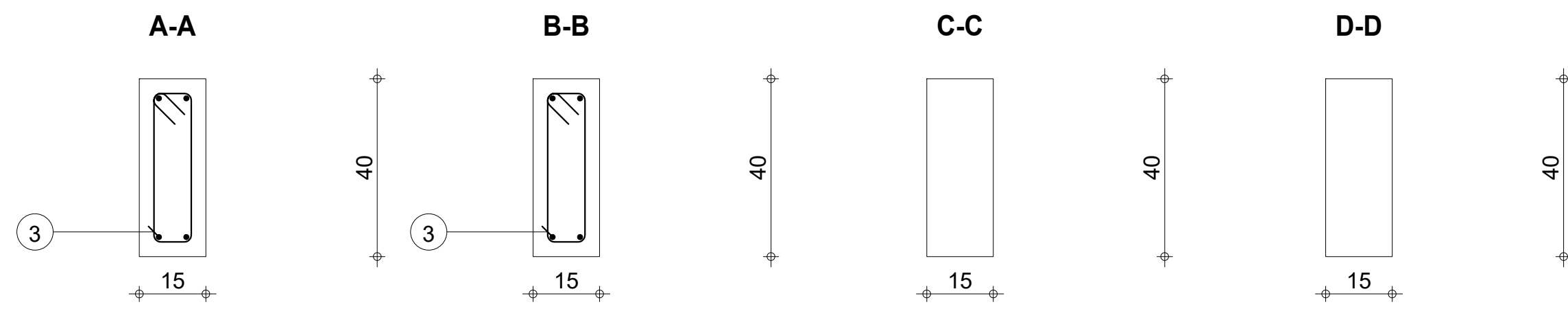
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.75 | 00   | 1.75  |
| ②    | 5HA 6    | l=98   | 31   |       |



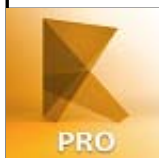
|                                                                                    |                                              |                                   |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                              | Fax                        |                                                   | Acier HA 400 = 6.2 kg                                                       |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.108 m3                                                    | Acier HA 400 = 1.09 kg |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP0 3 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 1.77 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                   |                            | Densité = 67.41 kg/ m3<br>Diamètre moyen = 9.53mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m            | Page 2/29              |

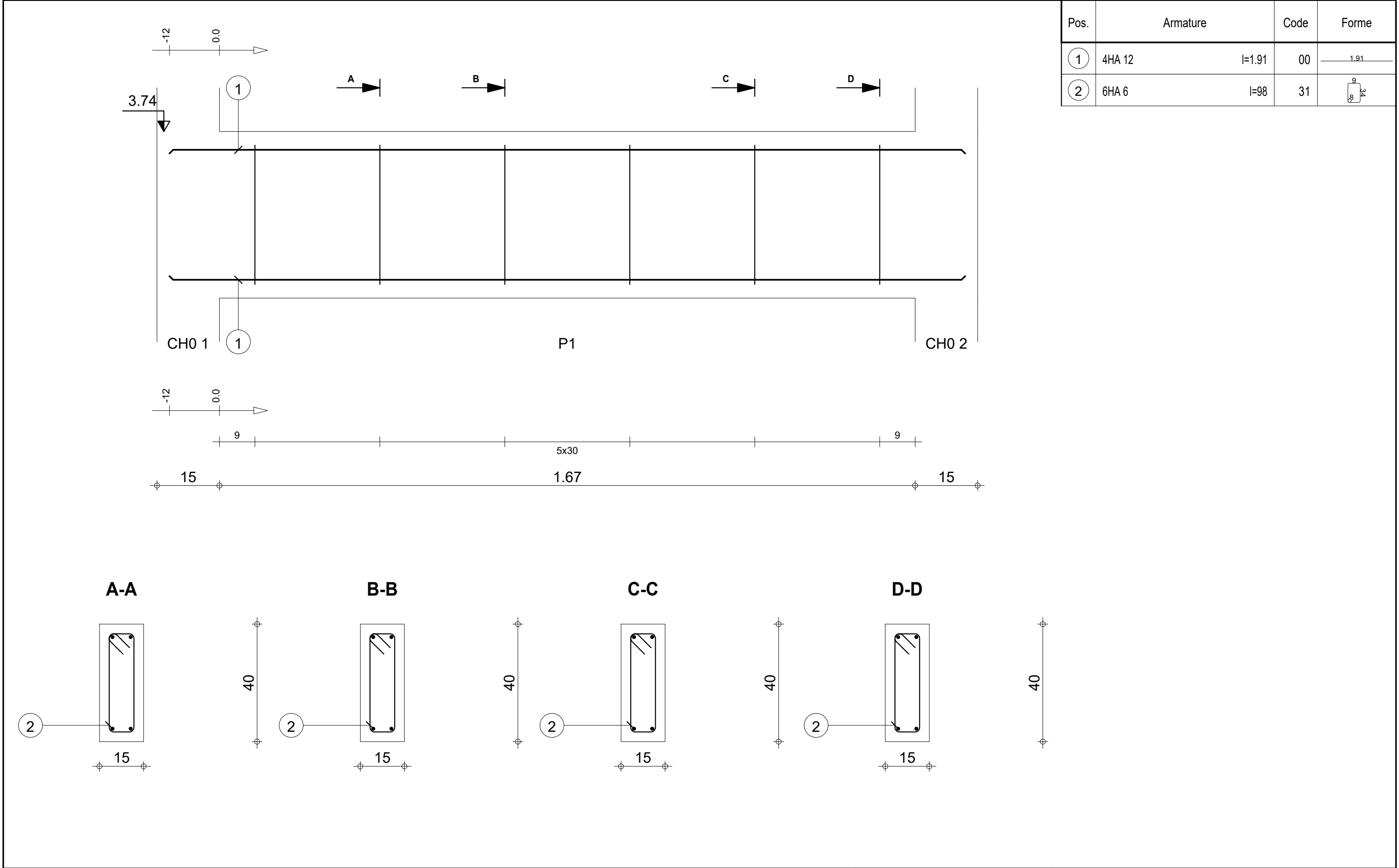


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=2.52 | 00   |       |
| ②    | 2HA 12   | l=2.33 | 00   |       |
| ③    | 7HA 6    | l=98   | 31   |       |



|                                                                                    |                                              |                              |          |                                                   |                                                                             |           |
|------------------------------------------------------------------------------------|----------------------------------------------|------------------------------|----------|---------------------------------------------------|-----------------------------------------------------------------------------|-----------|
| Tél.                                                                               |                                              | Fax                          |          | Béton : BETON = 0.143 m3                          | Acier HA 400 = 8.61 kg                                                      |           |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable    |          |                                                   | Acier HA 400 = 1.52 kg                                                      |           |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 17<br><br>Section 15x40 | Nombre 1 | Surface du coffrage = 2.33 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |           |
|                                                                                    |                                              |                              |          | Densité = 70.63 kg/ m3<br>Diamètre moyen = 9.52mm | Echelle pour la vue 10.5cm/m<br>Echelle pour la section 8.56cm/m            | Page 3/29 |
|                                                                                    |                                              |                              |          |                                                   |                                                                             |           |

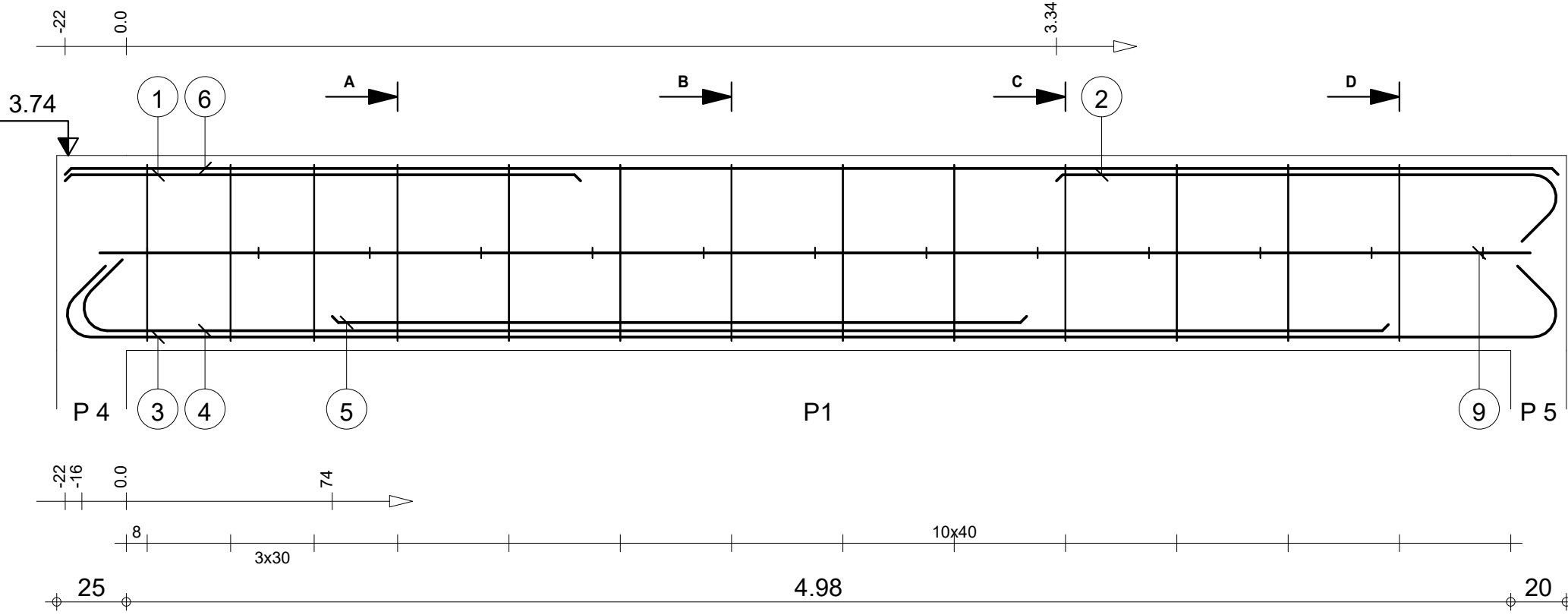




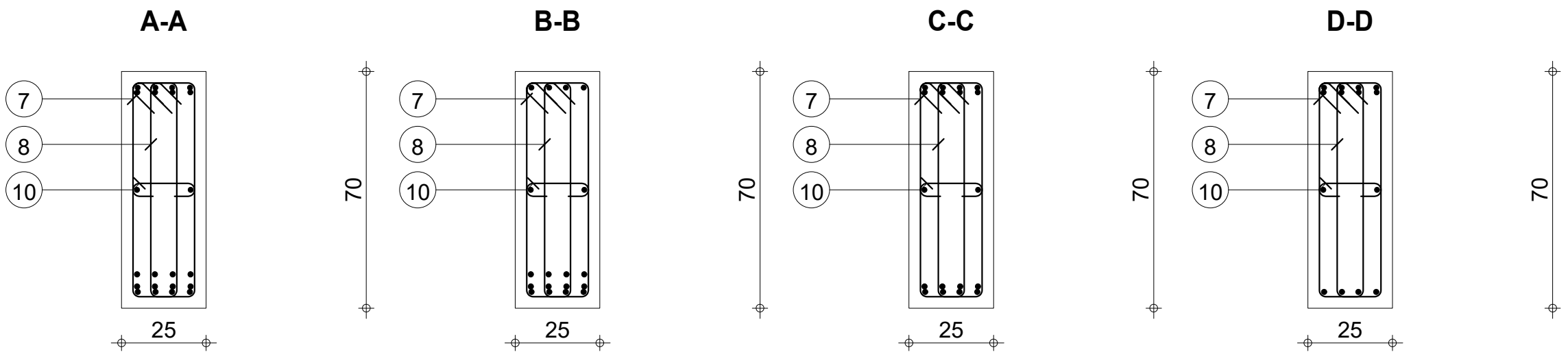
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.91 | 00   | 1.91                                                                                |
| ②    | 6HA 6    | l=98   | 31   |  |

|                                                                                    |                                              |                                   |                            |          |                                                   |                                                                  |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|----------------------------|----------|---------------------------------------------------|------------------------------------------------------------------|
|                                                                                    |                                              | Tél.                              | Fax                        |          | Acier HA 400 = 6.78 kg                            |                                                                  |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         | Reprise de bétonnage : Non |          | Béton : BETON = 0.118 m3                          | Acier HA 400 = 1.3 kg                                            |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP0 2 : P1<br><br>Section 15x40 |                            | Nombre 1 | Surface du coffrage = 1.95 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |
|                                                                                    |                                              |                                   |                            |          | Densité = 68.56 kg/ m3<br>Diamètre moyen = 9.39mm | Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m |
|                                                                                    |                                              |                                   |                            |          | Page 4/29                                         |                                                                  |

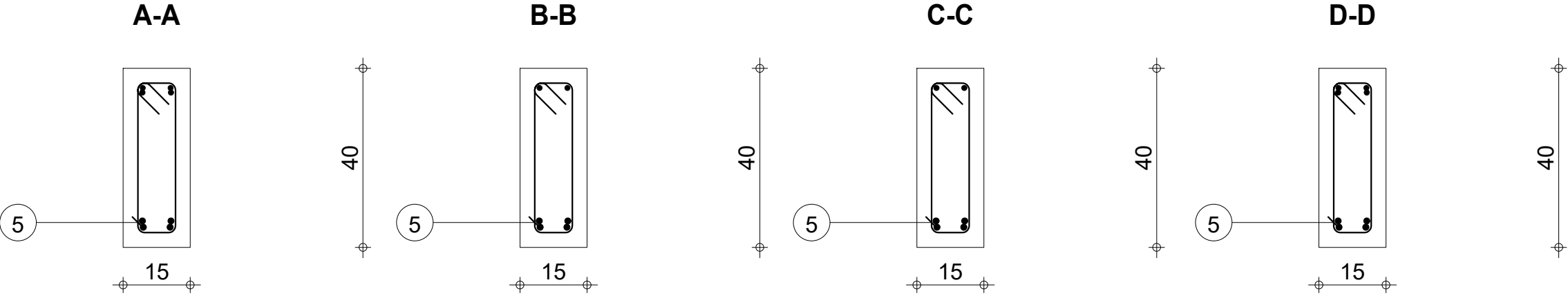
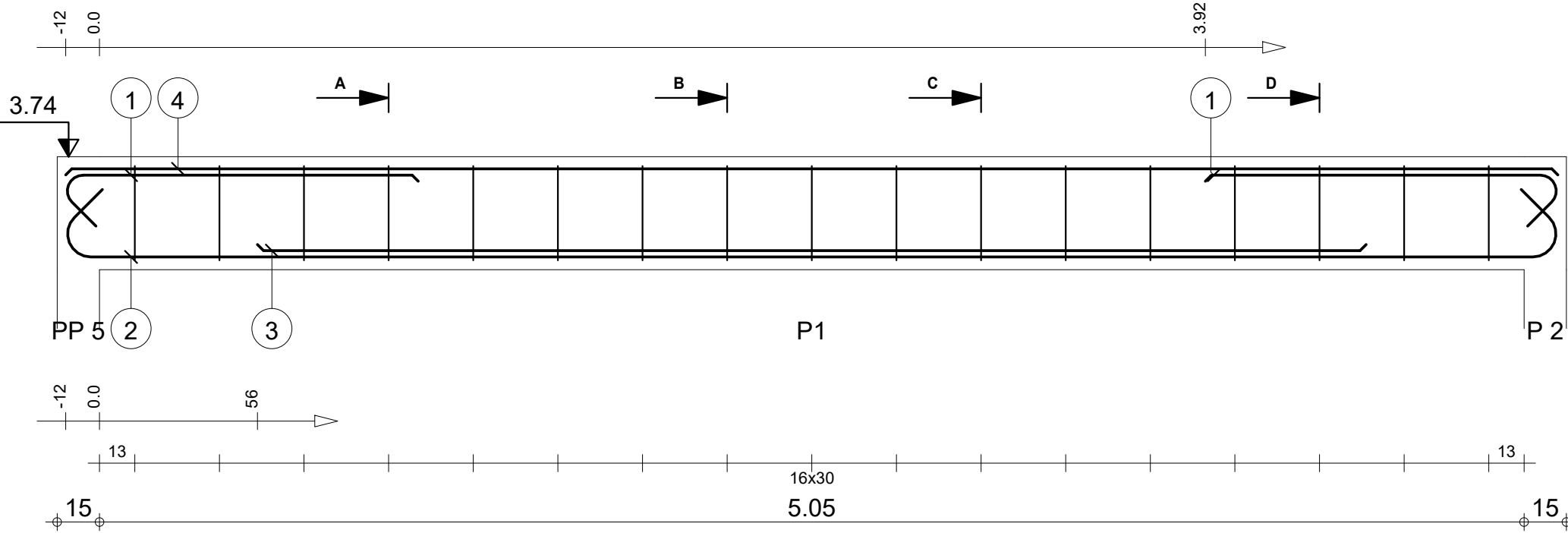




| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 14   | l=1.85 | 00   | 1.85  |
| ②    | 4HA 14   | l=2.05 | 00   | 1.80  |
| ③    | 4HA 16   | l=5.89 | 00   | 5.37  |
| ④    | 4HA 16   | l=4.96 | 00   | 4.70  |
| ⑤    | 4HA 16   | l=2.50 | 00   | 2.50  |
| ⑥    | 4HA 14   | l=5.37 | 00   | 5.37  |
| ⑦    | 13HA 8   | l=1.81 | 31   |       |
| ⑧    | 13HA 8   | l=1.60 | 31   |       |
| ⑨    | 2HA 14   | l=5.14 | 00   | 5.14  |
| ⑩    | 13HA 8   | l=34   | 00   |       |



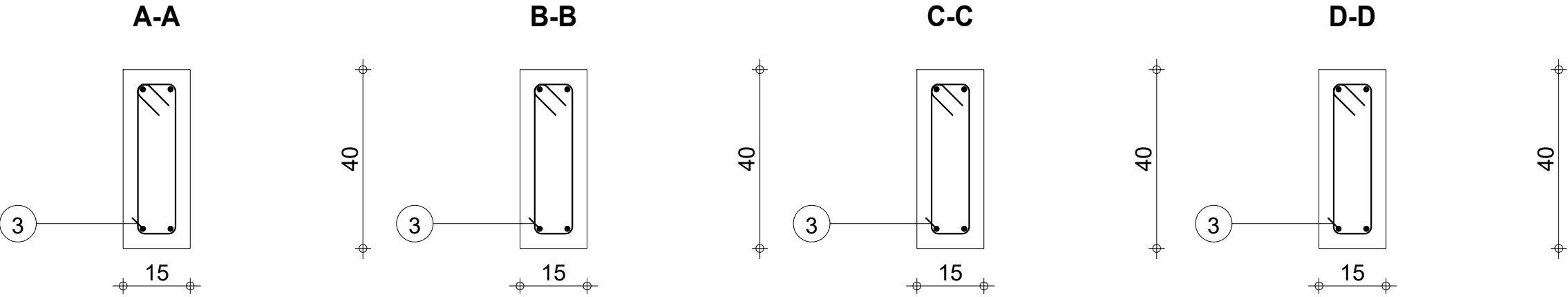
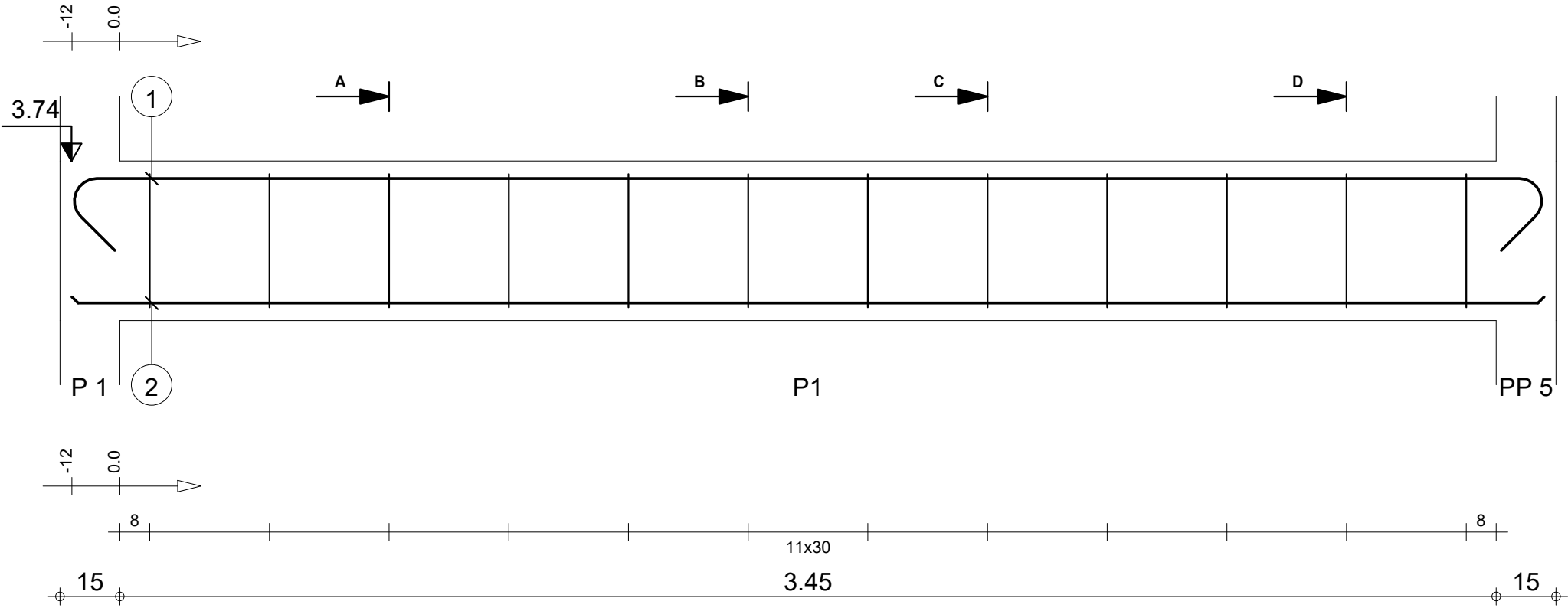
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.44 | 00   |       |
| ②    | 2HA 14   | l=5.78 | 00   |       |
| ③    | 2HA 14   | l=3.93 | 00   |       |
| ④    | 2HA 10   | l=5.29 | 00   |       |
| ⑤    | 17HA 6   | l=98   | 31   |       |



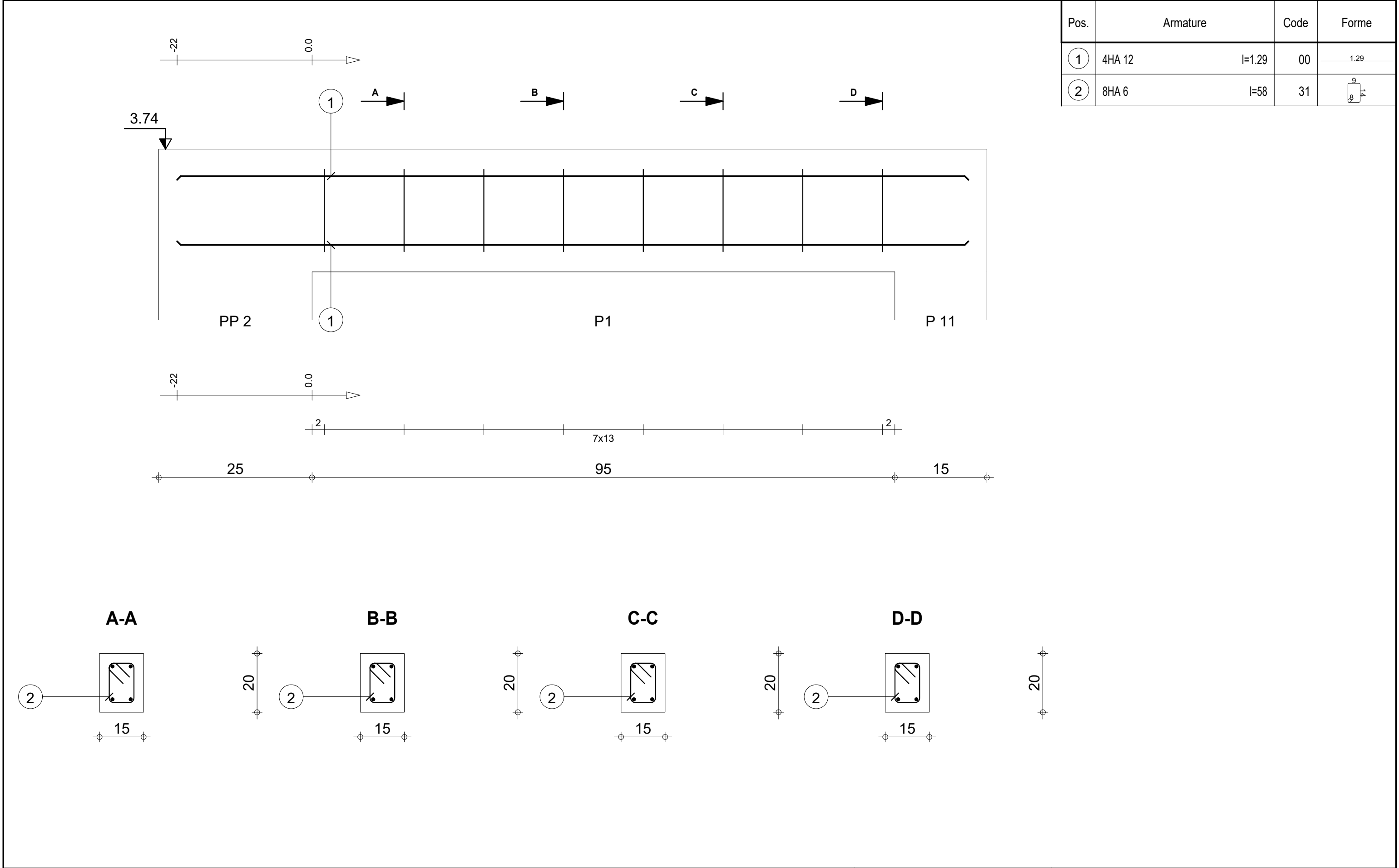
|                                                                                    |                                              |                                   |     |                            |                                                   |                                                                  |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|---------------------------------------------------|------------------------------------------------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            |                                                   | Acier HA 400 = 35.1 kg                                           |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                   | Acier HA 400 = 3.69 kg                                           |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 10 : P1<br><br>Section 15x40 |     | Nombre 1                   | Surface du coffrage = 5.16 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |
|                                                                                    |                                              |                                   |     |                            | Densité = 120.9 kg/ m3<br>Diamètre moyen = 10.4mm | Echelle pour la vue 4.92cm/m<br>Echelle pour la section 8.56cm/m |
|                                                                                    |                                              |                                   |     |                            |                                                   | Page 6/29                                                        |

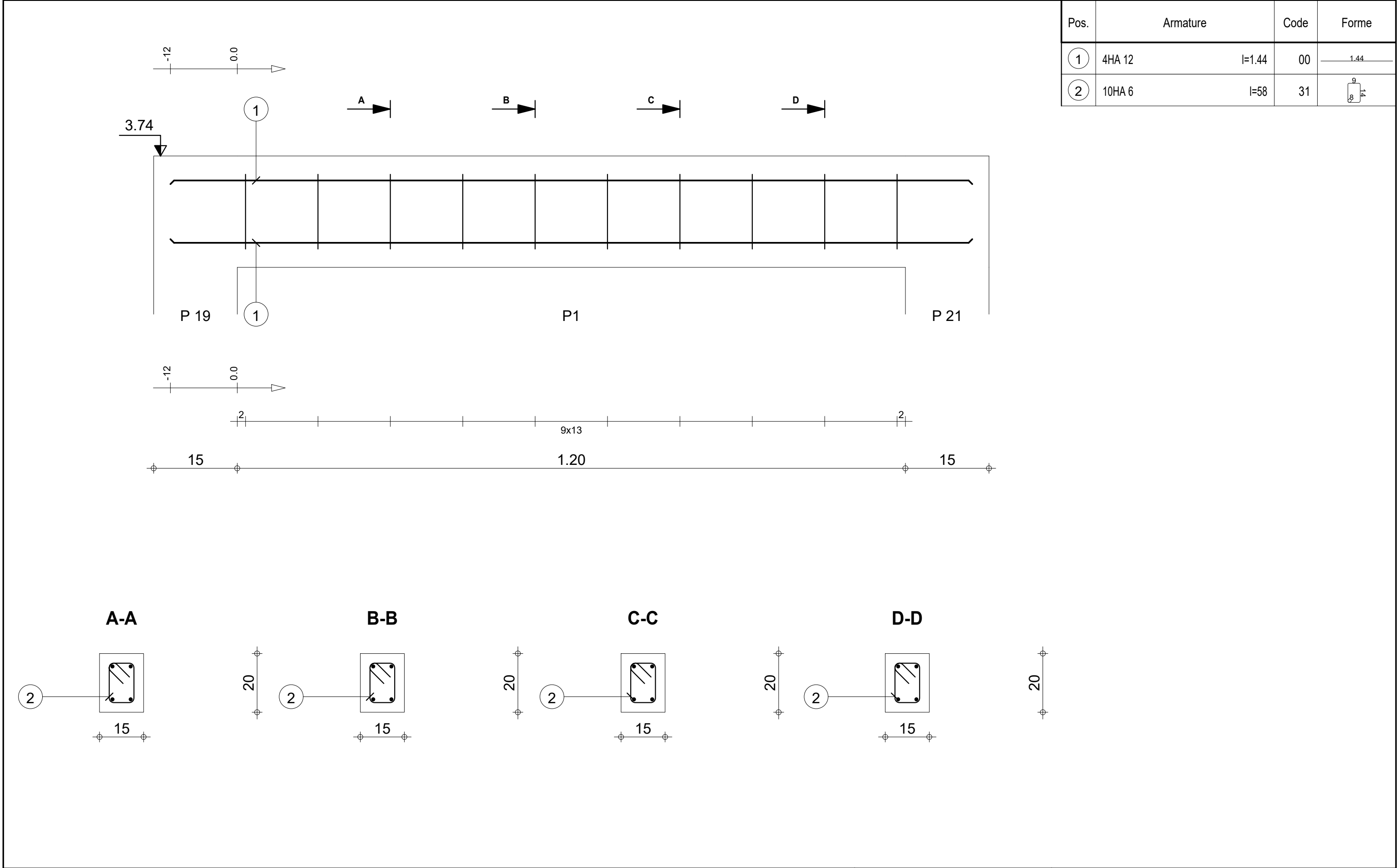


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=4.07 | 00   |       |
| ②    | 2HA 12   | l=3.69 | 00   |       |
| ③    | 12HA 6   | l=98   | 31   |       |



|                                                                                    |                                                        |  |                                            |  |  |                            |  |                        |                                                   |  |                                                                             |  |
|------------------------------------------------------------------------------------|--------------------------------------------------------|--|--------------------------------------------|--|--|----------------------------|--|------------------------|---------------------------------------------------|--|-----------------------------------------------------------------------------|--|
| Tél.                                                                               |                                                        |  | Fax                                        |  |  |                            |  | Acier HA 400 = 13.8 kg |                                                   |  |                                                                             |  |
| Tenue au feu 0h                                                                    |                                                        |  | Fissuration préjudiciable                  |  |  | Reprise de bétonnage : Non |  |                        | Béton : BETON = 0.225 m3                          |  | Acier HA 400 = 2.61 kg                                                      |  |
|  | <b>RDC</b><br><b>DETAILS DE STRUCTURE DUO 2 TOGBIN</b> |  | <b>2_PS 1 : P1</b><br><b>Section 15x40</b> |  |  | <b>Nombre 1</b>            |  |                        | Surface du coffrage = 3.64 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |                                                        |  |                                            |  |  |                            |  |                        | Densité = 72.89 kg/ m3<br>Diamètre moyen = 9.42mm |  | Echelle pour la vue 6.89cm/m<br>Echelle pour la section 8.56cm/m            |  |

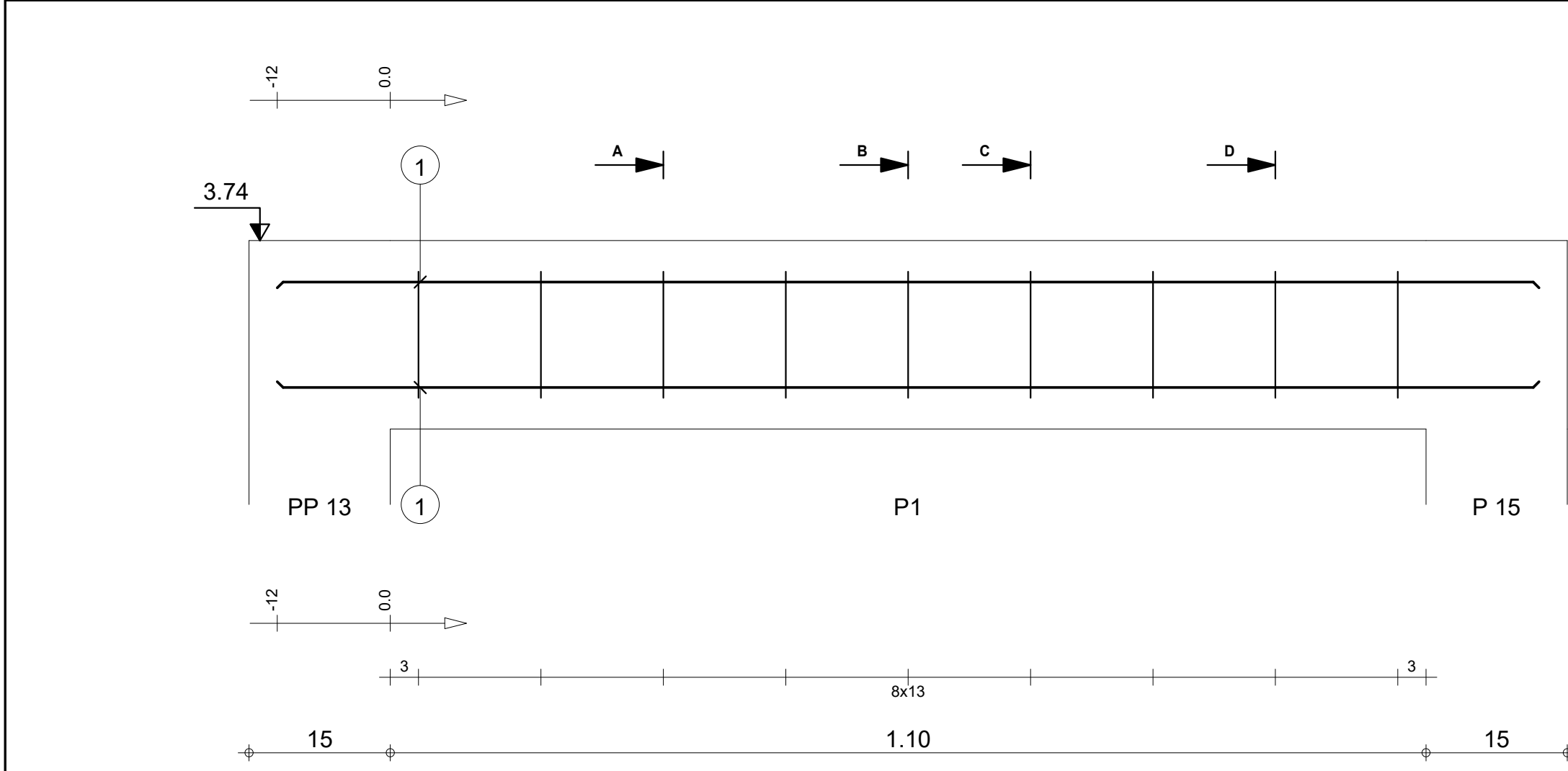




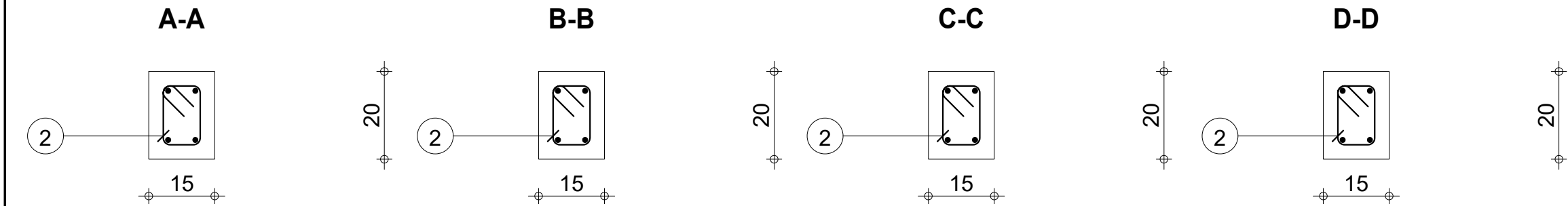
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.44 | 00   | 1.44  |
| ②    | 10HA 6   | l=58   | 31   |       |

|                                          |  |  |                              |  |                                                                  |                                                   |  |
|------------------------------------------|--|--|------------------------------|--|------------------------------------------------------------------|---------------------------------------------------|--|
| Tél.                                     |  |  | Fax                          |  | <div><div></div><div>PRO</div></div>                             | Acier HA 400 = 5.11 kg                            |  |
| Tenue au feu 0h                          |  |  | Reprise de bétonnage : Non   |  |                                                                  | Acier HA 400 = 1.28 kg                            |  |
| RDC<br>DETAILS DE STRUCTURE DUO 2 TOGBIN |  |  | 2_CH 2 : P1<br>Section 15x20 |  |                                                                  | Béton : BETON = 0.045 m3                          |  |
|                                          |  |  |                              |  |                                                                  | Surface du coffrage = 0.84 m2                     |  |
|                                          |  |  |                              |  |                                                                  | Densité = 142.2 kg/ m3<br>Diamètre moyen = 8.99mm |  |
| Fissuration préjudiciable                |  |  | Nombre 1                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |                                                   |  |
|                                          |  |  |                              |  | Enrobage supérieur 3 cm                                          |                                                   |  |
|                                          |  |  |                              |  | Echelle pour la vue 16.2cm/m<br>Echelle pour la section 8.56cm/m |                                                   |  |
|                                          |  |  |                              |  | Page 9/29                                                        |                                                   |  |



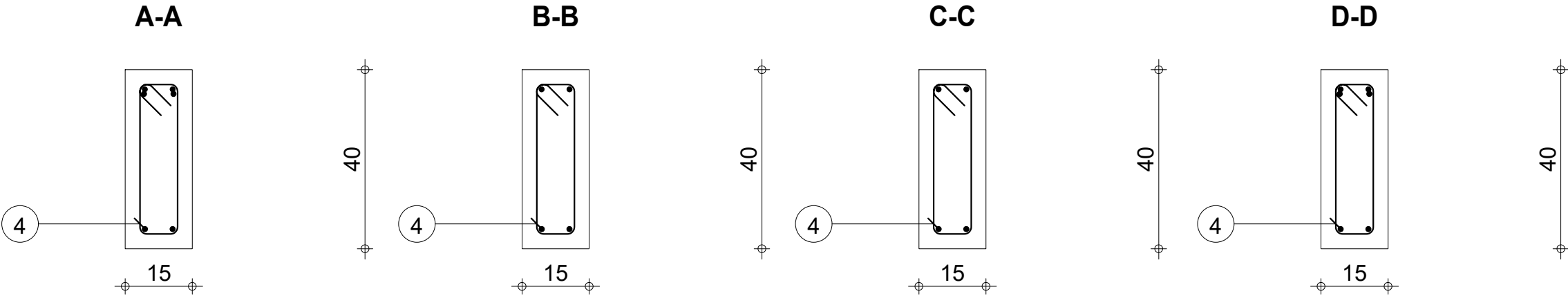
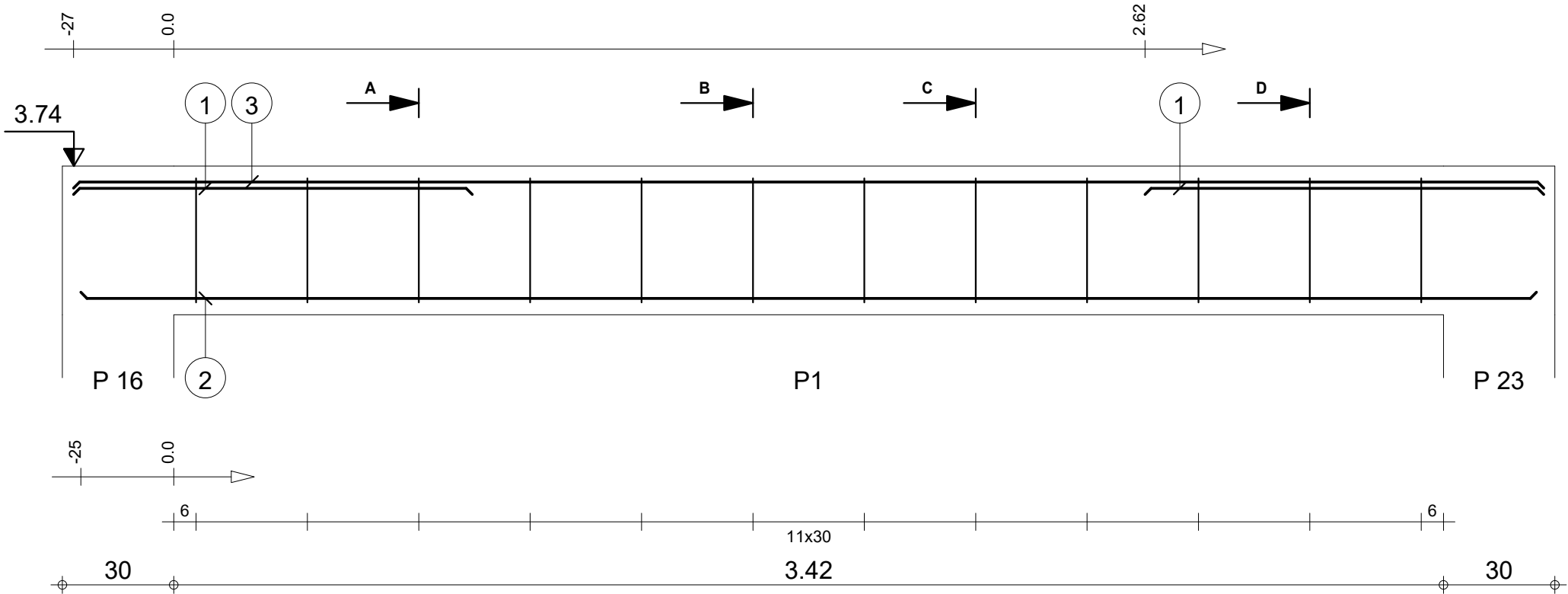


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.34 | 00   | 1.34  |
| ②    | 9HA 6    | l=58   | 31   |       |

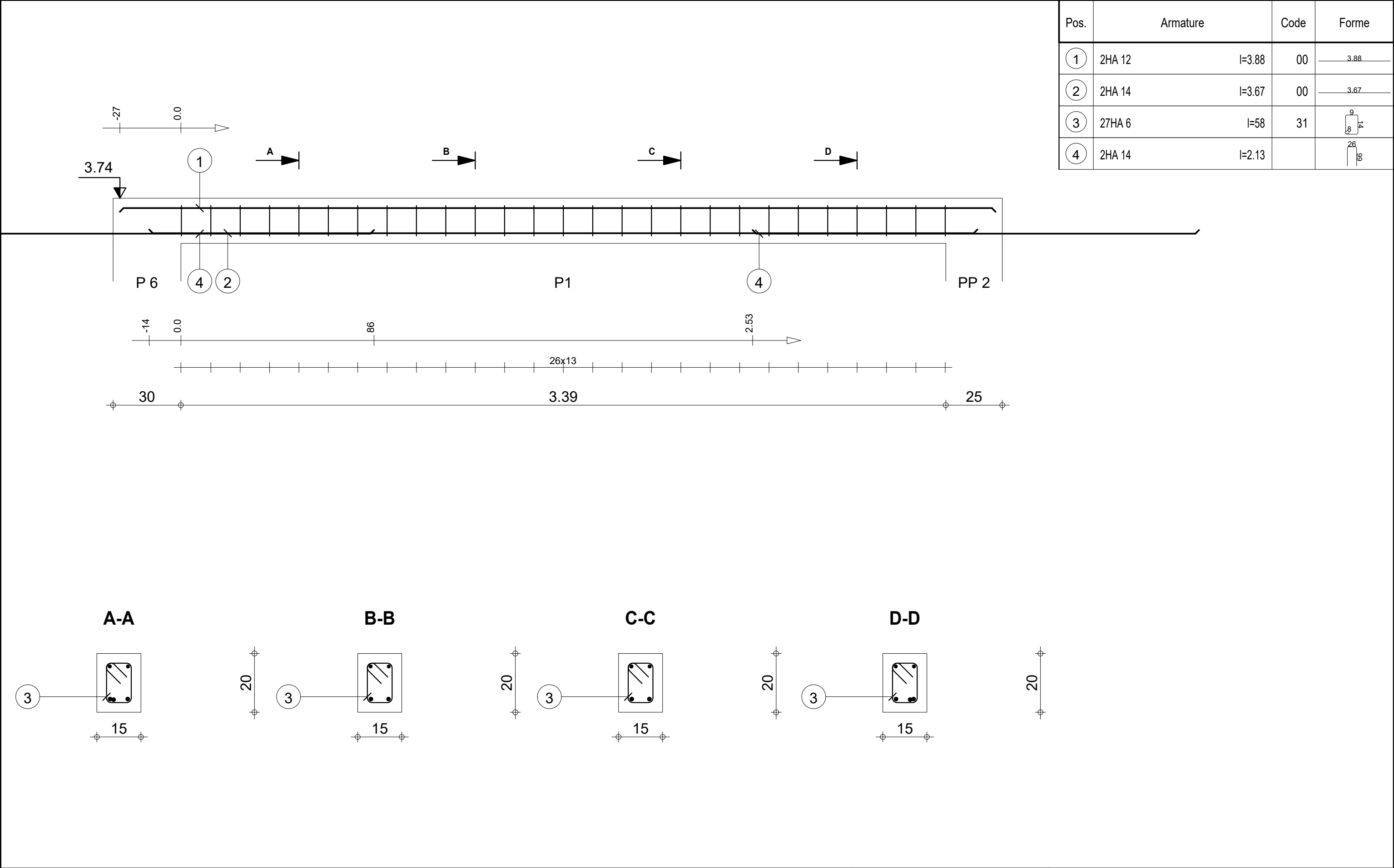


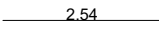
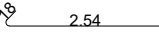
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 4.76 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.042 m3                                                    | Acier HA 400 = 1.15 kg |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_CH 3 : P1<br><br>Section 15x20 | Nombre 1                   | Surface du coffrage = 0.785 m2                    | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 140.7 kg/ m3<br>Diamètre moyen = 9.04mm | Echelle pour la vue 17.3cm/m<br>Echelle pour la section 8.56cm/m            | Page 10/29             |
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |

