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European Technical Assessment ETA 22/0732 of 16/03/2023

GENERAL PART

Trade name of the construction product	**GABBIONI SER.CA.**
Product family to which the construction product belongs	**PAC 20: STRUCTURAL METALLIC PRODUCTS AND ANCILLARIES. Weldmesh gabion boxes and mattresses**
Manufacturer	**Ser.Ca. S.r.l. Via A. Pacinotti, 6-8-10 I - 25034 Orzinuovi (BS) - Italy**
Manufacturing plant	**Via A. Pacinotti, 6-8-10 I - 25034 Orzinuovi (BS) - Italy**
This European Technical Assessment contains:	**22 pages, including 17 annexes which form an integral part of this assessment**
This European Technical Assessment is issued in accordance with Regulation (EU) n° 305/2011, on the basis of	**EAD 200020-00-0102 – Weldmesh gabion boxes and mattresses**

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SPECIFIC PARTS

1. TECHNICAL DESCRIPTION OF THE PRODUCT

The GABBIONI SER.CA. is a gabion box of variable sizes which consists of a structure composed by electro-welded metallic coated wire panels and structural tie rods positioned as in the drawings of the Manufacturer‘s assembly plan, summarized in Annexes A2-A7, to be filled with stones on the construction site. The gabion is a wire mesh container which, once filled with suitable stone, can constitute the modular unit of a permeable earth retaining structure and is used for earth retention and as a barrier against erosion.
This ETA deals with the gabion as a container (wires, wire mesh and panel assemblies) to be filled with suitable stone for the intended use in works and the gabion filling is outside its scope.
Panels which make up the gabion boxes are manufactured from steel wire which is 95% Zn/5% Al alloy coated before welding (before the panel production). The same steel wire is used for the production of tie rods. Tie rods, positioned between the bottom panel and side panels, and across opposite side panels both in the direction of width and in the direction of length, prevent localized deformations of the gabion.
For what concerns the wire diameter, the GABBIONI SER.CA. are produced in two different wire diameters, as far as wire panel meshes are concerned; tie rods are also produced in two different diameters depending on which is the diameter of the wire in the panels of the gabion where they are used. According to the diameter of the wire, gabions are produced in the following two variants, then:

- with wire Ø mm 5.80 for wire mesh panels and wires Ø mm 5.80 and Ø mm 6.80 for internal tie rods
- with wire Ø mm 4.80 for wire mesh panels and wire Ø mm 5.80 for internal tie rods.

The wire meshes the panels consist of, are characterized by a bending of ends (on either one, or three or four sides according to the panel type) which allows for the junction between panel and panel in order to build up the gabion box. The connections, of the type “looped ends” among the types of panel connections illustrated in EAD 200020-00-0102 in clause 1.1 are manually finished during the assembly of the gabion box with the aid of specific tools, according to the instructions from the Manufacturer (for the sequence of assembly phases see Annexes A2-A7 “Assembly plan”).

The product description, with reference to its components, is given in Annexes A1 (wire panels), A4 (tie rods) and A8-A11, which provide the drawings of the gabion boxes in the variable available dimensions and a detailed description, as for their geometry, of the elements they are composed of.

2. SPECIFICATION OF THE INTENDED USE IN ACCORDANCE WITH EUROPEAN ASSESSMENT DOCUMENT N° 200020-00-0102 (hereinafter EAD)

The gabion boxes named GABBIONI SER.CA., filled with suitable stone, are intended to be used for earth retention, soil reinforcement, river training, erosion control and retaining structures in case of landslide.
The assumed working life for the intended use of the gabion boxes made from Zn/Al coated wires, according to the applicable EAD, is in accordance with EN 10223-8, Annex A, in relation to different corrosive categories of the environment when installed in the works, provided that the conditions for packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[1]. The indications given on the working life cannot be interpreted as a guarantee given by the Manufacturer, but are to be regarded only as a means for

[1] The real working life of a product incorporated in specific works depends on the environmental conditions to which those works are subject, as well as on the particular conditions of the design, execution, use and maintenance of the works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than the referred to above.

choosing the right products in relation to the expected economically reasonable working life of the works.

Concerning product packaging, transport and storage it is the responsibility of the Manufacturer to undertake the appropriate measures and to advise his clients on the transport and storage, as he considers necessary in order to reach the declared performances.
The information about installation is provided with the technical documentation from the Manufacturer and it is assumed that the product will be installed according to it or (in absence of such instructions) according to the usual practice of the building professionals.

3. PERFORMANCE OF THE PRODUCT AND REFERENCES TO THE METHODS USED FOR ITS ASSESSMENT

The tests for performance assessment of GABBIONI SER.CA. were carried out in compliance with EAD 200020-00-0102 according to the test methods reported herein, as well for what concerns sampling, conditioning and testing provisions.
The numbering (#) in the following tables corresponds to the numbering of Table 1 of clause 2.1 of EAD 200020-00-0102.

3.1 MECHANICAL RESISTANCE AND STABILITY (BWR 1)

#	Essential characteristic	Performance
1	Wire diameters D_w	4.8 mm – 5.8 mm – 6.8 mm
2	Wire tensile strength f_t	See Annex B1. Table B1
3	Dimensions of product H,L,W, mesh size M x N and connection components	See Annex B1. Table B2 and Annex B2. Table B3
4	Corrosion protection: non-ferrous metallic coating type Class of coating mass	The Zinc/Aluminium alloy coated steel wires are coated with: - wire Ø 4.8 mm: minimum 280 g/m^2 corresponding to class A in accordance with Table 2 of EN 10244-2; - wires Ø 5.8 and Ø 6.8 mm: minimum 290 g/m^2 corresponding to class A in accordance with Table 2 of EN 10244-2.
	Corrosion protection: mass of hot dip galvanized coating	**Not applicable.**
5	Additional corrosion protection: organic coating type Coating thickness and wire diameter Coating concentricity	**Not applicable.**
6	Weld shear strength	**No performance assessed.**
7	C-ring (or similar fastener) resistance to opening F_m	**Not applicable.**
8	Tensile strength of the gabion/mattress including connection	- Gabion with wire Ø mm 5.80 for wire mesh panels: 18.7 kN/m - Gabion with wire Ø mm 4.80 for wire mesh panels: 12.1 kN/m
9	Durability in artificial atmospheres: sulphur dioxide test with general condensation of moisture	**No performance assessed.**
	Durability in artificial atmospheres: neutral salt spray test	Exposure time in hours with surface DBR (Dark Brown Rust) ≤ 5% surface: 2000 hours
	Durability in artificial atmospheres: UV resistance of organic coating material	**Not applicable.**

3.2 SAFETY AND ACCESSIBILITY IN USE (BWR 4)

#	Essential characteristic	Performance
10	Protection against injury	The gabion does not pose any obvious risk of injury rising from sharp edges of jut out wires

3.3 PROTECTION AGAINST NOISE (BWR 5)

#	Essential characteristic	Performance
11	Airborne sound insulation	**No performance assessed.**
12	Sound absorption	**No performance assessed.**

4. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

In accordance with the European Assessment Document EAD No. 200020-00-0102 the applicable European legal act is: **Decision 98/214/EC.**
The system(s) of assessment and verification of constancy of performance (AVCP) is: **2+.**

5. TECHNICAL DETAILS NECESSARY FOR THE IMPLEMENTATION OF THE AVCP SYSTEM, AS PROVIDED FOR IN EAD 200020-00-0102

Technical details necessary for the implementation of the AVCP system are laid down in the Control Plan deposited at STC.