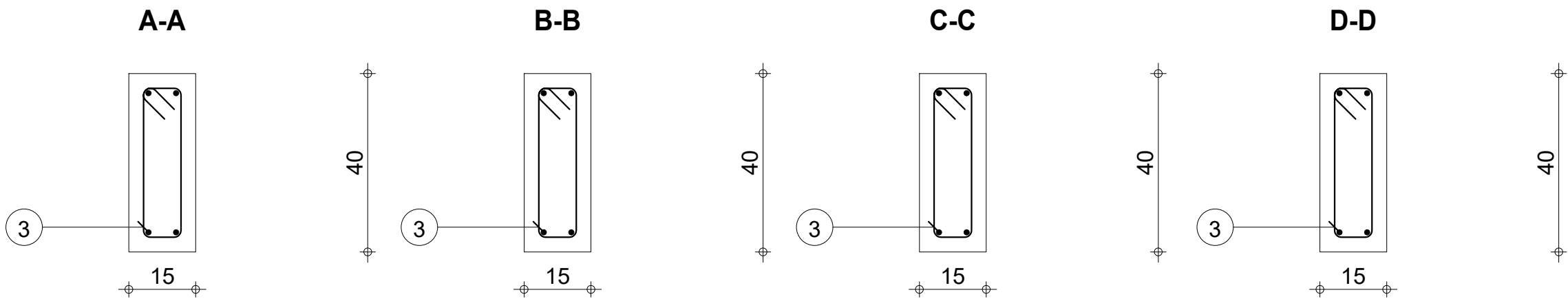
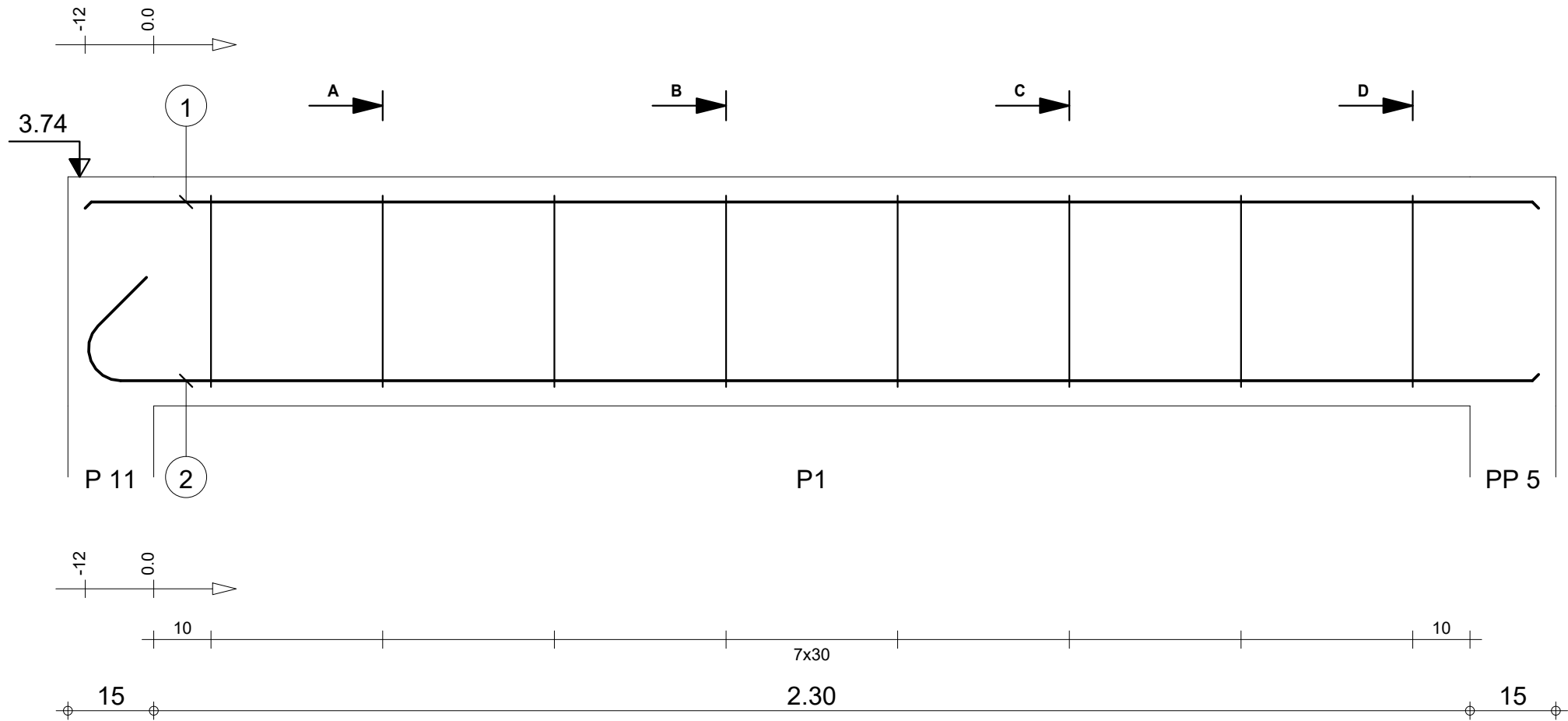
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.07 | 00   | 1.07  |
| ②    | 2HA 12   | l=3.92 | 00   | 3.92  |
| ③    | 2HA 10   | l=3.96 | 00   | 3.96  |
| ④    | 12HA 6   | l=98   | 31   |       |

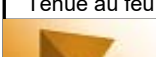


|                                                                                    |                                              |                                  |     |                            |                                                   |                                                                  |                         |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|-----|----------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------|
|                                                                                    |                                              | Tél.                             | Fax |                            | Acier HA 400 = 15.7 kg                            |                                                                  |                         |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        |     | Reprise de bétonnage : Non |                                                   | Acier HA 400 = 2.61 kg                                           |                         |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 8 : P1<br><br>Section 15x40 |     | Nombre 1                   | Béton : BETON = 0.241 m3                          |                                                                  |                         |
|                                                                                    |                                              |                                  |     |                            | Surface du coffrage = 3.85 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 | Enrobage supérieur 3 cm |
|                                                                                    |                                              |                                  |     |                            | Densité = 75.93 kg/ m3<br>Diamètre moyen = 9.29mm | Echelle pour la vue 6.46cm/m<br>Echelle pour la section 8.56cm/m | Page 11/29              |

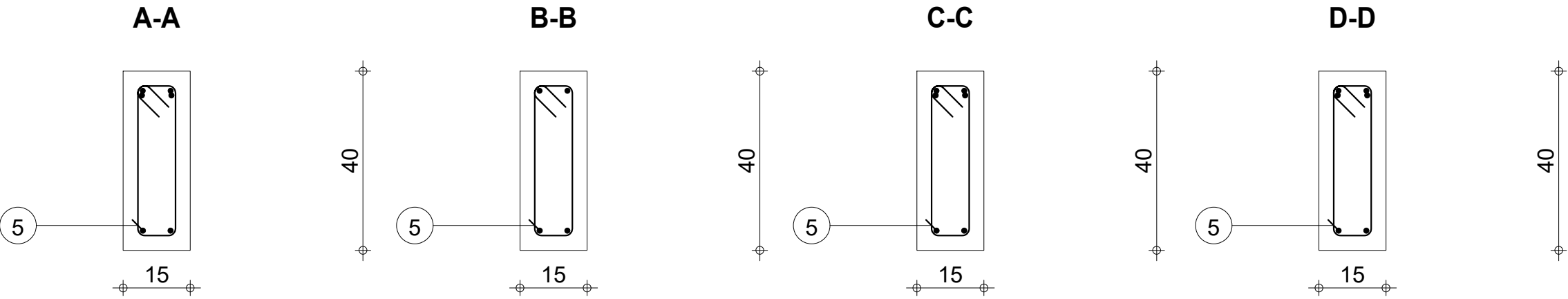
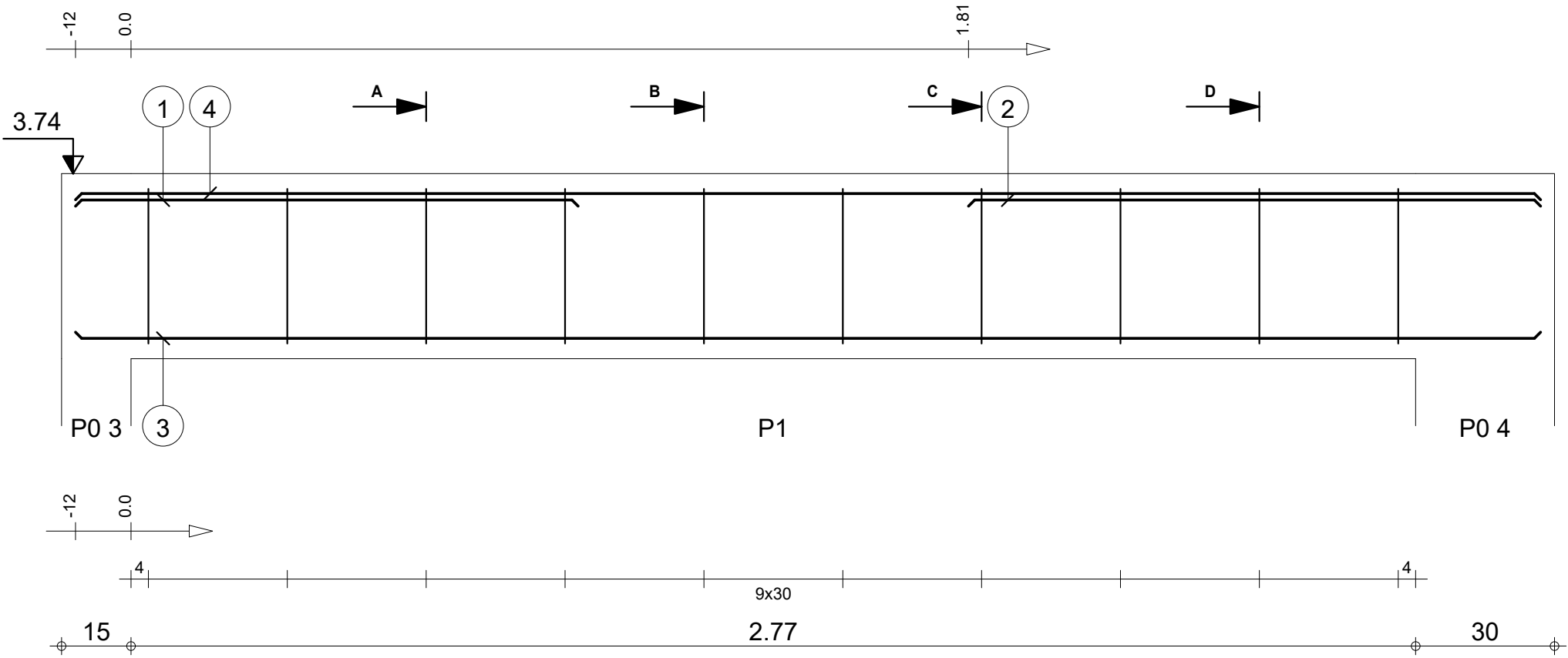


| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 2HA 12   | l=2.54 | 00   |  |
| ②    | 2HA 12   | l=2.73 | 00   |  |
| ③    | 8HA 6    | l=98   | 31   |  |



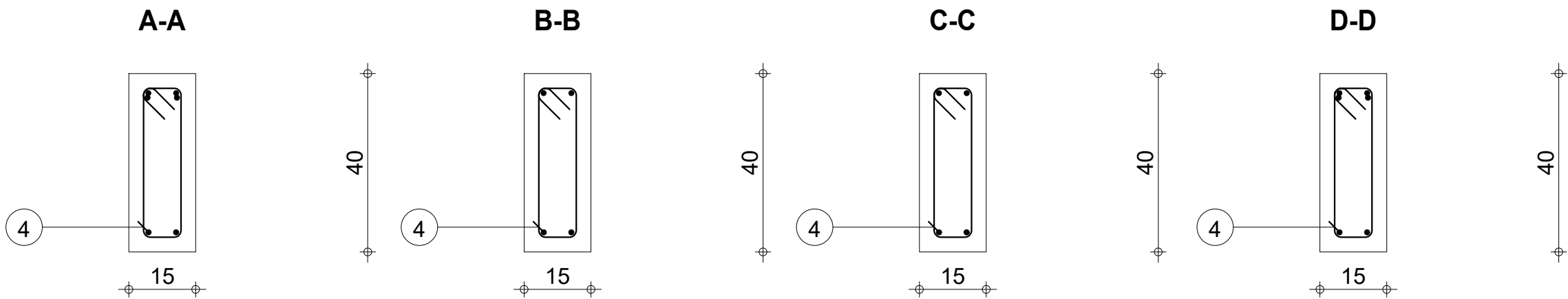
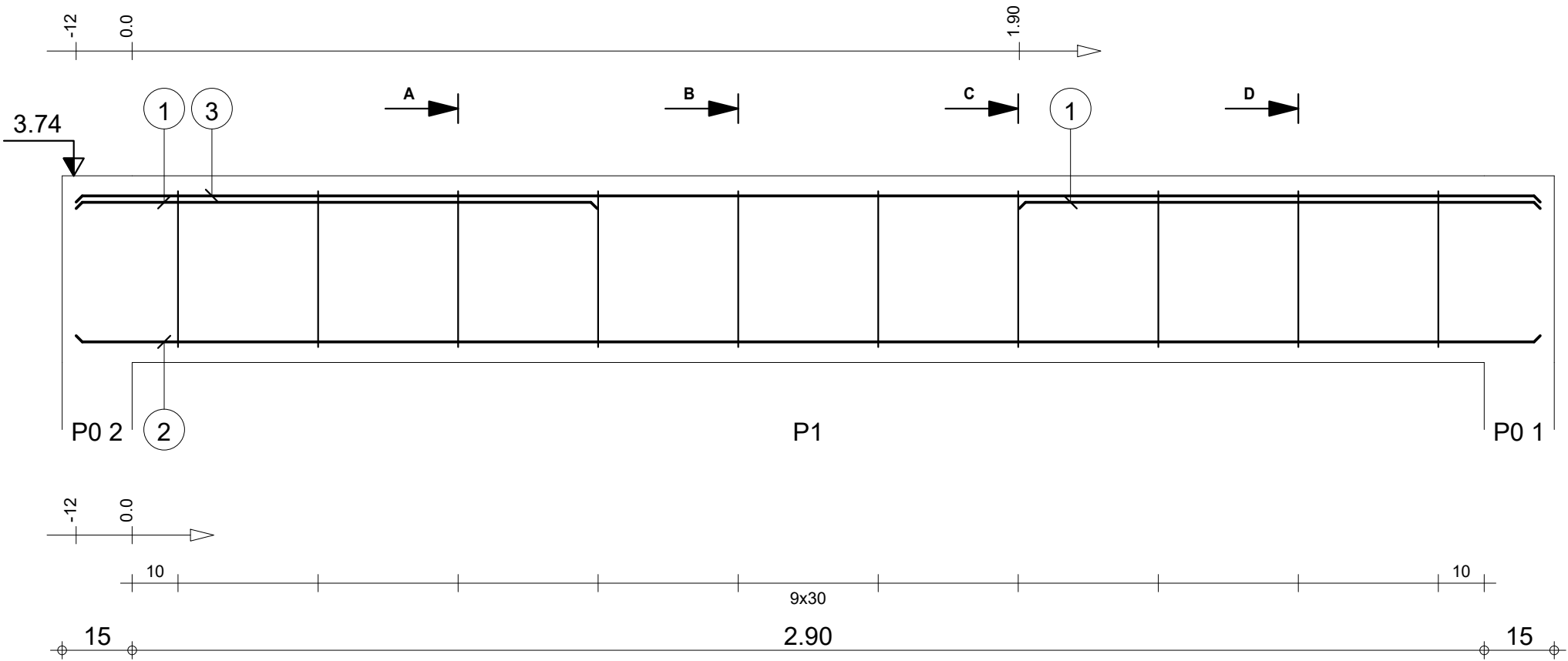
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|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|----------------------------|----------|---------------------------------------------------|-----------------------------------------------------------------------------|
|                                                                                    |                                              | Tél.                              | Fax                        |          | Acier HA 400 = 9.36 kg                            |                                                                             |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         | Reprise de bétonnage : Non |          | Béton : BETON = 0.156 m3                          | Acier HA 400 = 1.74 kg                                                      |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 18 : P1<br><br>Section 15x40 |                            | Nombre 1 | Surface du coffrage = 2.55 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |
|                                                                                    |                                              |                                   |                            |          | Densité = 71.15 kg/ m3<br>Diamètre moyen = 9.44mm | Echelle pour la vue 9.73cm/m<br>Echelle pour la section 8.56cm/m            |
|                                                                                    |                                              |                                   |                            |          | Page 13/29                                        |                                                                             |

| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 2HA 12   | l=1.09 | 00   | 1.09                                                                                |
| ②    | 2HA 12   | l=1.24 | 00   | 1.24                                                                                |
| ③    | 2HA 12   | l=3.17 | 00   | 3.17                                                                                |
| ④    | 2HA 10   | l=3.17 | 00   | 3.17                                                                                |
| ⑤    | 10HA 6   | l=98   | 31   |  |

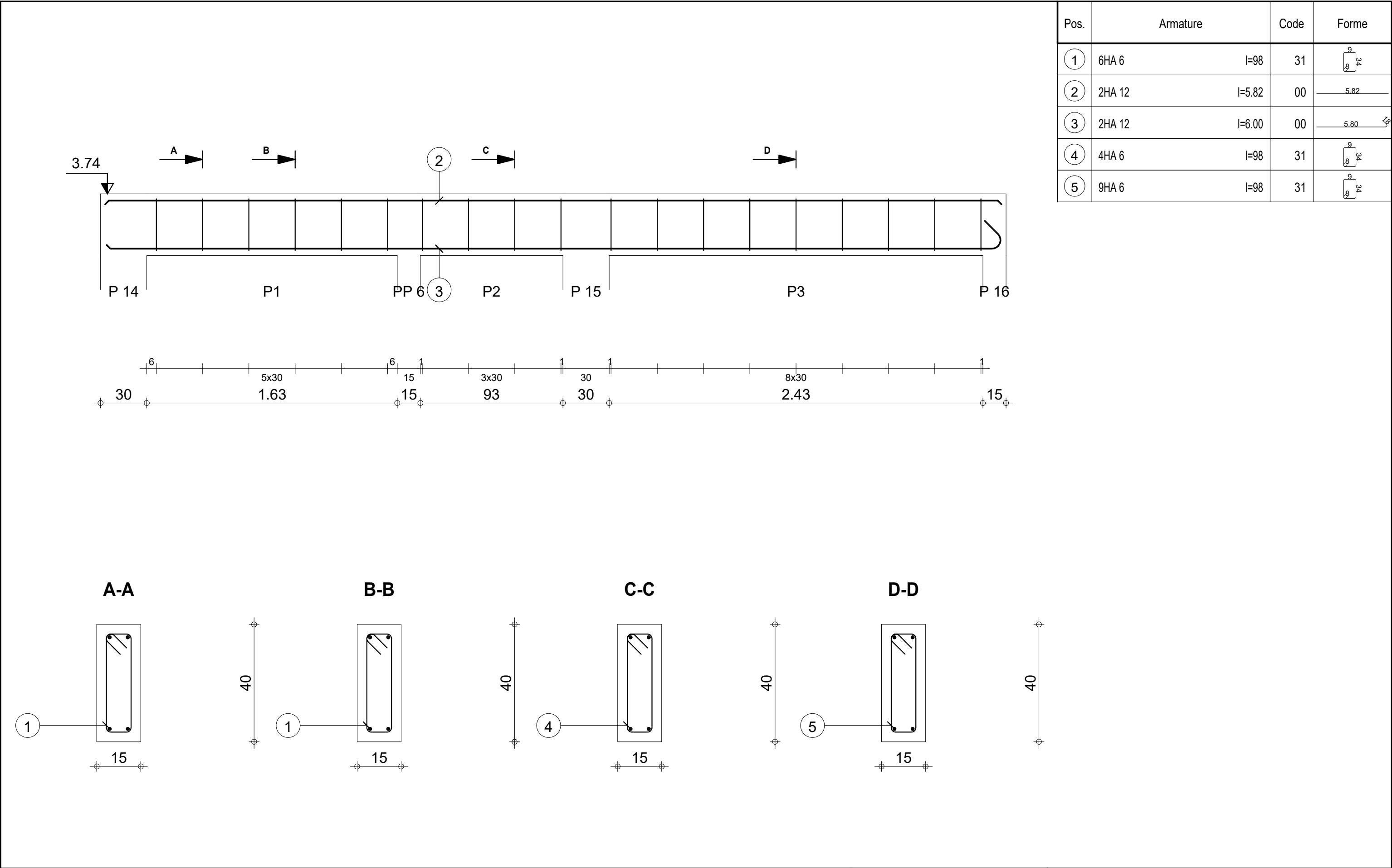


|                                                                                    |                                              |                                   |     |                            |                                                      |                                  |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|------------------------------------------------------|----------------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 13.6 kg                               |                                  |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                      | Béton : BETON = 0.194 m3         |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_CH0 2 : P1<br><br>Section 15x40 |     | Nombre 1                   | Acier HA 400 = 2.17 kg                               |                                  |
|                                                                                    |                                              |                                   |     |                            | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |                                  |
|                                                                                    |                                              |                                   |     |                            | Enrobage latéral 3 cm                                |                                  |
|                                                                                    |                                              |                                   |     |                            | Densité = 81.44 kg/ m3                               | Echelle pour la vue 7.95cm/m     |
|                                                                                    |                                              |                                   |     |                            | Diamètre moyen = 9.37mm                              | Echelle pour la section 8.56cm/m |
|                                                                                    |                                              |                                   |     |                            |                                                      | Page 14/29                       |

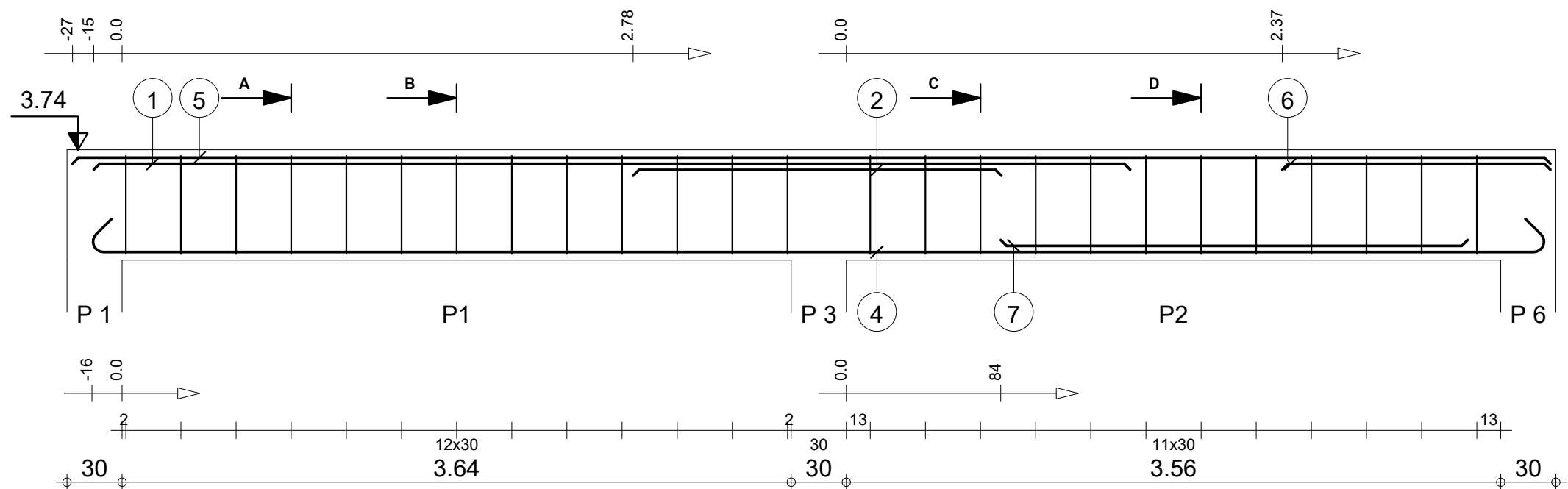
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.12 | 00   | 1.12                                                                                |
| ②    | 2HA 12   | l=3.14 | 00   | 3.14                                                                                |
| ③    | 2HA 10   | l=3.14 | 00   | 3.14                                                                                |
| ④    | 10HA 6   | l=98   | 31   |  |



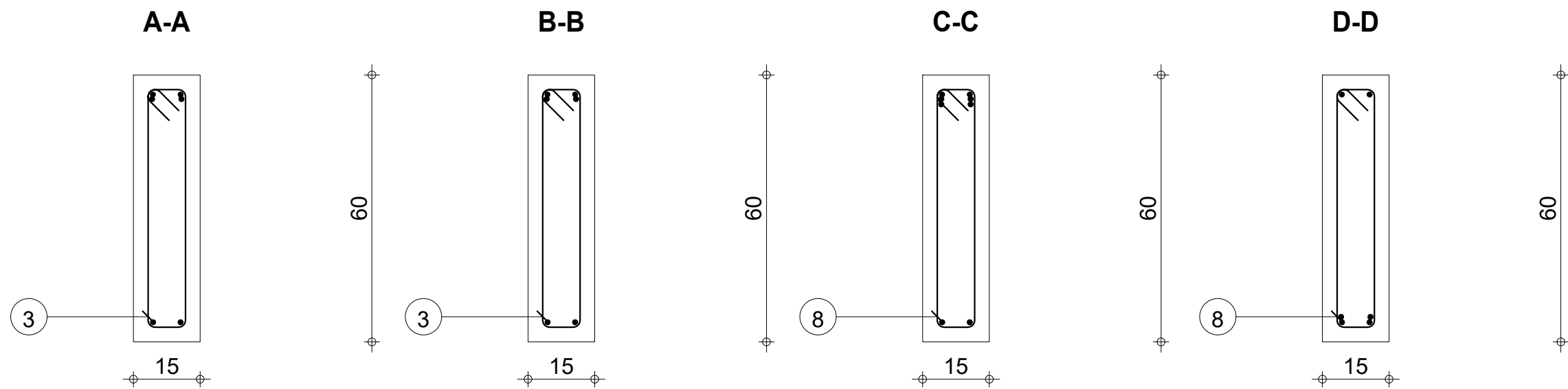
|                                                                                    |                                              |                                   |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                              | Fax                        |                                                   | Acier HA 400 = 13.4 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.192 m3                                                    | Acier HA 400 = 2.17 kg |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_CH0 1 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 3.11 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                   |                            | Densité = 81.25 kg/ m3<br>Diamètre moyen = 9.34mm | Echelle pour la vue 8.01cm/m<br>Echelle pour la section 8.56cm/m            | Page 15/29             |

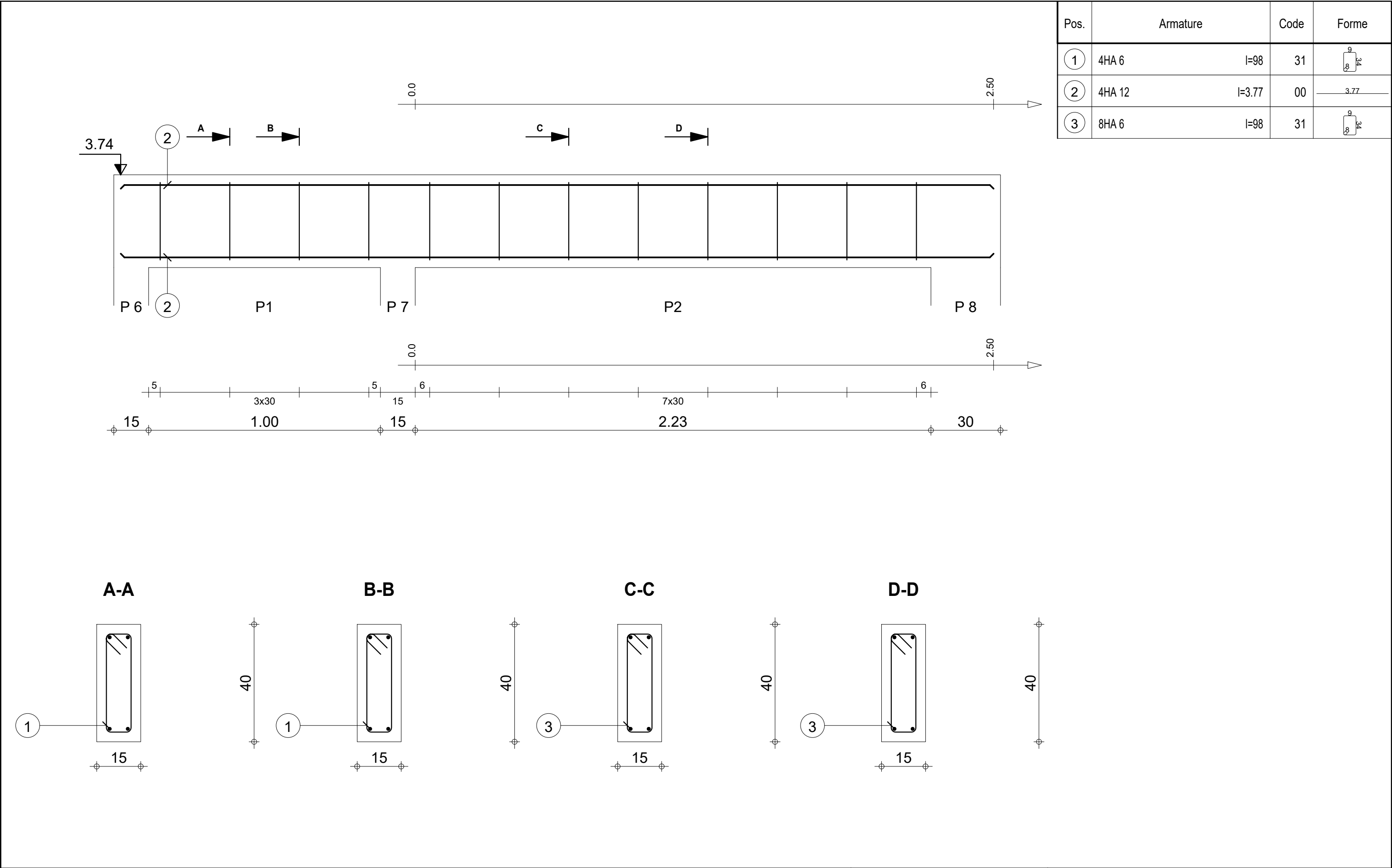


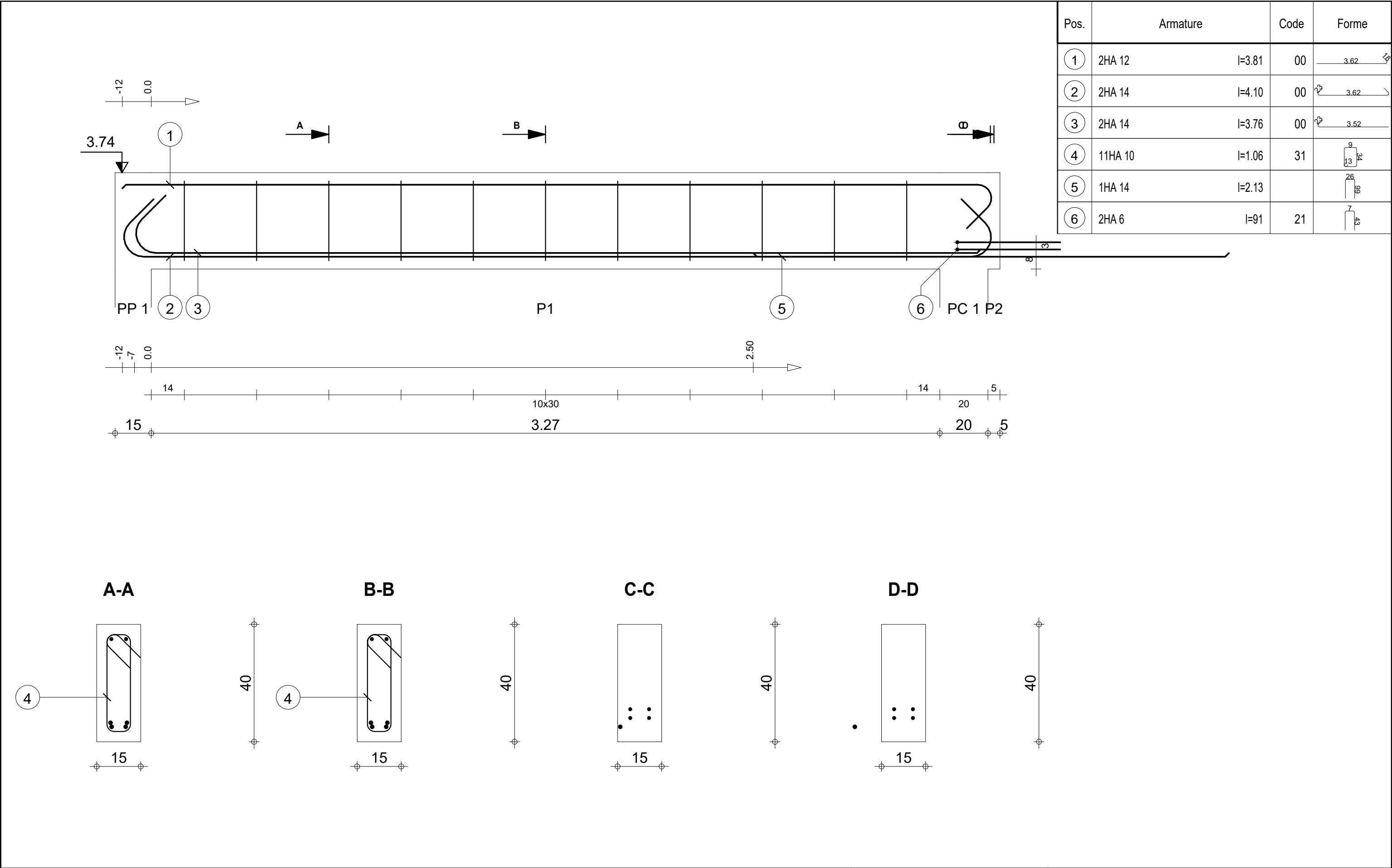
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 6HA 6    | l=98   | 31   |       |
| ②    | 2HA 12   | l=5.82 | 00   |       |
| ③    | 2HA 12   | l=6.00 | 00   |       |
| ④    | 4HA 6    | l=98   | 31   |       |
| ⑤    | 9HA 6    | l=98   | 31   |       |

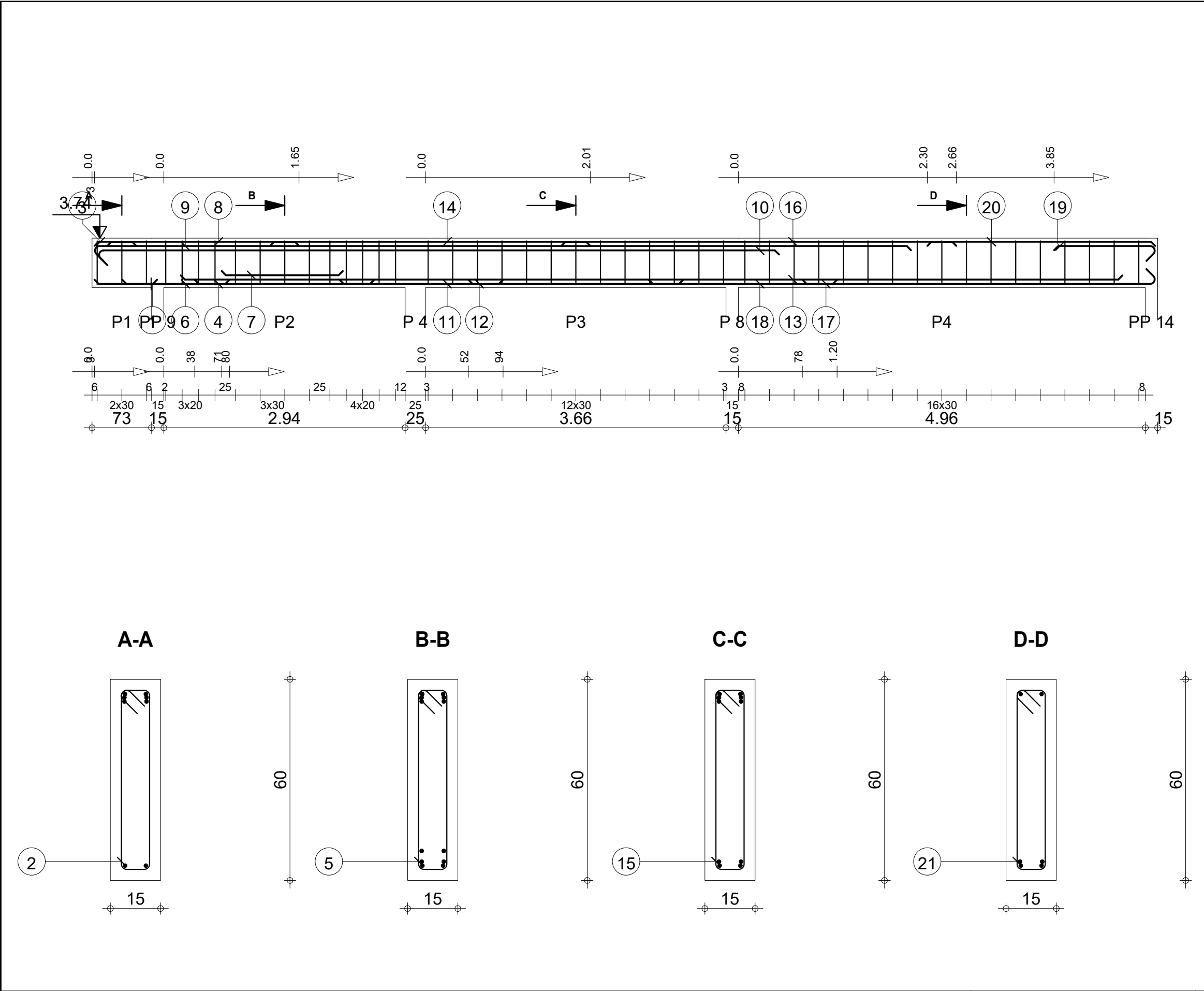


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=5.64 | 00   | 5.64  |
| ②    | 2HA 12   | l=2.00 | 00   | 2.00  |
| ③    | 13HA 6   | l=1.38 | 31   |       |
| ④    | 2HA 12   | l=8.29 | 00   | 7.91  |
| ⑤    | 2HA 10   | l=8.04 | 00   | 8.04  |
| ⑥    | 2HA 12   | l=1.46 | 00   | 1.46  |
| ⑦    | 2HA 12   | l=2.54 | 00   | 2.54  |
| ⑧    | 12HA 6   | l=1.38 | 31   |       |

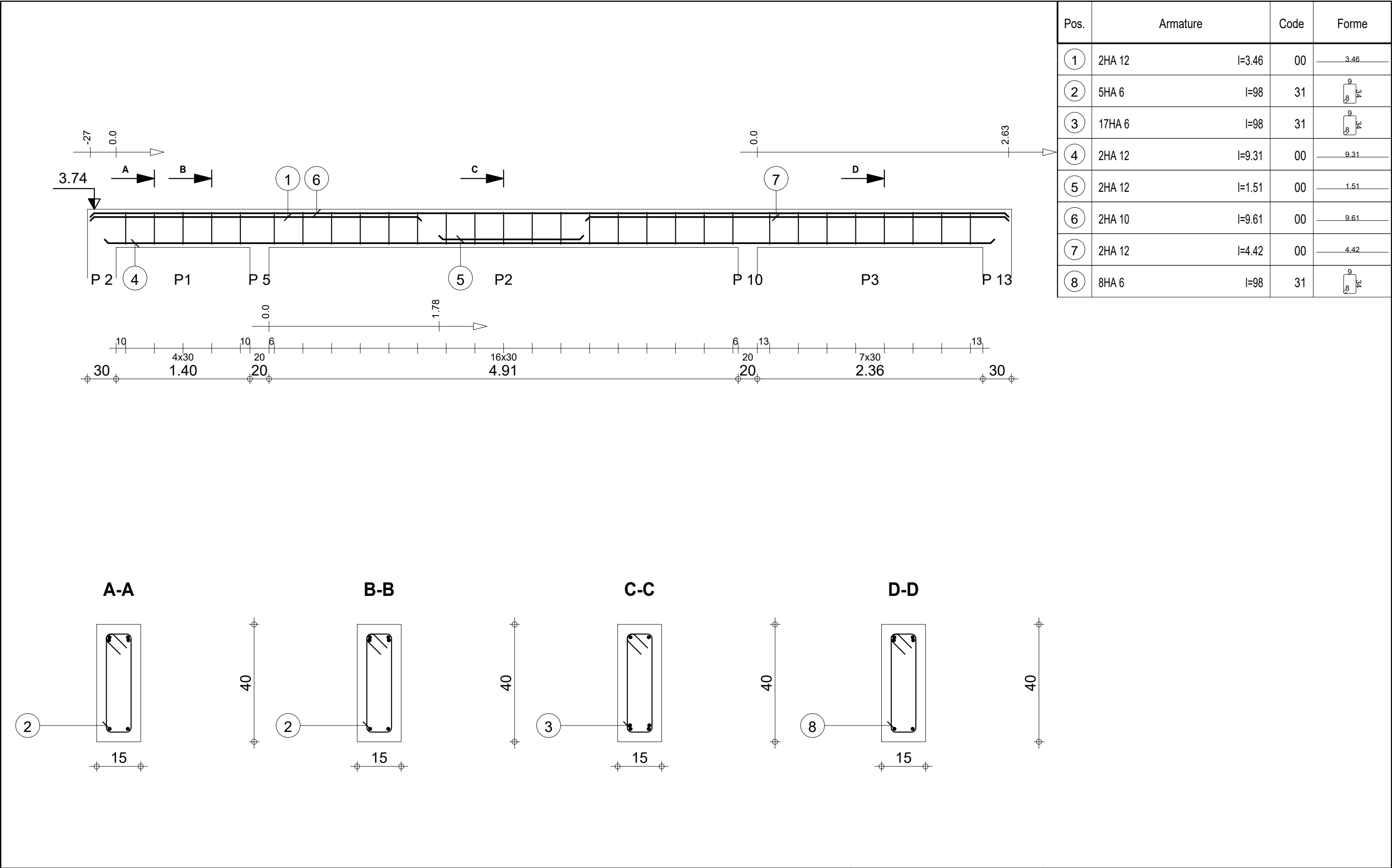


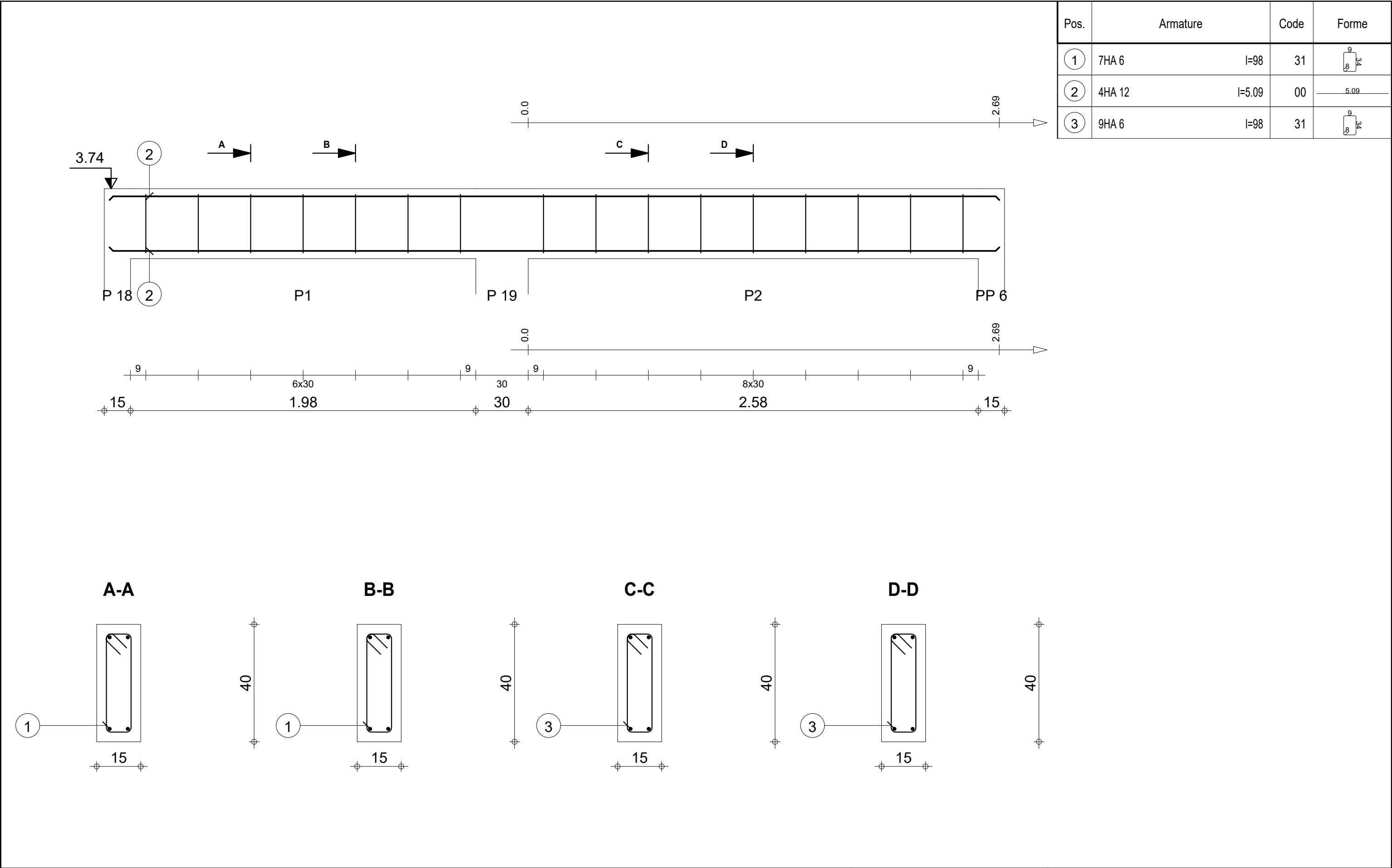




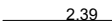


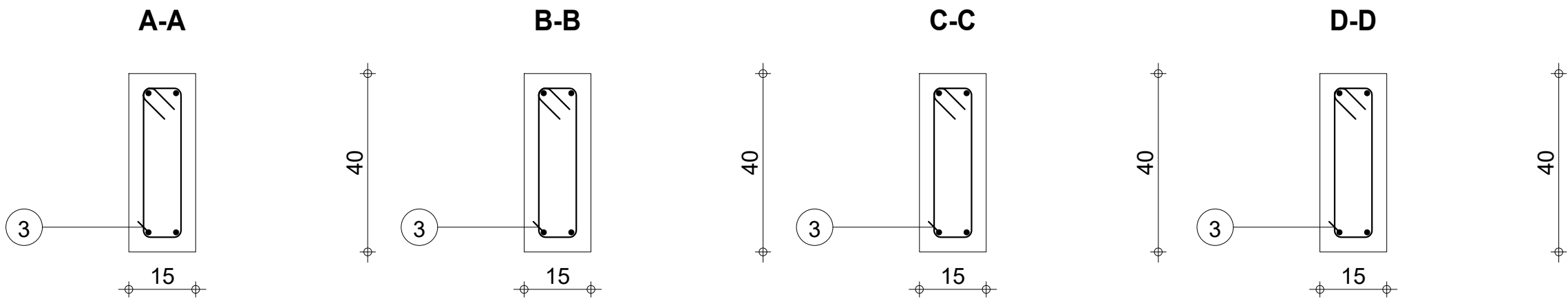
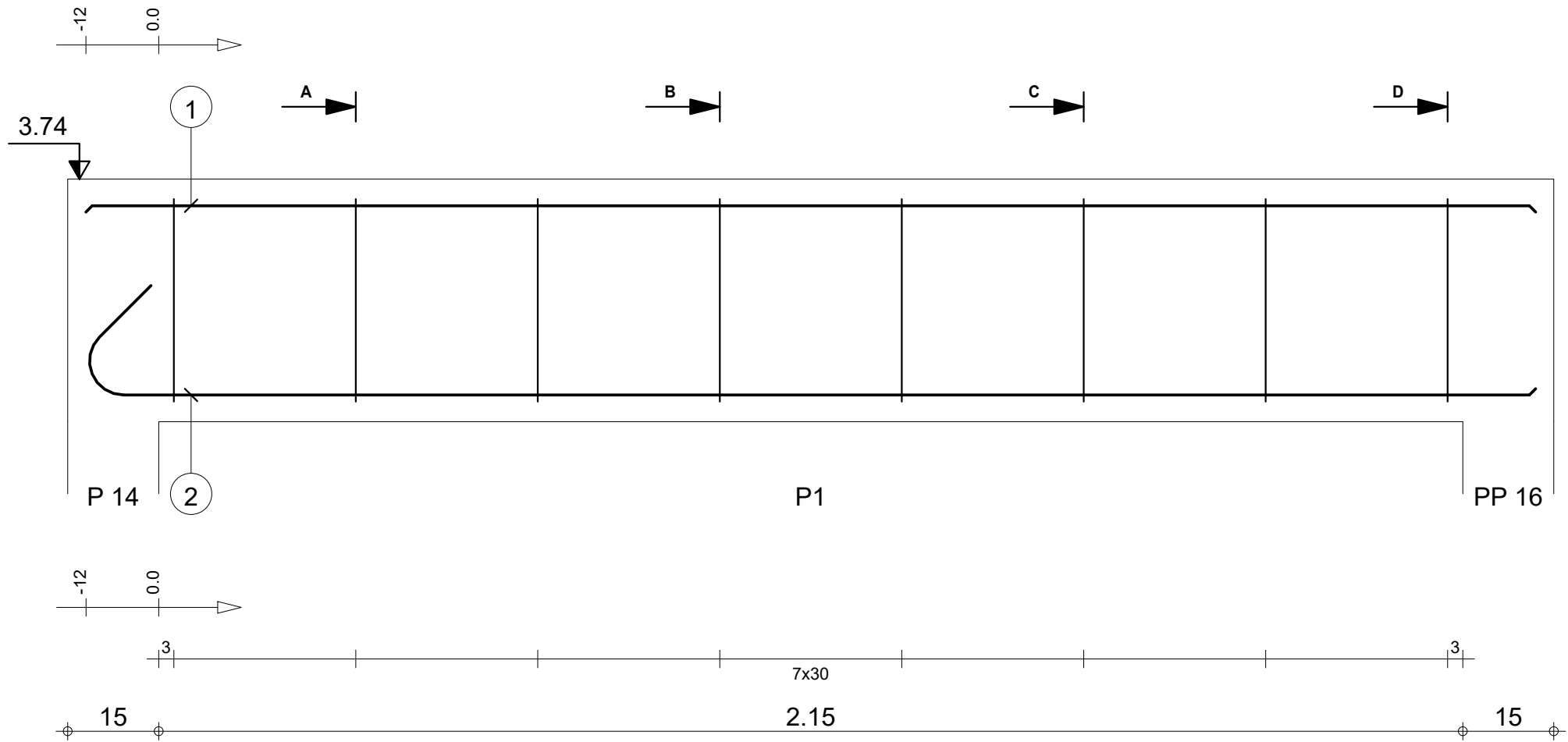
| Pos. | Armature |         | Code | Forme |
|------|----------|---------|------|-------|
| ①    | 2HA 12   | l=76    | 00   | 76    |
| ②    | 3HA 6    | l=1.38  | 31   |       |
| ③    | 2HA 10   | l=51    | 00   | 51    |
| ④    | 2HA 12   | l=2.19  | 00   | 2.19  |
| ⑤    | 13HA 6   | l=1.38  | 31   |       |
| ⑥    | 2HA 12   | l=1.31  | 00   | 1.31  |
| ⑦    | 2HA 12   | l=1.48  | 00   | 1.48  |
| ⑧    | 2HA 10   | l=2.34  | 00   | 2.34  |
| ⑨    | 2HA 12   | l=10.14 | 00   |       |
| ⑩    | 2HA 12   | l=8.48  | 00   |       |
| ⑪    | 2HA 12   | l=1.99  | 00   | 1.99  |
| ⑫    | 2HA 12   | l=2.62  | 00   | 2.62  |
| ⑬    | 2HA 12   | l=11.48 | 00   | 11.48 |
| ⑭    | 2HA 10   | l=3.90  | 00   | 3.90  |
| ⑮    | 13HA 6   | l=1.38  | 31   |       |
| ⑯    | 2HA 10   | l=4.81  | 00   | 4.81  |
| ⑰    | 2HA 12   | l=4.49  | 00   | 4.30  |
| ⑱    | 2HA 12   | l=2.30  | 00   | 2.30  |
| ⑲    | 2HA 12   | l=1.42  | 00   | 1.23  |
| ⑳    | 2HA 10   | l=2.78  | 00   | 2.78  |
| ㉑    | 17HA 6   | l=1.38  | 31   |       |



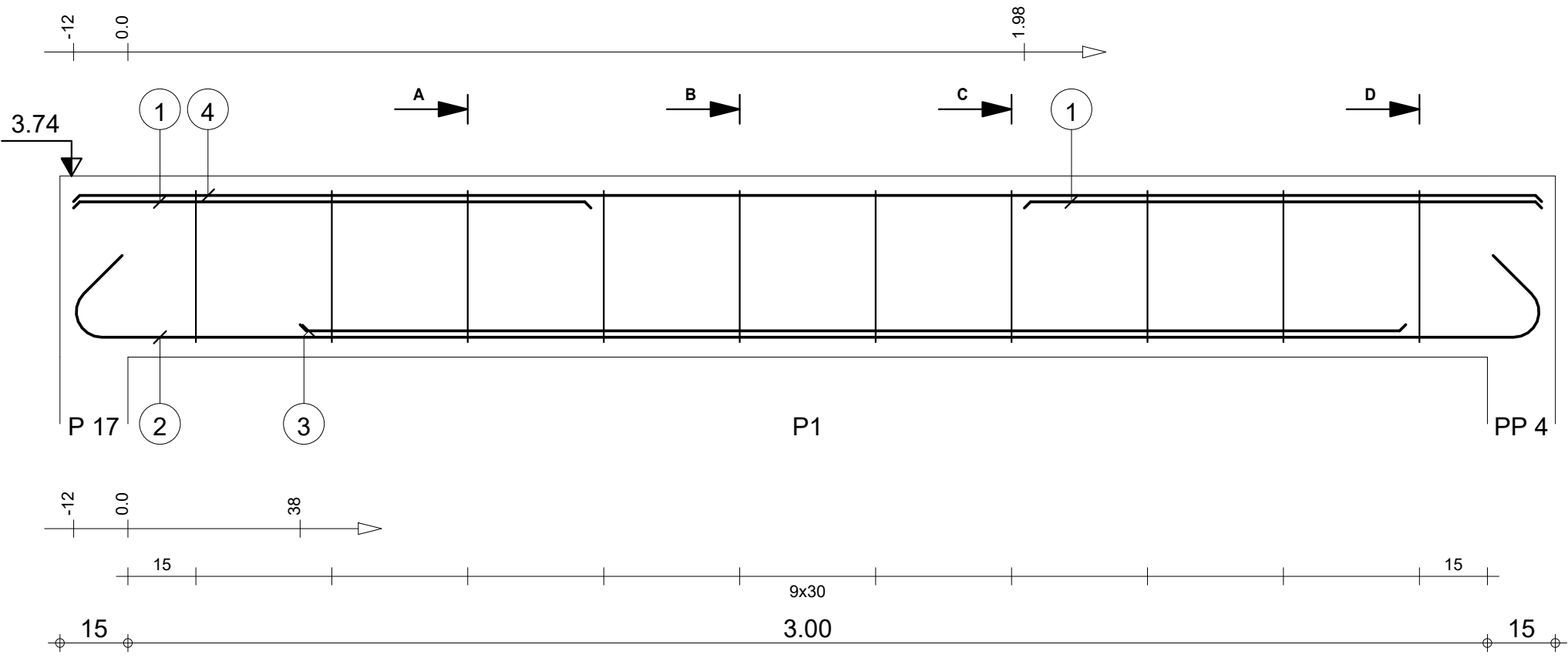


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 7HA 6    | l=98   | 31   |       |
| ②    | 4HA 12   | l=5.09 | 00   |       |
| ③    | 9HA 6    | l=98   | 31   |       |

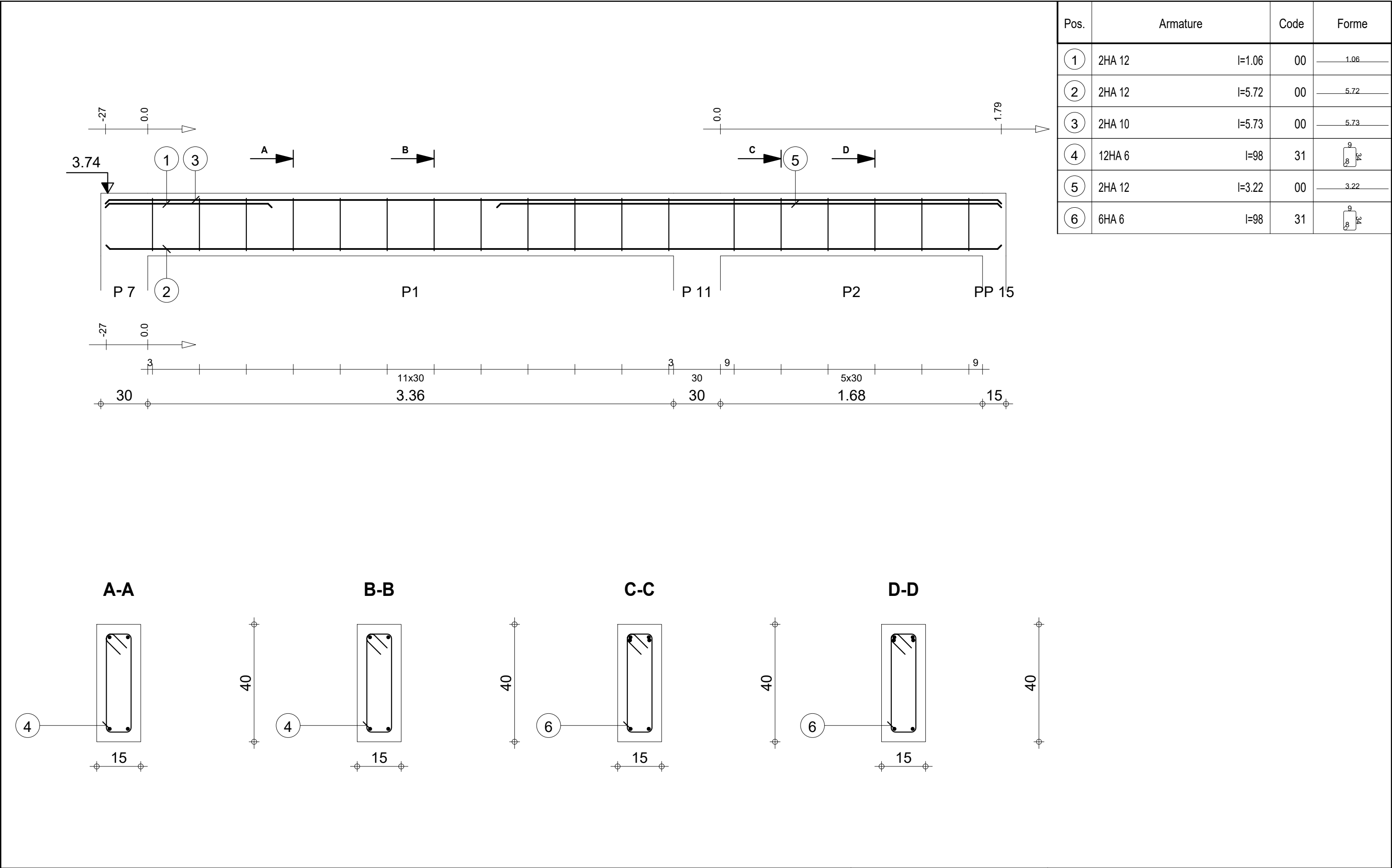
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 2HA 12   | l=2.39 | 00   |  |
| ②    | 2HA 12   | l=2.58 | 00   |  |
| ③    | 8HA 6    | l=98   | 31   |  |



|                                                                                    |                                          |                              |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|------------------------------------------|------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                          | Tél.                         | Fax                        |                                                   | Acier HA 400 = 8.82 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                          | Fissuration préjudiciable    | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.147 m3                                                    | Acier HA 400 = 1.74 kg |
|  | RDC<br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 4 : P1<br>Section 15x40 | Nombre 1                   | Surface du coffrage = 2.4 m2                      | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                          |                              |                            | Densité = 72.11 kg/ m3<br>Diamètre moyen = 9.36mm | Echelle pour la vue 10.3cm/m<br>Echelle pour la section 8.56cm/m            | Page 23/29             |



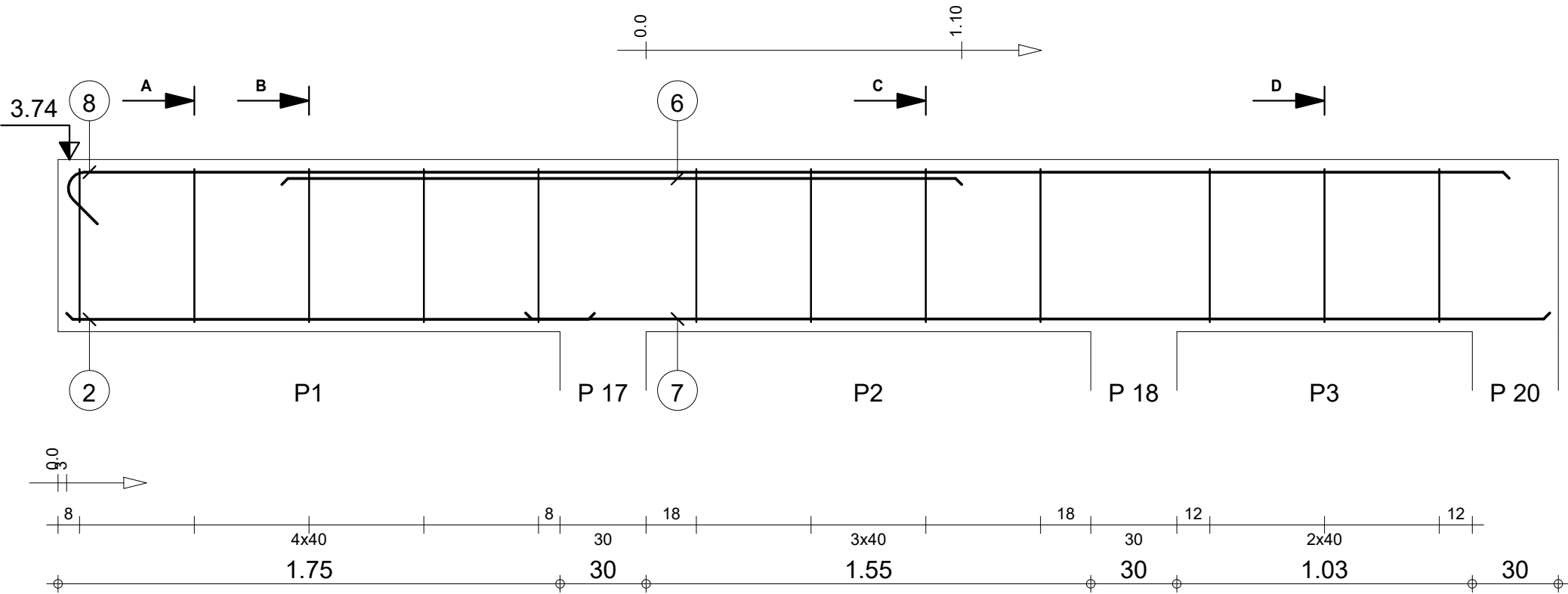
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.14 | 00   | 1.14  |
| ②    | 2HA 12   | l=3.62 | 00   | 3.24  |
| ③    | 2HA 12   | l=2.44 | 00   | 2.44  |
| ④    | 2HA 10   | l=3.24 | 00   | 3.24  |
| ⑤    | 10HA 6   | l=98   | 31   | 98    |



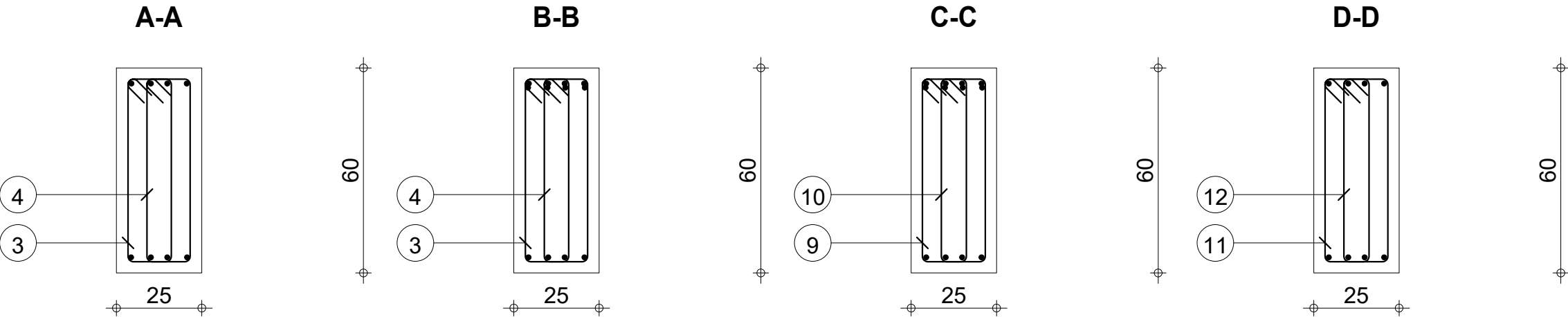
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.06 | 00   | 1.06  |
| ②    | 2HA 12   | l=5.72 | 00   | 5.72  |
| ③    | 2HA 10   | l=5.73 | 00   | 5.73  |
| ④    | 12HA 6   | l=98   | 31   |       |
| ⑤    | 2HA 12   | l=3.22 | 00   | 3.22  |
| ⑥    | 6HA 6    | l=98   | 31   |       |

|                                                                                    |                                              |                             |                            |                                                   |                                                                  |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------|----------------------------|---------------------------------------------------|------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                        | Fax                        |                                                   | Acier HA 400 = 24.8 kg                                           |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable   | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.347 m3                                         | Acier HA 400 = 3.91 kg |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 2_PP 3<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 5.5 m2                      | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |                        |
|                                                                                    |                                              |                             |                            | Densité = 82.71 kg/ m3<br>Diamètre moyen = 9.38mm | Echelle pour la vue 4.57cm/m<br>Echelle pour la section 8.56cm/m | Page 25/29             |



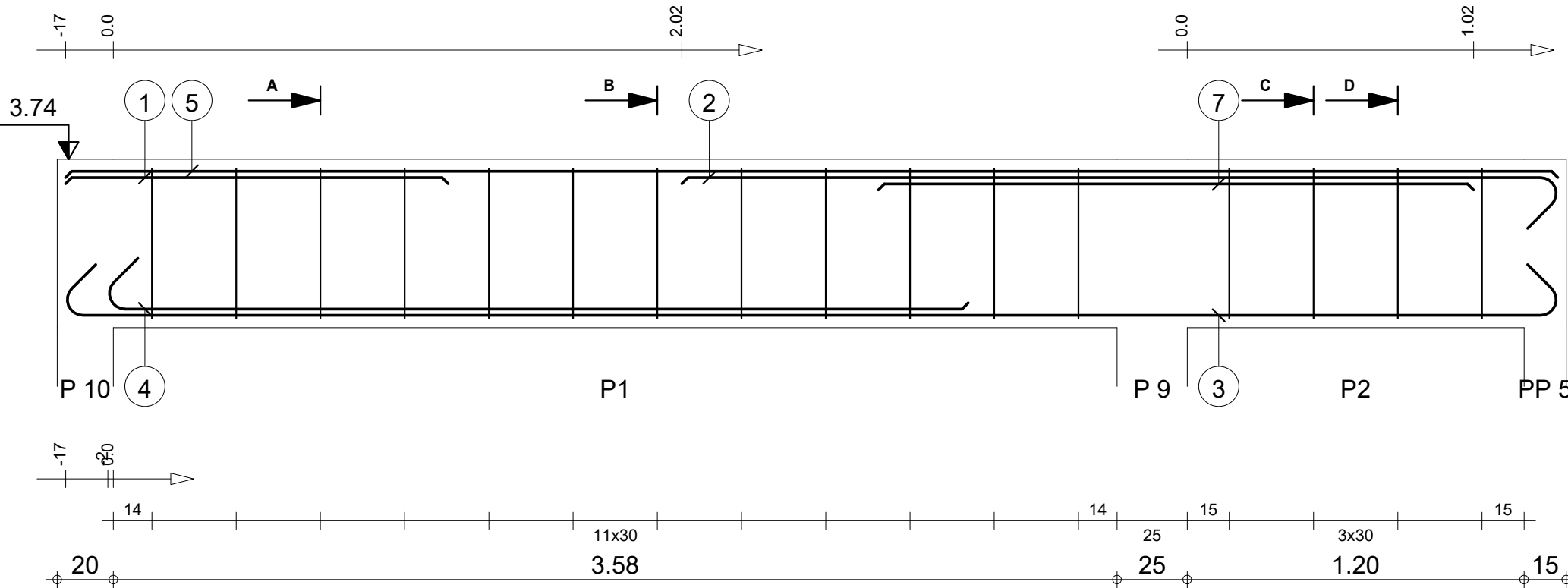


| Pos. | Armature |         | Code | Forme   |
|------|----------|---------|------|---------|
| 2    | 4HA 10   | l=1.84  | 00   | 1.84    |
| 3    | 5HA 6    | l=1.58* | 31   | 19 54 8 |
| 4    | 5HA 6    | l=1.35* | 31   | 8 54 8  |
| 6    | 4HA 12   | l=2.37  | 00   | 2.37    |
| 7    | 4HA 12   | l=3.57  | 00   | 3.57    |
| 8    | 4HA 12   | l=5.22  | 00   | 5.03    |
| 9    | 4HA 6    | l=1.58  | 31   | 19 54 8 |
| 10   | 4HA 6    | l=1.36  | 31   | 8 54 8  |
| 11   | 3HA 6    | l=1.58  | 31   | 19 54 8 |
| 12   | 3HA 6    | l=1.36  | 31   | 8 54 8  |

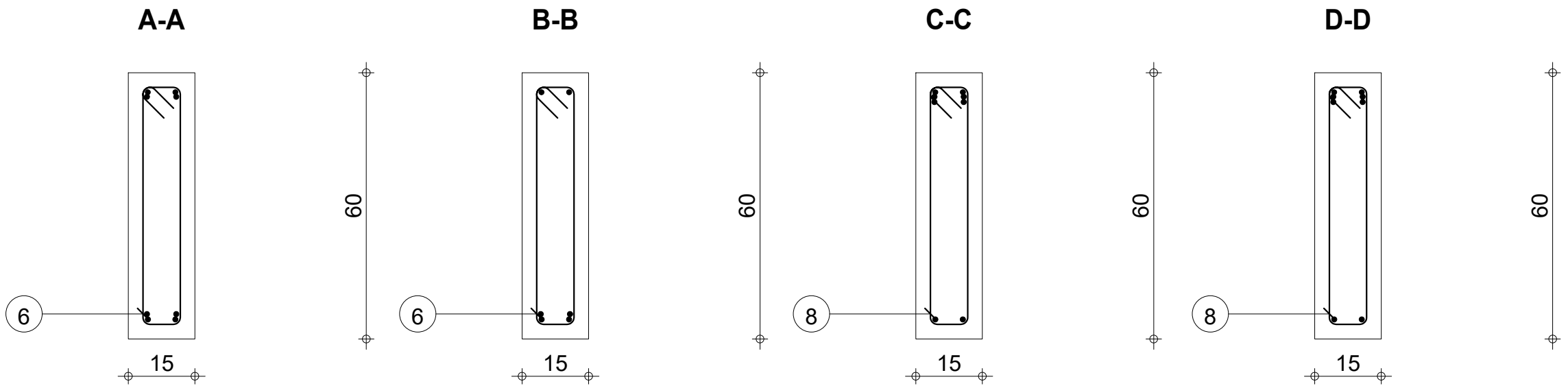


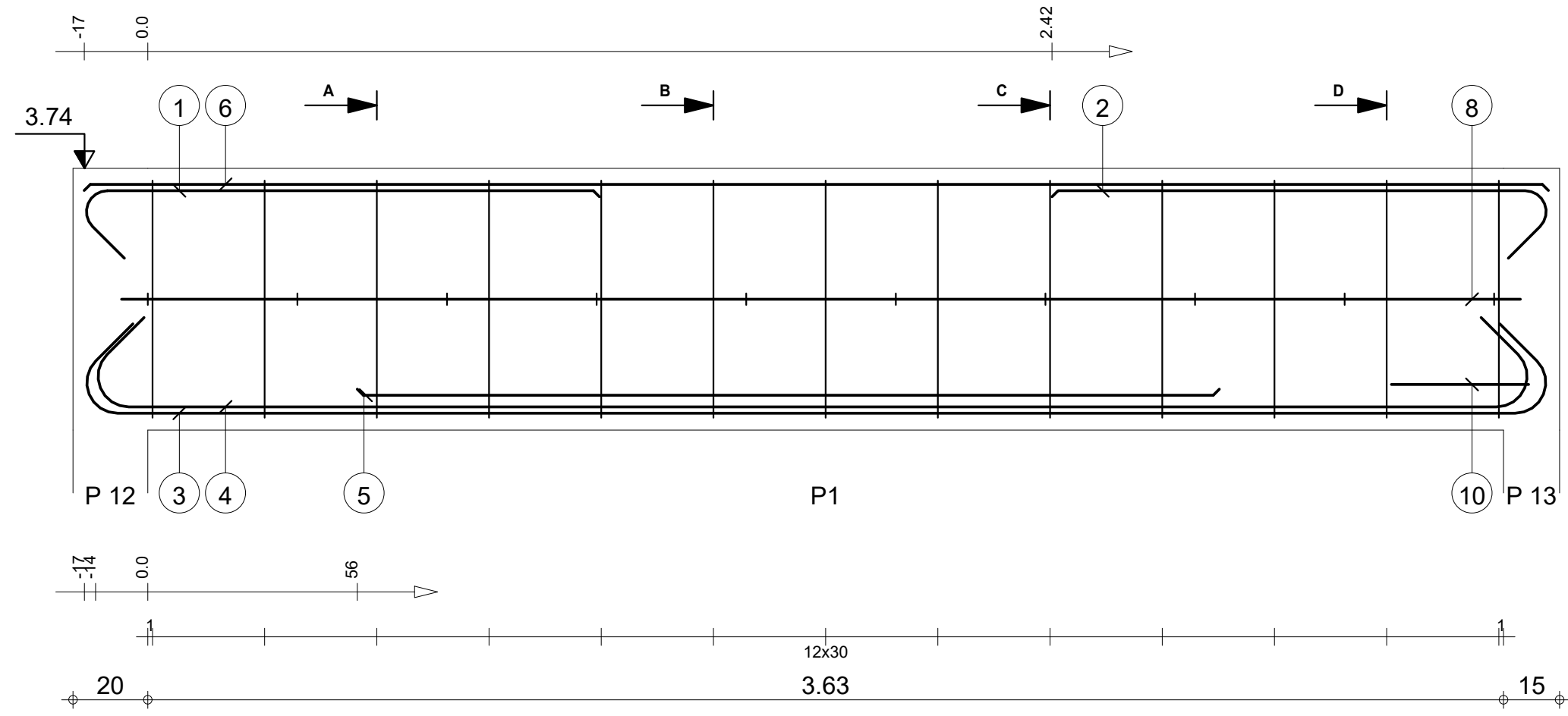
|                                                                                    |                                              |                           |                             |                            |          |                                                   |  |                                                                  |  |
|------------------------------------------------------------------------------------|----------------------------------------------|---------------------------|-----------------------------|----------------------------|----------|---------------------------------------------------|--|------------------------------------------------------------------|--|
|                                                                                    |                                              | Tél.                      |                             | Fax                        |          |                                                   |  | Acier HA 400 = 44.2 kg                                           |  |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable |                             | Reprise de bétonnage : Non |          | Béton : BETON = 0.784 m3                          |  | Acier HA 400 = 7.81 kg                                           |  |
|  | RDC<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN |                           | 2_PP 2<br><br>Section 25x60 |                            | Nombre 1 | Surface du coffrage = 7.66 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |  |
|                                                                                    |                                              |                           |                             |                            |          | Densité = 66.33 kg/ m3<br>Diamètre moyen = 9.41mm |  | Echelle pour la vue 5.03cm/m<br>Echelle pour la section 6.53cm/m |  |
|                                                                                    |                                              |                           |                             |                            |          |                                                   |  | Page 26/29                                                       |  |





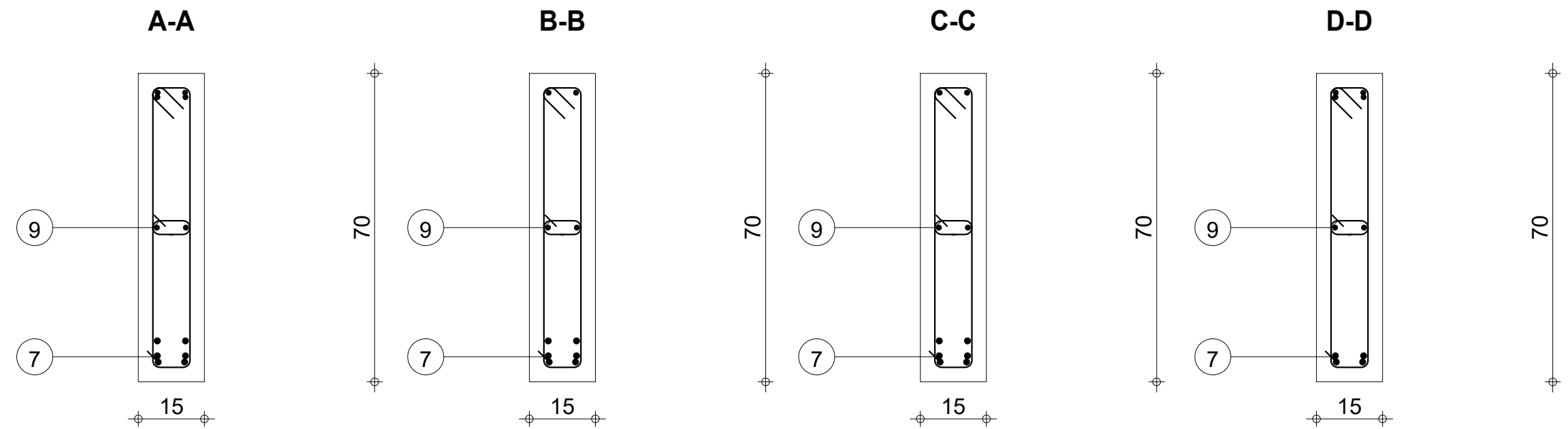
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.36 | 00   | 1.36  |
| ②    | 2HA 12   | l=3.31 | 00   | 3.12  |
| ③    | 2HA 12   | l=5.70 | 00   | 5.32  |
| ④    | 2HA 12   | l=3.25 | 00   | 3.07  |
| ⑤    | 2HA 10   | l=5.32 | 00   | 5.32  |
| ⑥    | 12HA 6   | l=1.38 | 31   |       |
| ⑦    | 2HA 12   | l=2.12 | 00   | 2.12  |
| ⑧    | 4HA 6    | l=1.38 | 31   |       |

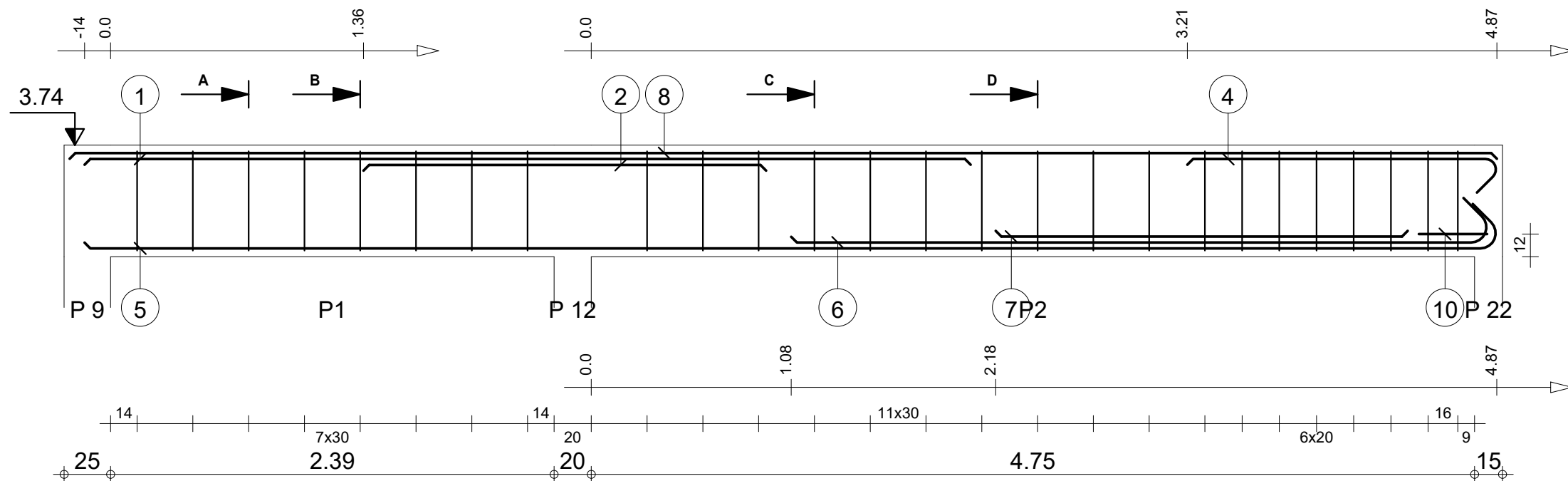




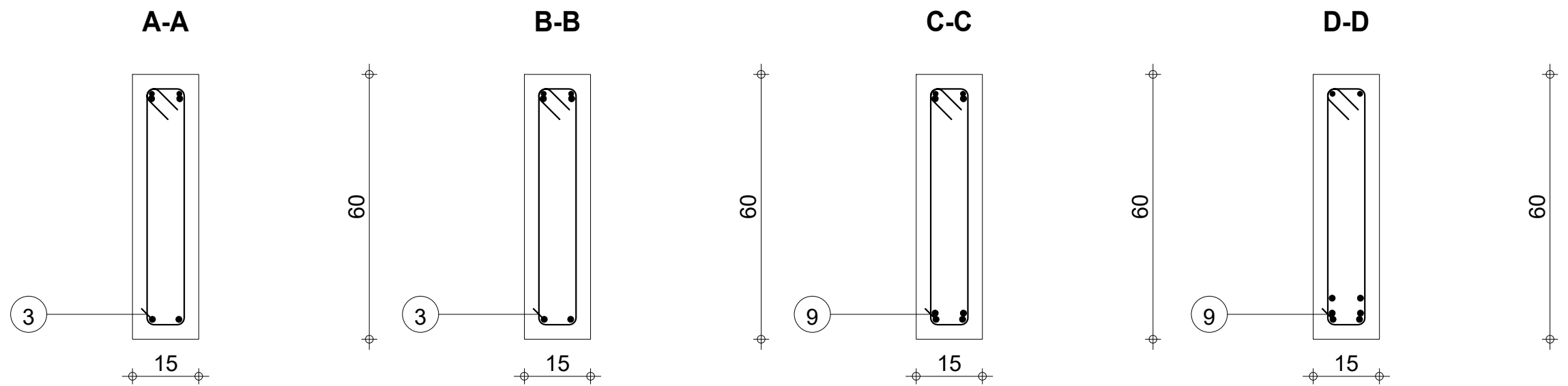
12

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.57 | 00   |       |
| ②    | 2HA 12   | l=1.52 | 00   |       |
| ③    | 2HA 14   | l=4.40 | 00   |       |
| ④    | 2HA 14   | l=4.32 | 00   |       |
| ⑤    | 2HA 14   | l=2.31 | 00   |       |
| ⑥    | 2HA 10   | l=3.92 | 00   |       |
| ⑦    | 13HA 6   | l=1.58 | 31   |       |
| ⑧    | 2HA 12   | l=3.74 | 00   |       |
| ⑨    | 10HA 6   | l=21   | 00   |       |
| ⑩    | 1HA 6    | l=79   | 21   |       |





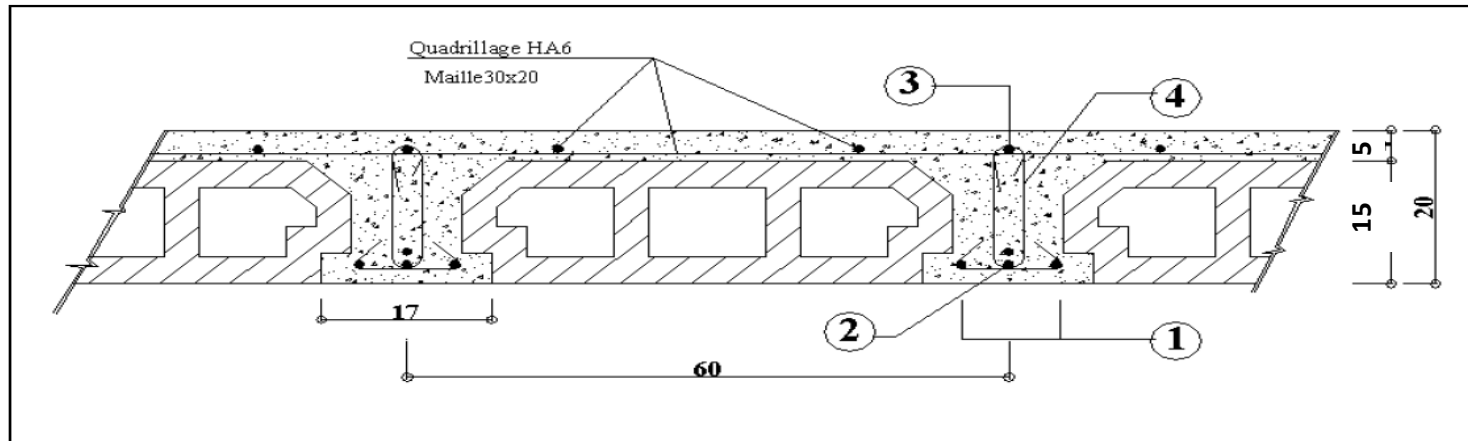
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 14   | l=4.76 | 00   | 4.77  |
| ②    | 2HA 14   | l=2.17 | 00   | 2.17  |
| ③    | 8HA 6    | l=1.38 | 31   |       |
| ④    | 2HA 12   | l=1.86 | 00   | 1.67  |
| ⑤    | 2HA 14   | l=7.84 | 00   | 7.60  |
| ⑥    | 2HA 14   | l=3.99 | 00   | 3.75  |
| ⑦    | 2HA 14   | l=2.21 | 00   | 2.22  |
| ⑧    | 2HA 10   | l=7.67 | 00   | 7.68  |
| ⑨    | 18HA 6   | l=1.38 | 31   |       |
| ⑩    | 1HA 6    | l=79   | 21   |       |



## **PROJET: DUO 2 TOGBIN R+2**

**PLANCHER HAUT:** ep= 20 cm

### **SCHEMA TYPE DES POUTRELLES**



### **TABLEAU DES POUTRELLES**

| NOMS | PORTEES<br>(cm) | COFFRAGES<br>(cm) | ARMATURES |        |        |            | CHAPEAUX |
|------|-----------------|-------------------|-----------|--------|--------|------------|----------|
|      |                 |                   | 1         | 2      | 3      | 4          |          |
| N1   | 510             | 480               | 2HA 14    | 1HA 06 | 1HA 06 | 1HA6(Ep=6) | HA 10    |
| N2   | 378             | 348               | 2HA 10    | 1HA 06 | 1HA 06 | 1HA6(Ep=6) | HA 10    |
| N3   | 260             | 230               | 2HA 08    | 1HA 06 | 1HA 06 | 1HA6(Ep=6) | HA 10    |
|      |                 |                   |           |        |        |            |          |

**NOTA:** Les coffrages correspondent aux arrêts de coulage du béton

Les portées correspondent aux longueurs de découpe des armatures

# Hypotheses de calcul

## Légends

-  Poteaux
-  Poutre
-  Mur de 15 Creux

1°) Règle: Bael91 modif 99

2°) Matériaux :

a°) Béton: dosé à 350kg/m<sup>3</sup>;  $f_{c28} = 25\text{MPa}$

b°) Acier:

\*  $f_e = 400\text{MPa}$

\* Fissuration Préjudiciable

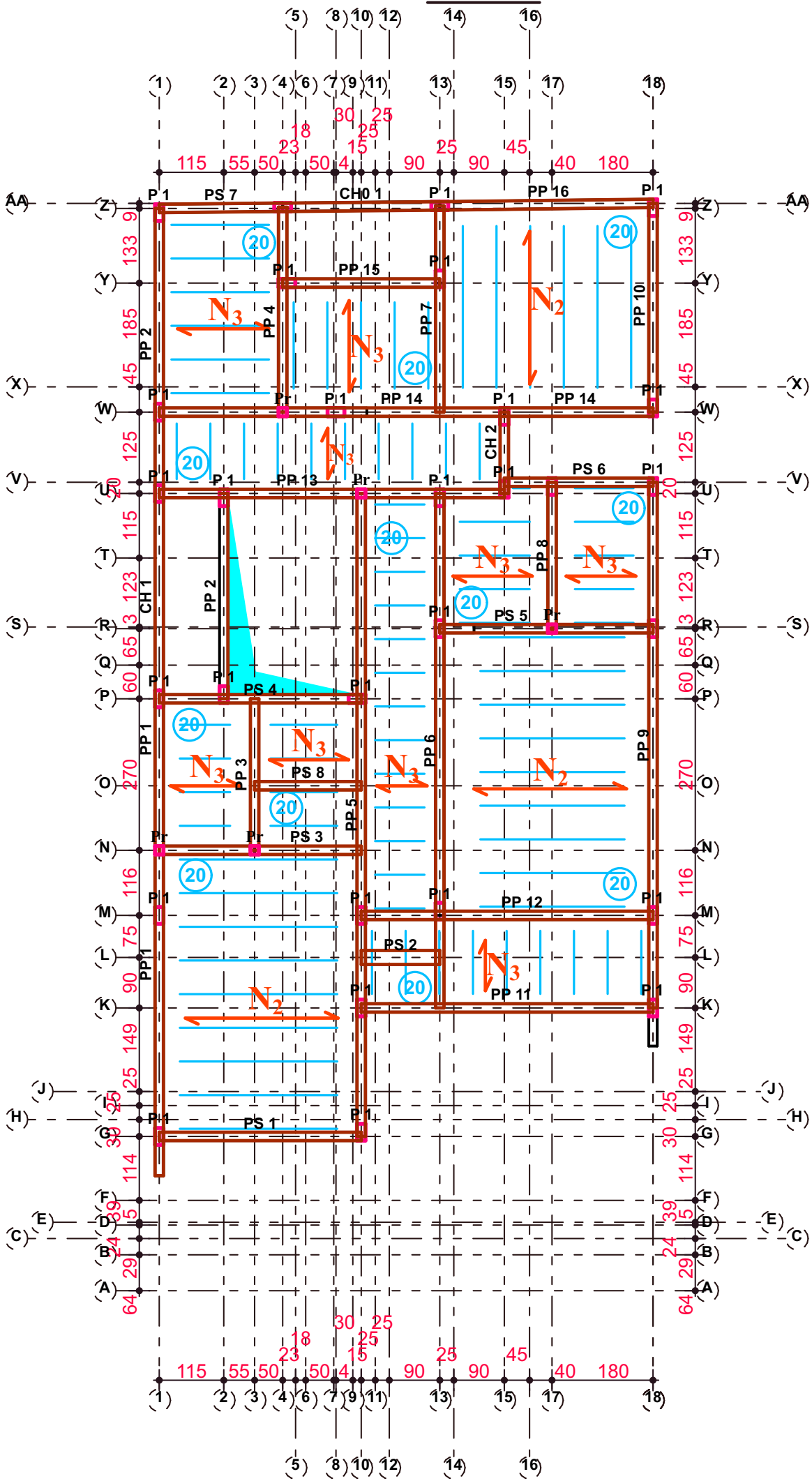
c°) Enrobage:

\* Poteau, Poutres : 3 cm

NB: -L'INGENIEUR DECLINE TOUTE RESPONSABILITE EN CAS  
DU NON RESPECT SCRUPULEUX DE LA STRUCTURE ET DU  
NON SUIVI CONTINU DES TRAVAUX  
PAR UN TECHNICIEN AGUERRI.