Rome, 16/03/2023

IL PRESIDENTE
DEL CONSIGLIO SUPERIORE DEI LAVORI PUBBLICI
Ing. Massimo SESSA

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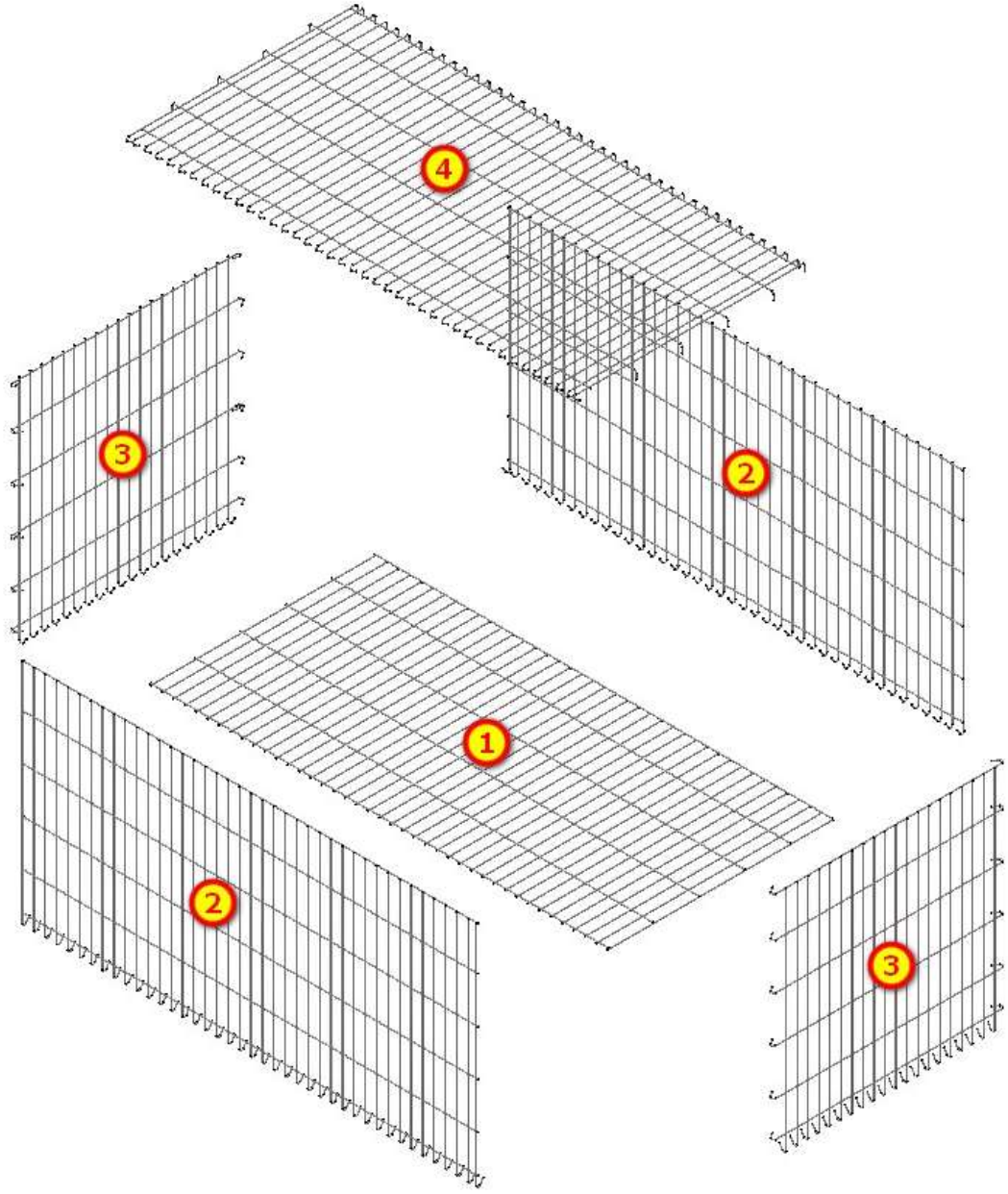
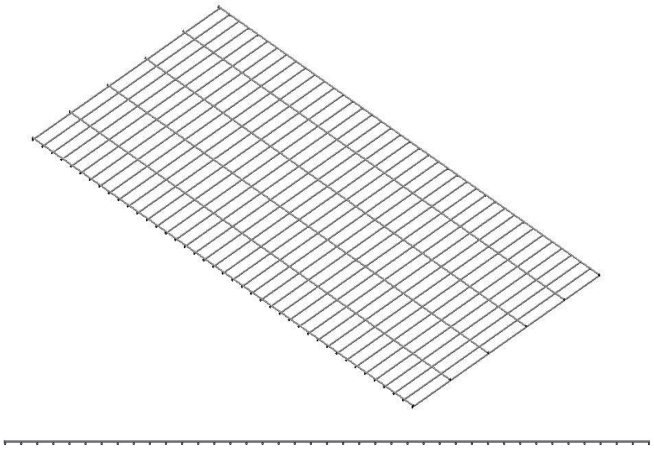


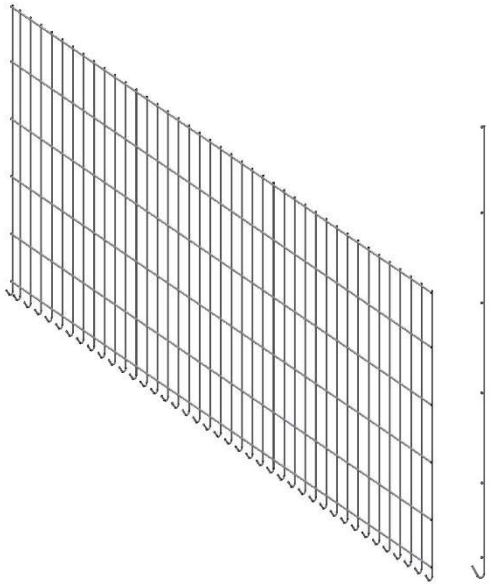
Figure A.1 – The mesh panels which make up the gabion box

1 Bottom panel
2 Plain side panel
3 Hooking side panel
4 Top panel

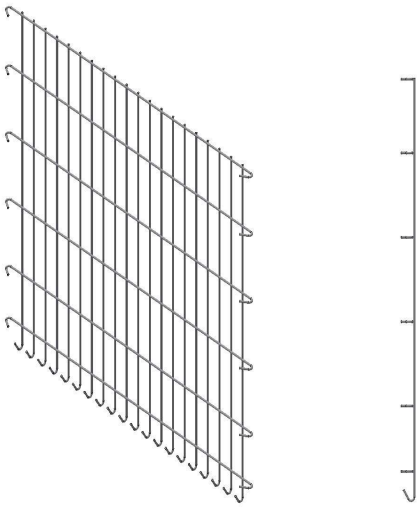
GABBIONI SER.CA.	**Annex A1/1** **of ETA N° 22/0732**
Product Description – Gabion box components: electro-welded wire mesh panels	



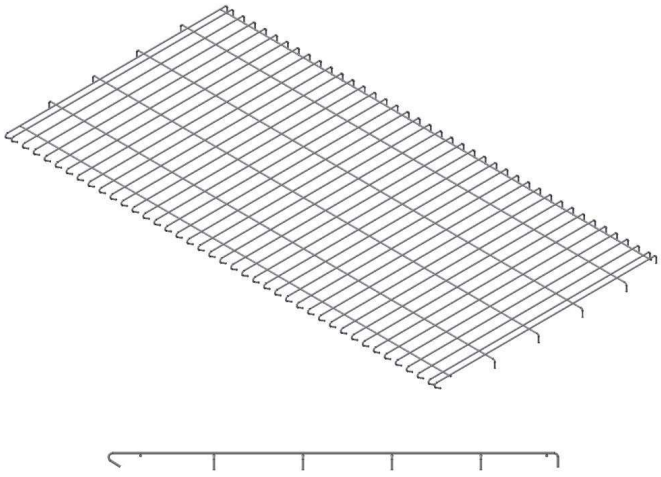
1 Bottom panel



2 Plain side panel



3 Hooking side panel



4 Top panel

Figure A.2 – Components of the gabion box (excluding tie rods)

GABBIONI SER.CA.	**Annex A1/2** **of ETA N° 22/0732**
Product Description – Gabion box components: electro-welded wire mesh panels	