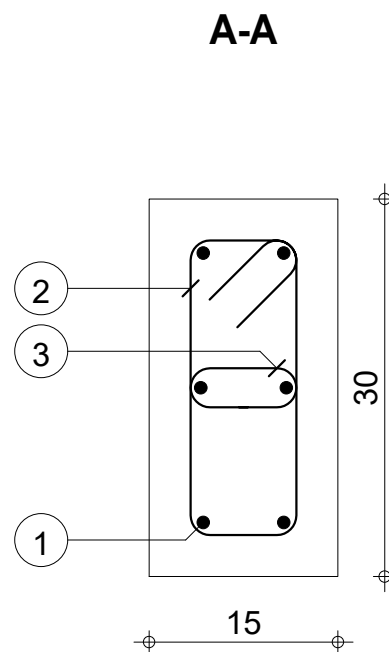
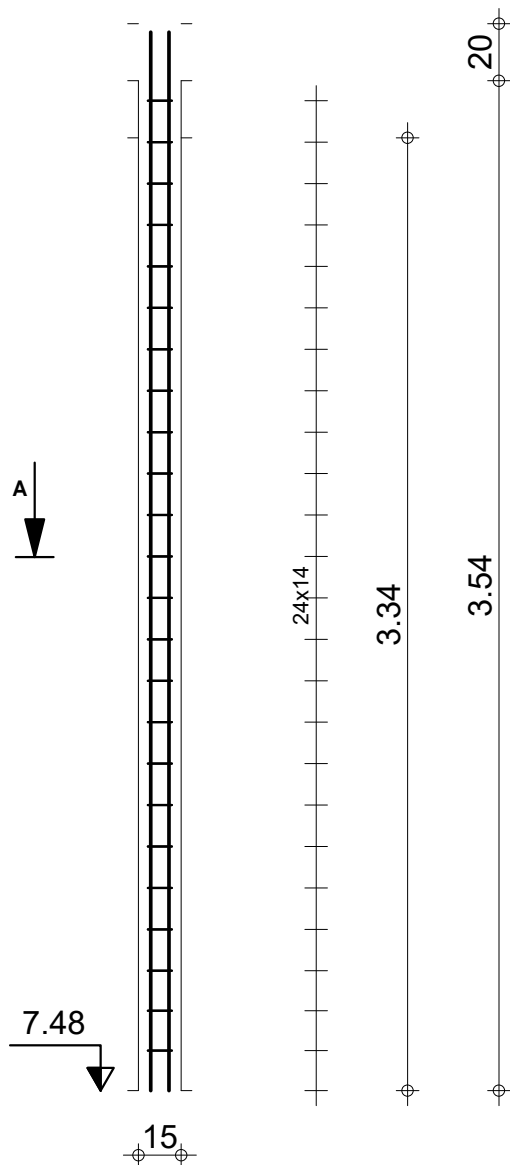
## CHAPEAUX

HA 10 x var  $\geq 200$



Plan de Poutraison N° 2  
(Couverture R + 1)

Ech: 1 / 100



| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=3.71 | 00   | 3.71  |
| ②    | 24HA 6 l=78   | 31   | 8 2   |
| ③    | 24HA 6 l=21   | 00   | 5 9   |

Tél.

Fax

Acier HA 400 = 13.7 kg

Béton : BETON = 0.15 m3

Acier HA 400 = 5.27 kg

Surface du coffrage = 3.01 m2

Enrobage 3 cm

Echelle pour la vue 3.78cm/m

Echelle pour la section 16.7cm/m

Page 1/1



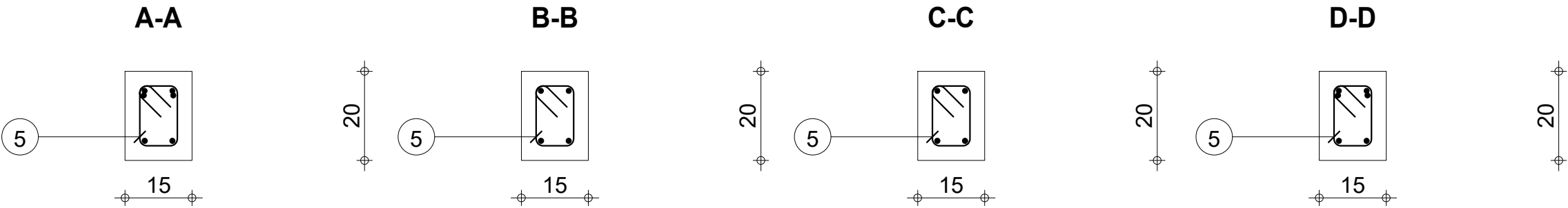
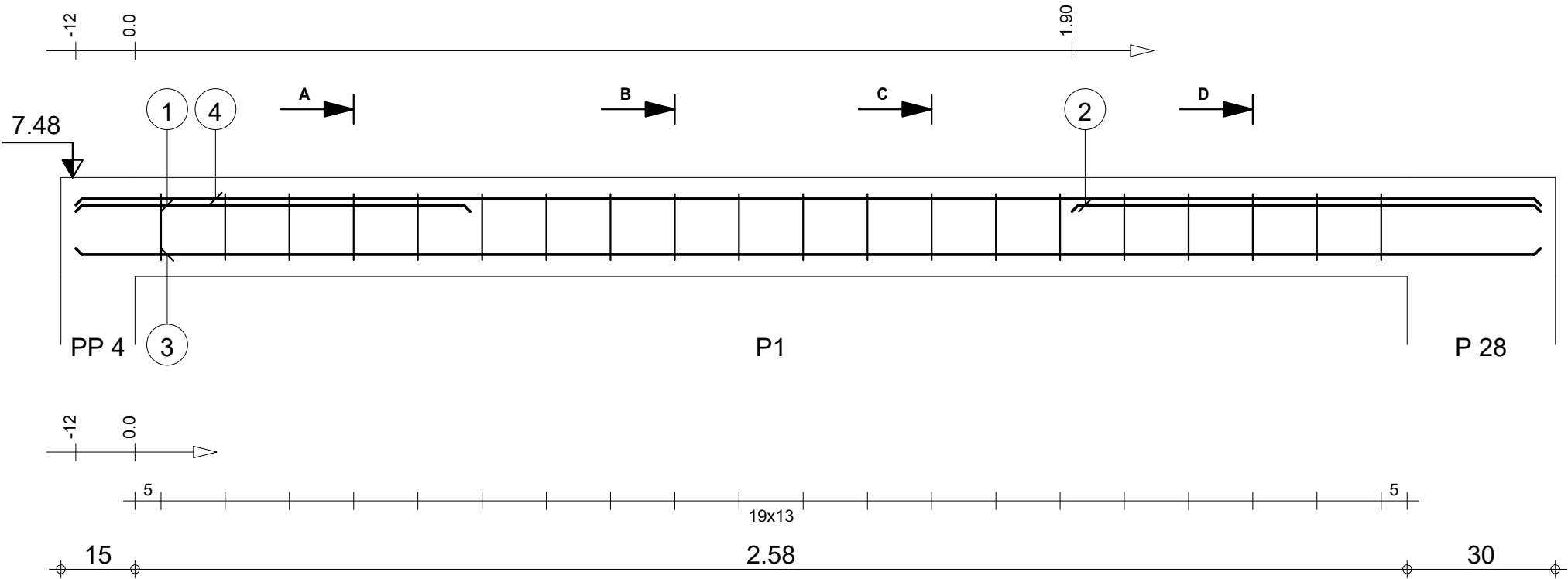
R+1

DETAILS DE STRUCTURE DUO 2 TOGBIN

3\_P 1

Section 15x30

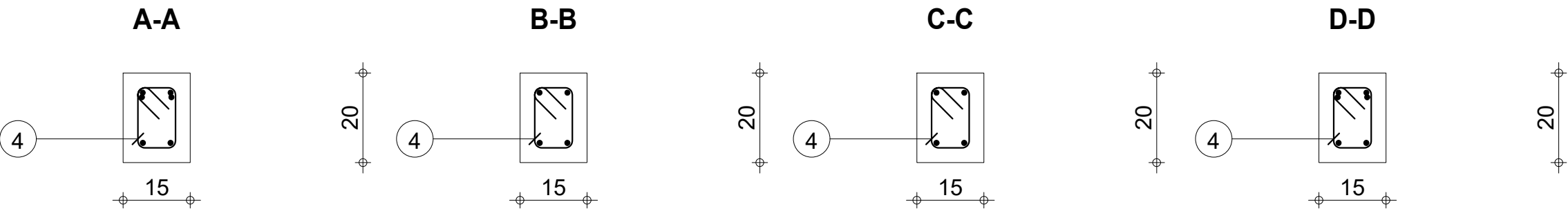
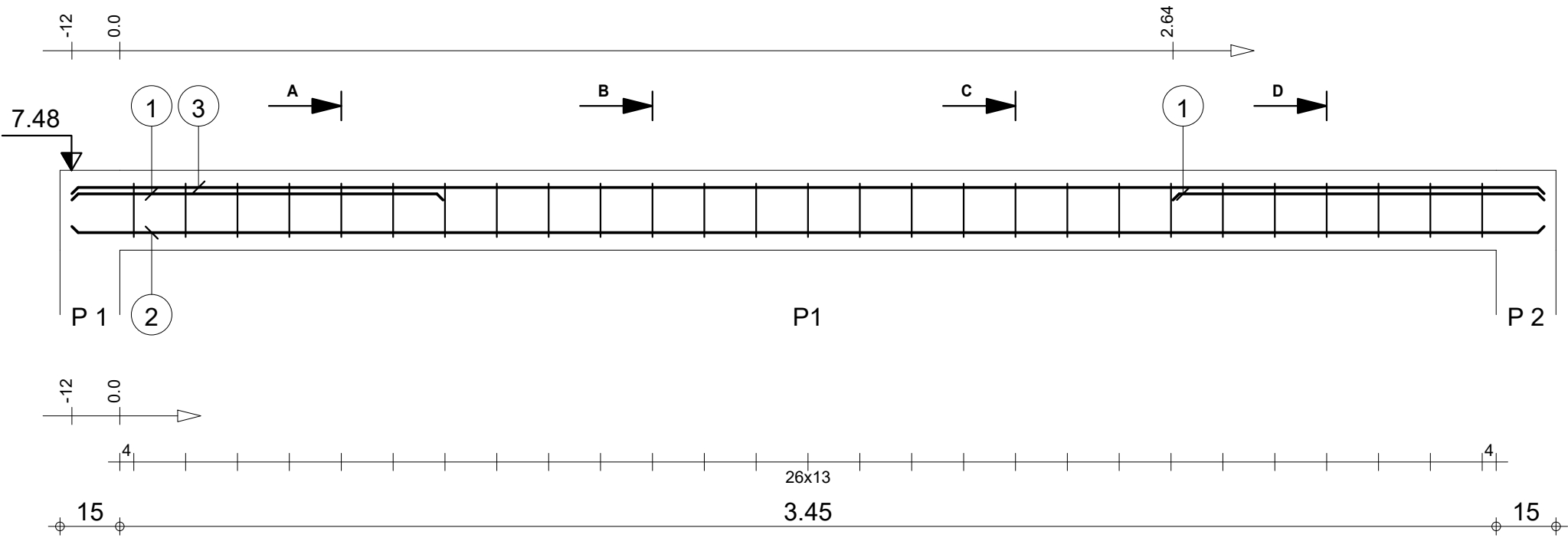
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 2HA 12   | l=80   | 00   | 80                                                                                  |
| ②    | 2HA 12   | l=95   | 00   | 95                                                                                  |
| ③    | 2HA 12   | l=2.96 | 00   | 2.97                                                                                |
| ④    | 2HA 10   | l=2.96 | 00   | 2.97                                                                                |
| ⑤    | 20HA 6   | l=58   | 31   |  |



|                                                                                    |                                              |                                   |     |                            |                                                      |                                  |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|------------------------------------------------------|----------------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 12 kg                                 |                                  |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                      | Béton : BETON = 0.0908 m3        |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_CH0 1 : P1<br><br>Section 15x20 |     | Nombre 1                   | Acier HA 400 = 2.57 kg                               |                                  |
|                                                                                    |                                              |                                   |     |                            | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |                                  |
|                                                                                    |                                              |                                   |     |                            | Enrobage latéral 3 cm                                |                                  |
|                                                                                    |                                              |                                   |     |                            | Densité = 160.8 kg/ m3                               | Echelle pour la vue 8.44cm/m     |
|                                                                                    |                                              |                                   |     |                            | Diamètre moyen = 8.98mm                              | Echelle pour la section 8.56cm/m |
|                                                                                    |                                              |                                   |     |                            |                                                      | Page 1/27                        |

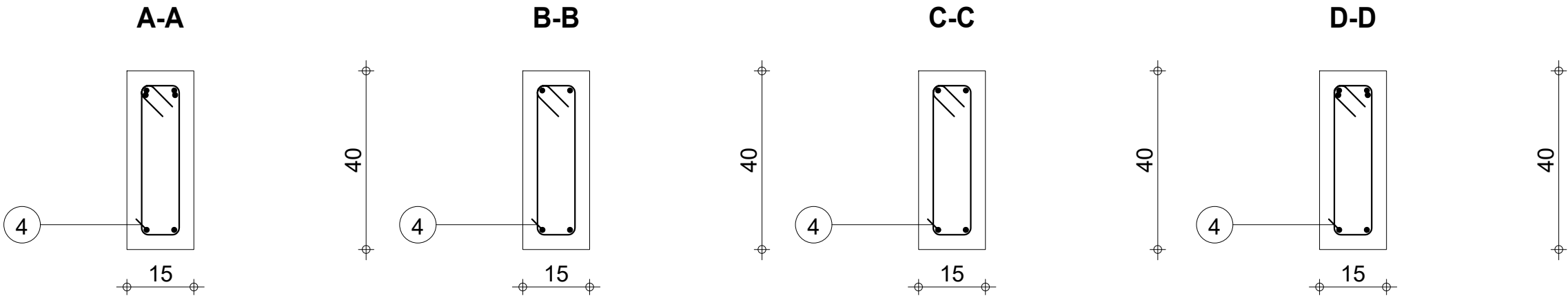
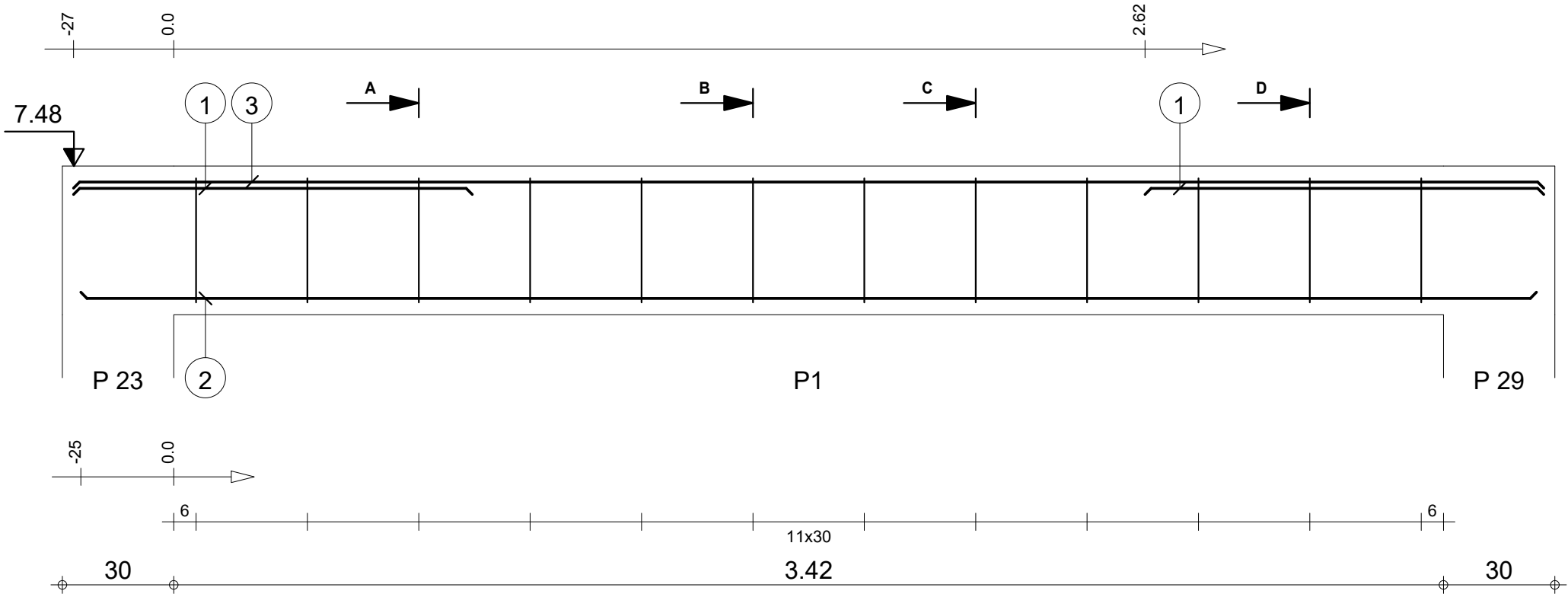


| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | I=93   | 00   | 93                                                                                  |
| ②    | 2HA 12   | I=3.69 | 00   | 3.69                                                                                |
| ③    | 2HA 10   | I=3.69 | 00   | 3.69                                                                                |
| ④    | 27HA 6   | I=58   | 31   |  |



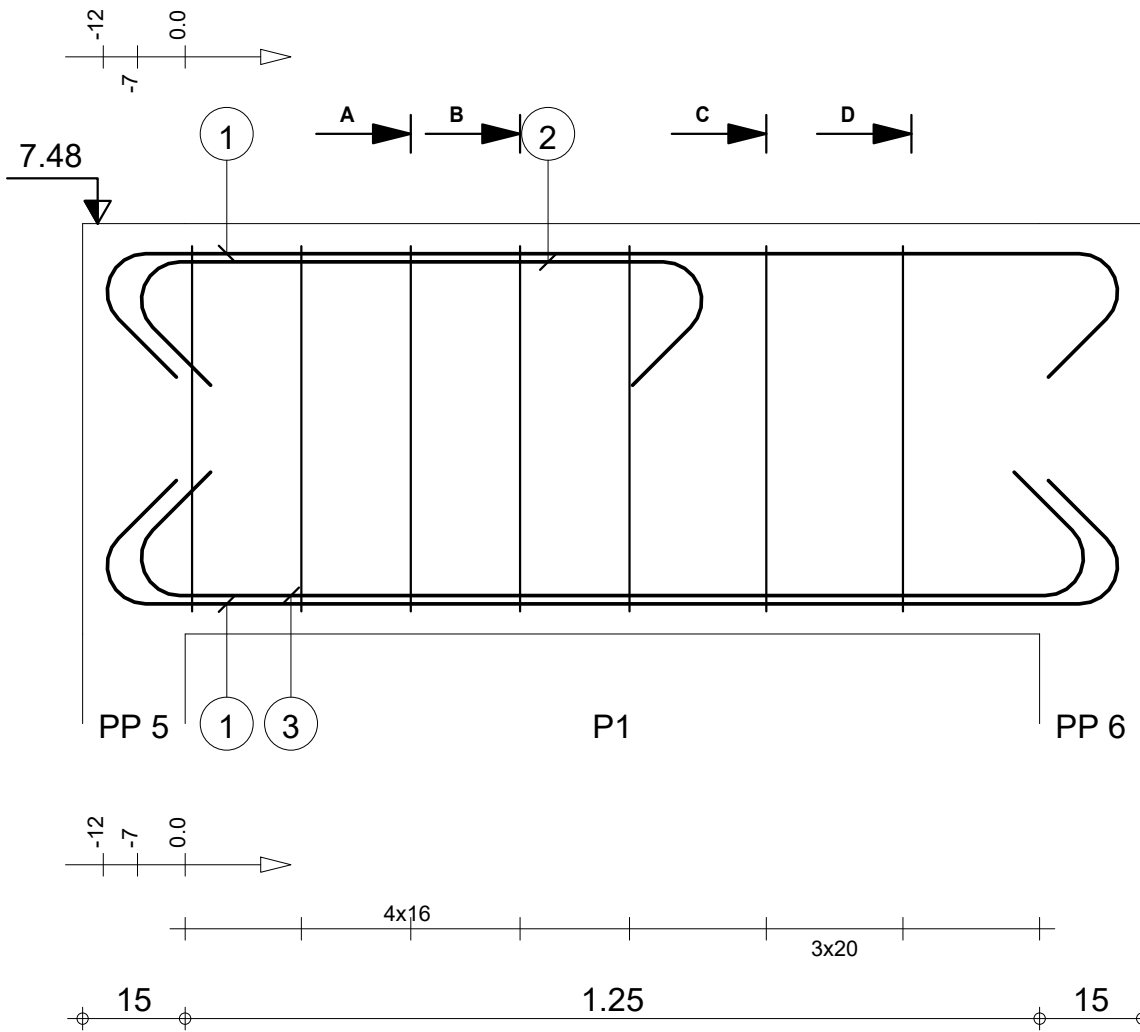
|                                                                                    |     |                                   |             |                            |          |                                  |  |                                                      |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|----------------------------|----------|----------------------------------|--|------------------------------------------------------|--|
|                                                                                    |     | Tél.                              |             | Fax                        |          |                                  |  | Acier HA 400 = 14.4 kg                               |  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             | Reprise de bétonnage : Non |          | Béton : BETON = 0.113 m3         |  | Acier HA 400 = 3.46 kg                               |  |
|  | R+1 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 1 : P1 | Section 15x20              | Nombre 1 | Surface du coffrage = 2.08 m2    |  | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |  |
|                                                                                    |     |                                   |             |                            |          | Densité = 158.4 kg/ m3           |  | Enrobage latéral 3 cm                                |  |
|                                                                                    |     |                                   |             |                            |          | Diamètre moyen = 8.82mm          |  | Echelle pour la vue 6.89cm/m                         |  |
|                                                                                    |     |                                   |             |                            |          | Echelle pour la section 8.56cm/m |  | Page 2/27                                            |  |

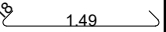
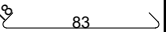
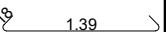
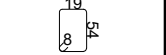
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.07 | 00   | 1.07                                                                                |
| ②    | 2HA 12   | l=3.92 | 00   | 3.92                                                                                |
| ③    | 2HA 10   | l=3.96 | 00   | 3.96                                                                                |
| ④    | 12HA 6   | l=98   | 31   |  |

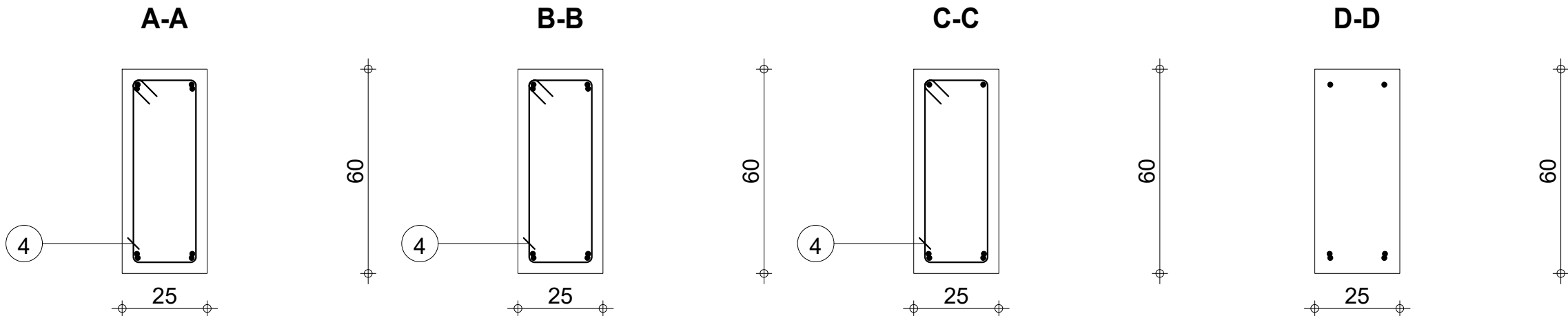


|                                                                                    |                                              |                                   |     |                            |                                                   |                                                                  |                         |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 15.7 kg                            |                                                                  |                         |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                   | Acier HA 400 = 2.61 kg                                           |                         |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PP 10 : P1<br><br>Section 15x40 |     | Nombre 1                   | Béton : BETON = 0.241 m3                          |                                                                  |                         |
|                                                                                    |                                              |                                   |     |                            | Surface du coffrage = 3.85 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 | Enrobage supérieur 3 cm |
|                                                                                    |                                              |                                   |     |                            | Densité = 75.93 kg/ m3<br>Diamètre moyen = 9.29mm | Echelle pour la vue 6.46cm/m<br>Echelle pour la section 8.56cm/m | Page 3/27               |





| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.87 | 00   |  |
| ②    | 2HA 12   | l=1.21 | 00   |  |
| ③    | 2HA 12   | l=1.77 | 00   |  |
| ④    | 7HA 6    | l=1.58 | 31   |  |

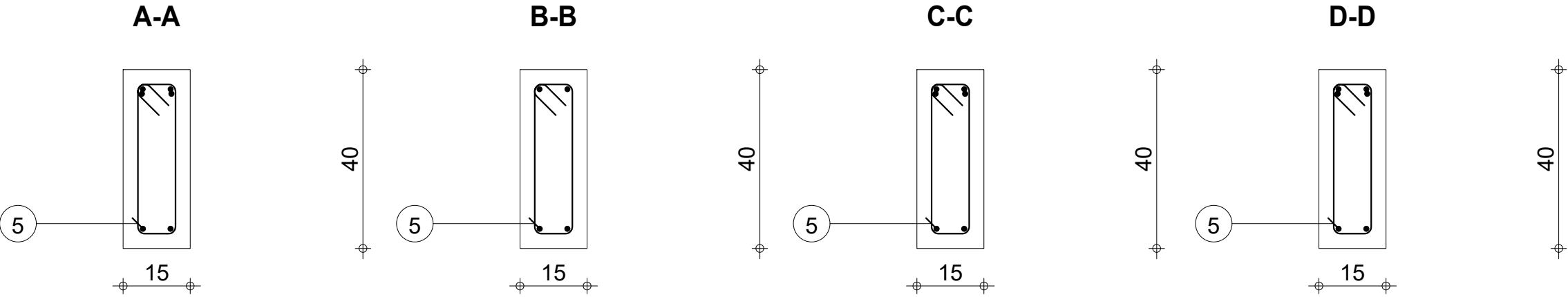
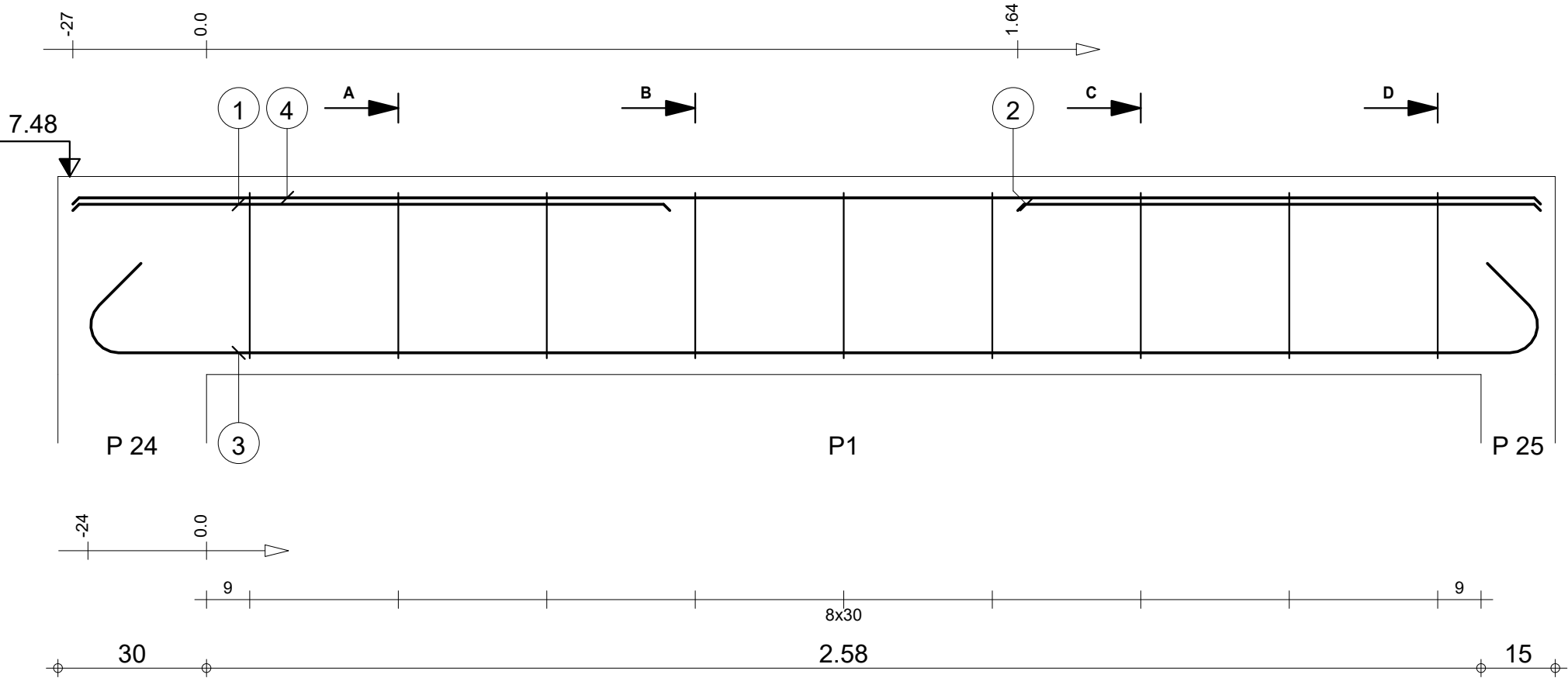


|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 11.9 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.232 m3                                                    | Acier HA 400 = 2.45 kg |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 2 : P1<br><br>Section 25x60 | Nombre 1                   | Surface du coffrage = 2.47 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 62.07 kg/ m3<br>Diamètre moyen = 9.29mm | Echelle pour la vue 9.05cm/m<br>Echelle pour la section 6.53cm/m            | Page 5/27              |

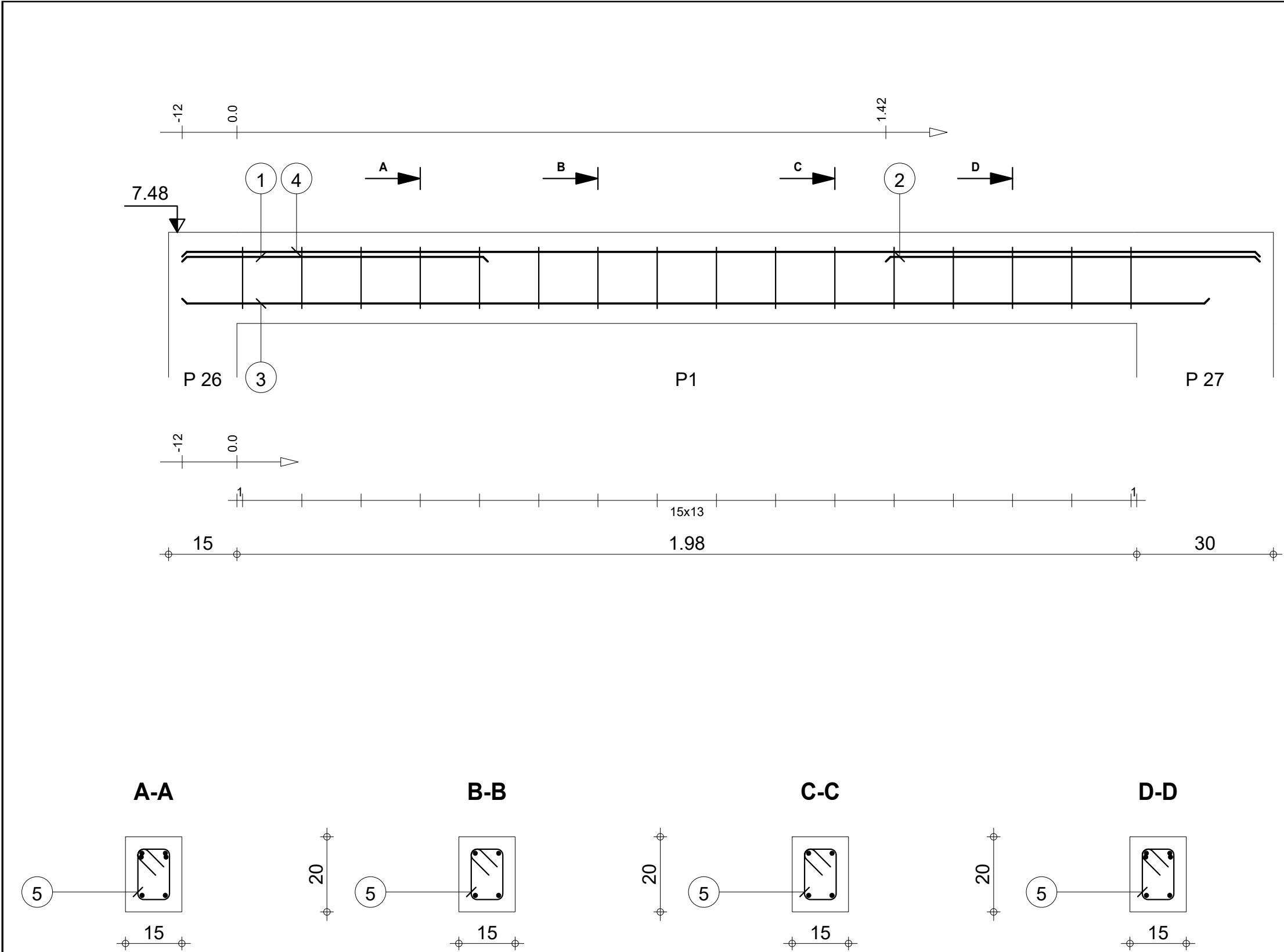




| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.21 | 00   | 1.21  |
| ②    | 2HA 12   | l=1.06 | 00   | 1.06  |
| ③    | 2HA 12   | l=3.31 | 00   | 2.93  |
| ④    | 2HA 10   | l=2.96 | 00   | 2.97  |
| ⑤    | 9HA 6    | l=98   | 31   | 98    |



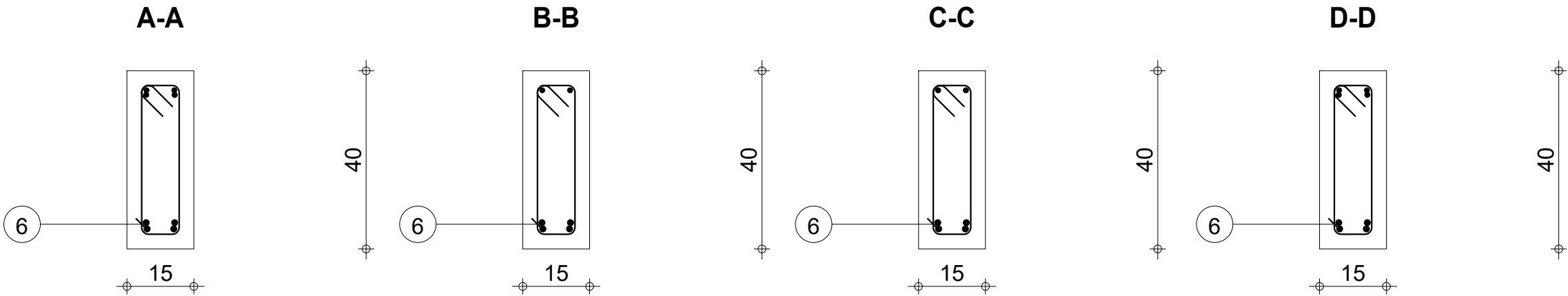
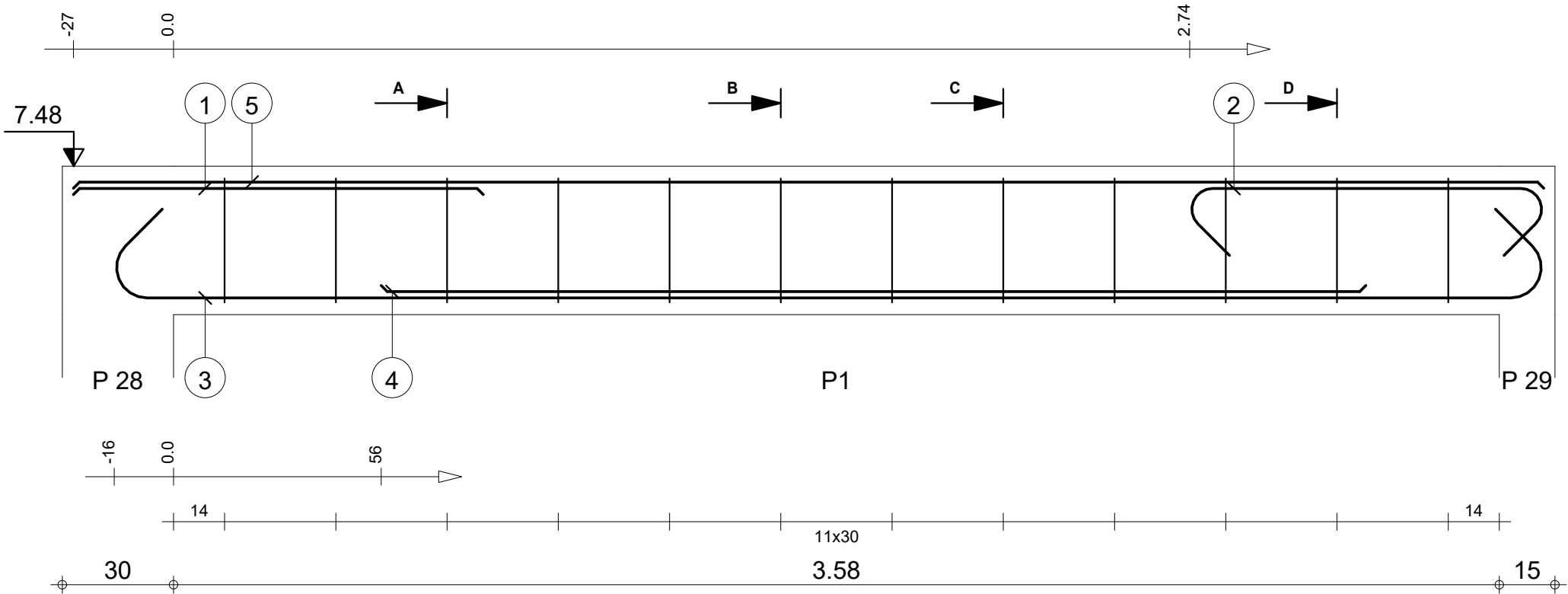
|                                                                                    |                                              |                                   |     |                            |                                                  |                                                                  |                         |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|--------------------------------------------------|------------------------------------------------------------------|-------------------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 13.6 kg                           |                                                                  |                         |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                  | Acier HA 400 = 1.95 kg                                           |                         |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PP 15 : P1<br><br>Section 15x40 |     | Nombre 1                   | Béton : BETON = 0.181 m3                         |                                                                  |                         |
|                                                                                    |                                              |                                   |     |                            | Surface du coffrage = 2.93 m2                    | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 | Enrobage supérieur 3 cm |
|                                                                                    |                                              |                                   |     |                            | Densité = 85.64 kg/ m3<br>Diamètre moyen = 9.5mm | Echelle pour la vue 8.44cm/m<br>Echelle pour la section 8.56cm/m | Page 7/27               |