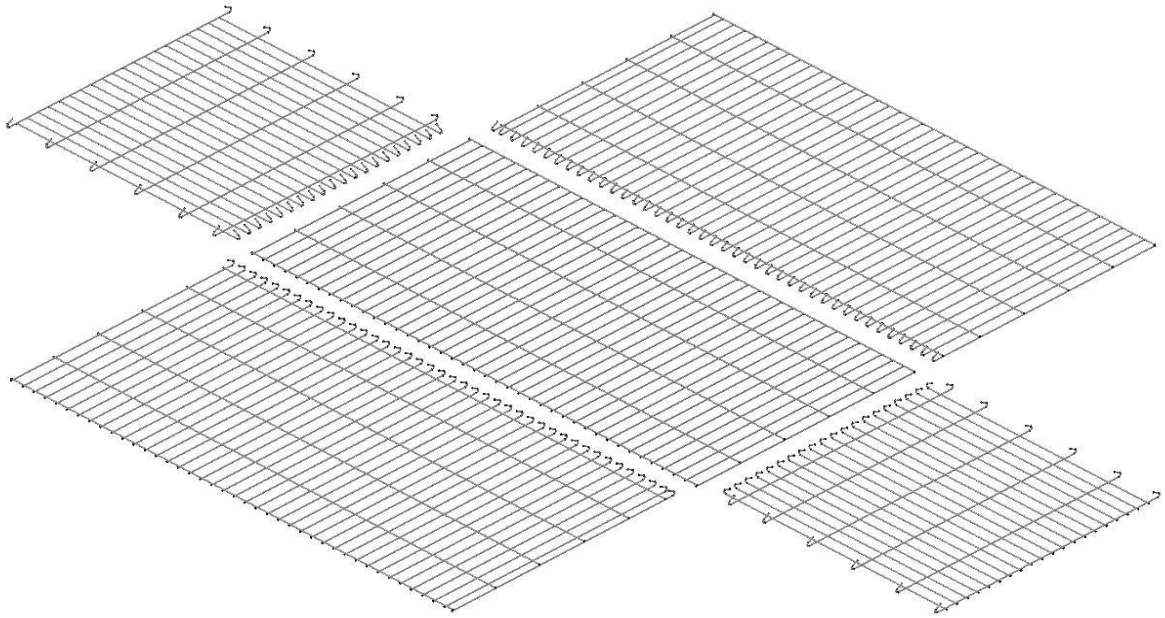


Figure A.3 – Step 1: position as in the drawing the panels which make up the gabion box, keeping the long wires of the bottom panel upwards (on the upper face of the panel)

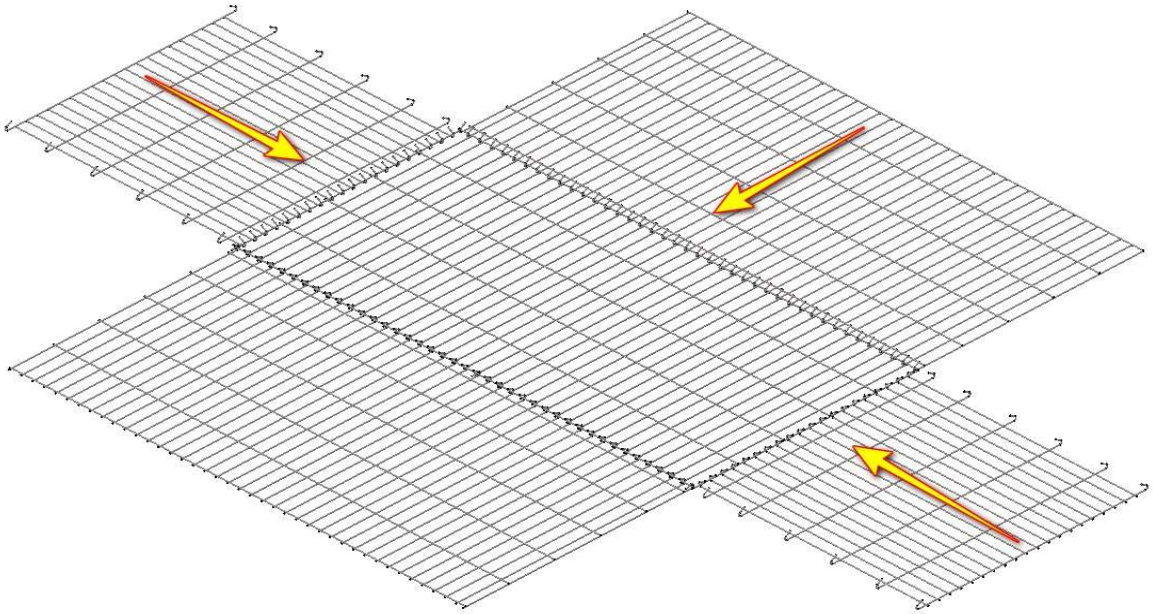


Figure A.4 – Step 2: connect one plain side panel with bottom panel

GABBIONI SER.CA.	**Annex A2** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	

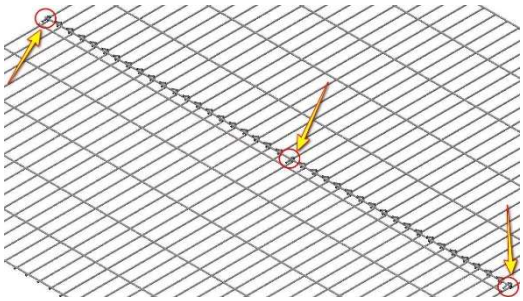


Figure A.5 – Step 3: with the help of a hammer close 2/3 hooks from the side panel onto the bottom panel and repeat the operations of steps 2 and 3 for the three side panels left

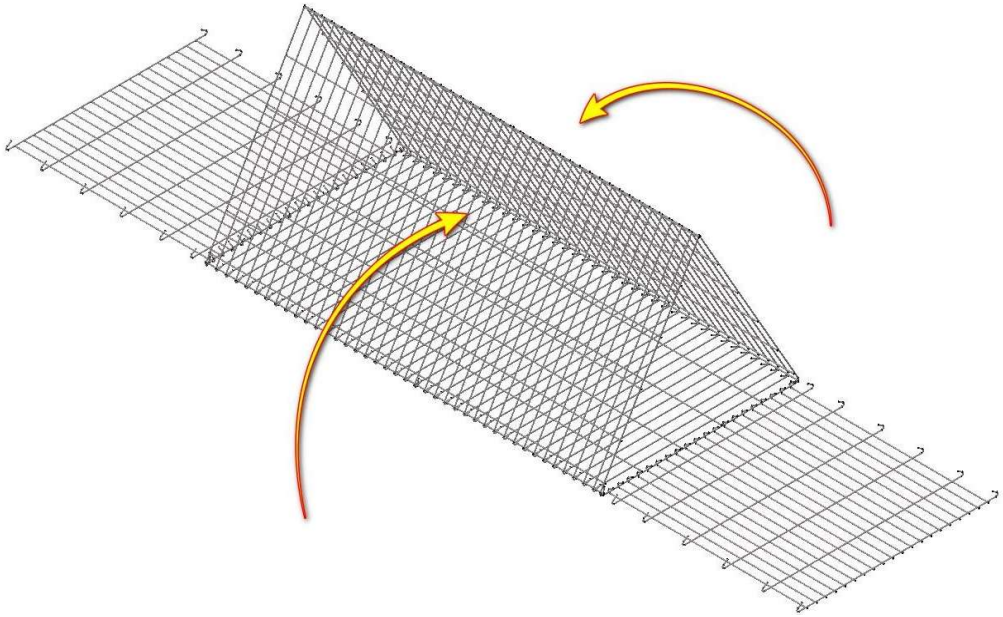


Figure A.6 – Step 4: lift the two plain side panels until they lean against each other

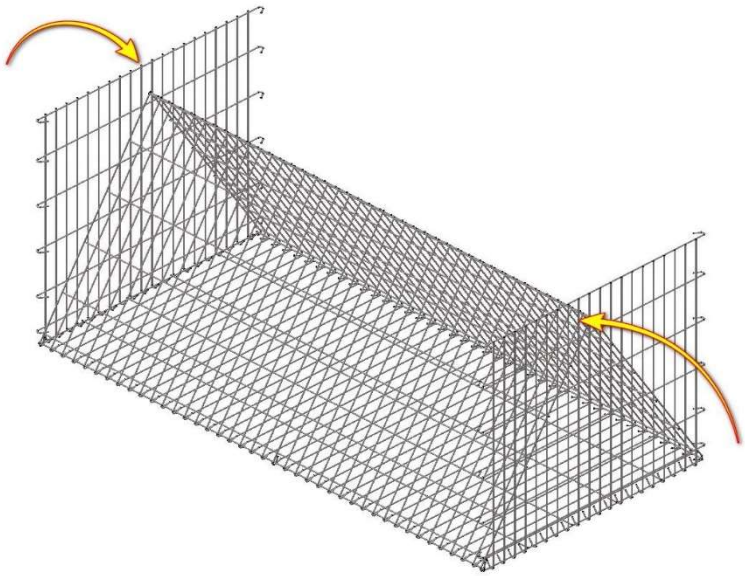


Figure A.7 – Step 5: lift the two hooking side panels

GABBIONI SER.CA.	**Annex A3** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	

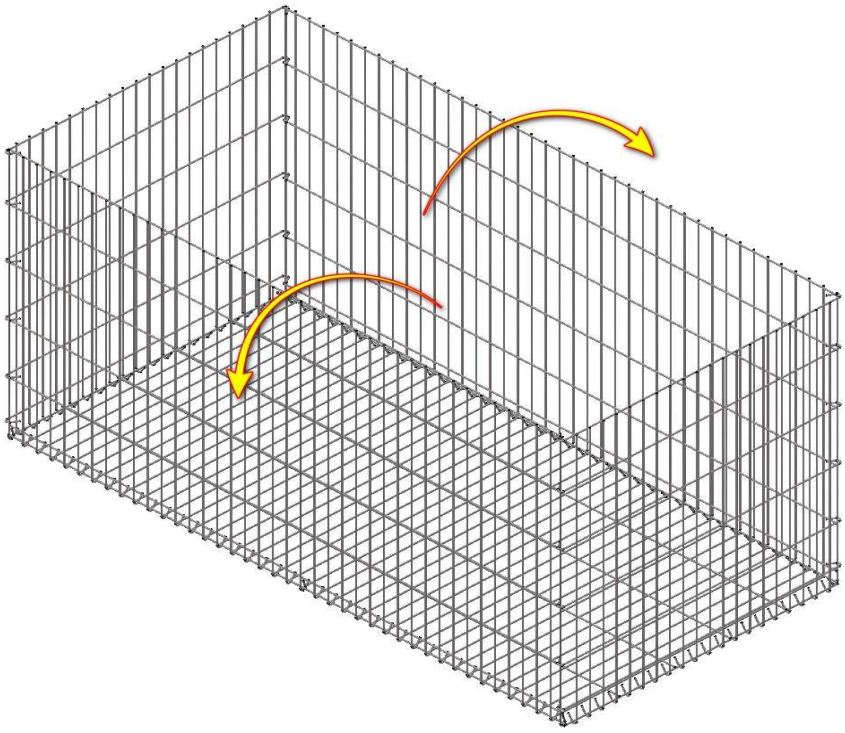


Figure A.8 – Step 6: open out the two plain side panels in order to let them slot into the hooking side panels

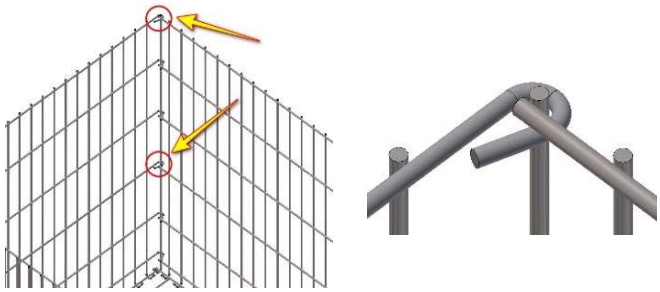


Figure A.9 – Step 7: by using the pliers close two hooks, the first and the fourth hook of each side panel

- 10 Tie rods Ø 6.80 mm, 100 cm length

- 4 Tie rods Ø 5.80 mm, 200 cm length

- 6 Tie rods Ø 5.80 mm, 60 cm length

Figure A.10 – Step 8: get the tie rods available in the prefixed number, diameter Ø and length

GABBIONI SER.CA.	**Annex A4** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	

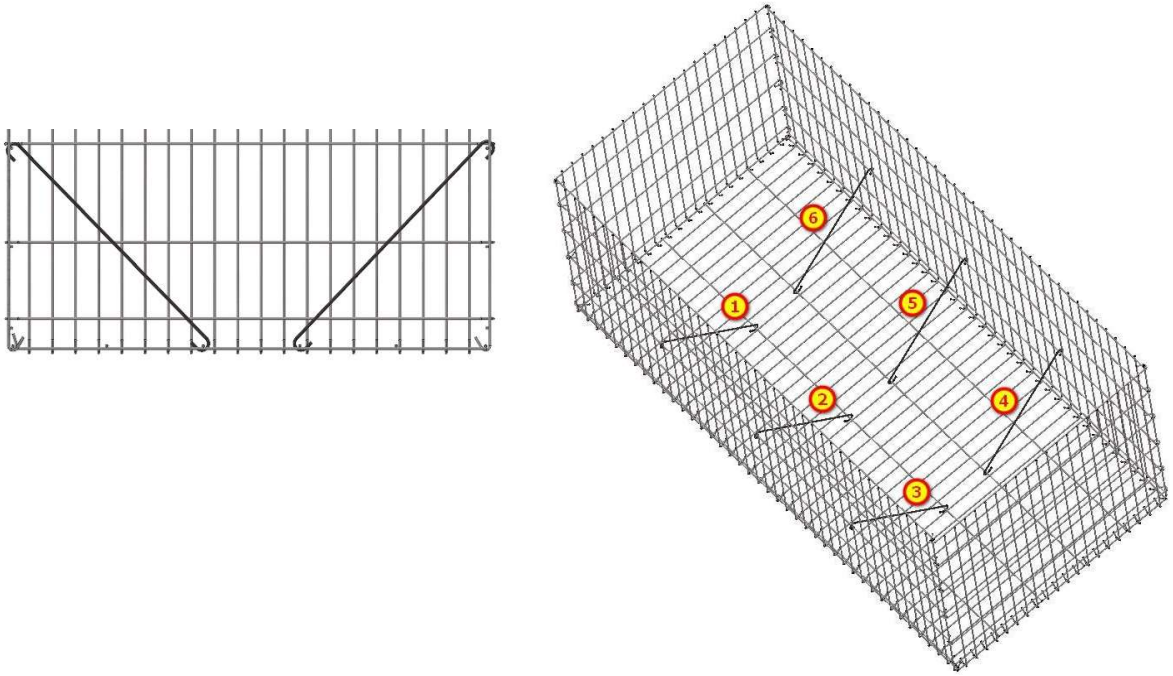


Figure A.11 – Step 9: insert 6 tie rods of cm 60 length between the plain side panel and the bottom panel (3 for each side panel)