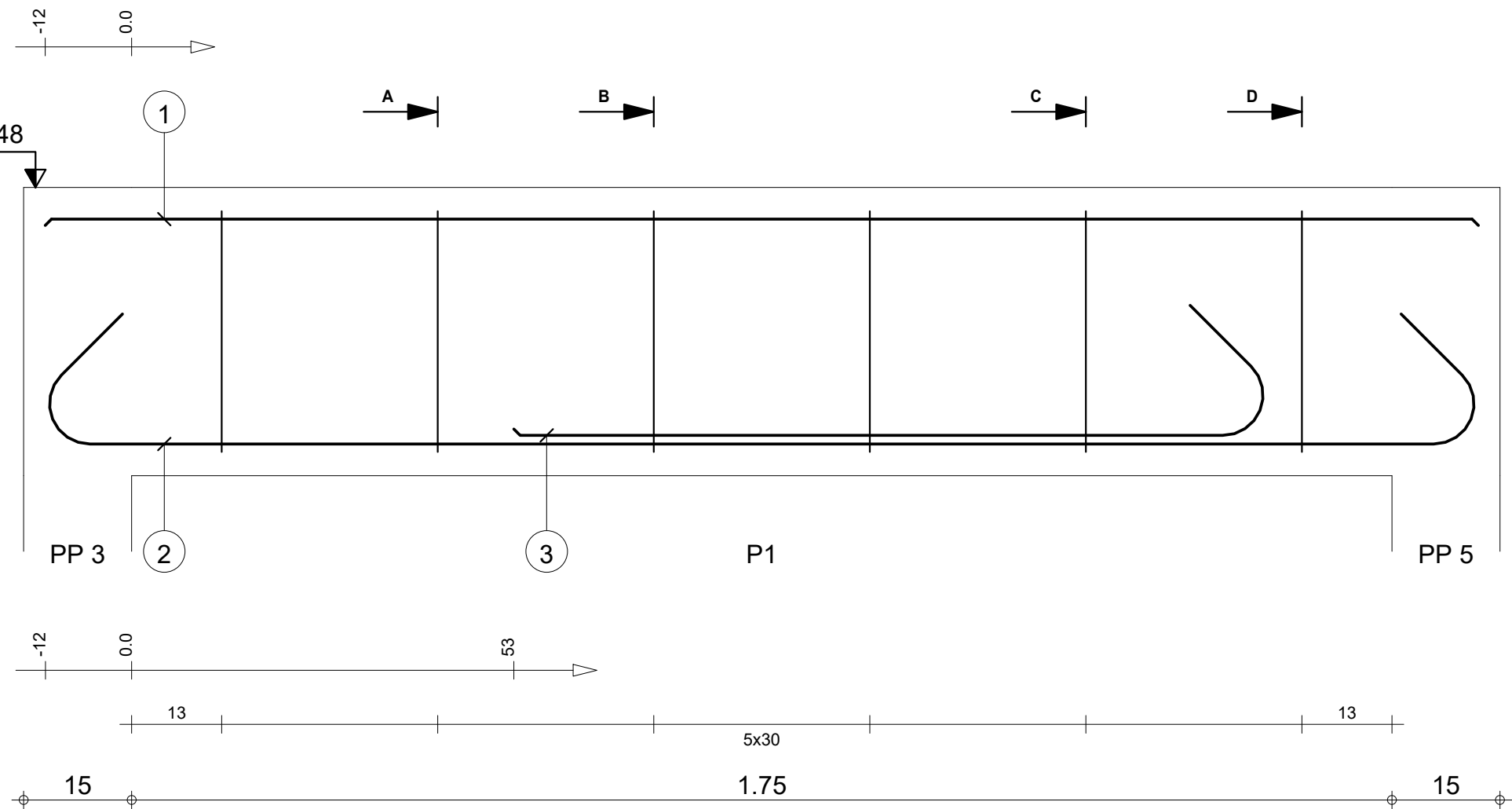
| Pos. | Armature |        | Code | Forme          |
|------|----------|--------|------|----------------|
| ①    | 2HA 12   | l=67   | 00   | _____67_____   |
| ②    | 2HA 12   | l=82   | 00   | _____82_____   |
| ③    | 2HA 12   | l=2.25 | 00   | _____2.25_____ |
| ④    | 2HA 10   | l=2.37 | 00   | _____2.37_____ |
| ⑤    | 16HA 6   | l=58   | 31   |                |

|                                                                                    |     |                                   |             |                           |                                                   |                                                                  |                         |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|---------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------|
| Tél.                                                                               |     | Fax                               |             | Béton : BETON = 0.0728 m3 | Acier HA 400 = 9.57 kg                            |                                                                  |                         |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             |                           | Acier HA 400 = 2.05 kg                            |                                                                  |                         |
|  | R+1 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 7 : P1 | Nombre 1                  | Surface du coffrage = 1.33 m2                     | Enrobage inférieur 3 cm                                          | Enrobage supérieur 3 cm |
|                                                                                    |     |                                   |             |                           | Densité = 159.3 kg/ m3<br>Diamètre moyen = 8.97mm | Echelle pour la vue 10.4cm/m<br>Echelle pour la section 8.56cm/m | Page 8/27               |
|                                                                                    |     | Reprise de bétonnage : Non        |             |                           |                                                   |                                                                  |                         |
|                                                                                    |     | Section 15x20                     |             |                           |                                                   |                                                                  |                         |

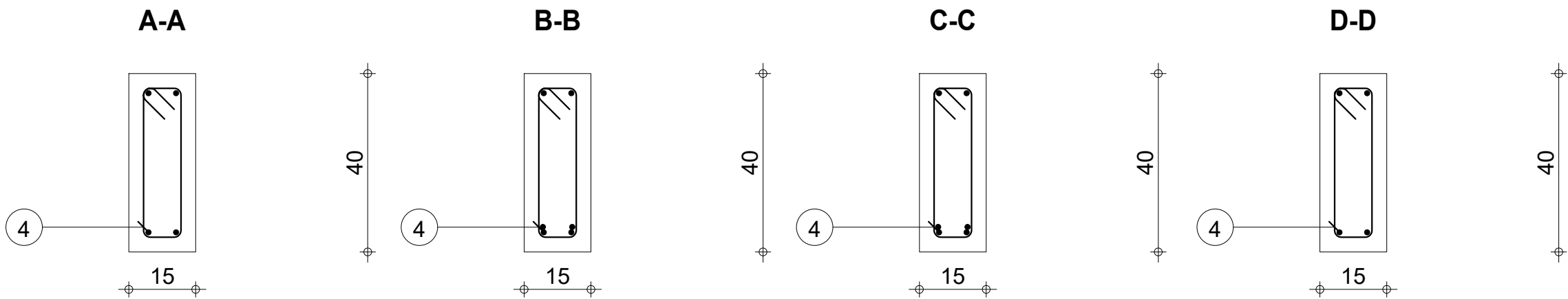
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.11 | 00   | 1.11  |
| ②    | 2HA 12   | l=1.34 | 00   | 96    |
| ③    | 2HA 14   | l=4.34 | 00   | 3.86  |
| ④    | 2HA 14   | l=2.66 | 00   | 2.66  |
| ⑤    | 2HA 10   | l=3.97 | 00   | 3.97  |
| ⑥    | 12HA 6   | l=98   | 31   | 98    |



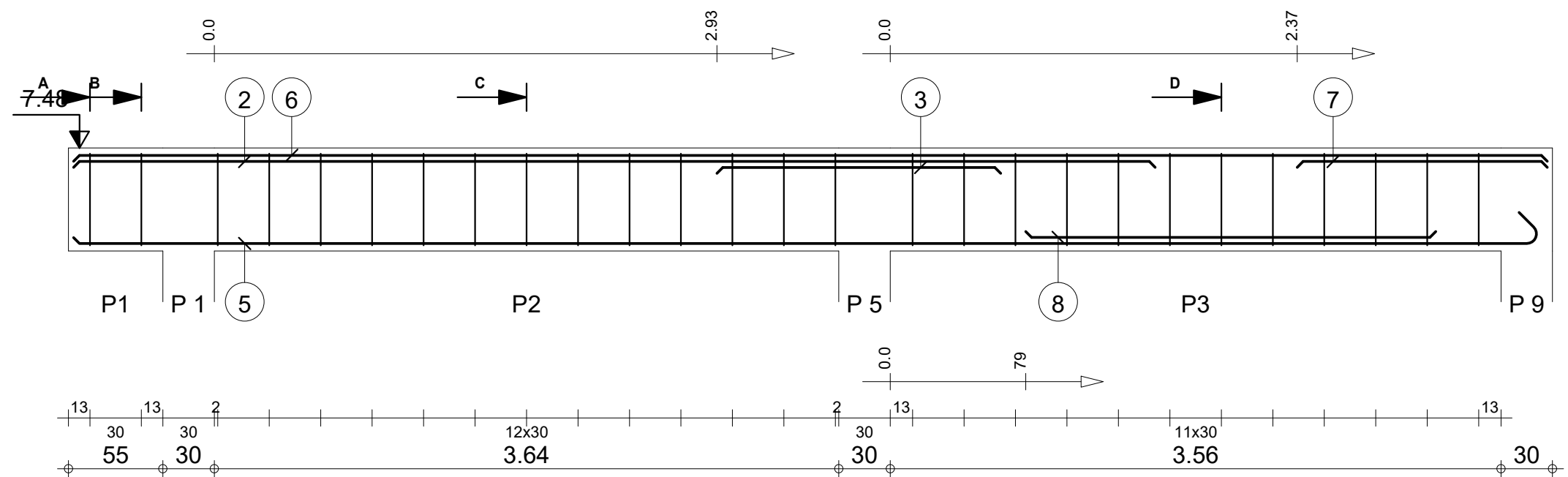
|                                                                                    |     |                           |     |                            |                                                      |                        |
|------------------------------------------------------------------------------------|-----|---------------------------|-----|----------------------------|------------------------------------------------------|------------------------|
|                                                                                    |     | Tél.                      | Fax |                            | Acier HA 400 = 26.1 kg                               |                        |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable |     | Reprise de bétonnage : Non |                                                      | Acier HA 400 = 2.61 kg |
|  | R+1 | 3_PP 16 : P1              |     | Nombre 1                   | Béton : BETON = 0.242 m3                             |                        |
|                                                                                    |     |                           |     |                            | Surface du coffrage = 3.88 m2                        |                        |
|                                                                                    |     |                           |     |                            | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |                        |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |     | Section 15x40             |     | Densité = 118.6 kg/ m3     | Echelle pour la vue 6.45cm/m                         | Page 9/27              |
|                                                                                    |     |                           |     | Diamètre moyen = 10.5mm    | Echelle pour la section 8.56cm/m                     |                        |



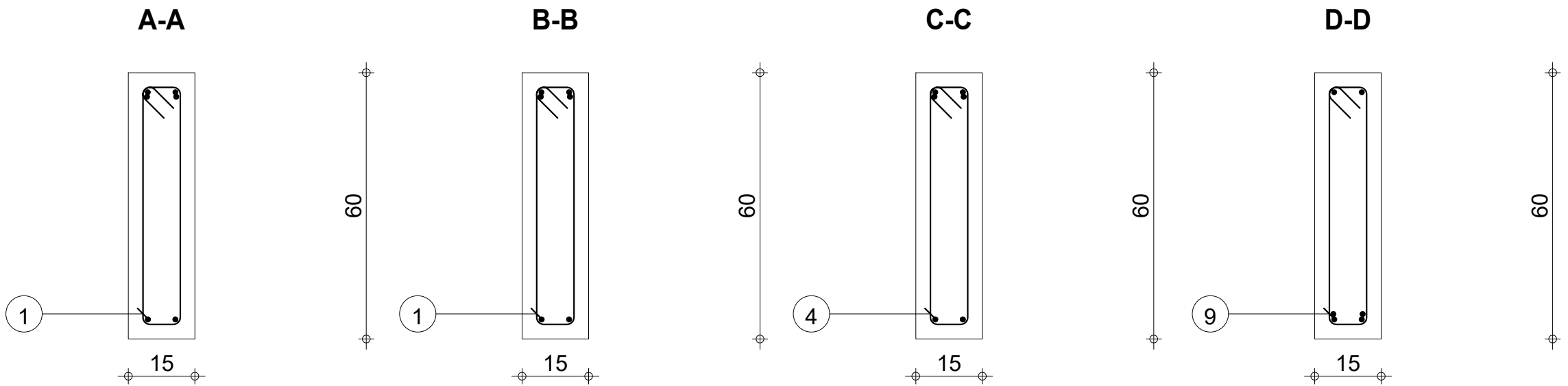
| Pos. | Armature |        | Code | Forme  |
|------|----------|--------|------|--------|
| ①    | 2HA 12   | l=1.99 | 00   | 1.99   |
| ②    | 2HA 12   | l=2.37 | 00   | 1.99   |
| ③    | 2HA 12   | l=1.24 | 00   | 1.05   |
| ④    | 6HA 6    | l=98   | 31   | 9 34 8 |

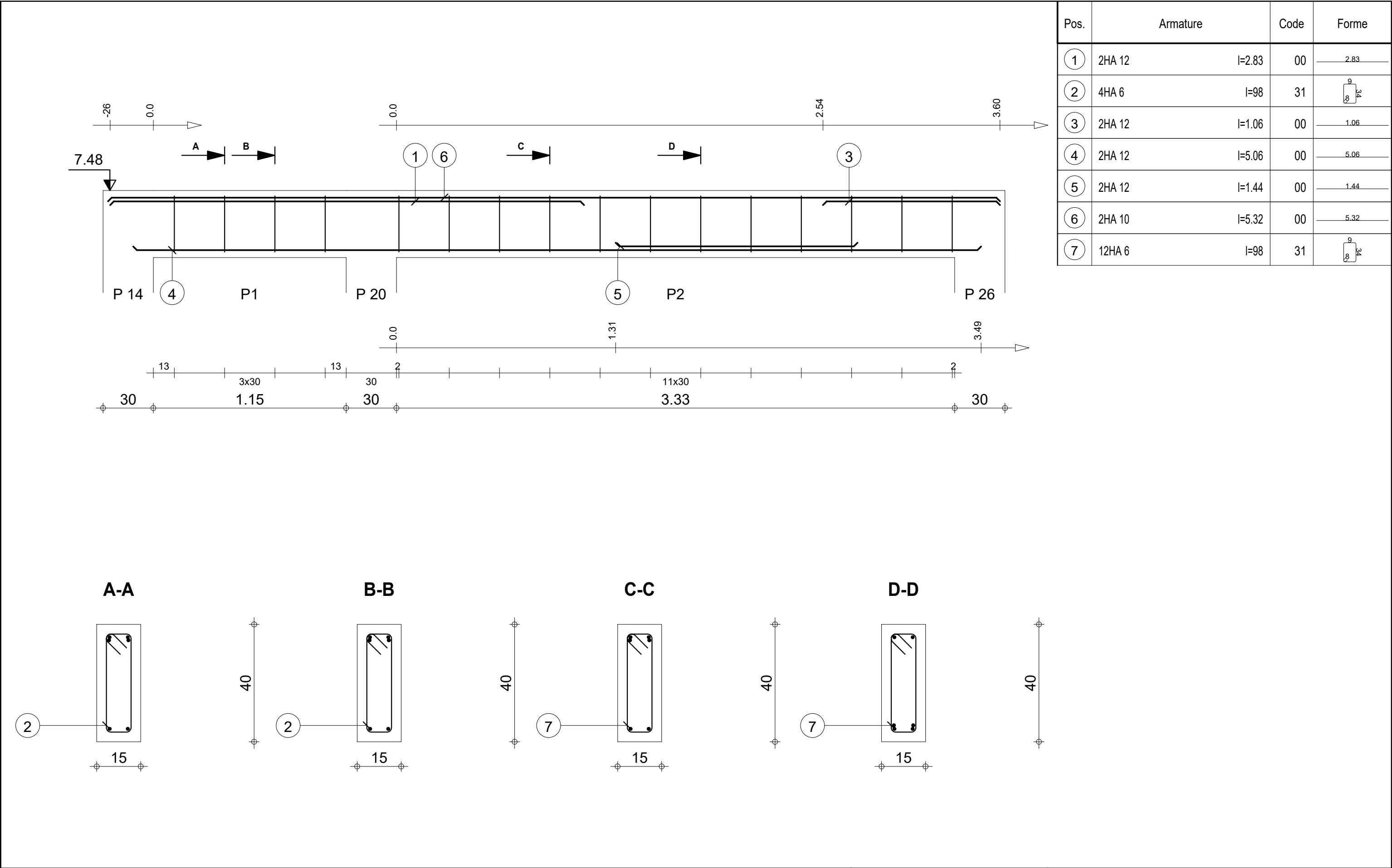


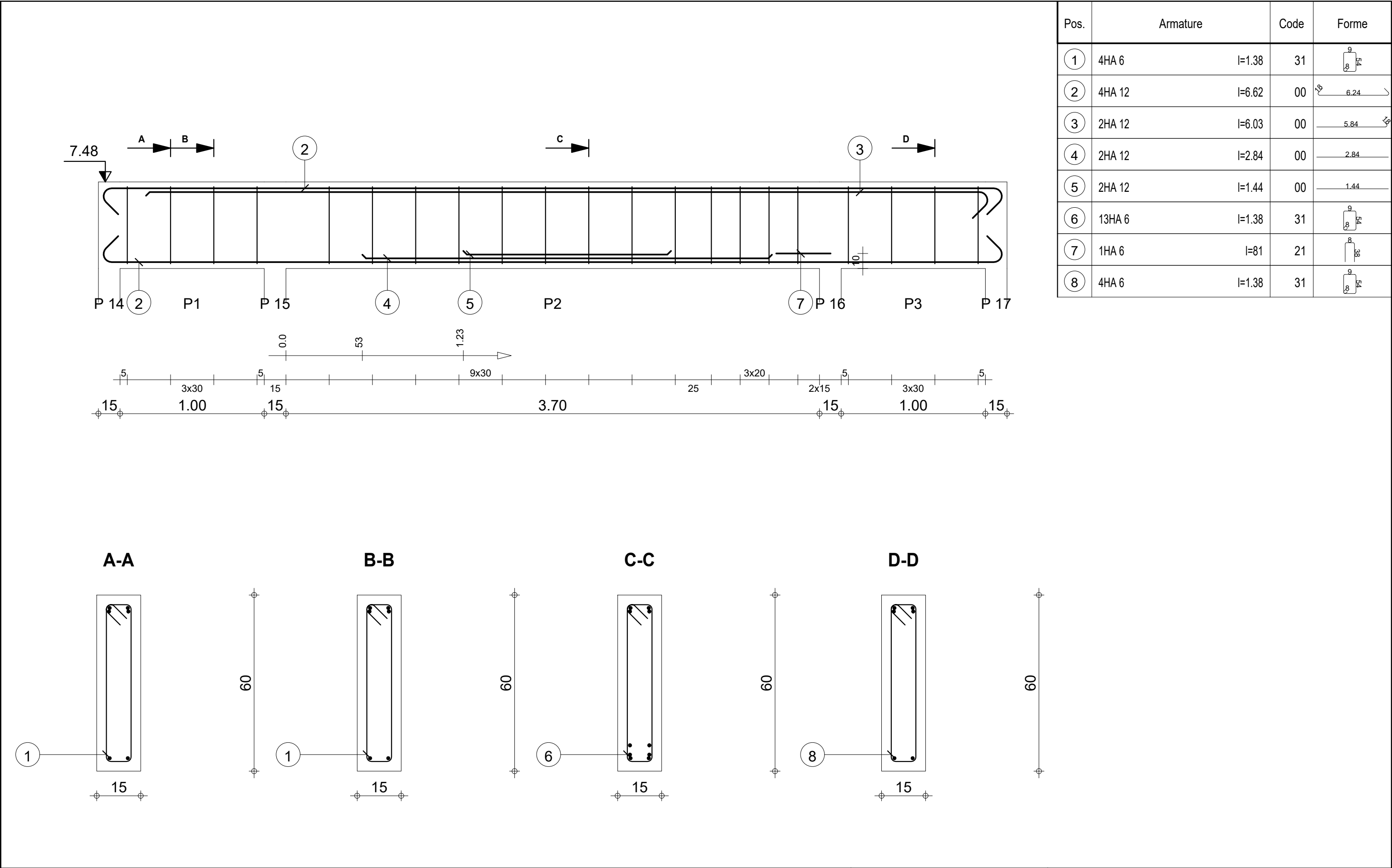
|                                                                                    |                                              |                                  |     |                            |                                                                                                                       |                                                   |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|-----|----------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
|                                                                                    |                                              | Tél.                             | Fax |                            | Acier HA 400 = 9.94 kg                                                                                                |                                                   |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        |     | Reprise de bétonnage : Non |                                                                                                                       | Béton : BETON = 0.123 m3<br>Acier HA 400 = 1.3 kg |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 8 : P1<br><br>Section 15x40 |     | Nombre 1                   | Surface du coffrage = 2.02 m2<br><br>Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                                 |                                                   |
|                                                                                    |                                              |                                  |     |                            | Densité = 91.06 kg/ m3<br>Diamètre moyen = 9.94mm<br>Echelle pour la vue 12.1cm/m<br>Echelle pour la section 8.56cm/m |                                                   |
|                                                                                    |                                              |                                  |     |                            |                                                                                                                       | Page 10/27                                        |



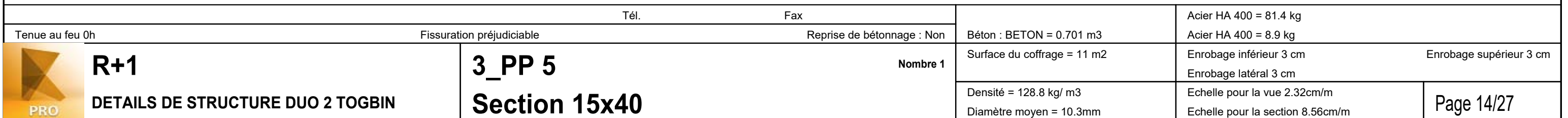
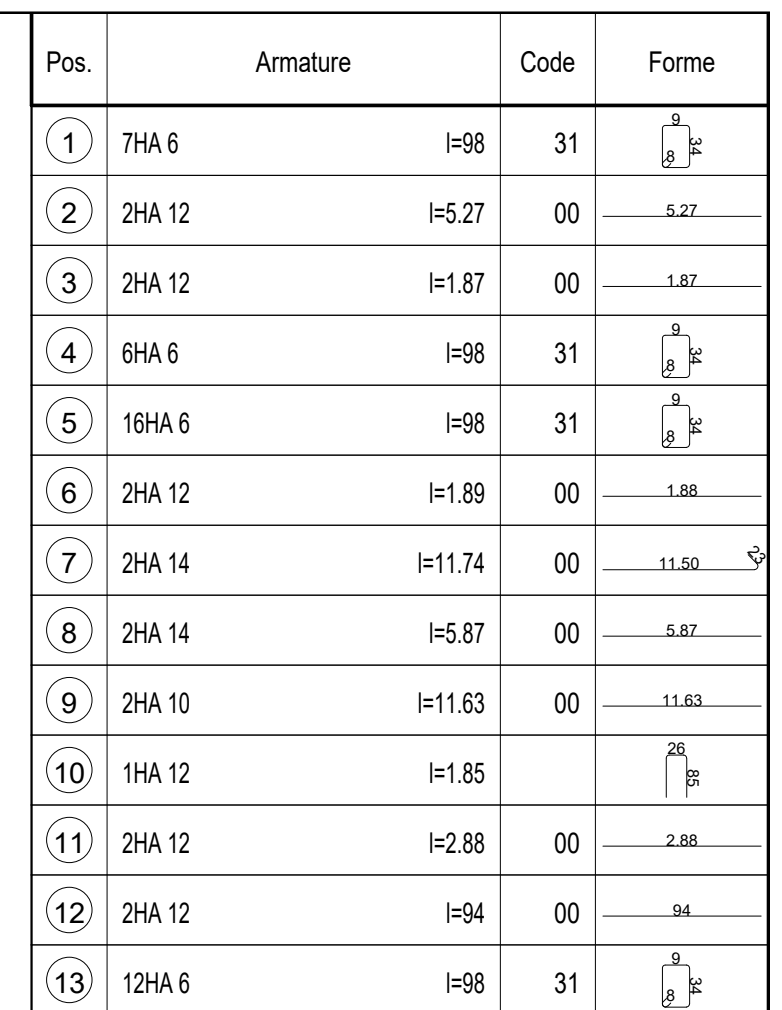
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 6    | l=1.38 | 31   |       |
| ②    | 2HA 12   | l=6.30 | 00   |       |
| ③    | 2HA 12   | l=1.65 | 00   |       |
| ④    | 13HA 6   | l=1.38 | 31   |       |
| ⑤    | 2HA 12   | l=8.72 | 00   |       |
| ⑥    | 2HA 10   | l=8.59 | 00   |       |
| ⑦    | 2HA 12   | l=1.46 | 00   |       |
| ⑧    | 2HA 12   | l=2.39 | 00   |       |
| ⑨    | 12HA 6   | l=1.38 | 31   |       |

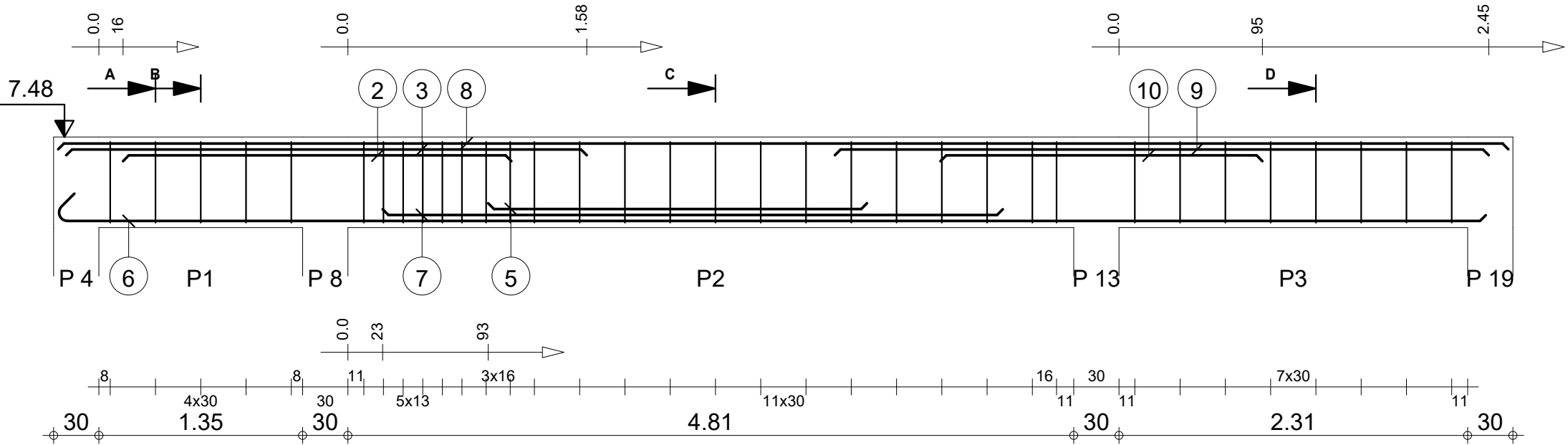




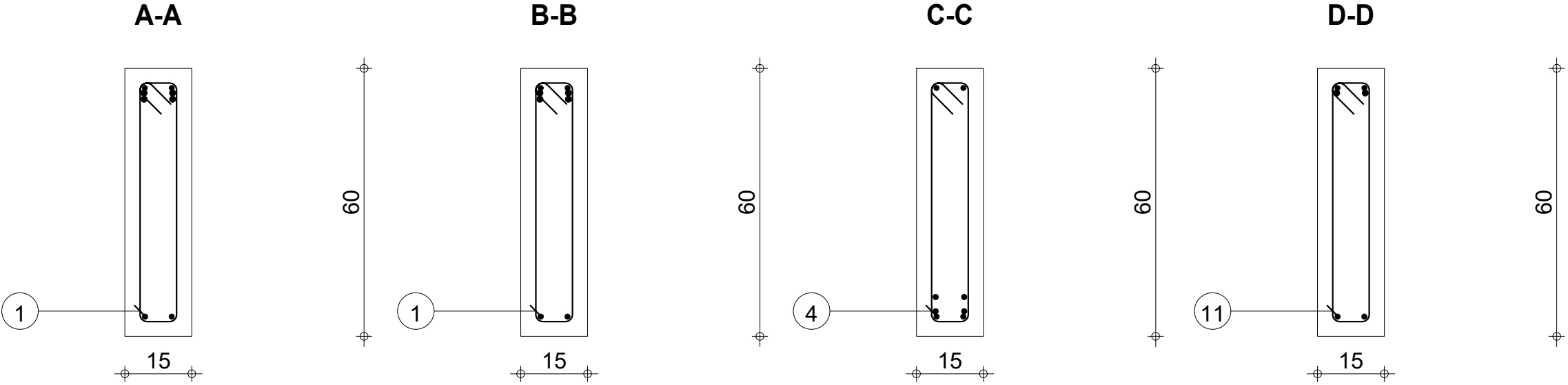


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 6    | l=1.38 | 31   |       |
| ②    | 4HA 12   | l=6.62 | 00   |       |
| ③    | 2HA 12   | l=6.03 | 00   |       |
| ④    | 2HA 12   | l=2.84 | 00   |       |
| ⑤    | 2HA 12   | l=1.44 | 00   |       |
| ⑥    | 13HA 6   | l=1.38 | 31   |       |
| ⑦    | 1HA 6    | l=81   | 21   |       |
| ⑧    | 4HA 6    | l=1.38 | 31   |       |





| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 5HA 6    | l=1.37 | 31   |       |
| ②    | 2HA 14   | l=2.57 | 00   |       |
| ③    | 2HA 14   | l=3.45 | 00   |       |
| ④    | 21HA 6   | l=1.37 | 31   |       |
| ⑤    | 2HA 12   | l=2.51 | 00   |       |
| ⑥    | 2HA 12   | l=9.65 | 00   |       |
| ⑦    | 2HA 12   | l=4.11 | 00   |       |
| ⑧    | 2HA 10   | l=9.61 | 00   |       |
| ⑨    | 2HA 14   | l=4.33 | 00   |       |
| ⑩    | 2HA 14   | l=2.13 | 00   |       |
| ⑪    | 8HA 6    | l=1.37 | 31   |       |

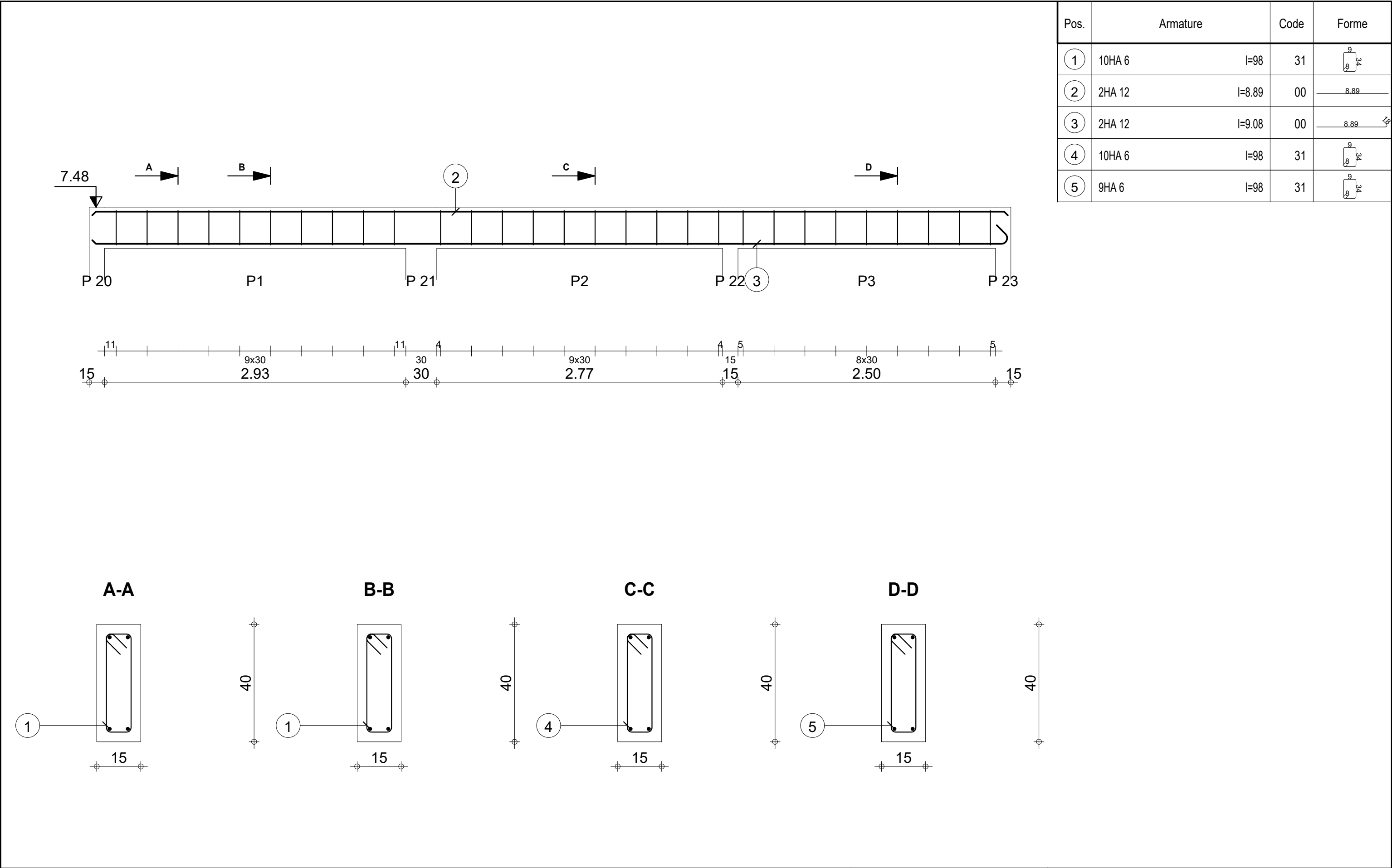


R+1

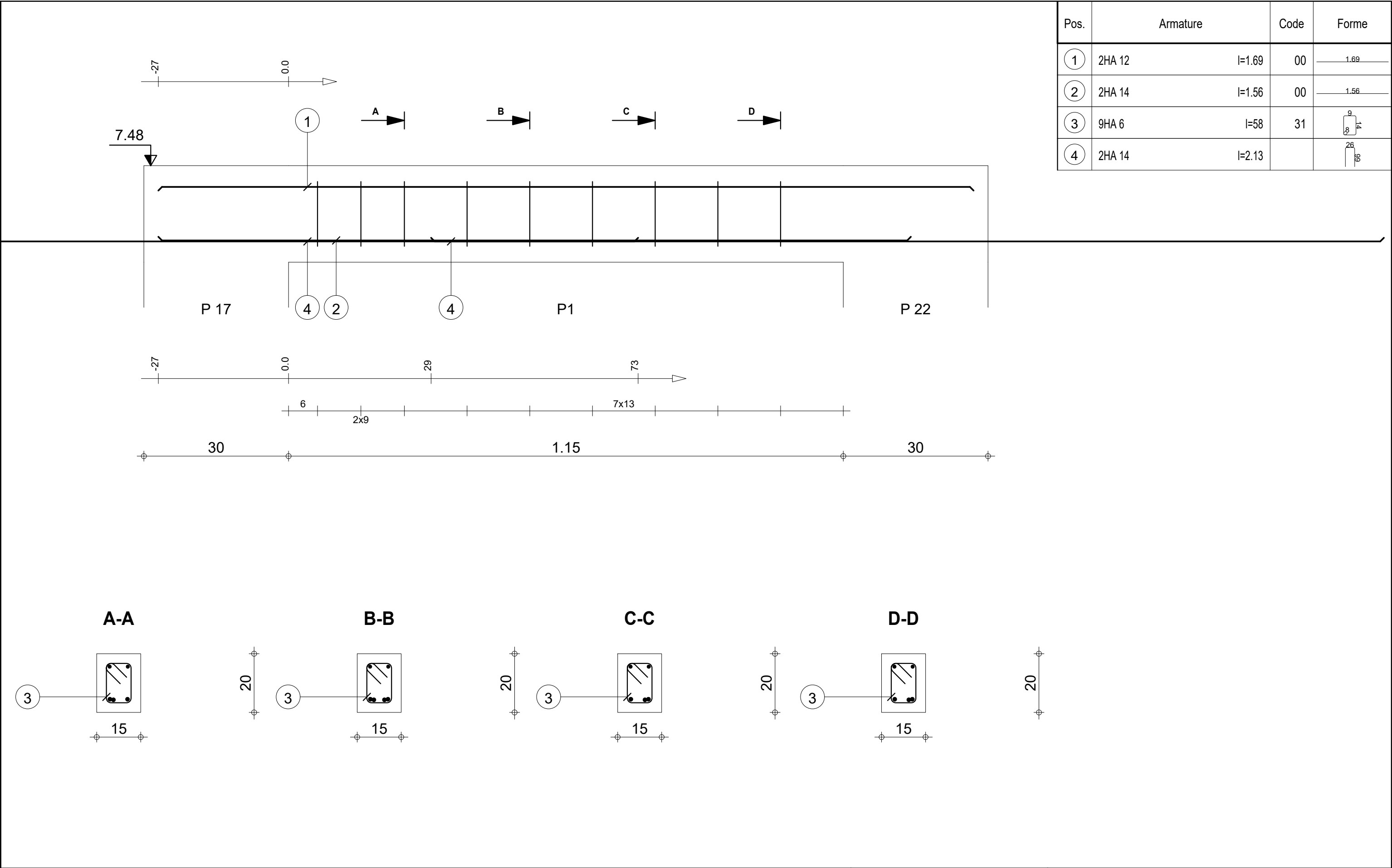
DETAILS DE STRUCTURE DUO 2 TOGBIN

3\_PP 9

Section 15x60



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 10HA 6   | l=98   | 31   |       |
| ②    | 2HA 12   | l=8.89 | 00   |       |
| ③    | 2HA 12   | l=9.08 | 00   |       |
| ④    | 10HA 6   | l=98   | 31   |       |
| ⑤    | 9HA 6    | l=98   | 31   |       |



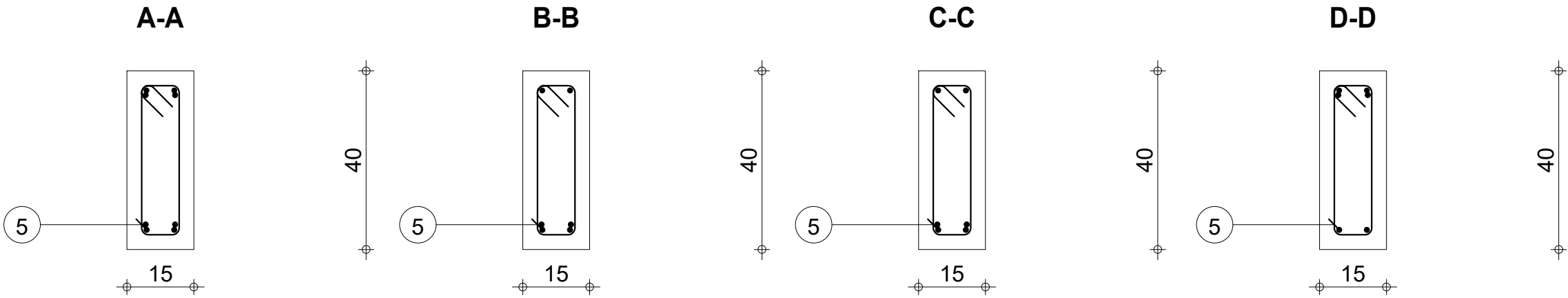
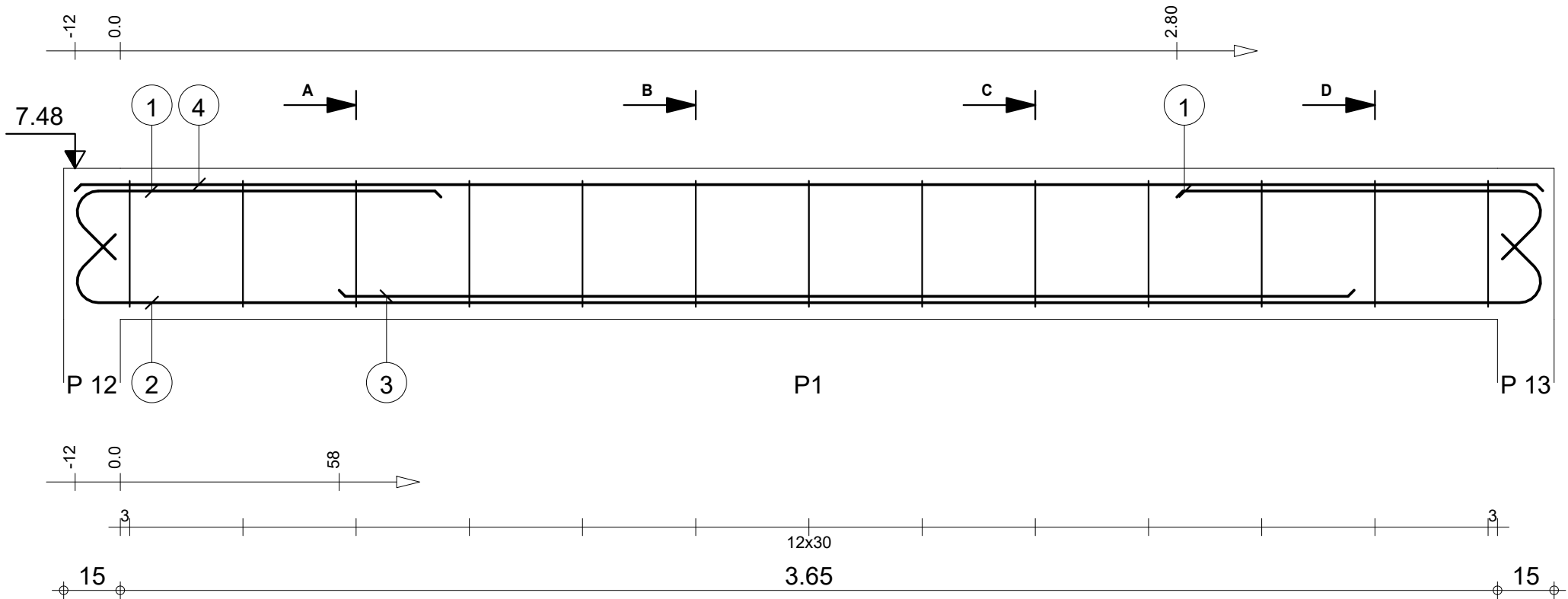
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.69 | 00   | 1.69  |
| ②    | 2HA 14   | l=1.56 | 00   | 1.56  |
| ③    | 9HA 6    | l=58   | 31   |       |
| ④    | 2HA 14   | l=2.13 |      |       |

|                                                                                    |                                              |                                  |                            |                                                 |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                 | Acier HA 400 = 11.9 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                 | Béton : BETON = 0.0525 m3                                                   | Acier HA 400 = 1.15 kg |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_CH 2 : P1<br><br>Section 15x20 | Nombre 1                   | Surface du coffrage = 0.933 m2                  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 249.5 kg/ m3<br>Diamètre moyen = 11mm | Echelle pour la vue 14.1cm/m<br>Echelle pour la section 8.56cm/m            | Page 17/27             |



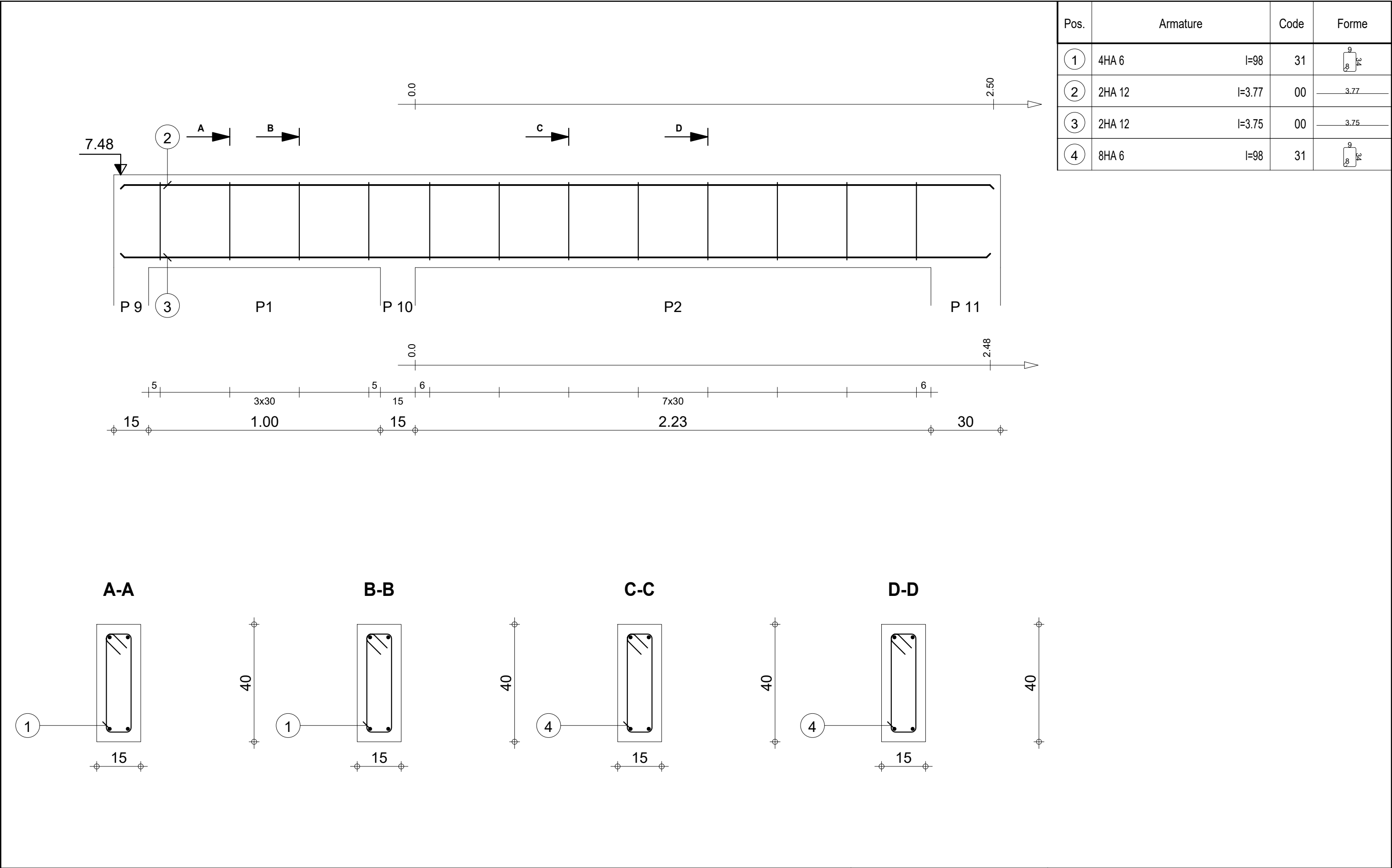


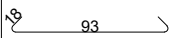
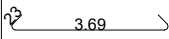
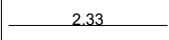
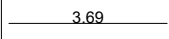
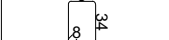
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.16 | 00   |       |
| ②    | 2HA 12   | l=4.27 | 00   |       |
| ③    | 2HA 12   | l=2.69 | 00   |       |
| ④    | 2HA 10   | l=3.89 | 00   |       |
| ⑤    | 13HA 6   | l=98   | 31   |       |