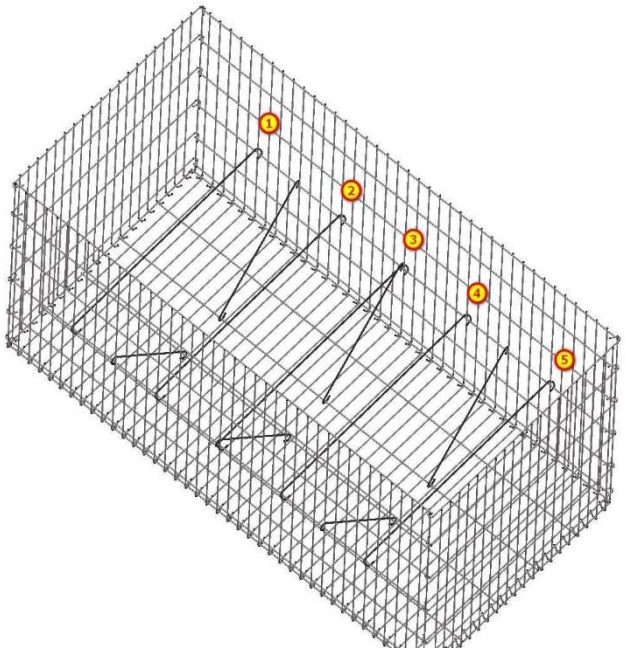
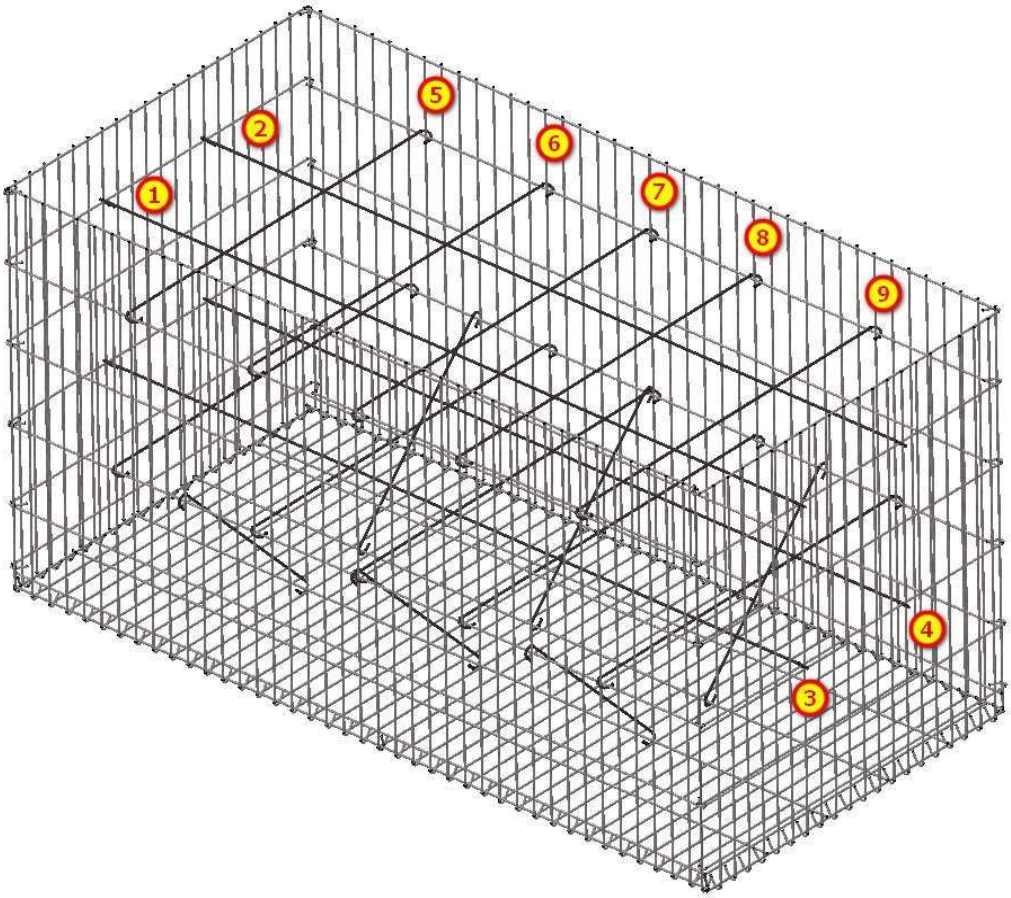


Figure A.12 – Step 10: insert 5 tie rods of cm 100 length as shown in the drawing

GABBIONI SER.CA.	**Annex A5** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	



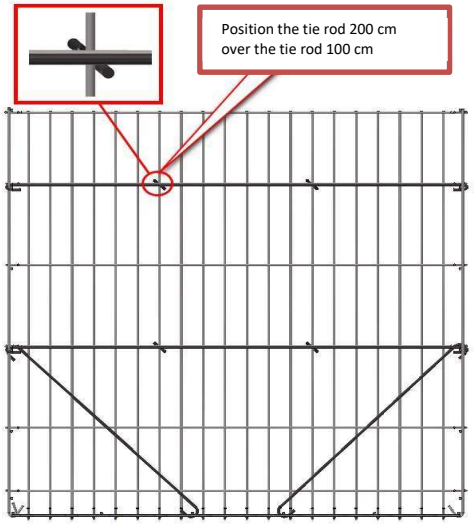


Figure A.13 – Step 11: insert the remaining tie rods, positioning the tie rods of L cm 200 over the tie rods of L cm 100

GABBIONI SER.CA.	**Annex A6** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	

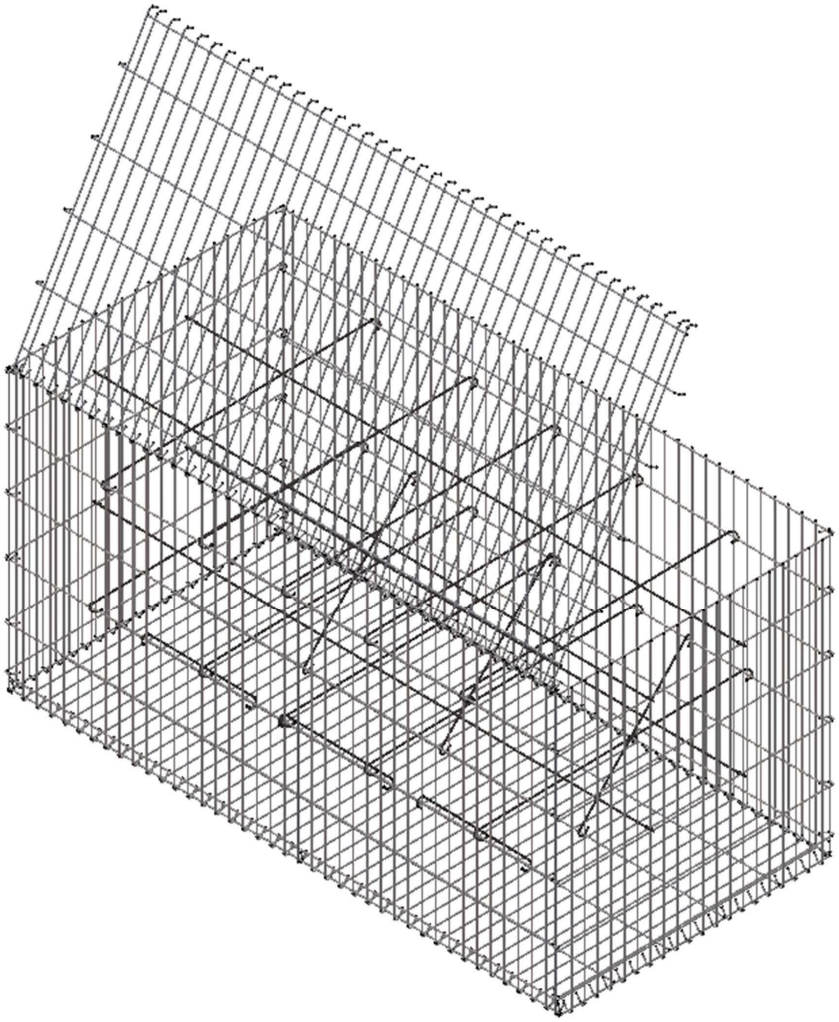


Figure A.14 – Step 12: after the gabion filling, secure the top panel to the plain side panel closing 2/3 hooks through the same procedure as in step3

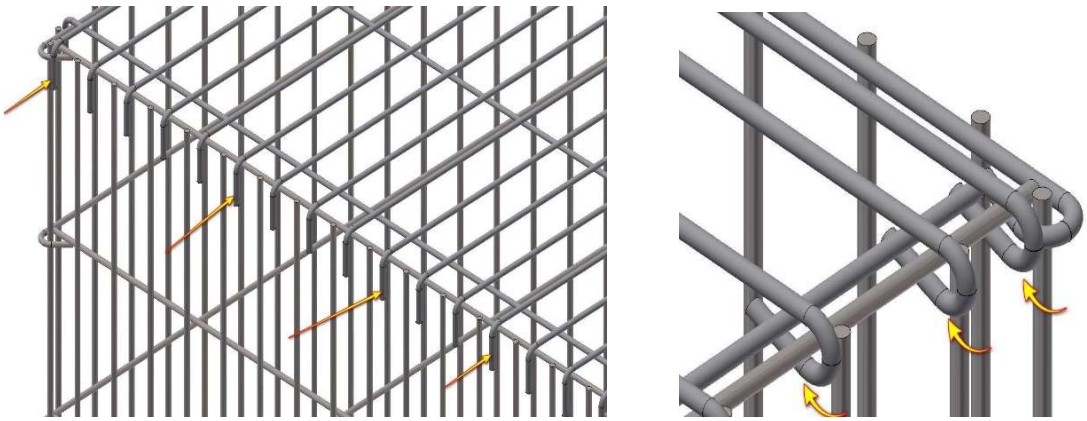
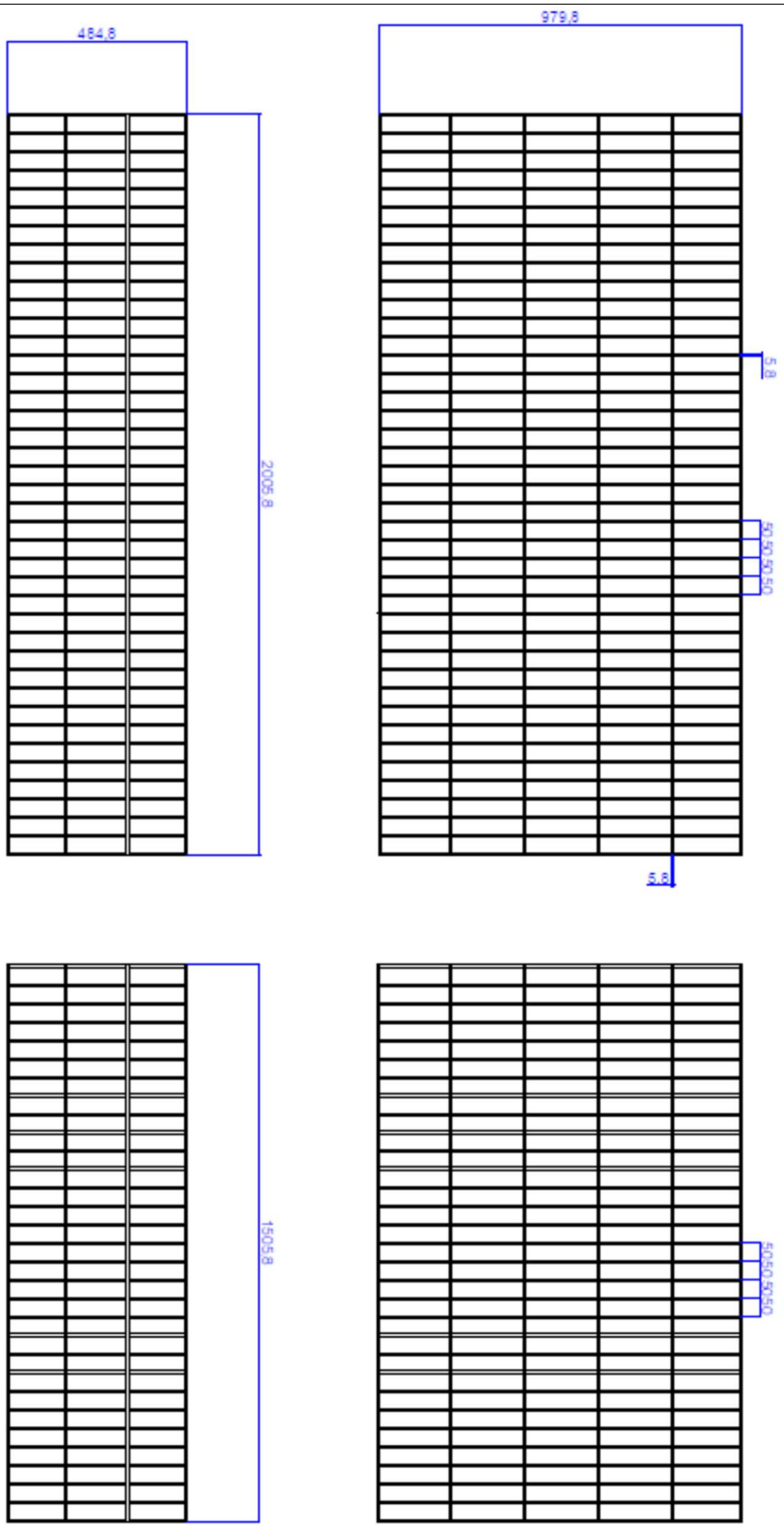


Figure A.15 – Step 13: bend inwards all the 90° laid hooks of the top panel

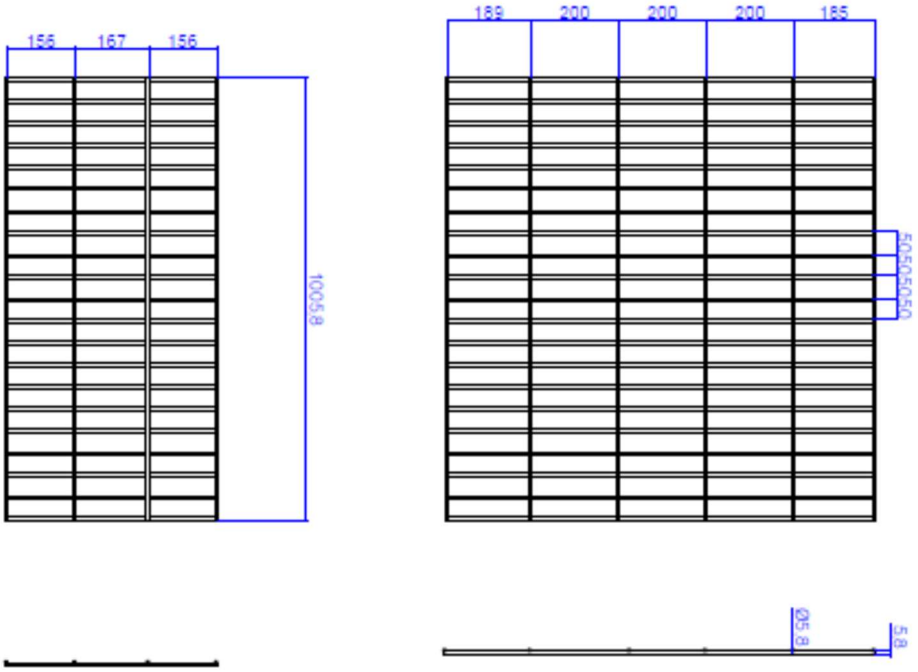
GABBIONI SER.CA.	**Annex A7** **of ETA N° 22/0732**
Product Description – Assembly plan: the assembly phases of the gabion box	



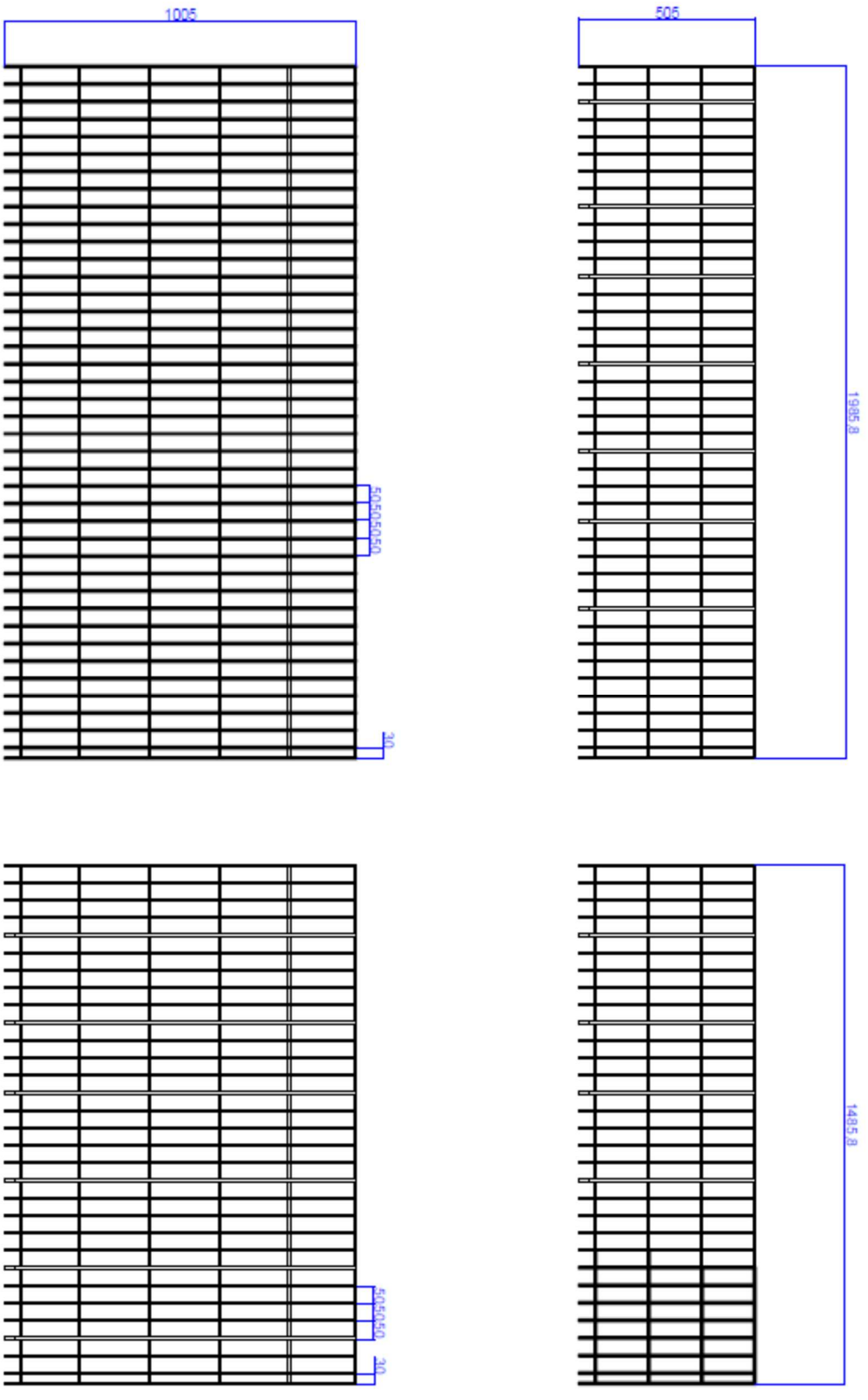
GABBIONI SER.CA.