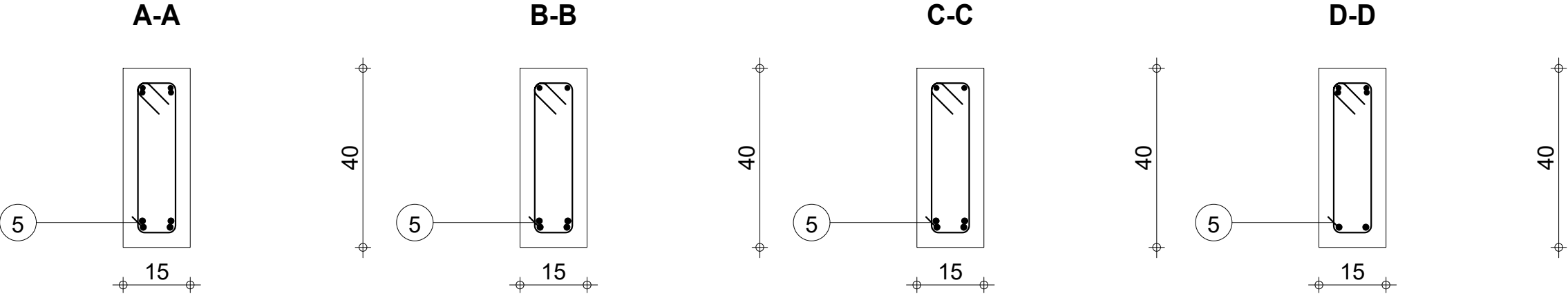
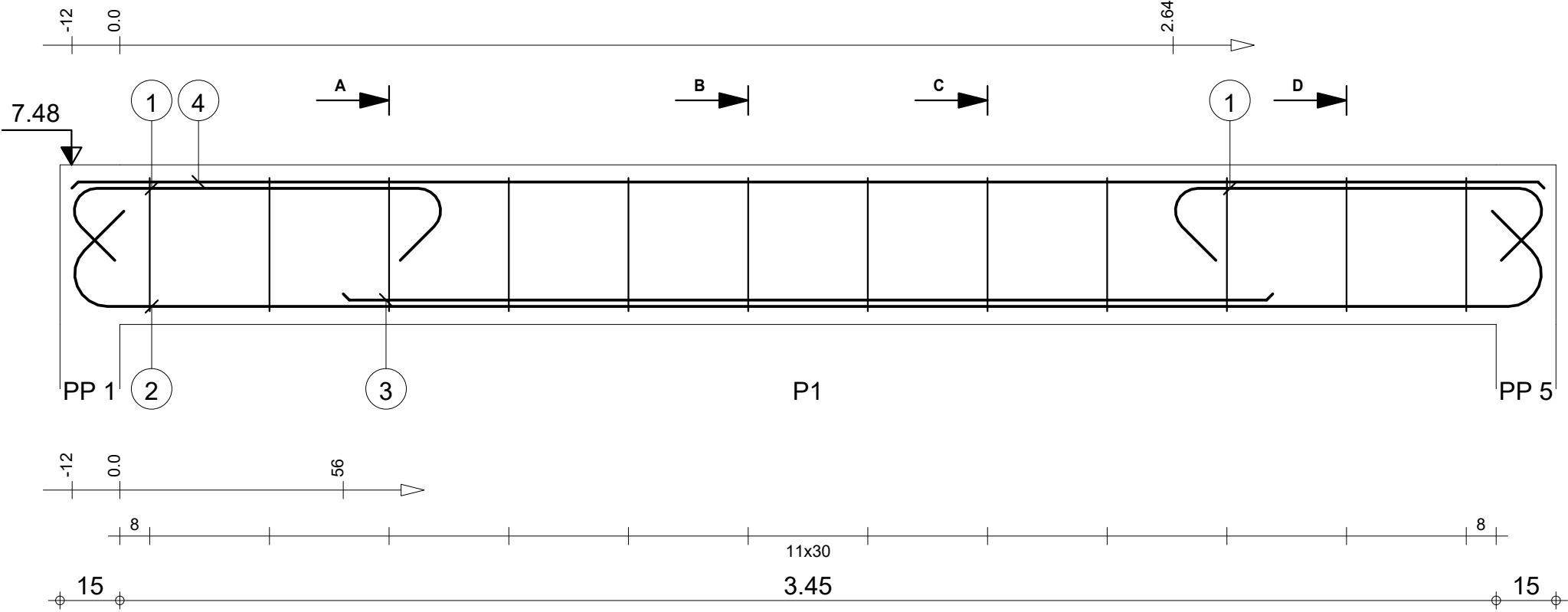


|                                                                                    |     |                                   |             |                            |          |                                                   |  |                                                                             |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|----------------------------|----------|---------------------------------------------------|--|-----------------------------------------------------------------------------|--|
|                                                                                    |     | Tél.                              |             | Fax                        |          |                                                   |  | Acier HA 400 = 21.3 kg                                                      |  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             | Reprise de bétonnage : Non |          | Béton : BETON = 0.237 m3                          |  | Acier HA 400 = 2.82 kg                                                      |  |
|  | R+1 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 5 : P1 | Section 15x40              | Nombre 1 | Surface du coffrage = 3.83 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |     |                                   |             |                            |          | Densité = 101.7 kg/ m3<br>Diamètre moyen = 9.65mm |  | Echelle pour la vue 6.56cm/m<br>Echelle pour la section 8.56cm/m            |  |

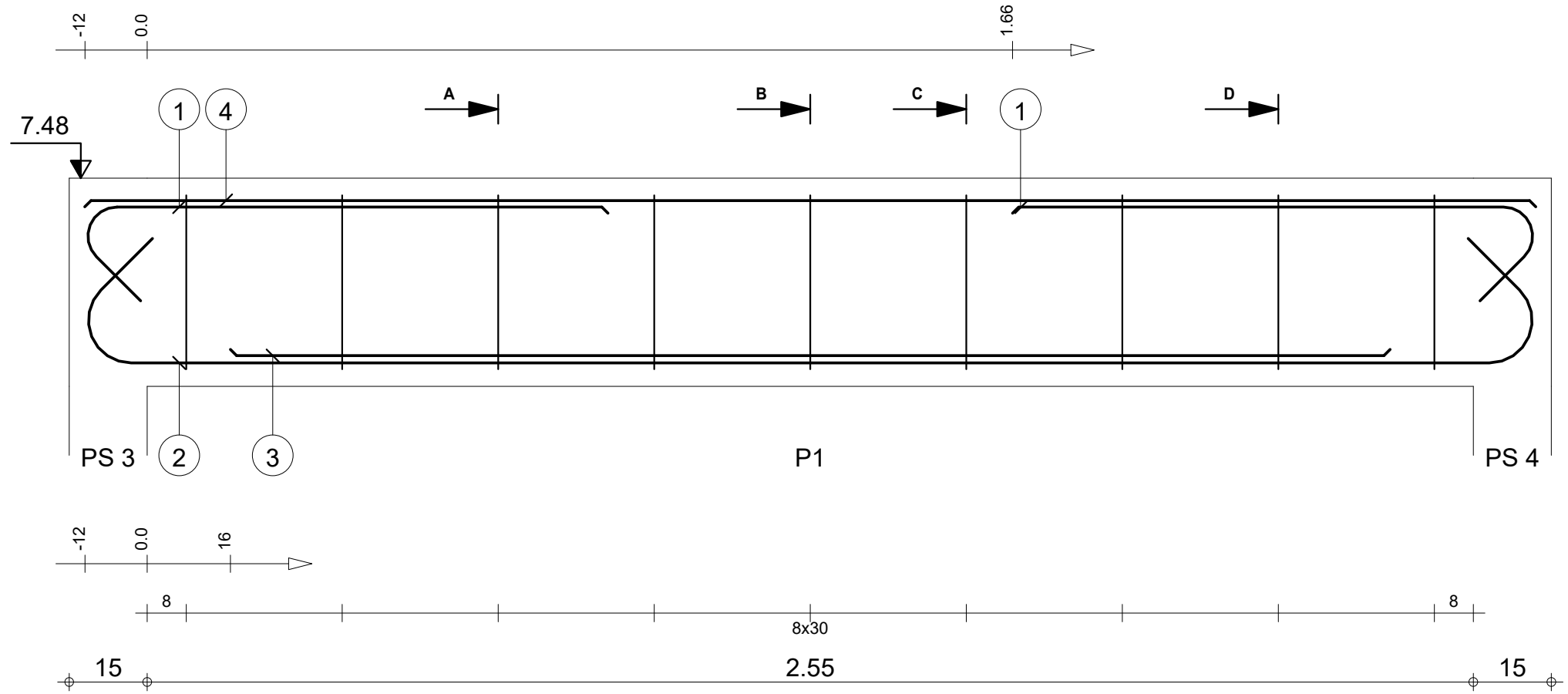




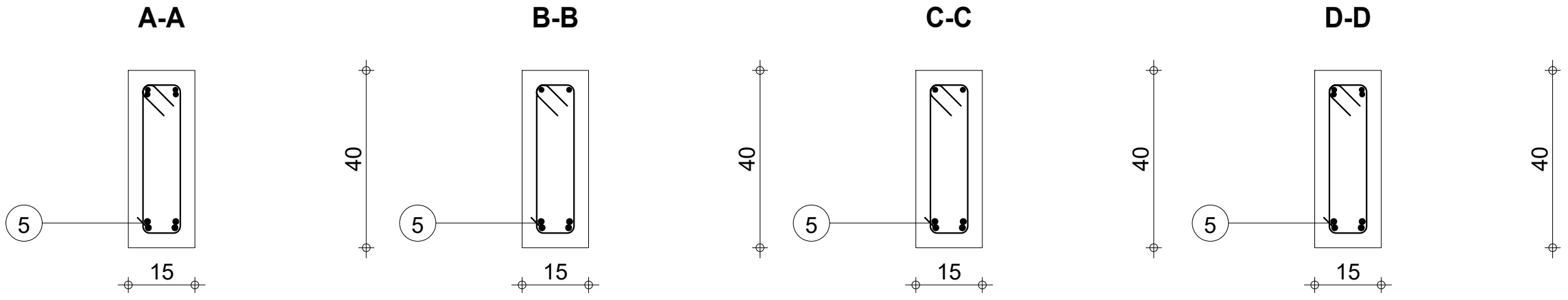
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.31 | 00   |  |
| ②    | 2HA 14   | l=4.18 | 00   |  |
| ③    | 2HA 14   | l=2.33 | 00   |  |
| ④    | 2HA 10   | l=3.69 | 00   |  |
| ⑤    | 12HA 6   | l=98   | 31   |  |



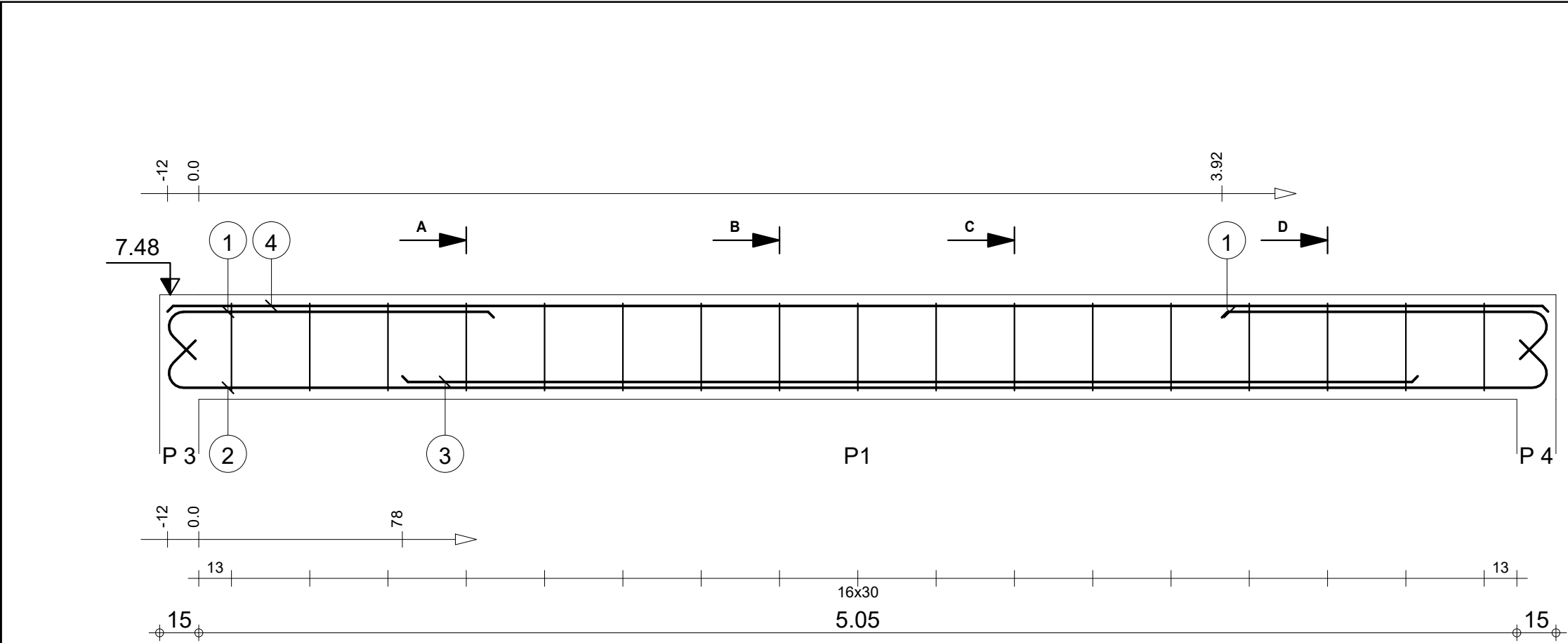
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 24.9 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.225 m3                                                    | Acier HA 400 = 2.61 kg |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PS 3 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 3.64 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 122.2 kg/ m3<br>Diamètre moyen = 10.4mm | Echelle pour la vue 6.89cm/m<br>Echelle pour la section 8.56cm/m            | Page 21/27             |
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |



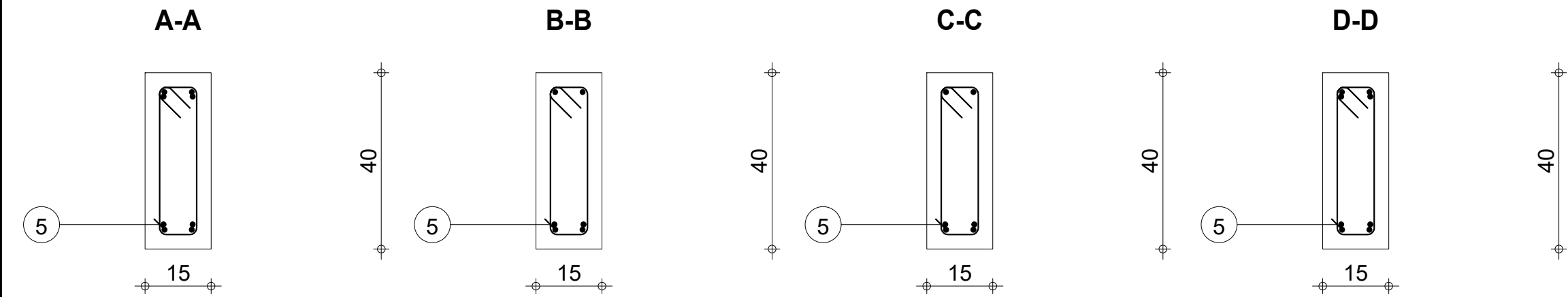
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.20 | 00   |       |
| ②    | 2HA 14   | l=3.28 | 00   |       |
| ③    | 2HA 14   | l=2.23 | 00   |       |
| ④    | 2HA 10   | l=2.79 | 00   |       |
| ⑤    | 9HA 6    | l=98   | 31   |       |



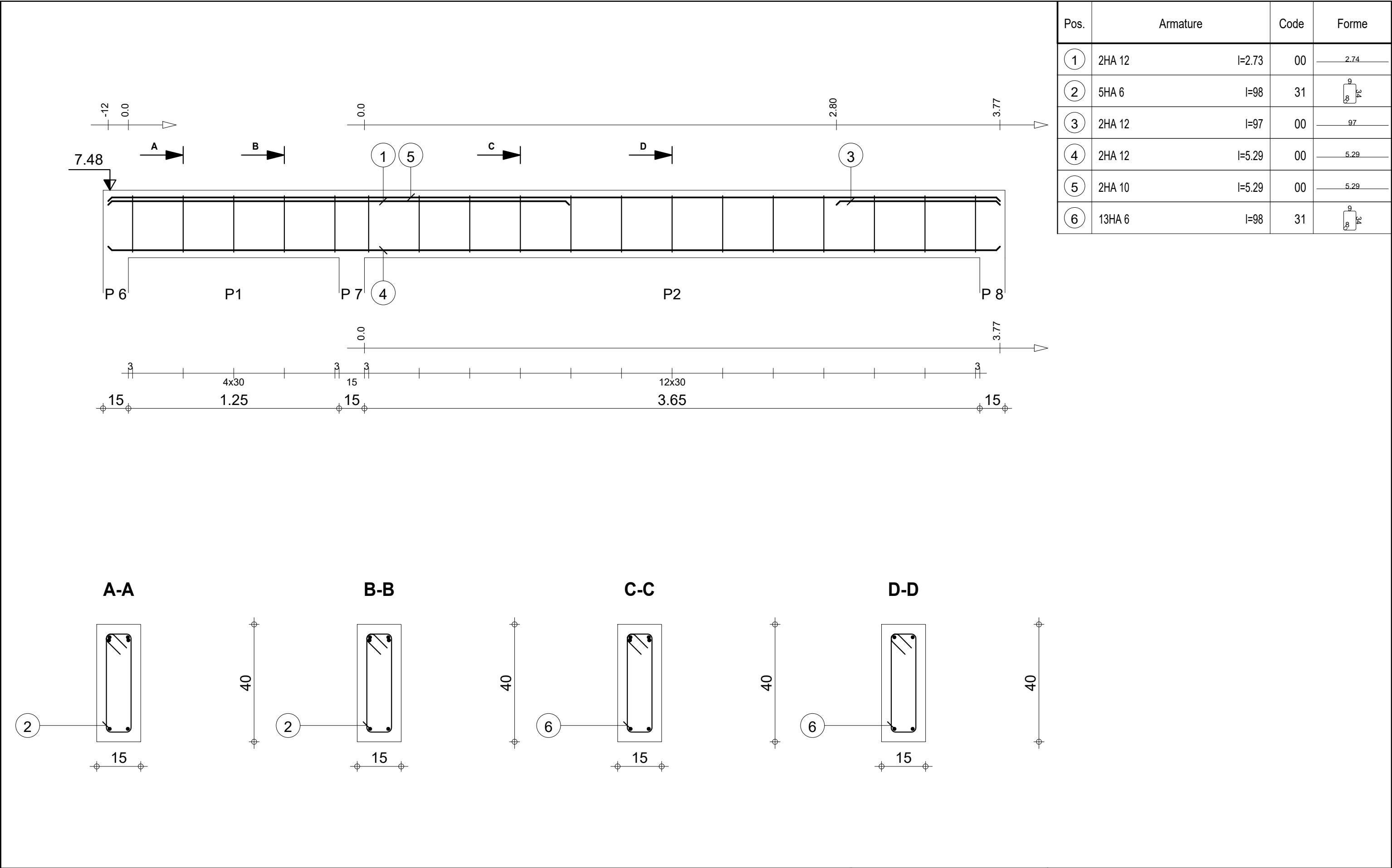
|                                                                                    |     |                                   |             |                            |          |                                  |  |                                                      |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|----------------------------|----------|----------------------------------|--|------------------------------------------------------|--|
|                                                                                    |     | Tél.                              |             | Fax                        |          |                                  |  | Acier HA 400 = 21 kg                                 |  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             | Reprise de bétonnage : Non |          | Béton : BETON = 0.171 m3         |  | Acier HA 400 = 1.95 kg                               |  |
|  | R+1 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PP 3 : P1 | Section 15x40              | Nombre 1 | Surface du coffrage = 2.78 m2    |  | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |  |
|                                                                                    |     |                                   |             |                            |          | Densité = 134.5 kg/ m3           |  | Enrobage latéral 3 cm                                |  |
|                                                                                    |     |                                   |             |                            |          | Diamètre moyen = 10.6mm          |  | Echelle pour la vue 8.93cm/m                         |  |
|                                                                                    |     |                                   |             |                            |          | Echelle pour la section 8.56cm/m |  | Page 22/27                                           |  |



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.44 | 00   |       |
| ②    | 2HA 12   | l=5.67 | 00   |       |
| ③    | 2HA 12   | l=3.89 | 00   |       |
| ④    | 2HA 10   | l=5.29 | 00   |       |
| ⑤    | 17HA 6   | l=98   | 31   |       |

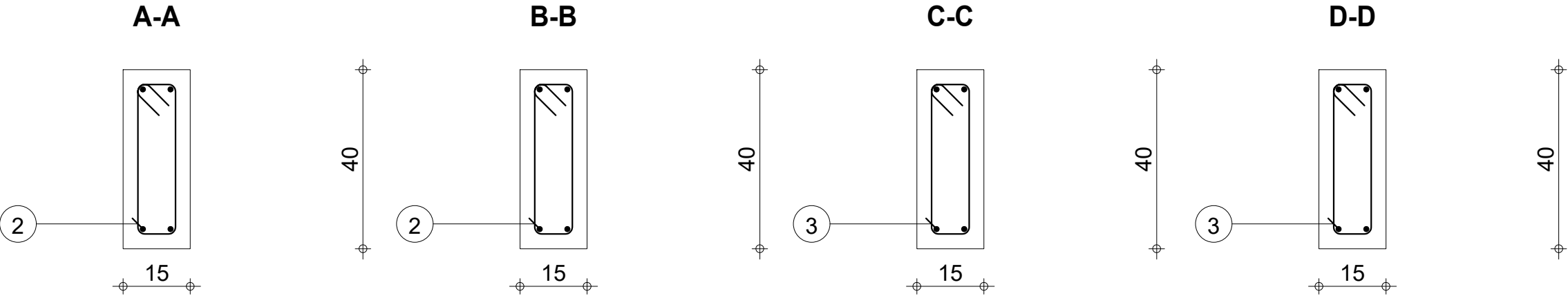
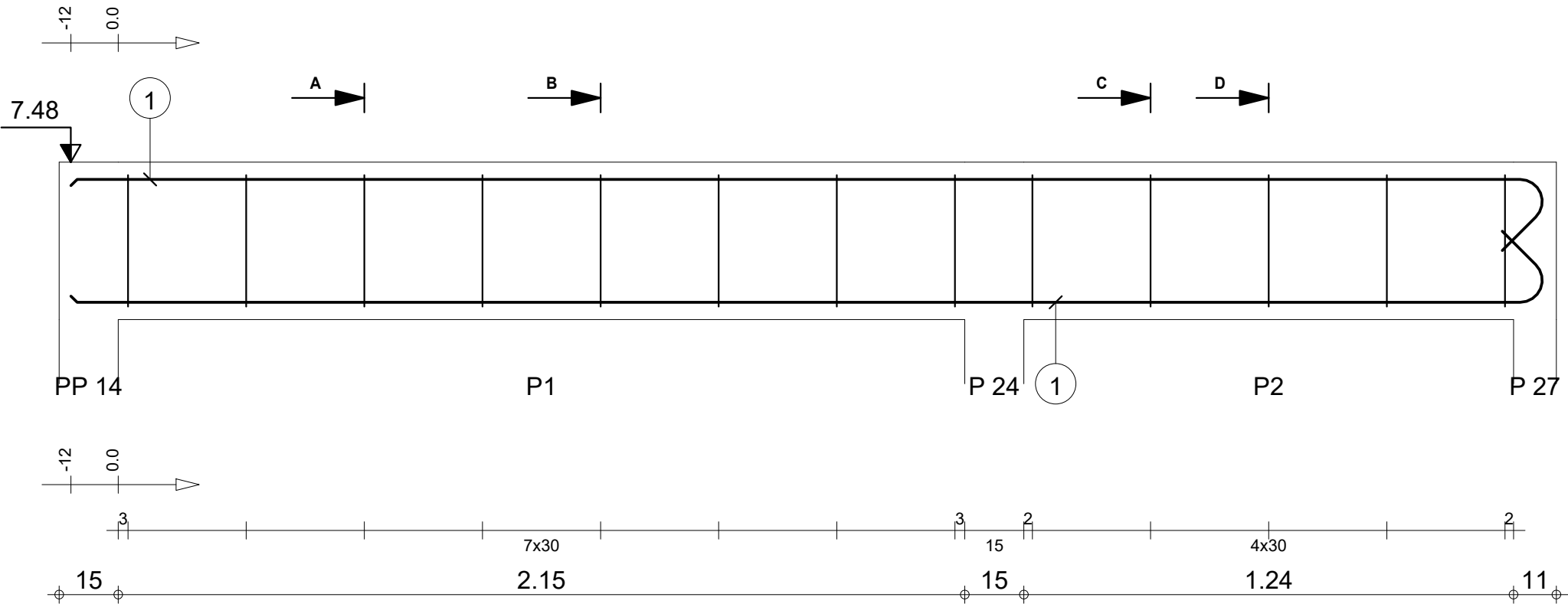


|                                                                                    |                                              |                                   |     |                            |                                                   |                                                                  |            |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----|----------------------------|---------------------------------------------------|------------------------------------------------------------------|------------|
|                                                                                    |                                              | Tél.                              | Fax |                            | Acier HA 400 = 28.6 kg                            |                                                                  |            |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable         |     | Reprise de bétonnage : Non |                                                   | Acier HA 400 = 3.69 kg                                           |            |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PP 11 : P1<br><br>Section 15x40 |     | Nombre 1                   | Béton : BETON = 0.321 m3                          | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm             |            |
|                                                                                    |                                              |                                   |     |                            | Surface du coffrage = 5.16 m2                     | Enrobage latéral 3 cm                                            |            |
|                                                                                    |                                              |                                   |     |                            | Densité = 100.6 kg/ m3<br>Diamètre moyen = 9.68mm | Echelle pour la vue 4.92cm/m<br>Echelle pour la section 8.56cm/m | Page 23/27 |

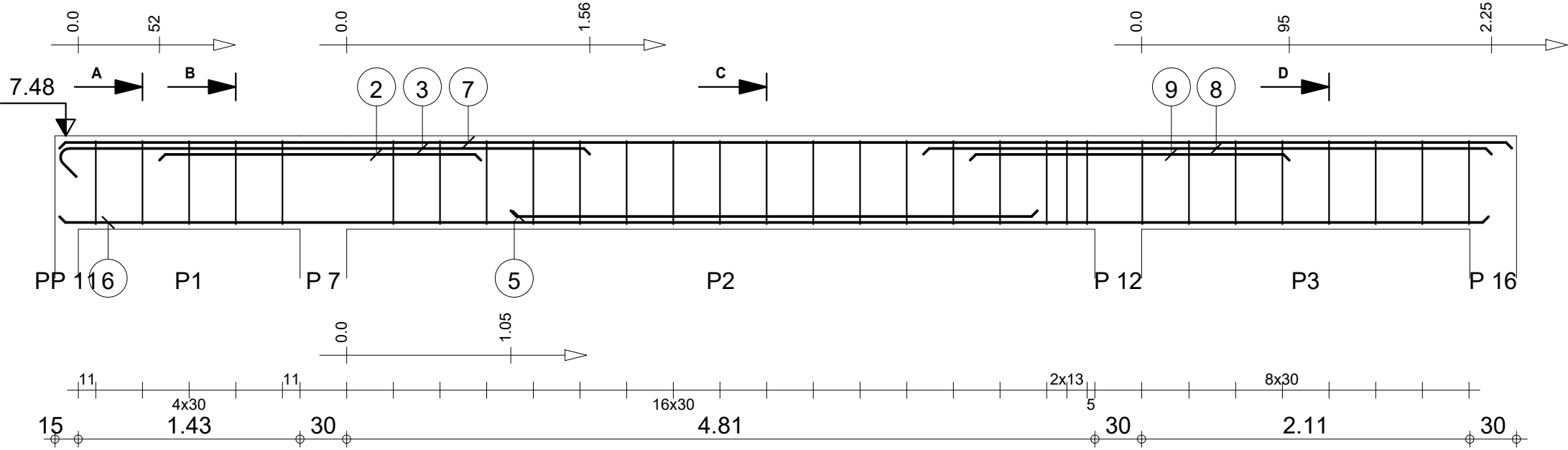




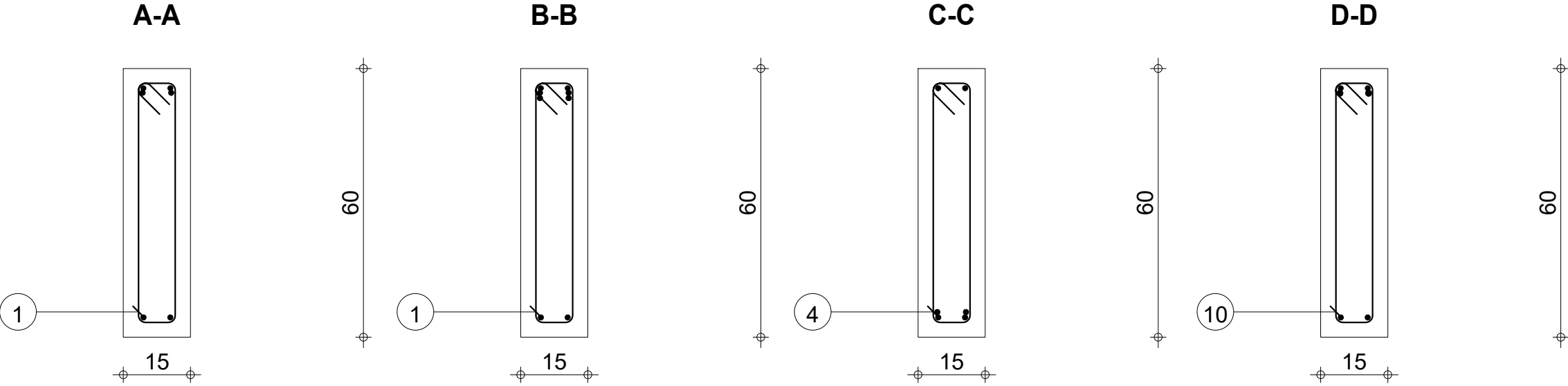
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=3.93 | 00   | 3.74  |
| ②    | 8HA 6    | l=98   | 31   |       |
| ③    | 5HA 6    | l=98   | 31   |       |



|                                                                                    |                                              |                             |          |                                                   |                                                                 |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------|----------|---------------------------------------------------|-----------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                        | Fax      |                                                   | Acier HA 400 = 14 kg                                            |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable   |          | Reprise de bétonnage : Non                        |                                                                 | Acier HA 400 = 2.82 kg |
|  | R+1<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 3_PP 4<br><br>Section 15x40 | Nombre 1 | Béton : BETON = 0.228 m3                          | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm            |                        |
|                                                                                    |                                              |                             |          | Surface du coffrage = 3.67 m2                     | Enrobage latéral 3 cm                                           |                        |
|                                                                                    |                                              |                             |          | Densité = 73.68 kg/ m3<br>Diamètre moyen = 9.32mm | Echelle pour la vue 6.8cm/m<br>Echelle pour la section 8.56cm/m | Page 26/27             |



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 5HA 6    | l=1.37 | 31   |       |
| ②    | 2HA 12   | l=2.07 | 00   |       |
| ③    | 2HA 12   | l=3.60 | 00   |       |
| ④    | 17HA 6   | l=1.37 | 31   |       |
| ⑤    | 2HA 12   | l=3.39 | 00   |       |
| ⑥    | 2HA 12   | l=9.19 | 00   |       |
| ⑦    | 2HA 10   | l=9.34 | 00   |       |
| ⑧    | 2HA 14   | l=3.65 | 00   |       |
| ⑨    | 2HA 14   | l=2.05 | 00   |       |
| ⑩    | 8HA 6    | l=1.37 | 31   |       |



Légends

Poteaux

Poutre

Mur de 15 Creux

1°) Règle: Bael91 modif 99

2°) Matériaux :

a°) Béton: dosé à 350kg/m<sup>3</sup>; f<sub>c28</sub> = 25MPa

b°) Acier:

\* f<sub>e</sub> = 400 MPa

\* Fissuration Préjudiciable

c°) Enrobage:

\* Poteau, Poutres : 3 cm

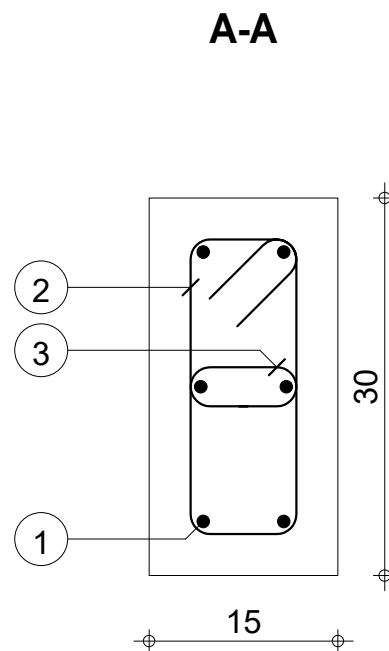
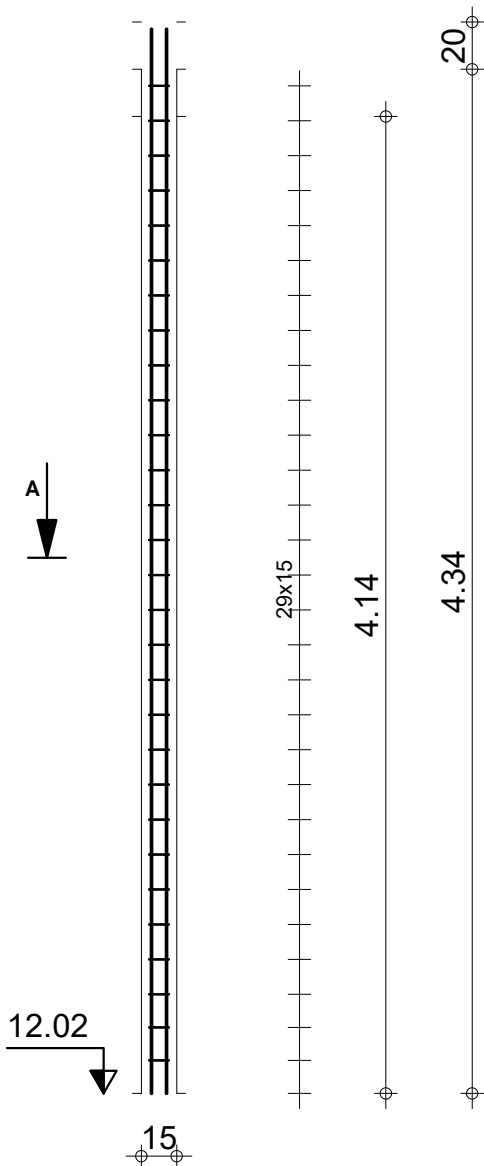
NB: -L'INGENIEUR DECLINE TOUTE RESPONSABILITE EN CAS  
DU NON RESPECT SCRUPULEUX DE LA STRUCTURE ET DU  
NON SUIVI CONTINU DES TRAVAUX  
PAR UN TECHNICIEN AGUERRI.

CHAPEAUX

HA 10 x var ≥ 200

Plan de Poutraison N° 3  
(Couverture R + 2)

Ech: 1 / 100



| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=4.51 | 00   | 4.51  |
| ②    | 29HA 6 l=78   | 31   | 8 2   |
| ③    | 29HA 6 l=21   | 00   | 5 9   |

Tél.

Fax

Acier HA 400 = 16.7 kg

Béton : BETON = 0.186 m3

Acier HA 400 = 6.36 kg

Surface du coffrage = 3.73 m2

Enrobage 3 cm

Echelle pour la vue 3.12cm/m

Echelle pour la section 16.7cm/m

Page 1/1



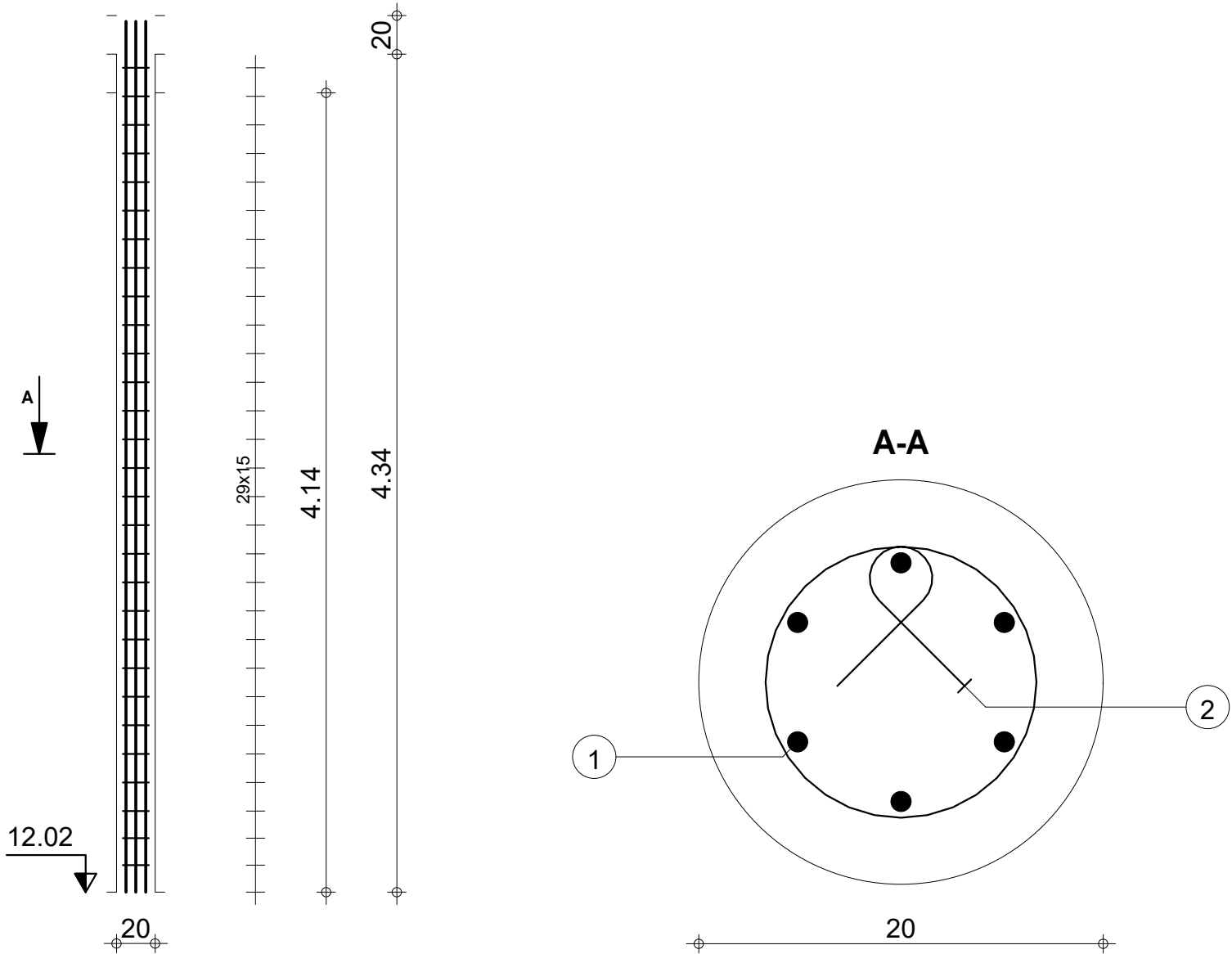
R+2

DETAILS DE STRUCTURE DUO 2 TOGBIN

4\_P 1

Section 15x30

| Pos. | Armature      | Code | Forme |
|------|---------------|------|-------|
| ①    | 6HA 10 l=4.51 | 00   | 4.51  |
| ②    | 29HA 6 l=61   |      | 13    |



R+2

DETAILS DE STRUCTURE DUO 2 TOGBIN

4\_PC 1

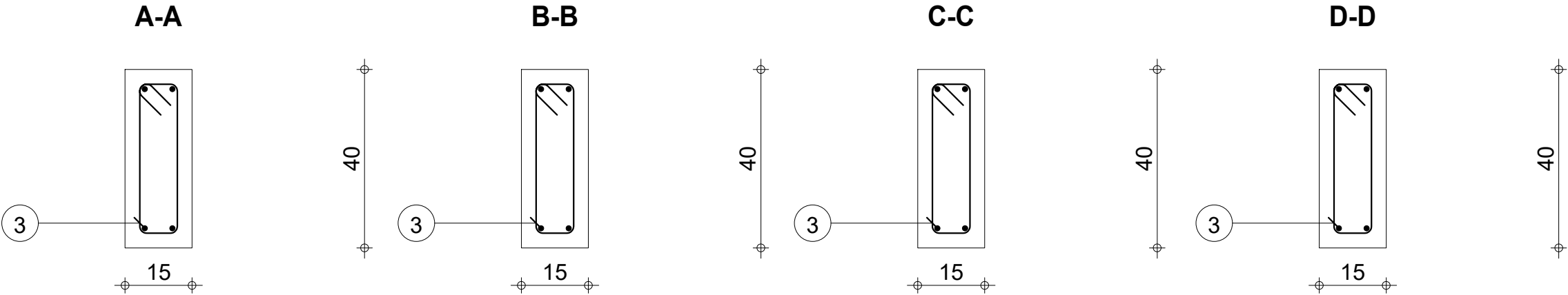
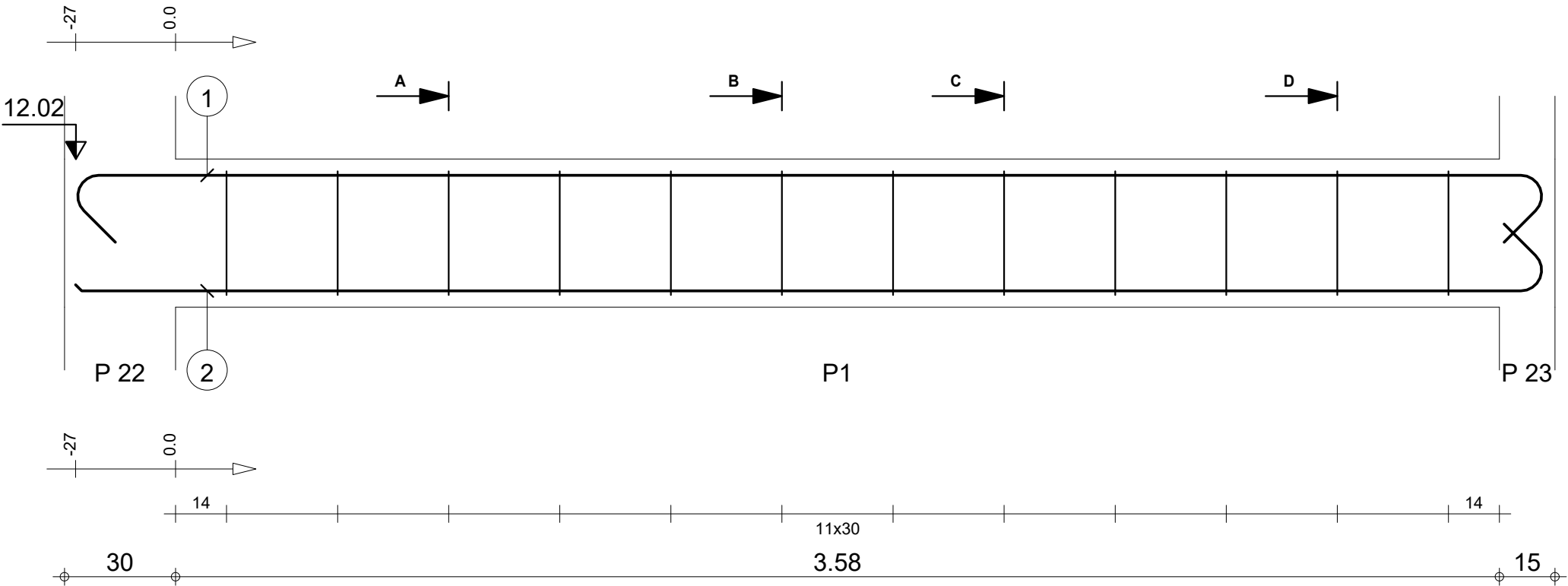
Tél.