Product Description – Gabion box components: bottom panels

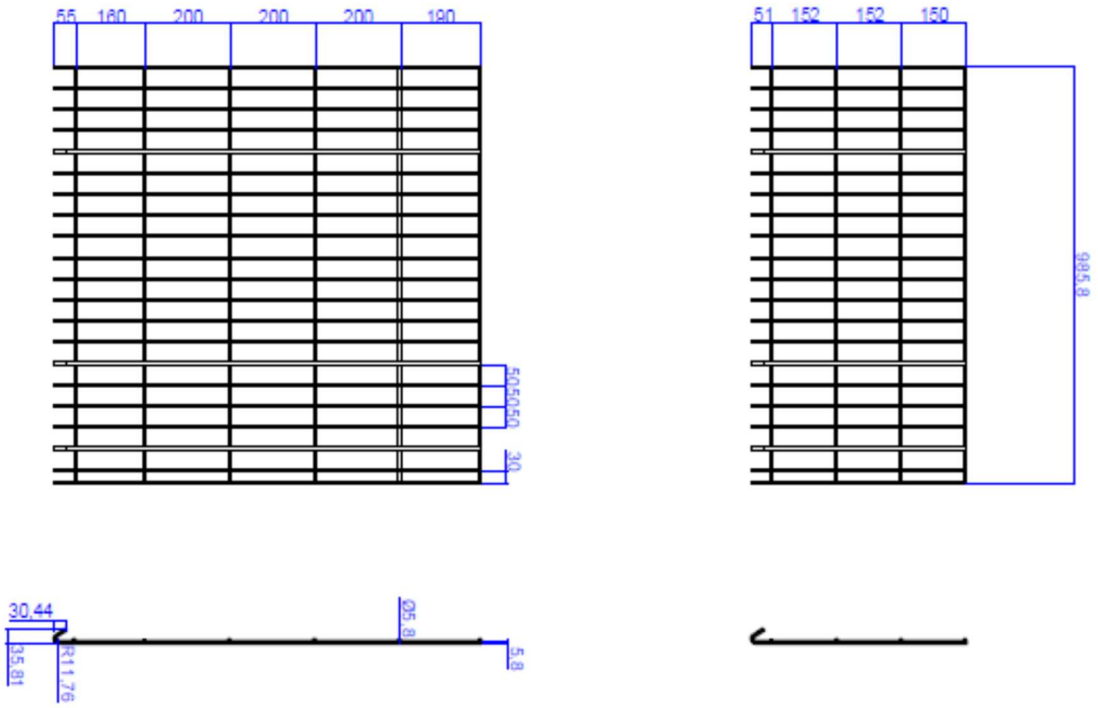
Annex A8/1
of ETA N° 22/0732



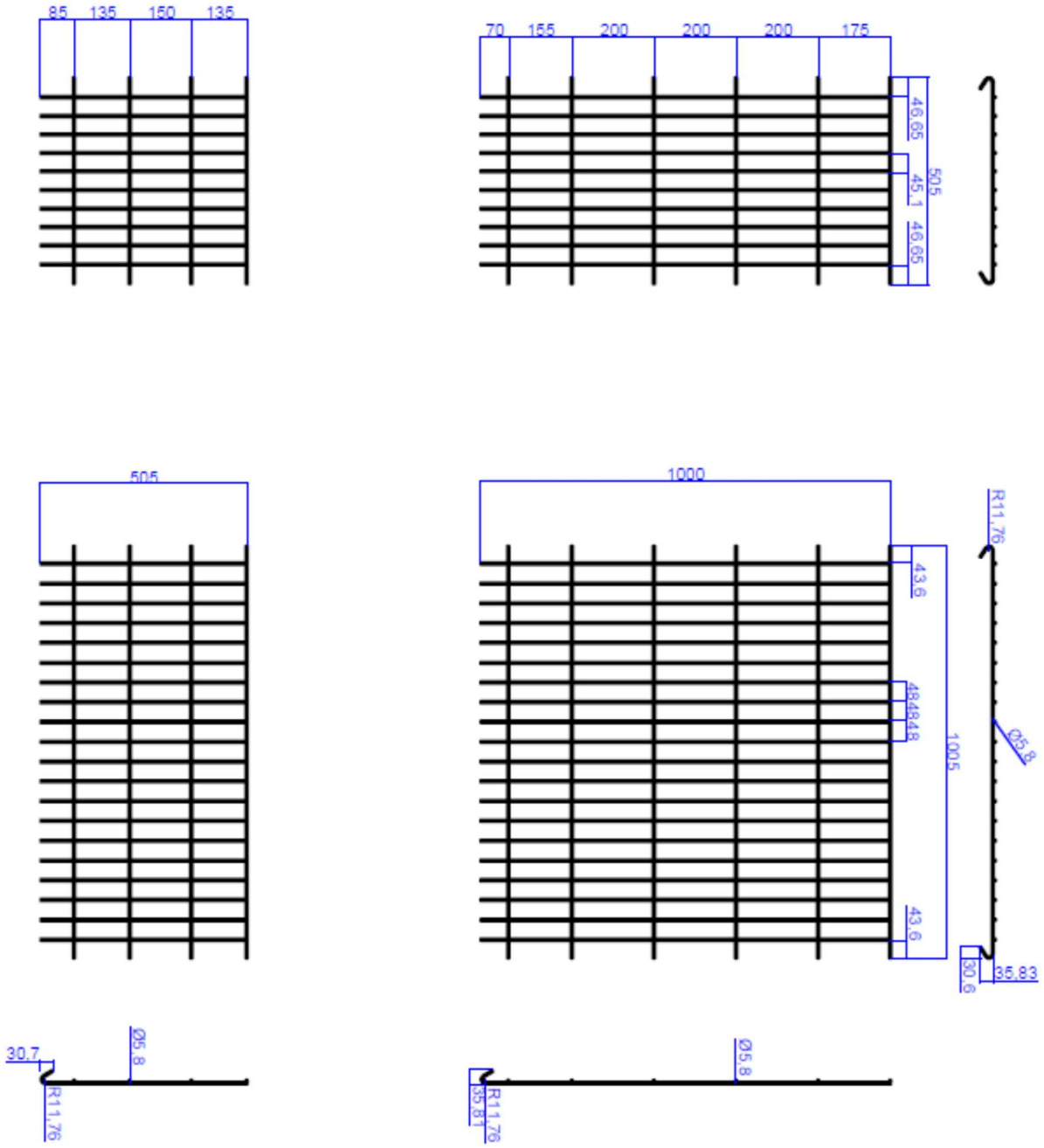
GABBIONI SER.CA.	Annex A8/2 of ETA N° 22/0732
Product Description – Gabion box components: bottom panels	