Fax

Acier HA 400 = 16.7 kg      Béton : BETON = 0.13 m3  
Acier HA 400 = 3.95 kg      Surface du coffrage = 2.6 m2  
Enrobage 3 cm

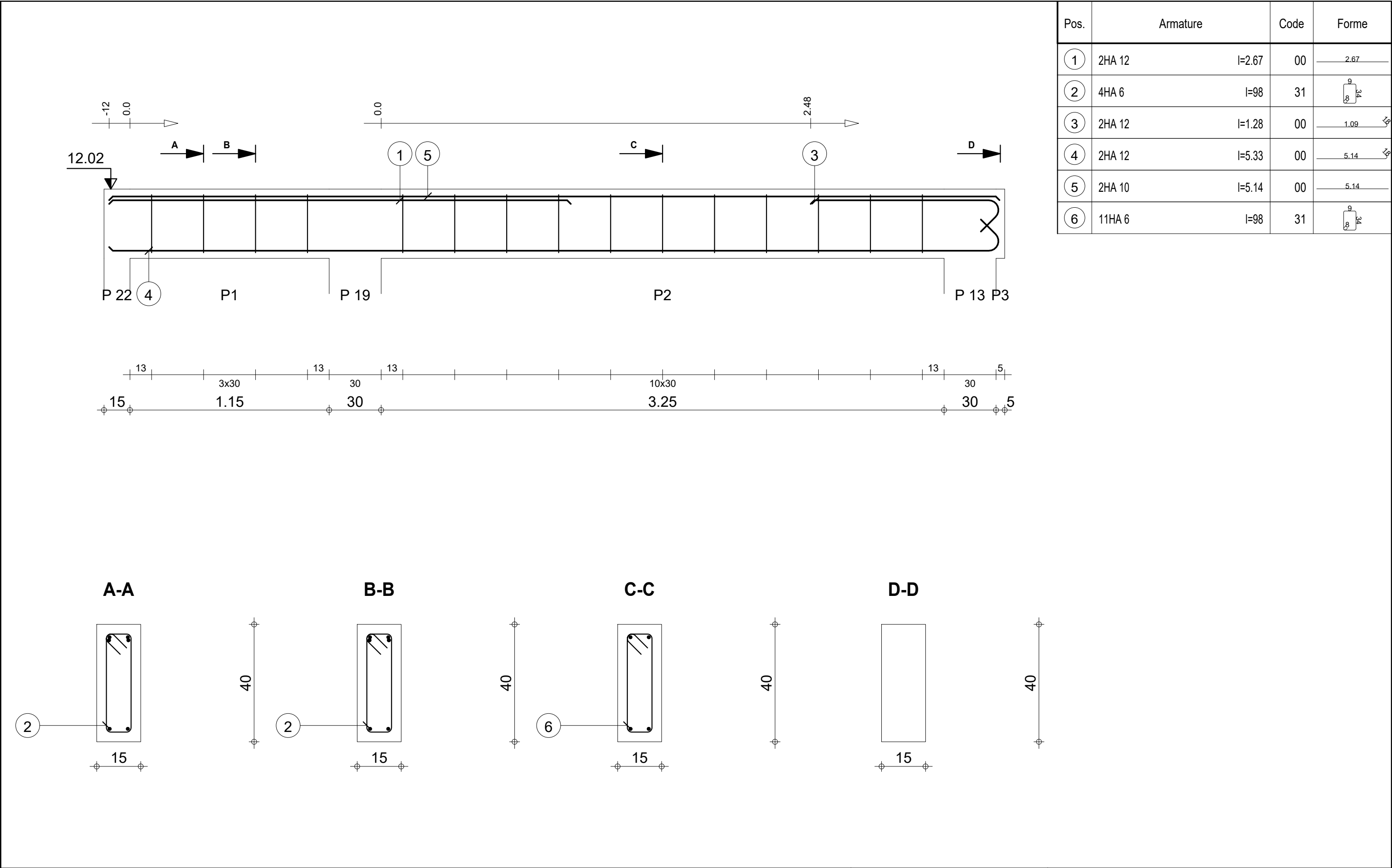
Echelle pour la vue 3.12cm/m  
Echelle pour la section 32.7cm/m

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=4.34 | 00   |       |
| ②    | 2HA 12   | l=4.16 | 00   |       |
| ③    | 12HA 6   | l=98   | 31   |       |

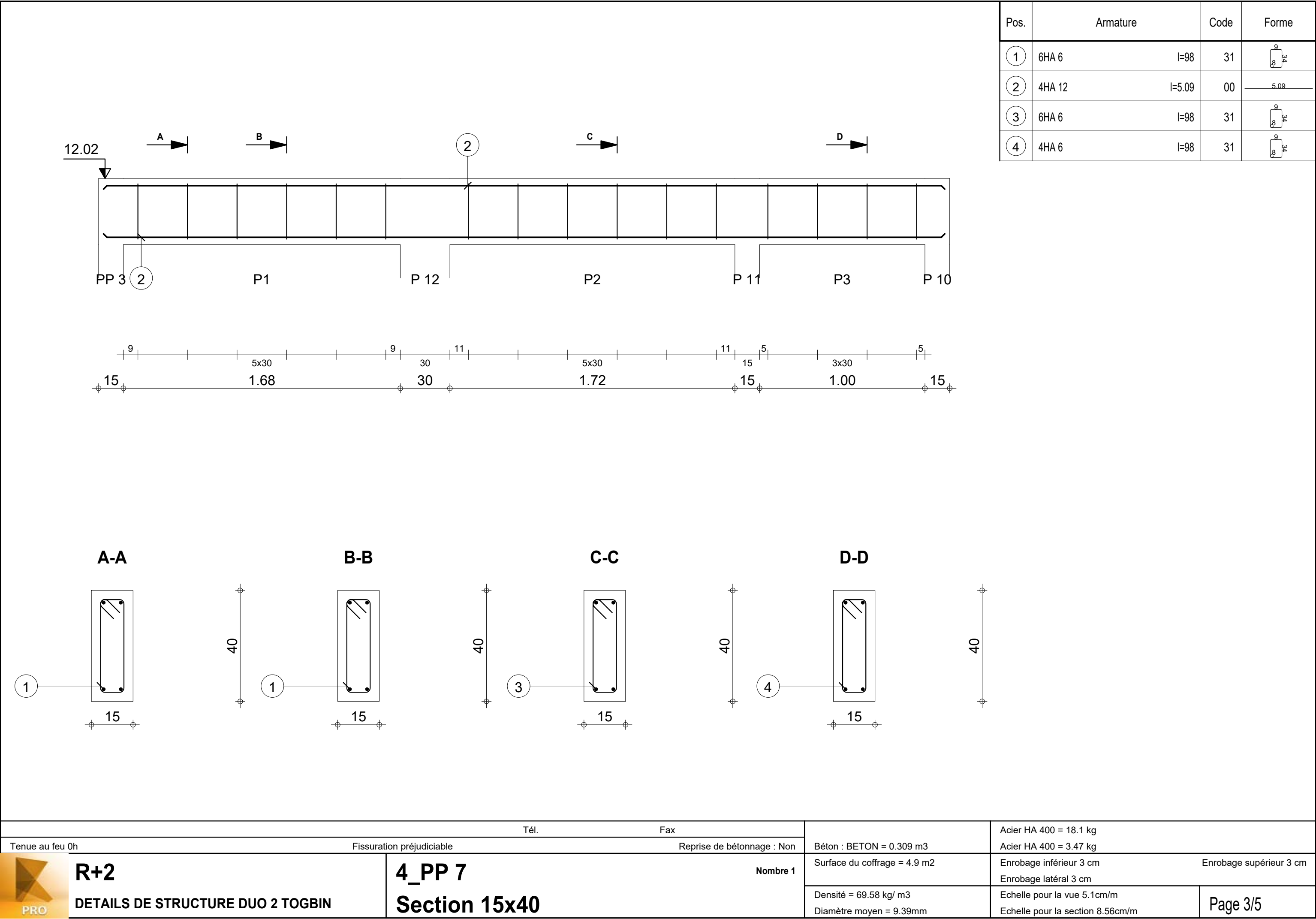


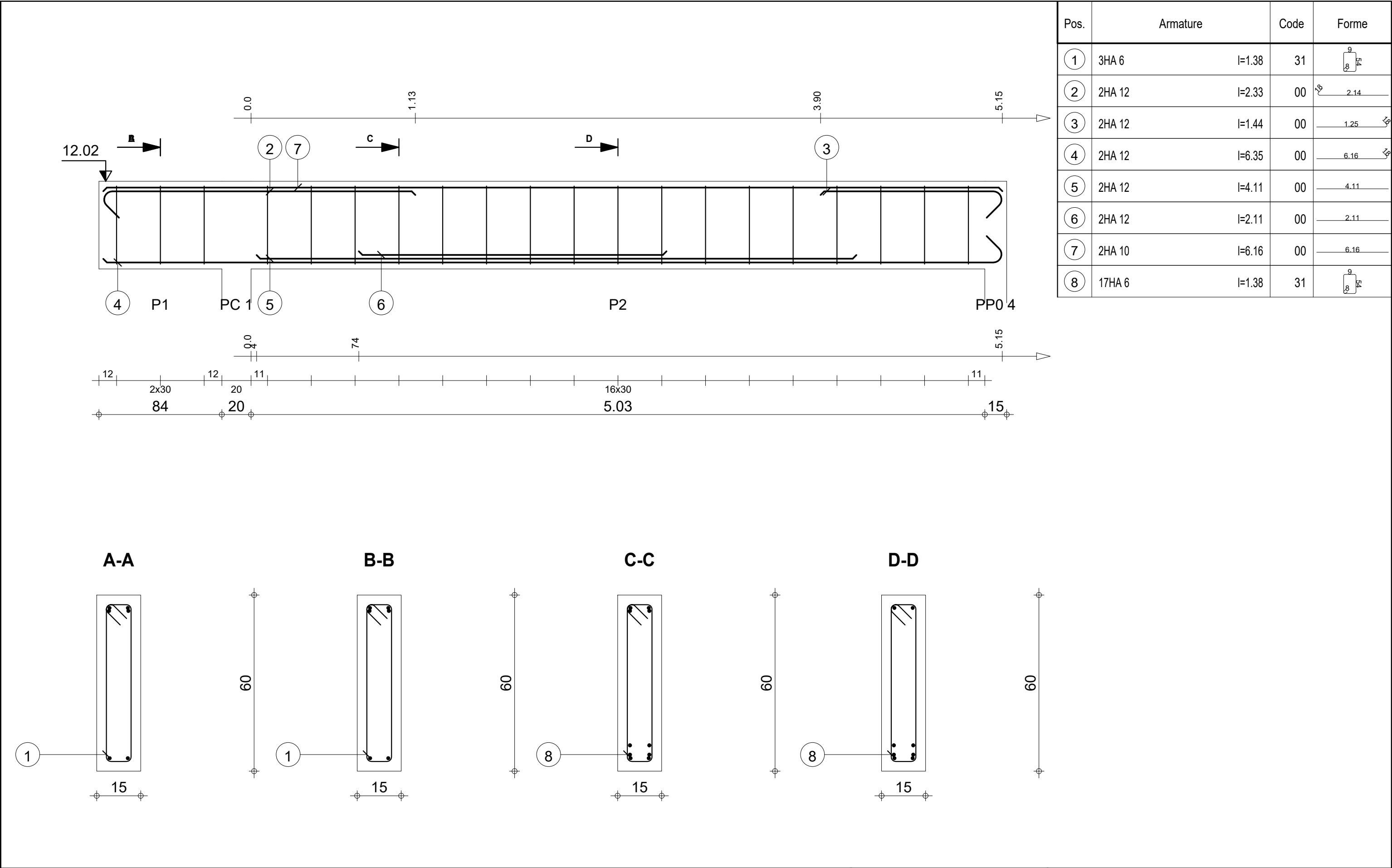
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |          |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|----------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 15.1 kg                                                      |          |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non | Béton : BETON = 0.242 m3                          | Acier HA 400 = 2.61 kg                                                      |          |
|  | R+2<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PS 4 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 3.88 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |          |
|                                                                                    |                                              |                                  |                            | Densité = 73.14 kg/ m3<br>Diamètre moyen = 9.55mm | Echelle pour la vue 6.45cm/m<br>Echelle pour la section 8.56cm/m            | Page 1/5 |





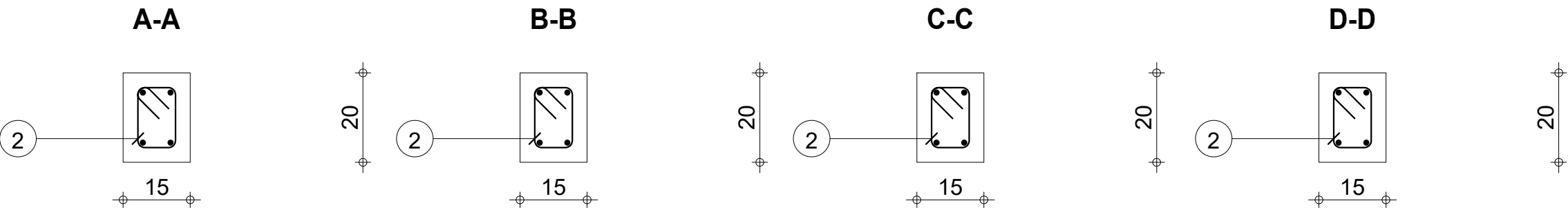
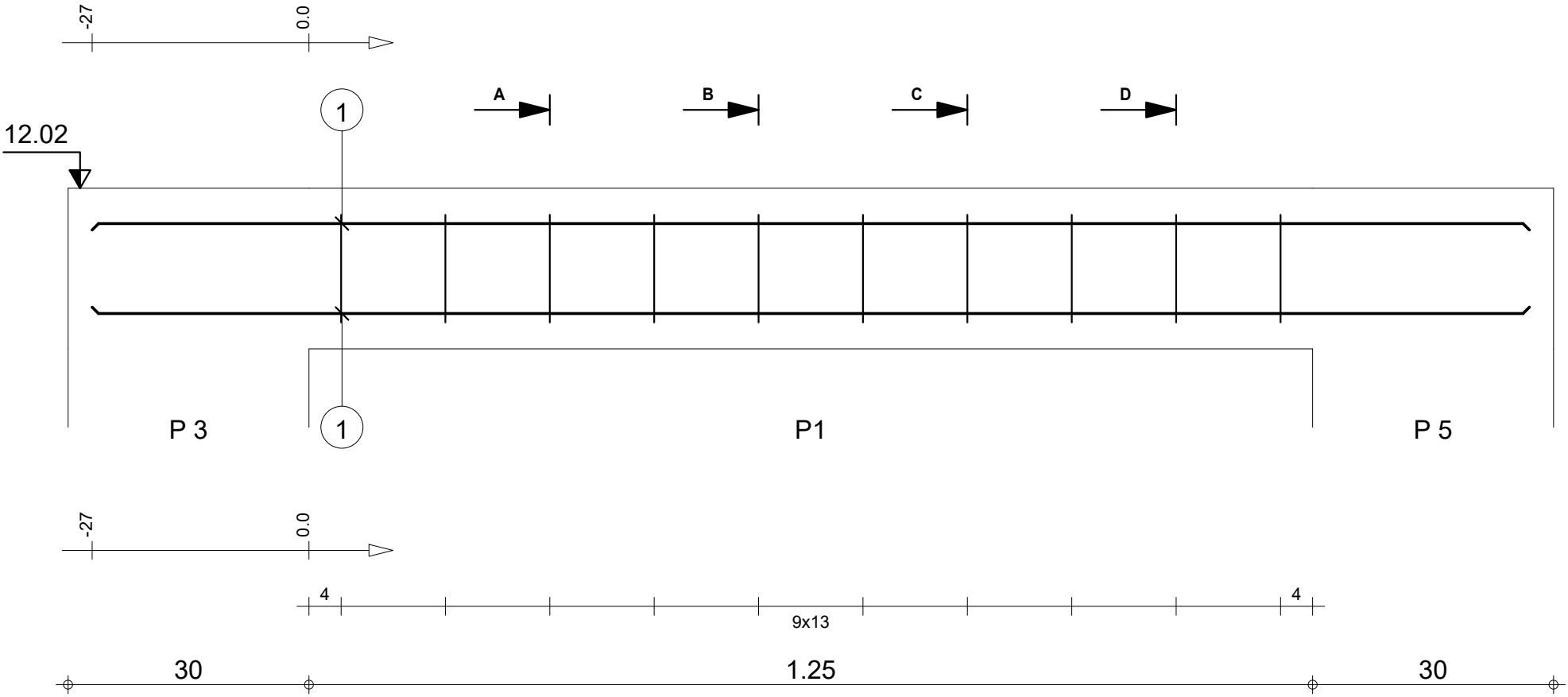
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=2.67 | 00   | 2.67  |
| ②    | 4HA 6    | l=98   | 31   |       |
| ③    | 2HA 12   | l=1.28 | 00   | 1.09  |
| ④    | 2HA 12   | l=5.33 | 00   | 5.14  |
| ⑤    | 2HA 10   | l=5.14 | 00   | 5.14  |
| ⑥    | 11HA 6   | l=98   | 31   |       |







| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.79 | 00   | 1.79  |
| ②    | 10HA 6   | l=58   | 31   |       |



|                                                                                    |     |                                   |             |                            |          |                                                   |  |                                                                  |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|----------------------------|----------|---------------------------------------------------|--|------------------------------------------------------------------|--|
|                                                                                    |     | Tél.                              |             | Fax                        |          |                                                   |  | Acier HA 400 = 6.36 kg                                           |  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             | Reprise de bétonnage : Non |          | Béton : BETON = 0.0555 m3                         |  | Acier HA 400 = 1.28 kg                                           |  |
|  | R+2 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_CH 1 : P1 | Section 15x20              | Nombre 1 | Surface du coffrage = 0.988 m2                    |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |  |
|                                                                                    |     |                                   |             |                            |          | Densité = 137.7 kg/ m3<br>Diamètre moyen = 9.32mm |  | Echelle pour la vue 13.4cm/m<br>Echelle pour la section 8.56cm/m |  |
|                                                                                    |     |                                   |             |                            |          |                                                   |  | Page 1/20                                                        |  |

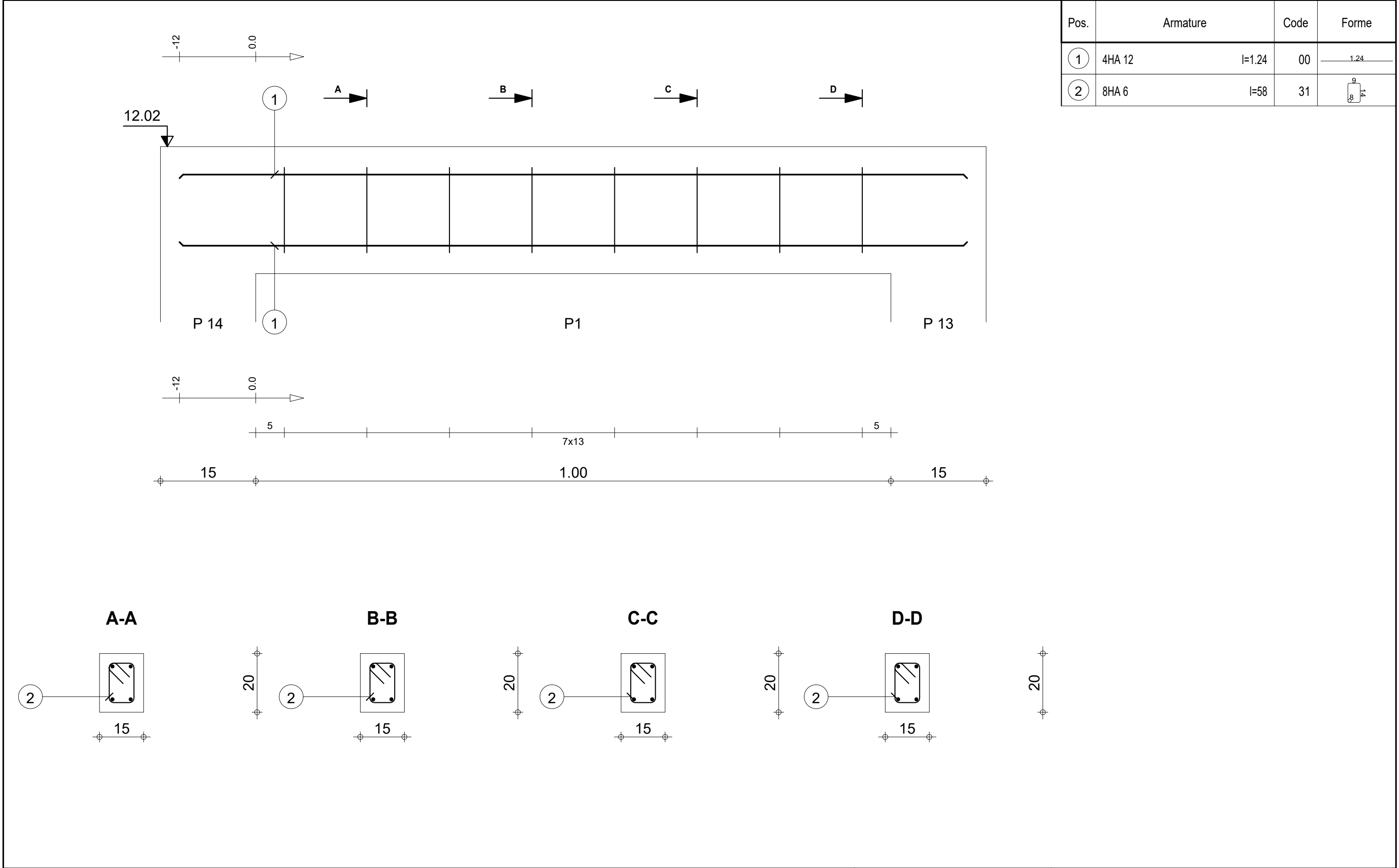


R+2

DETAILS DE STRUCTURE DUO 2 TOGBIN

4\_CH 1 : P1

Section 15x20

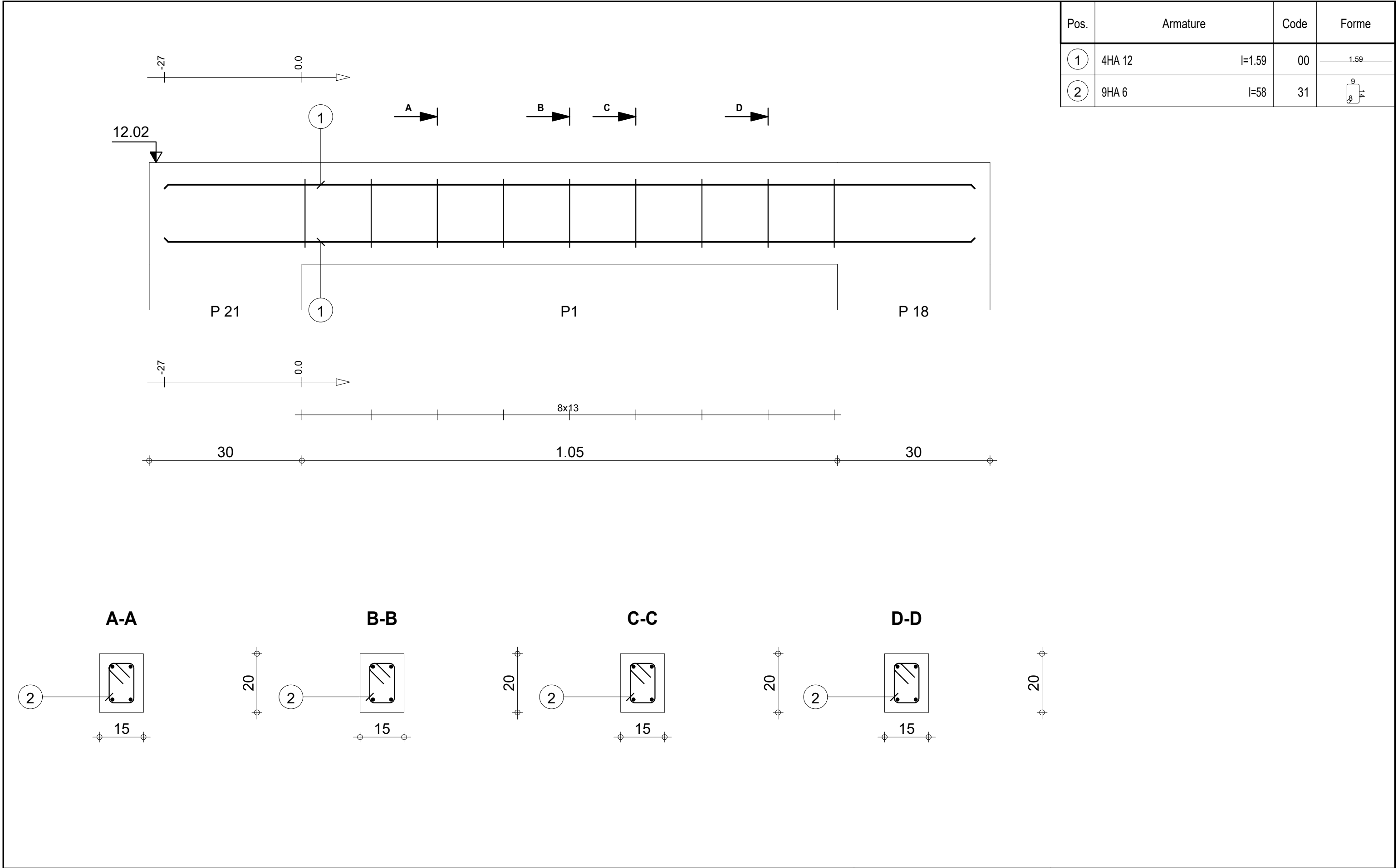


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.24 | 00   | 1.24  |
| ②    | 8HA 6    | l=58   | 31   | 8 14  |

|                                                                                    |                                              |                                  |                            |                                                  |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|--------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                  | Acier HA 400 = 4.4 kg                                                       |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                  | Béton : BETON = 0.039 m3                                                    | Acier HA 400 = 1.03 kg |
|  | R+2<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PS 3 : P1<br><br>Section 15x20 | Nombre 1                   | Surface du coffrage = 0.73 m2                    | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 139.2 kg/ m3<br>Diamètre moyen = 9.1mm | Echelle pour la vue 18.5cm/m<br>Echelle pour la section 8.56cm/m            | Page 2/20              |





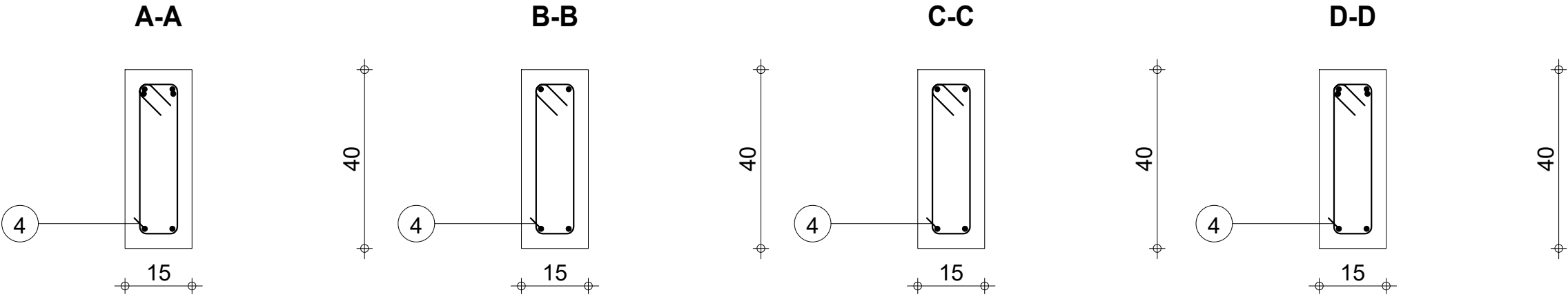
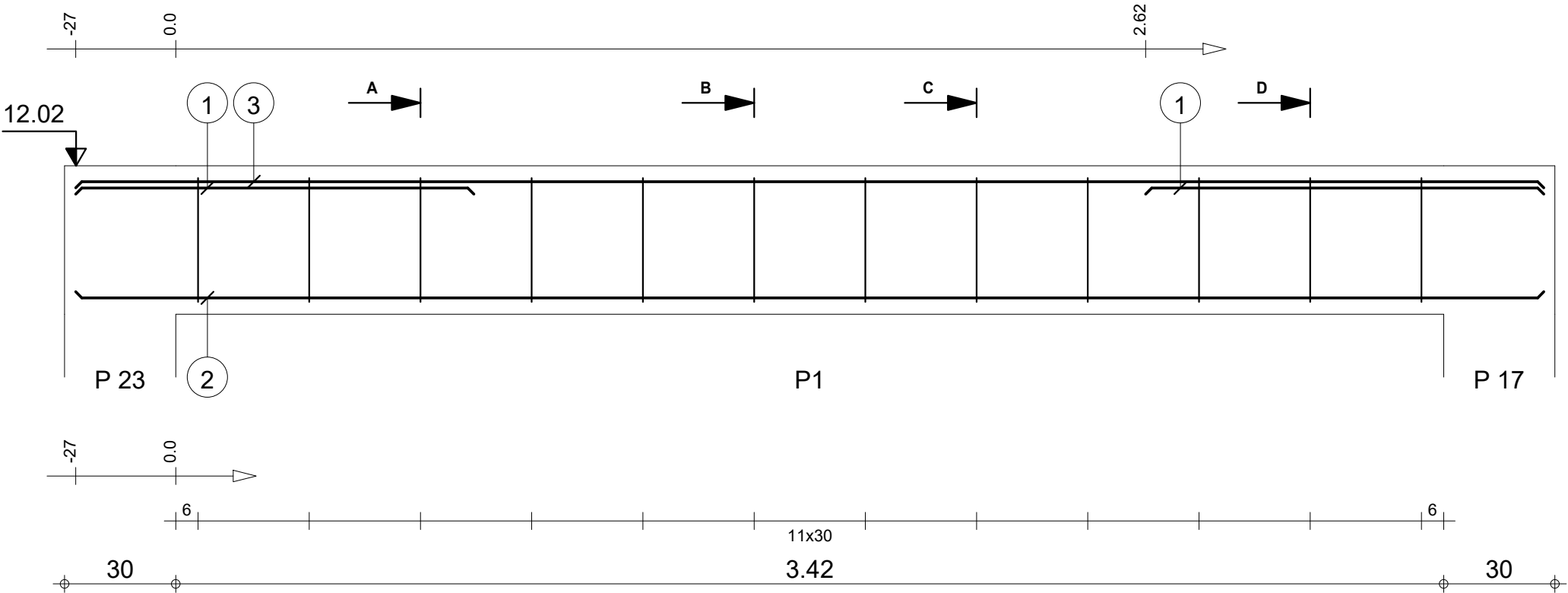


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.59 | 00   | 1.59  |
| ②    | 9HA 6    | l=58   | 31   |       |

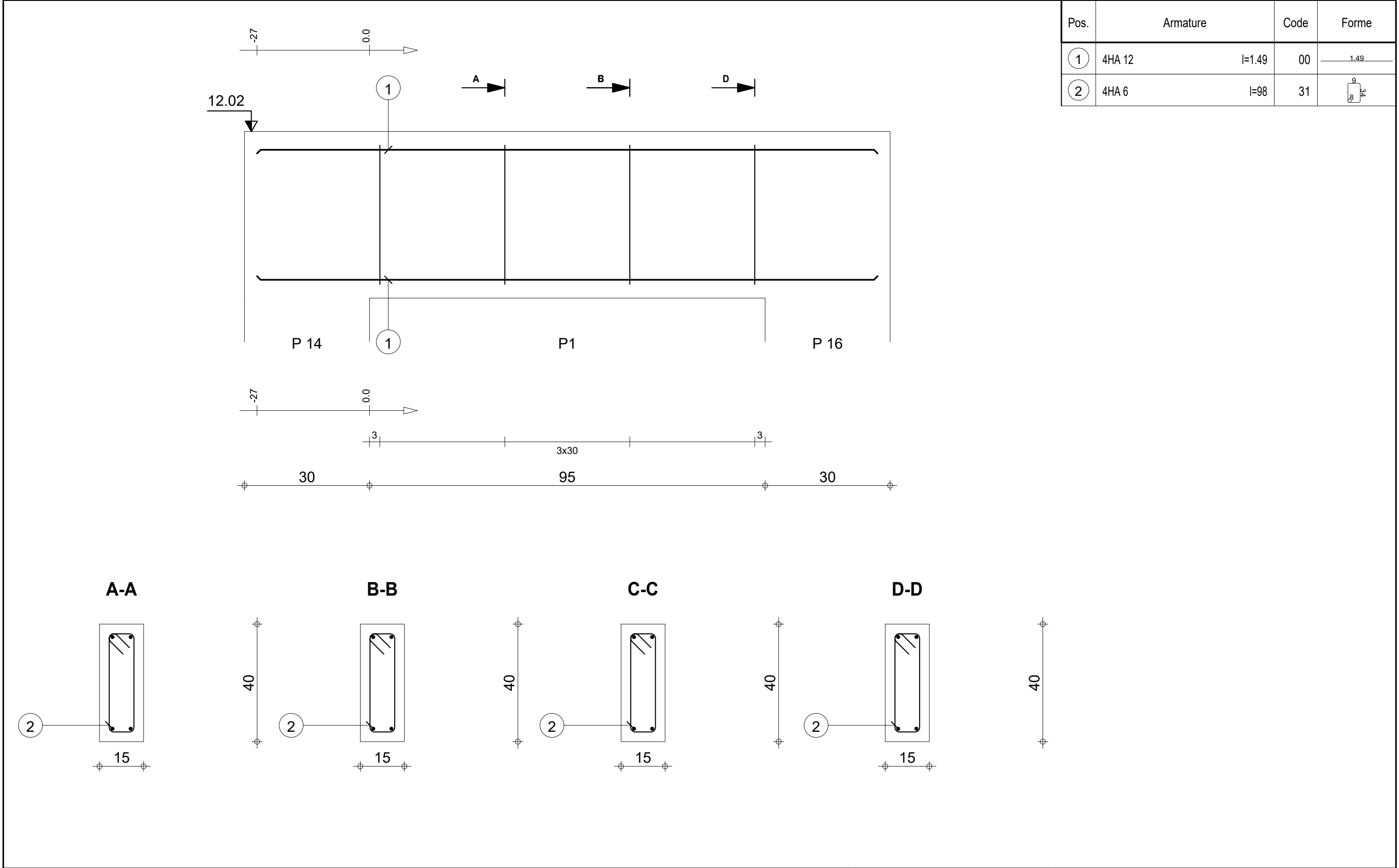
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|------------------------------------------------------------------------------------|-----------------------------------|---------------------------|--------------------|----------------------------|-----------------|---------------------------|--------------------------------------------------|------------------------|------------------------------------------------------------------|--|-------------------------|--|
|                                                                                    |                                   | Tél.                      |                    | Fax                        |                 |                           |                                                  | Acier HA 400 = 5.66 kg |                                                                  |  |                         |  |
| Tenue au feu 0h                                                                    |                                   | Fissuration préjudiciable |                    | Reprise de bétonnage : Non |                 | Béton : BETON = 0.0496 m3 |                                                  | Acier HA 400 = 1.15 kg |                                                                  |  |                         |  |
|  | <b>R+2</b>                        |                           | <b>4_CH 3 : P1</b> |                            | <b>Nombre 1</b> |                           | Surface du coffrage = 0.879 m2                   |                        | Enrobage inférieur 3 cm                                          |  | Enrobage supérieur 3 cm |  |
|                                                                                    |                                   |                           |                    |                            |                 |                           |                                                  |                        | Enrobage latéral 3 cm                                            |  |                         |  |
|                                                                                    | DETAILS DE STRUCTURE DUO 2 TOGBIN |                           | Section 15x20      |                            |                 |                           | Densité = 137.3 kg/ m3<br>Diamètre moyen = 9.3mm |                        | Echelle pour la vue 14.8cm/m<br>Echelle pour la section 8.56cm/m |  | Page 4/20               |  |



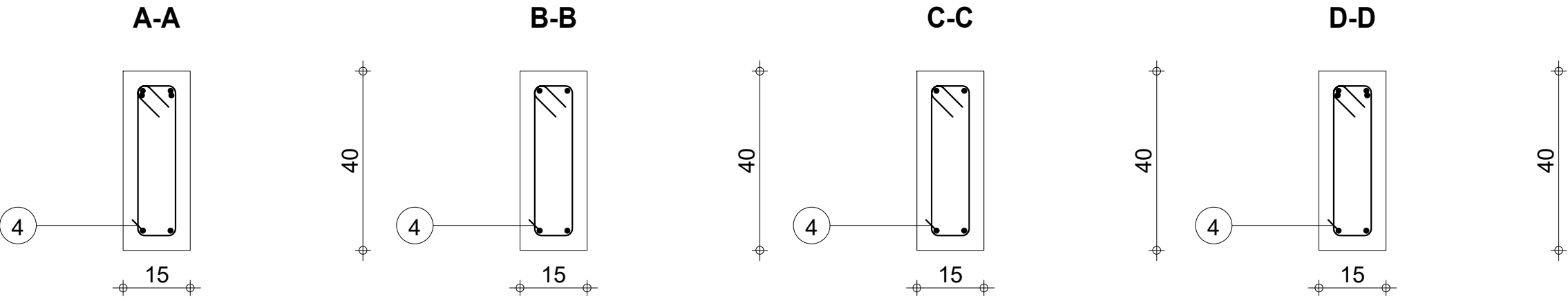
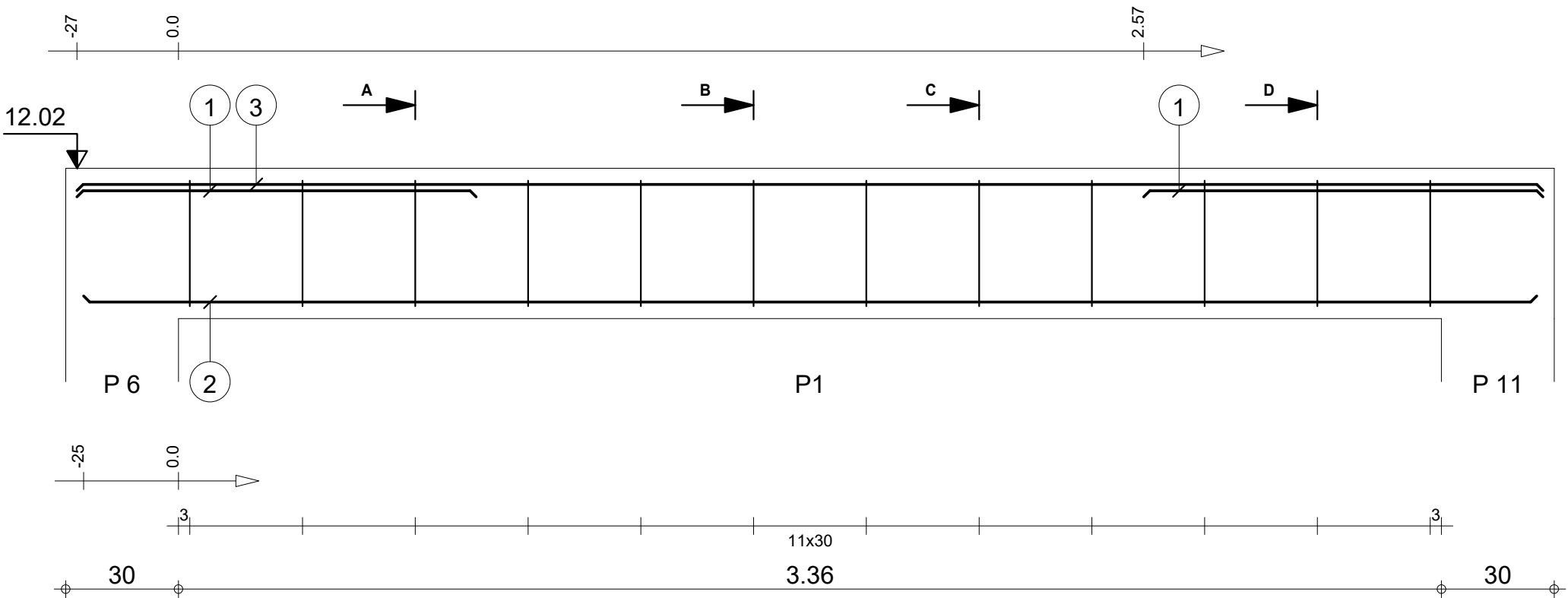
| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.07 | 00   | 1.07  |
| ②    | 2HA 12   | l=3.96 | 00   | 3.96  |
| ③    | 2HA 10   | l=3.96 | 00   | 3.96  |
| ④    | 12HA 6   | l=98   | 31   |       |



|                                                                                    |     |                                   |             |                            |          |                                                   |  |                                                                             |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|-------------|----------------------------|----------|---------------------------------------------------|--|-----------------------------------------------------------------------------|--|
|                                                                                    |     | Tél.                              |             | Fax                        |          |                                                   |  | Acier HA 400 = 15.7 kg                                                      |  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable         |             | Reprise de bétonnage : Non |          | Béton : BETON = 0.241 m3                          |  | Acier HA 400 = 2.61 kg                                                      |  |
|  | R+2 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PS 2 : P1 | Section 15x40              | Nombre 1 | Surface du coffrage = 3.85 m2                     |  | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |  |
|                                                                                    |     |                                   |             |                            |          | Densité = 75.93 kg/ m3<br>Diamètre moyen = 9.29mm |  | Echelle pour la vue 6.46cm/m<br>Echelle pour la section 8.56cm/m            |  |

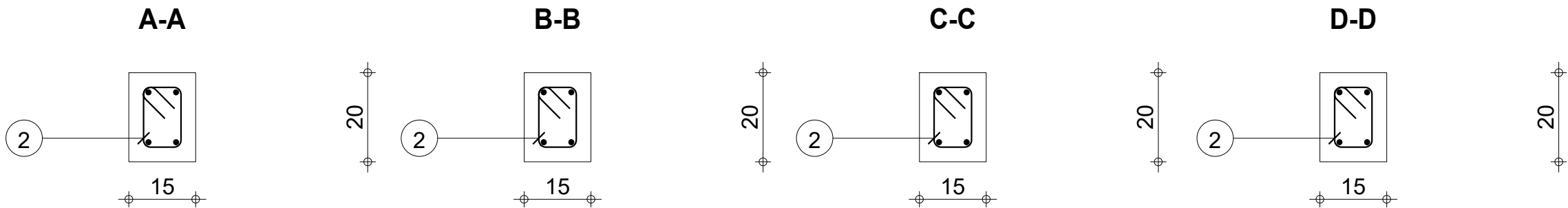
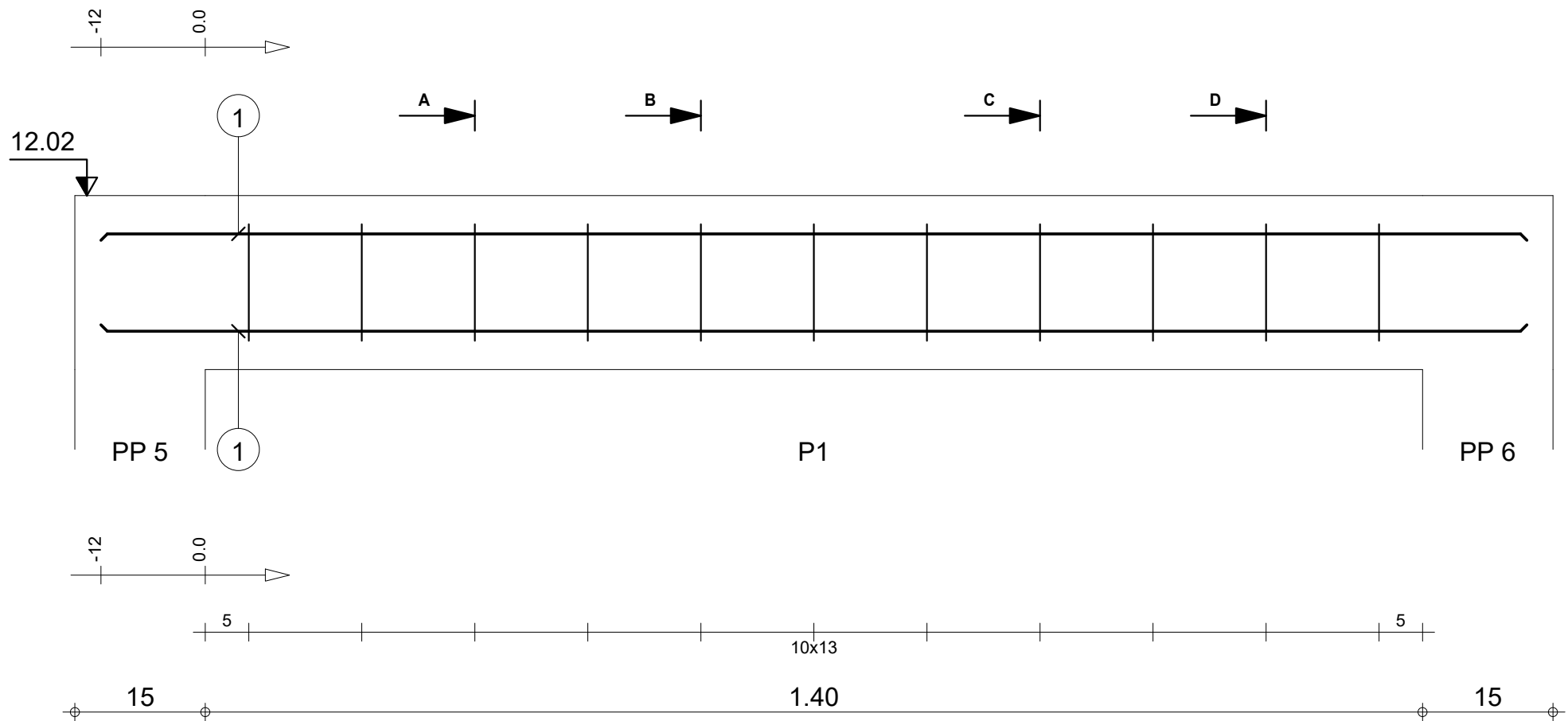


| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.06 | 00   | 1.06  |
| ②    | 2HA 12   | l=3.87 | 00   | 3.87  |
| ③    | 2HA 10   | l=3.90 | 00   | 3.90  |
| ④    | 12HA 6   | l=98   | 31   |       |



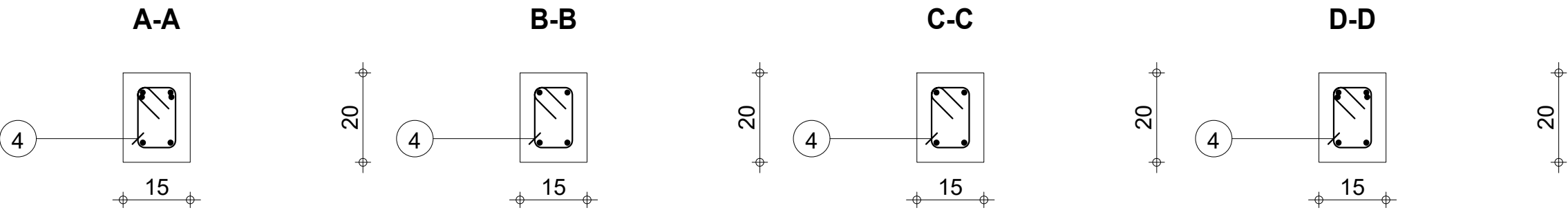
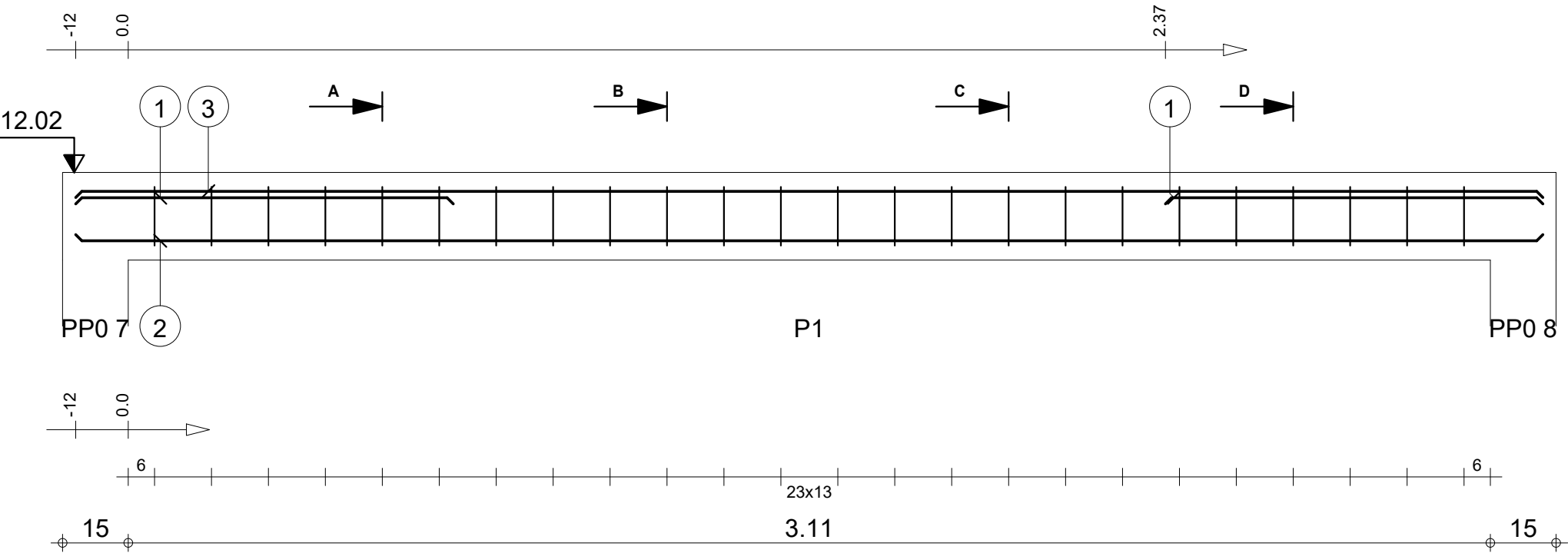
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 15.4 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.238 m3                                                    | Acier HA 400 = 2.61 kg |
|  | R+2<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PP 1 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 3.79 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 75.63 kg/ m3<br>Diamètre moyen = 9.27mm | Echelle pour la vue 6.54cm/m<br>Echelle pour la section 8.56cm/m            | Page 7/20              |

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=1.64 | 00   | 1.64  |
| ②    | 11HA 6   | l=58   | 31   |       |

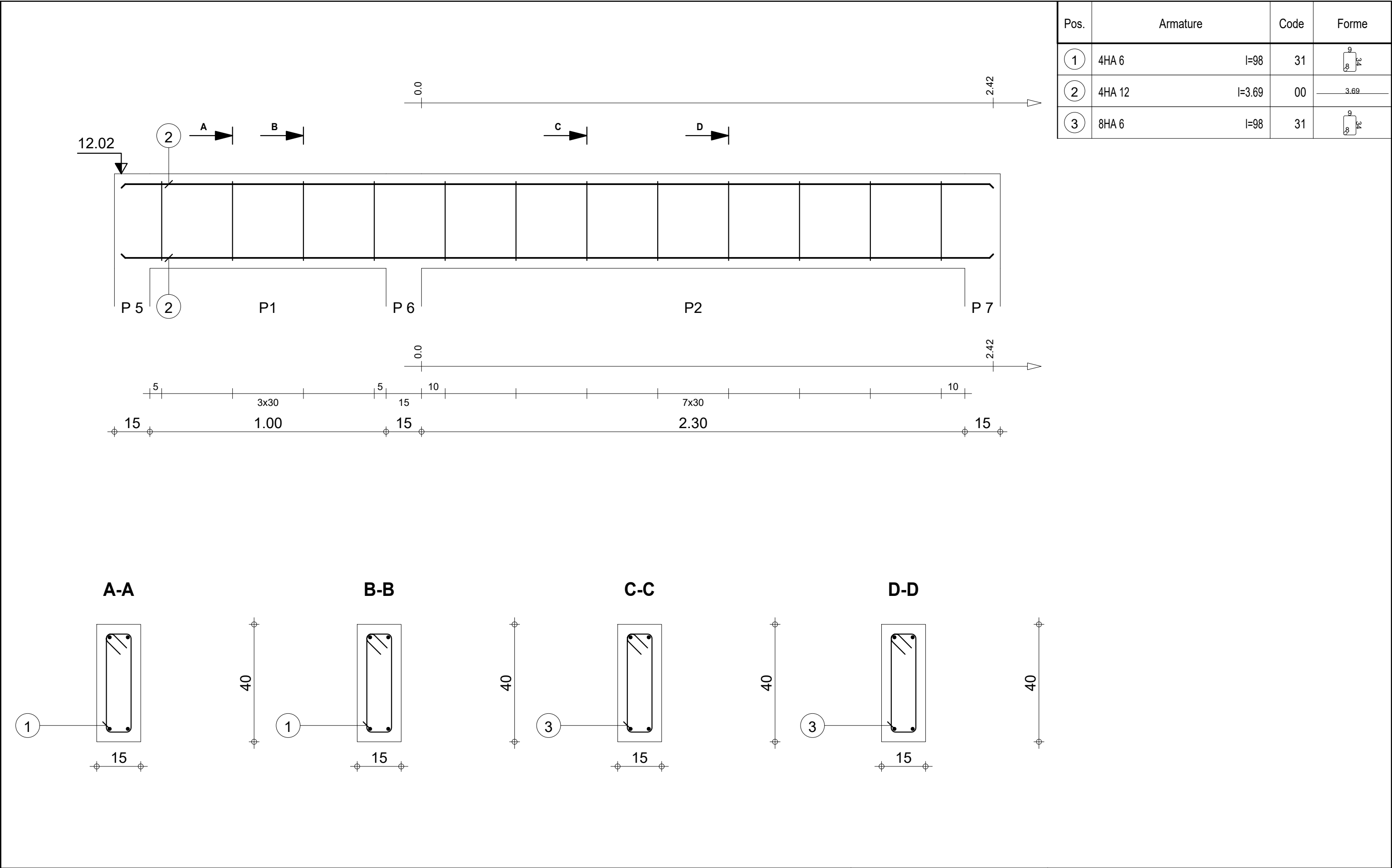


|                                                                                    |                                          |                              |                            |                                                 |                                                                  |           |
|------------------------------------------------------------------------------------|------------------------------------------|------------------------------|----------------------------|-------------------------------------------------|------------------------------------------------------------------|-----------|
|                                                                                    |                                          | Tél.                         | Fax                        |                                                 | Acier HA 400 = 5.82 kg                                           |           |
| Tenue au feu 0h                                                                    |                                          | Fissuration préjudiciable    | Reprise de bétonnage : Non | Béton : BETON = 0.051 m3                        | Acier HA 400 = 1.41 kg                                           |           |
|  | R+2<br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_CH 2 : P1<br>Section 15x20 | Nombre 1                   | Surface du coffrage = 0.95 m2                   | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm                 |           |
|                                                                                    |                                          |                              |                            | Densité = 142 kg/ m3<br>Diamètre moyen = 9.05mm | Echelle pour la vue 14.5cm/m<br>Echelle pour la section 8.56cm/m | Page 8/20 |

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=86   | 00   | 86    |
| ②    | 2HA 12   | l=3.35 | 00   | 3.35  |
| ③    | 2HA 10   | l=3.35 | 00   | 3.35  |
| ④    | 24HA 6   | l=58   | 31   |       |



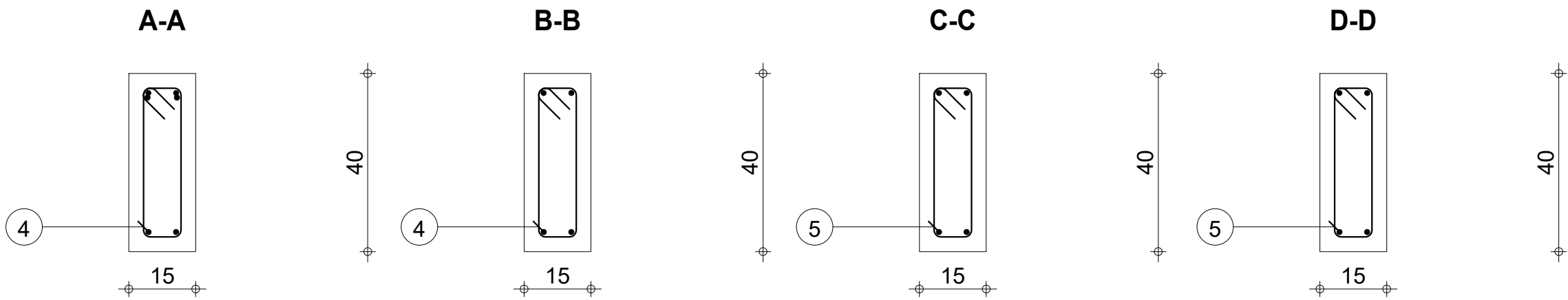
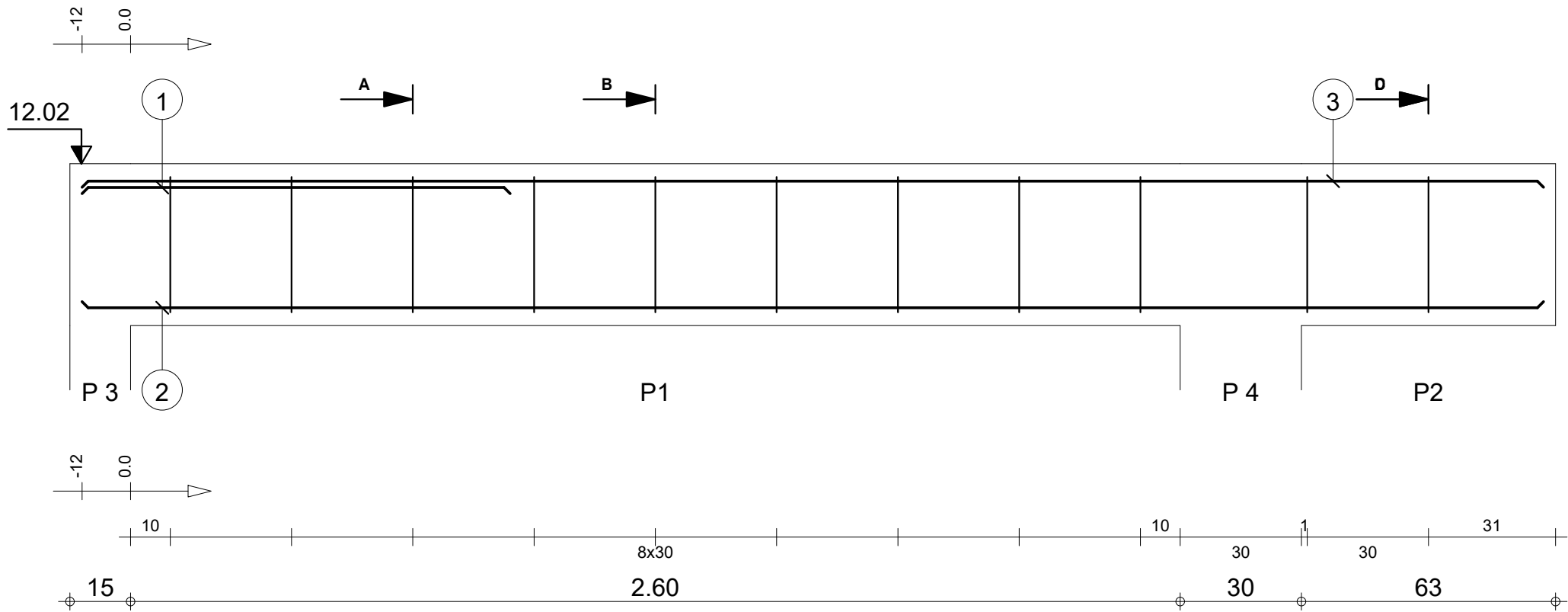
|                                                                                    |     |                                   |                           |               |                            |                                                   |                        |                              |  |                                  |  |
|------------------------------------------------------------------------------------|-----|-----------------------------------|---------------------------|---------------|----------------------------|---------------------------------------------------|------------------------|------------------------------|--|----------------------------------|--|
| Tél.                                                                               |     |                                   | Fax                       |               | Béton : BETON = 0.102 m3   |                                                   | Acier HA 400 = 13.1 kg |                              |  |                                  |  |
| Tenue au feu 0h                                                                    |     |                                   | Fissuration préjudiciable |               | Reprise de bétonnage : Non |                                                   | Acier HA 400 = 3.08 kg |                              |  |                                  |  |
|  | R+2 | DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PP0 3 : P1              | Section 15x20 | Nombre 1                   | Surface du coffrage = 1.89 m2                     |                        | Enrobage inférieur 3 cm      |  | Enrobage supérieur 3 cm          |  |
|                                                                                    |     |                                   |                           |               |                            | Densité = 158.8 kg/ m3<br>Diamètre moyen = 8.85mm |                        | Echelle pour la vue 7.54cm/m |  | Echelle pour la section 8.56cm/m |  |
|                                                                                    |     |                                   |                           |               |                            |                                                   |                        |                              |  | Page 9/20                        |  |



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 6    | l=98   | 31   |       |
| ②    | 4HA 12   | l=3.69 | 00   |       |
| ③    | 8HA 6    | l=98   | 31   |       |

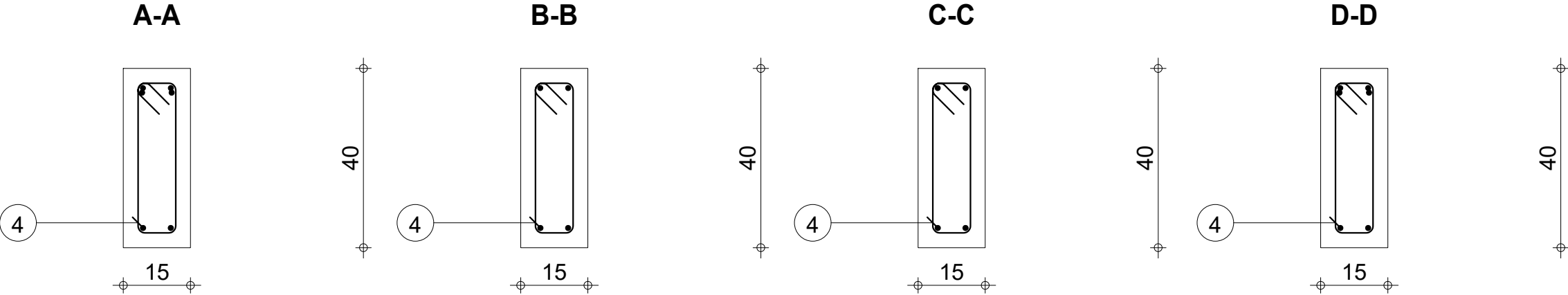
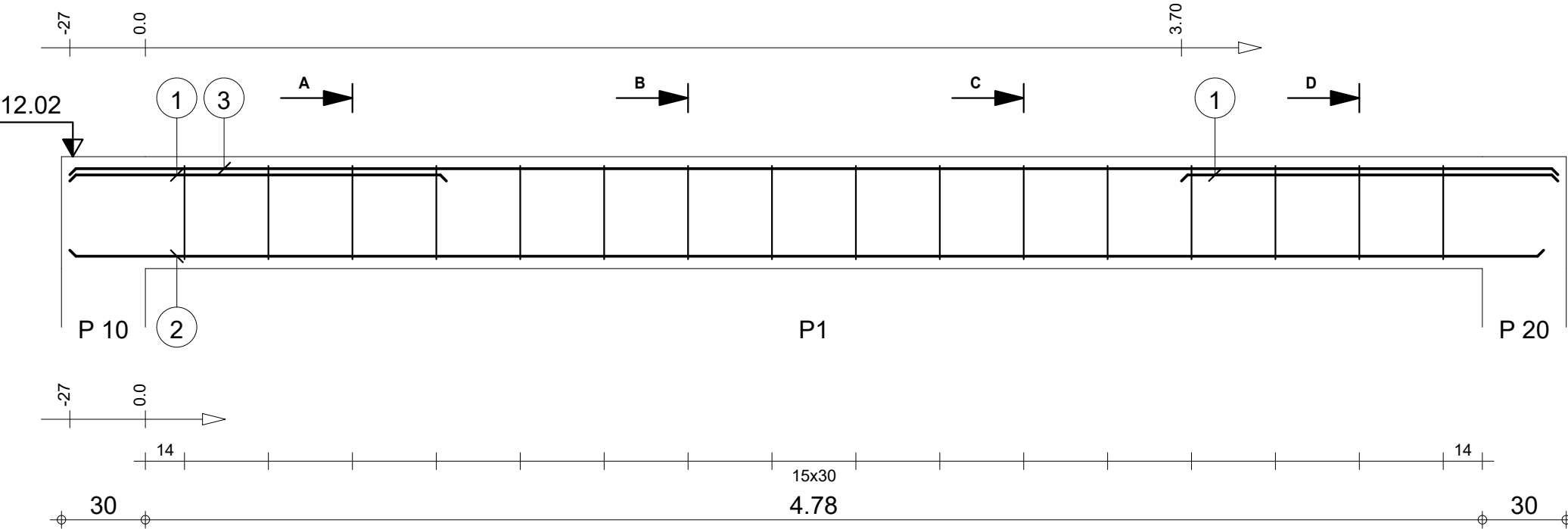
|                                                                                    |                                   |                           |               |                            |                 |                          |                               |                                  |                              |            |                         |  |
|------------------------------------------------------------------------------------|-----------------------------------|---------------------------|---------------|----------------------------|-----------------|--------------------------|-------------------------------|----------------------------------|------------------------------|------------|-------------------------|--|
|                                                                                    |                                   | Tél.                      |               | Fax                        |                 |                          |                               | Acier HA 400 = 13.1 kg           |                              |            |                         |  |
| Tenue au feu 0h                                                                    |                                   | Fissuration préjudiciable |               | Reprise de bétonnage : Non |                 | Béton : BETON = 0.225 m3 |                               | Acier HA 400 = 2.61 kg           |                              |            |                         |  |
|  | <b>R+2</b>                        |                           | <b>4_PP 6</b> |                            | <b>Nombre 1</b> |                          | Surface du coffrage = 3.61 m2 |                                  | Enrobage inférieur 3 cm      |            | Enrobage supérieur 3 cm |  |
|                                                                                    |                                   |                           |               |                            |                 |                          | Enrobage latéral 3 cm         |                                  |                              |            |                         |  |
|                                                                                    | DETAILS DE STRUCTURE DUO 2 TOGBIN |                           | Section 15x40 |                            |                 |                          | Densité = 69.78 kg/ m3        |                                  | Echelle pour la vue 6.89cm/m |            |                         |  |
|                                                                                    |                                   |                           |               |                            |                 | Diamètre moyen = 9.34mm  |                               | Echelle pour la section 8.56cm/m |                              | Page 10/20 |                         |  |

| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=1.06 | 00   | 1.06  |
| ②    | 2HA 12   | l=3.62 | 00   | 3.61  |
| ③    | 2HA 10   | l=3.62 | 00   | 3.61  |
| ④    | 9HA 6    | l=98   | 31   |       |
| ⑤    | 2HA 6    | l=98   | 31   |       |



|                                                                                    |                                   |                           |               |                            |                 |                         |                               |                                  |                              |            |                         |  |
|------------------------------------------------------------------------------------|-----------------------------------|---------------------------|---------------|----------------------------|-----------------|-------------------------|-------------------------------|----------------------------------|------------------------------|------------|-------------------------|--|
|                                                                                    |                                   | Tél.                      |               | Fax                        |                 |                         |                               | Acier HA 400 = 12.8 kg           |                              |            |                         |  |
| Tenue au feu 0h                                                                    |                                   | Fissuration préjudiciable |               | Reprise de bétonnage : Non |                 | Béton : BETON = 0.22 m3 |                               | Acier HA 400 = 2.39 kg           |                              |            |                         |  |
|  | <b>R+2</b>                        |                           | <b>4_PP 5</b> |                            | <b>Nombre 1</b> |                         | Surface du coffrage = 3.54 m2 |                                  | Enrobage inférieur 3 cm      |            | Enrobage supérieur 3 cm |  |
|                                                                                    |                                   |                           |               |                            |                 |                         | Enrobage latéral 3 cm         |                                  |                              |            |                         |  |
|                                                                                    | DETAILS DE STRUCTURE DUO 2 TOGBIN |                           | Section 15x40 |                            |                 |                         | Densité = 68.64 kg/ m3        |                                  | Echelle pour la vue 7.03cm/m |            |                         |  |
|                                                                                    |                                   |                           |               |                            |                 | Diamètre moyen = 9.11mm |                               | Echelle pour la section 8.56cm/m |                              | Page 11/20 |                         |  |

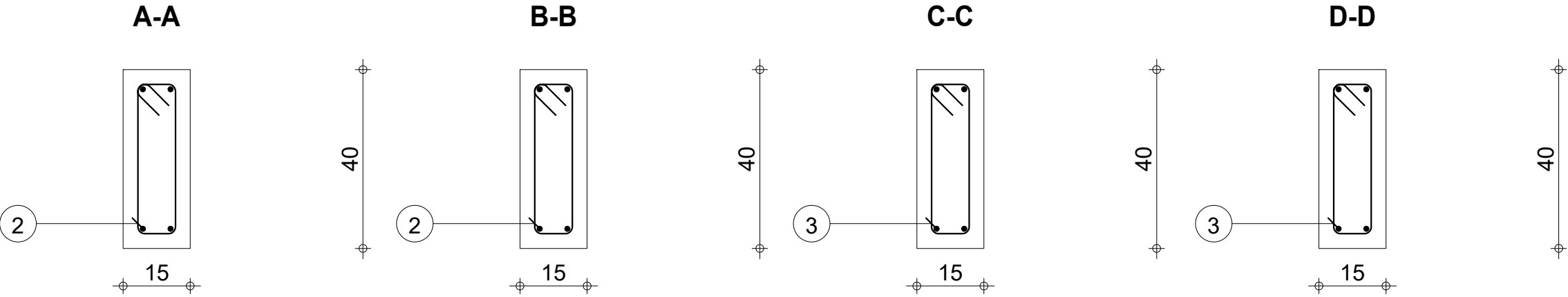
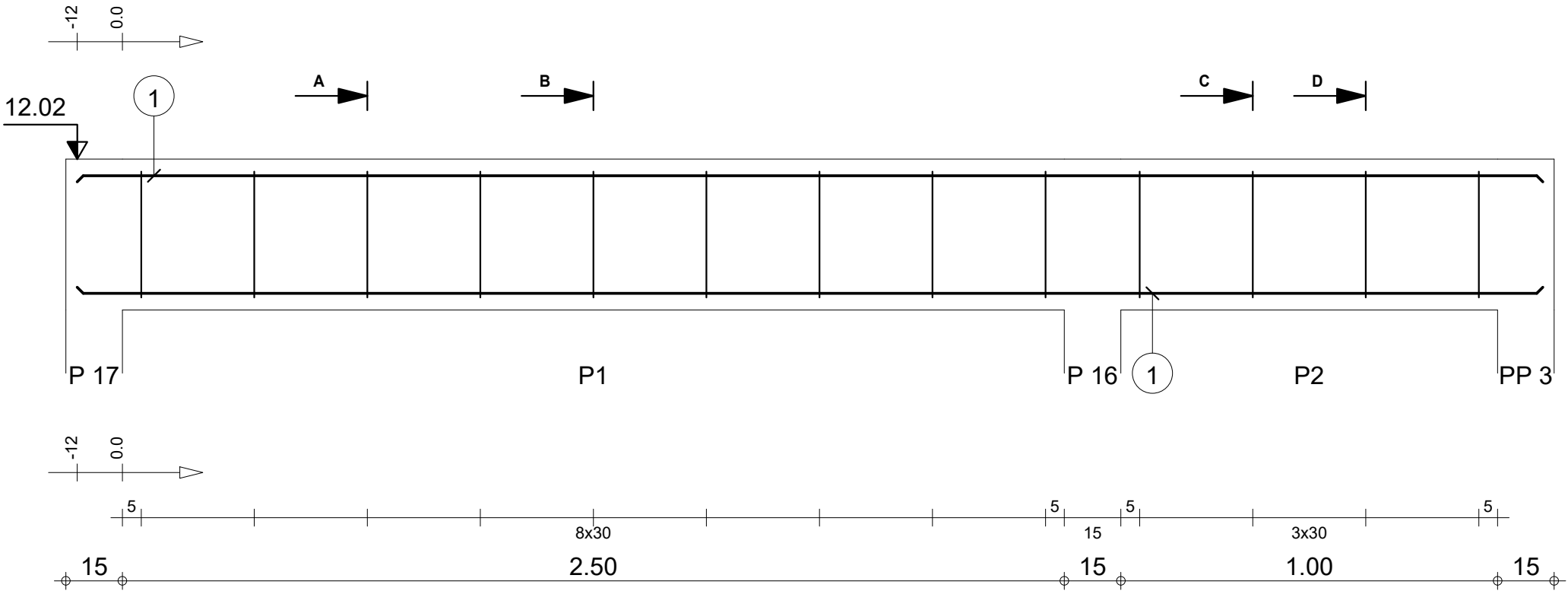
| Pos. | Armature |        | Code | Forme                                                                               |
|------|----------|--------|------|-------------------------------------------------------------------------------------|
| ①    | 4HA 12   | l=1.35 | 00   | 1.35                                                                                |
| ②    | 2HA 12   | l=5.27 | 00   | 5.27                                                                                |
| ③    | 2HA 10   | l=5.32 | 00   | 5.32                                                                                |
| ④    | 16HA 6   | l=98   | 31   |  |



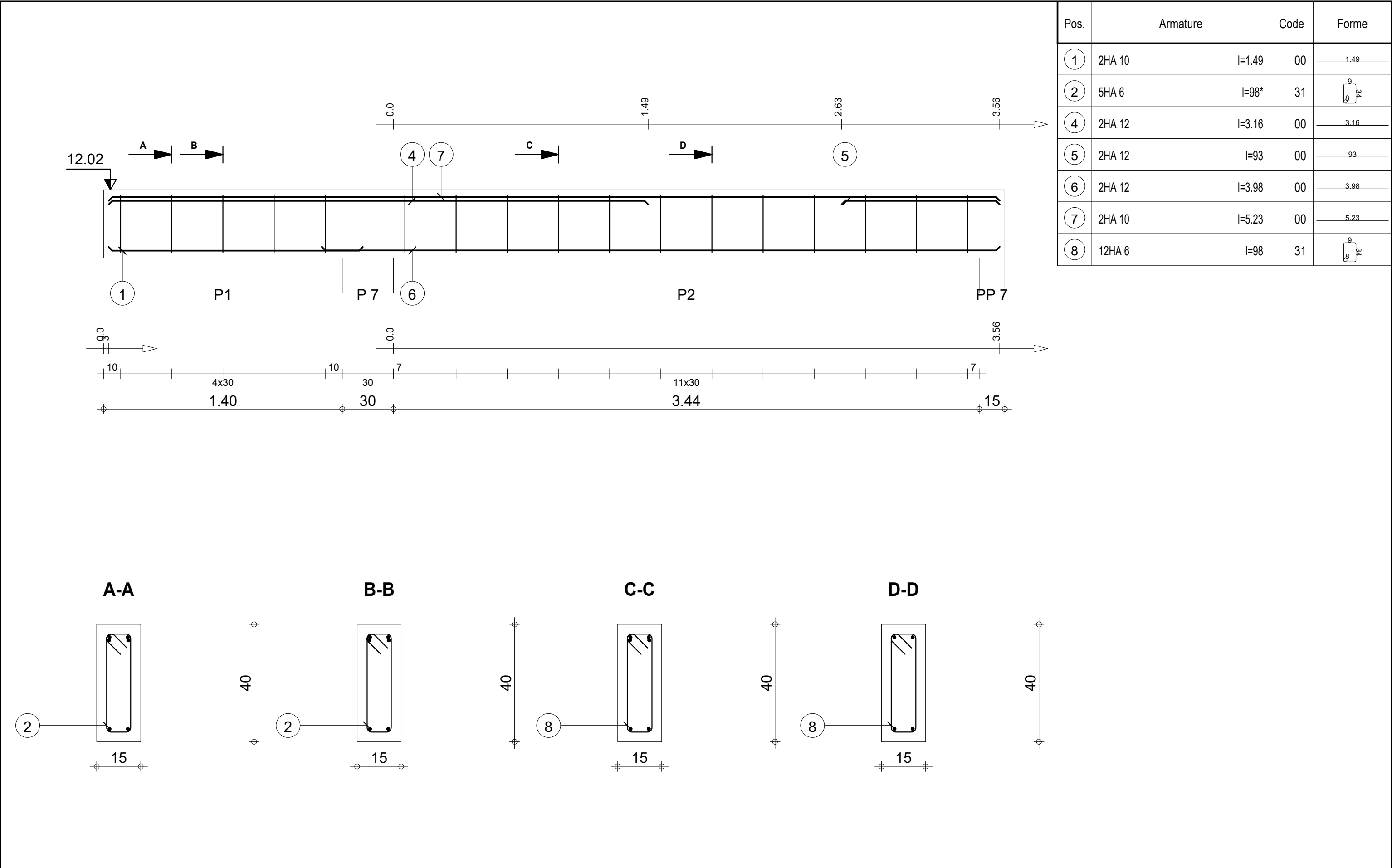
|                                                                                    |                                              |                                  |                            |                                                   |                                                                             |                        |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------|------------------------|
|                                                                                    |                                              | Tél.                             | Fax                        |                                                   | Acier HA 400 = 20.7 kg                                                      |                        |
| Tenue au feu 0h                                                                    |                                              | Fissuration préjudiciable        | Reprise de bétonnage : Non |                                                   | Béton : BETON = 0.323 m3                                                    | Acier HA 400 = 3.47 kg |
|  | R+2<br><br>DETAILS DE STRUCTURE DUO 2 TOGBIN | 4_PS 1 : P1<br><br>Section 15x40 | Nombre 1                   | Surface du coffrage = 5.14 m2                     | Enrobage inférieur 3 cm<br>Enrobage latéral 3 cm<br>Enrobage supérieur 3 cm |                        |
|                                                                                    |                                              |                                  |                            | Densité = 74.92 kg/ m3<br>Diamètre moyen = 9.27mm | Echelle pour la vue 4.89cm/m<br>Echelle pour la section 8.56cm/m            | Page 12/20             |



| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 4HA 12   | l=3.89 | 00   | 3.89  |
| ②    | 9HA 6    | l=98   | 31   |       |
| ③    | 4HA 6    | l=98   | 31   |       |

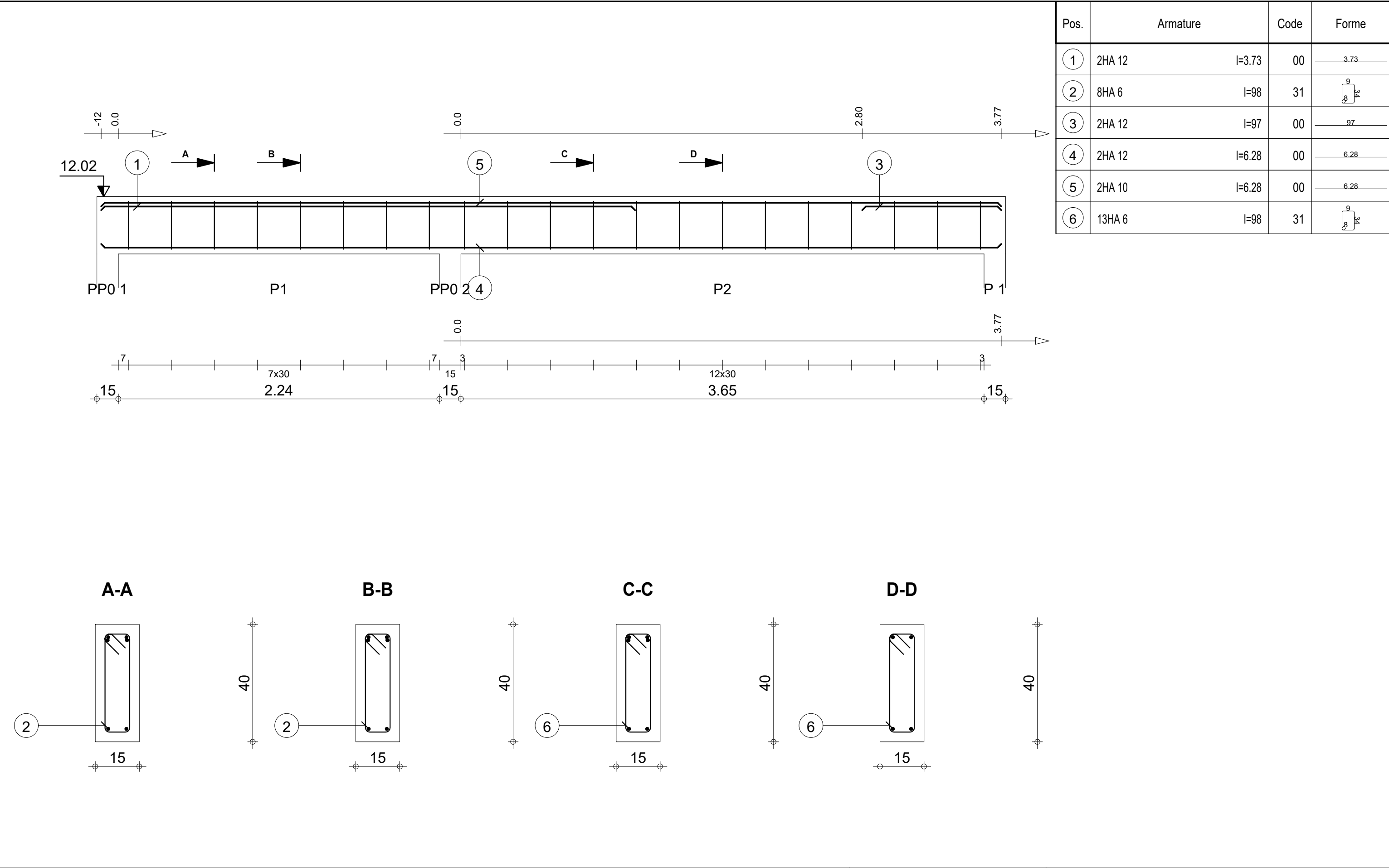


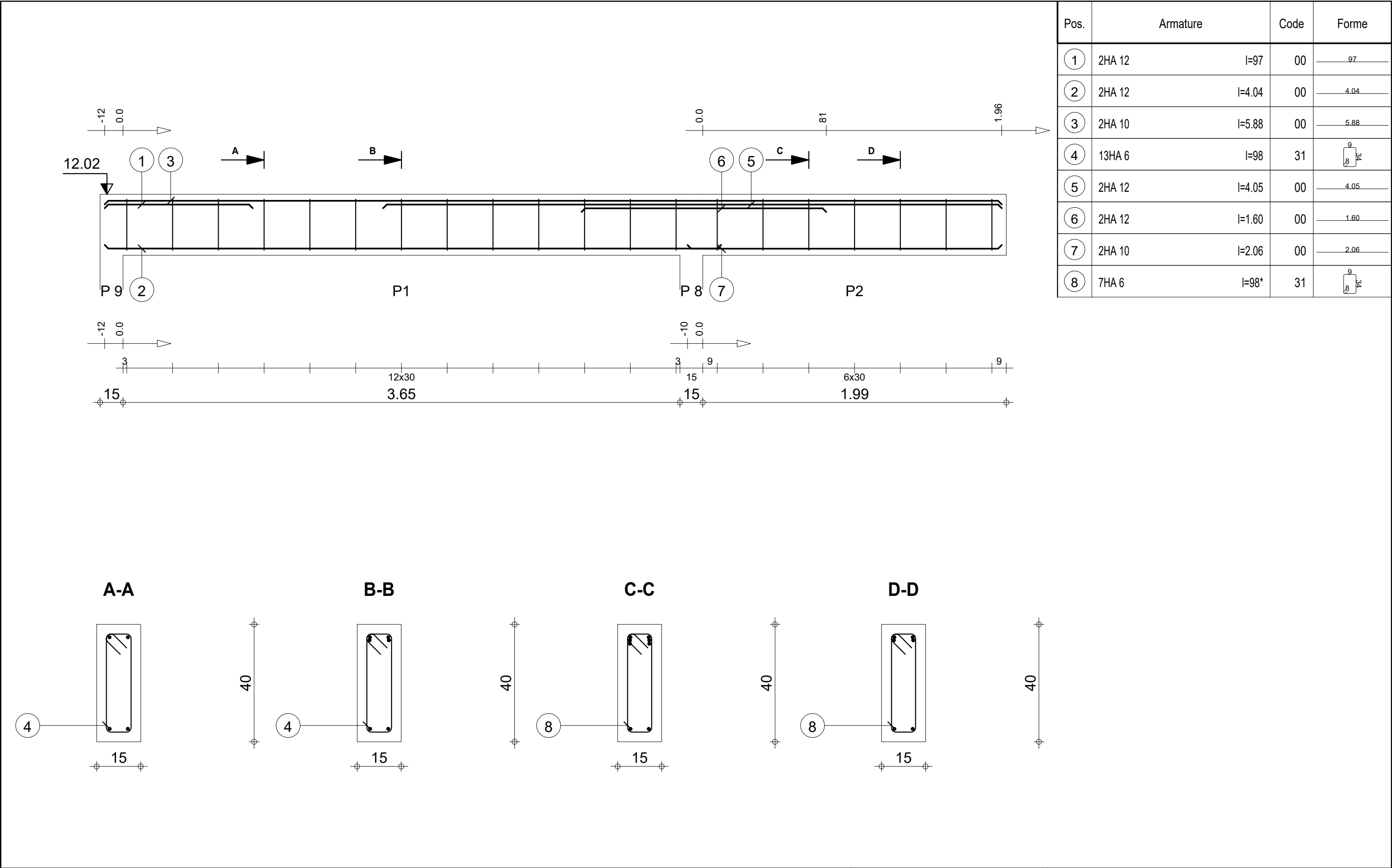
|                                                                                    |     |                           |     |                            |                                                      |                                  |
|------------------------------------------------------------------------------------|-----|---------------------------|-----|----------------------------|------------------------------------------------------|----------------------------------|
|                                                                                    |     | Tél.                      | Fax |                            | Acier HA 400 = 13.8 kg                               |                                  |
| Tenue au feu 0h                                                                    |     | Fissuration préjudiciable |     | Reprise de bétonnage : Non |                                                      | Acier HA 400 = 2.82 kg           |
|  | R+2 | 4_PP 8                    |     | Nombre 1                   | Béton : BETON = 0.237 m3                             |                                  |
|                                                                                    |     |                           |     |                            | Surface du coffrage = 3.81 m2                        |                                  |
|                                                                                    |     |                           |     |                            | Enrobage inférieur 3 cm      Enrobage supérieur 3 cm |                                  |
| DETAILS DE STRUCTURE DUO 2 TOGBIN                                                  |     | Section 15x40             |     | Densité = 70.04 kg/ m3     |                                                      | Echelle pour la vue 6.56cm/m     |
|                                                                                    |     |                           |     | Diamètre moyen = 9.3mm     |                                                      | Echelle pour la section 8.56cm/m |
|                                                                                    |     |                           |     |                            |                                                      | Page 14/20                       |

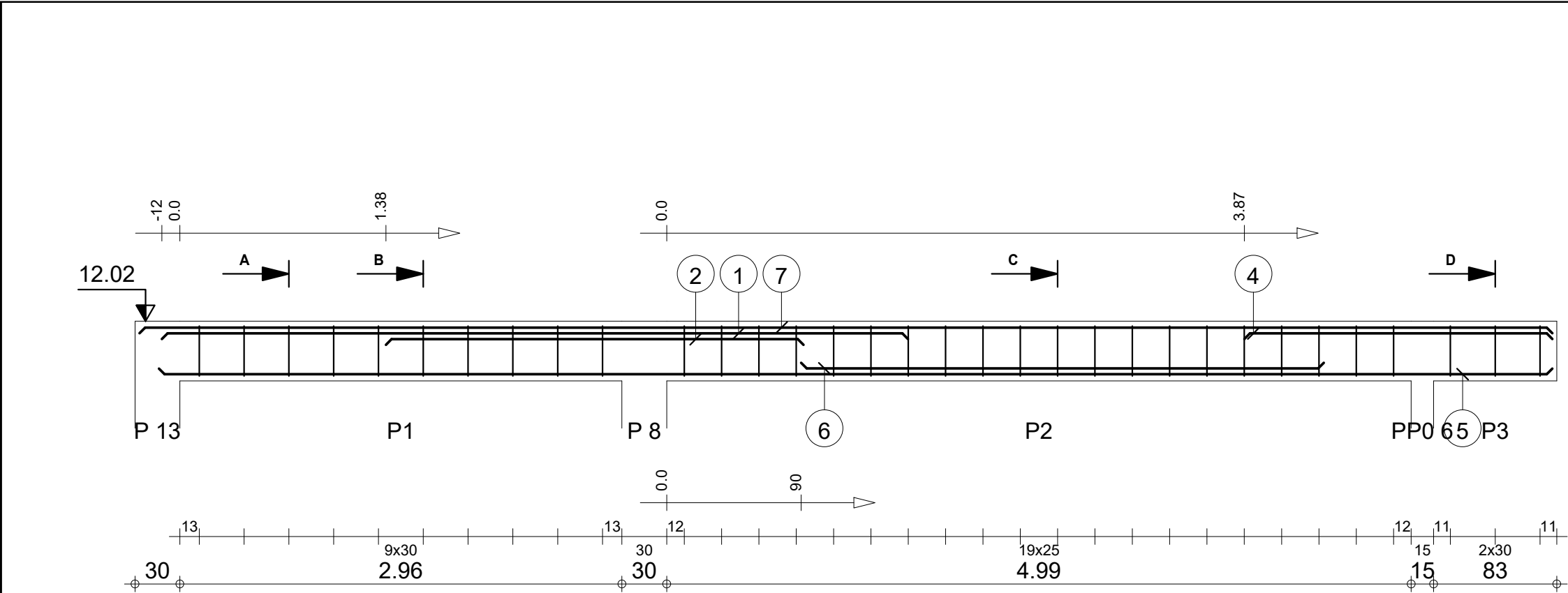












| Pos. | Armature |        | Code | Forme |
|------|----------|--------|------|-------|
| ①    | 2HA 12   | l=5.00 | 00   | 5.00  |
| ②    | 2HA 12   | l=2.79 | 00   | 2.80  |
| ③    | 10HA 6   | l=98   | 31   |       |
| ④    | 2HA 12   | l=2.06 | 00   | 2.06  |
| ⑤    | 2HA 14   | l=9.33 | 00   | 9.33  |
| ⑥    | 2HA 14   | l=3.50 | 00   | 3.50  |
| ⑦    | 2HA 10   | l=9.46 | 00   | 9.46  |
| ⑧    | 20HA 6   | l=98   | 31   |       |
| ⑨    | 3HA 6    | l=98   | 31   |       |