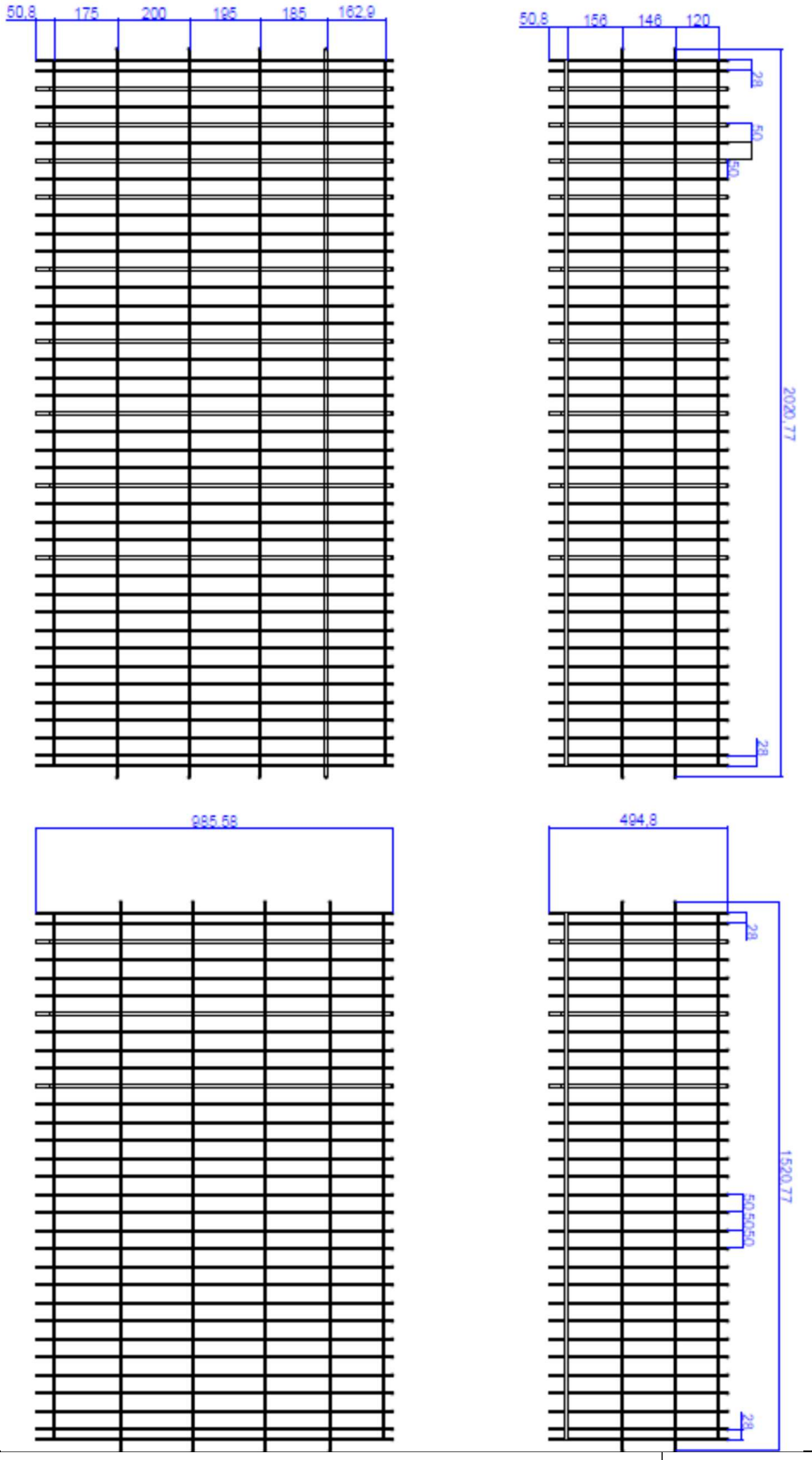
GABBIONI SER.CA.	
Product Description – Gabion box components: plain side panels	**Annex A9/1** **of ETA N° 22/0732**



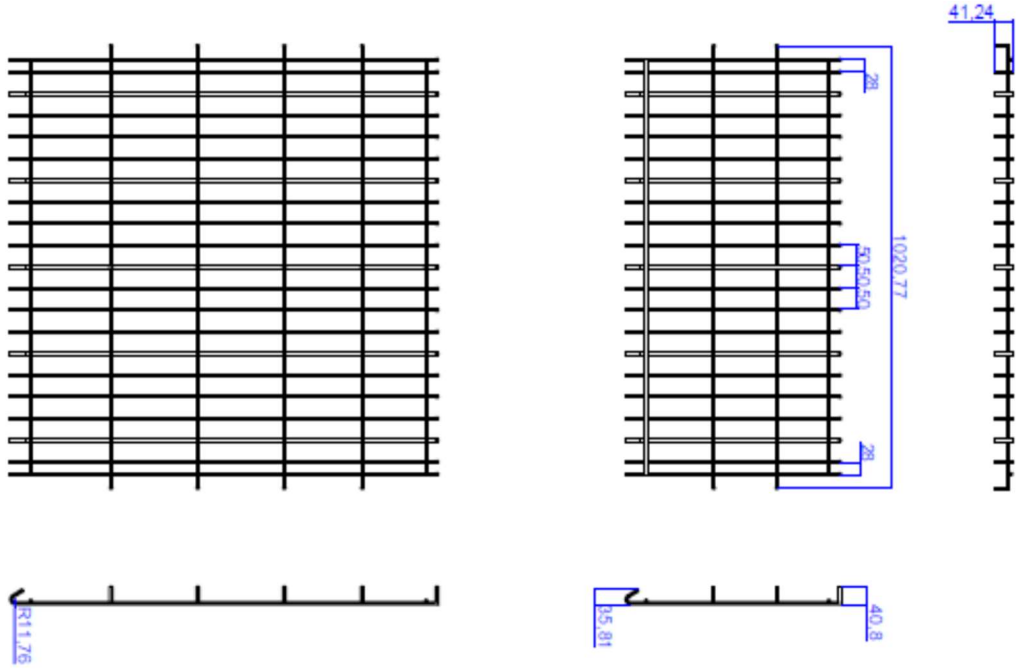
GABBIONI SER.CA.	
Product Description – Gabion box components: plain side panels	**Annex A9/2** **of ETA N° 22/0732**



GABBIONI SER.CA.	
Product Description – Gabion box components: hooking side panels	**Annex A10** **of ETA N° 22/0732**



GABBIONI SER.CA.	**Annex A11/1** **of ETA N° 22/0732**
Product Description – Gabion box components: top panels	



GABBIONI SER.CA.	Annex A11/2 of ETA N° 22/0732
Product Description – Gabion box components: top panels	

Table B1: Wire tensile strength f_t

Wire diameter [mm]	Wire tensile strength f_t (mean value from tests) [N/mm^2]	
4.8	667	Wire tensile strength > 500 N/mm^2 in accordance with clause 7.4 of EN 10223-8
5.8	609	
6.8	749	

Table B2: Dimensions of product

	Gabion nominal dimensions		
	[cm]	[cm]	[cm]
Code	H	L	W
TP2	50	100	50
TP3	100	100	50
TP4	100	150	50
TP5	100	100	100
TP6	100	150	100
TP7	100	200	100
TP8	100	200	50
TP9	50	200	50
TP10	50	150	50
TP11	50	150	100
TP12	50	200	100
TP13	50	100	100

GABBIONI SER.CA.	**Annex B1** **of ETA N° 22/0732**
Performances – Wire tensile strength, dimensions of product	

Table B3: Wire panels: mesh size M x N

Wire panel type/function	Mesh size M X N [mm x mm]
Bottom panel	50 x 156 50 x 167 50 x 185 50 x 189 50 x 200
Top panel	28 x 120 28 x 146 28 x 156 28 x 163 28 x 175 28 x 185 28 x 195 28 x 200 50 x 120 50 x 146 50 x 156 50 x 163 50 x 175 50 x 185 50 x 195 50 x 200
Plain side panel	30 x 150 30 x 152 30 x 160 30 x 190 30 x 200 50 x 150 50 x 152 50 x 160 50 x 190 50 x 200
Hooking side panel	48 x 135 48 x 150 48 x 155 48 x 175 48 x 200

GABBIONI SER.CA.	**Annex B2** **of ETA N° 22/0732**
Performances – Mesh size M x N	