

Permathene Gabion Kitset Assembly Guide:

Before you start the job, please follow these steps:

- 1) After you receive your order, check the components against our packing slip, make sure that you have received all components.
- 2) Prepare the tools you may need for assembling. If you have ordered spiral kitsets, you may need a good pair of pliers which are used to close stiffeners and spirals. If you have ordered u clip kitsets, you will need pliers to close the stiffeners and u clip pliers to close the clips.
- 3) For ground preparation, please refer to our website for more information. Special care must be taken if you are building a high retaining wall or a narrow free standing wall such as a pillar.

To start assembling:

Step 1) Start by connecting all side panels to base panel using spirals or U clips.

Spirals



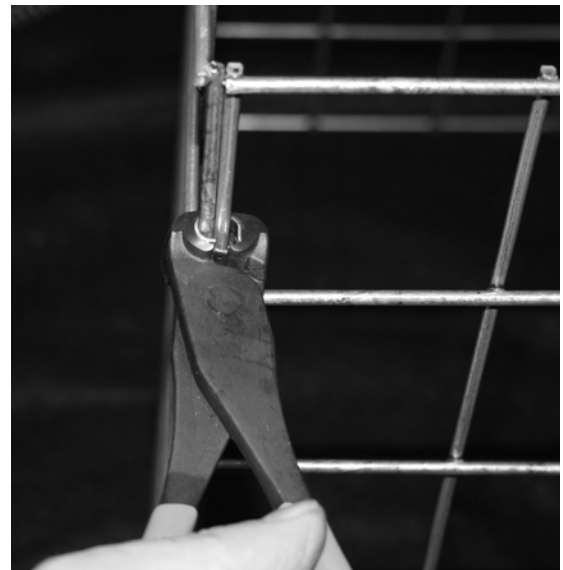
Using spirals connect all size panels to the base.
The spirals should go on easily. If not it is because you do not have the mesh square or have started the spiral connection at an angle.

Using pliers, bend the spiral ends up and then close towards the inside of cage to secure.

U Clips



Starting with the first aperture, place a clip and tighten using the pliers.
Make the panels as square as possible before tightening.
Continue all around, connecting every 150mm for 75x75mm, every 100mm for 100x50mm & 50x50mm.



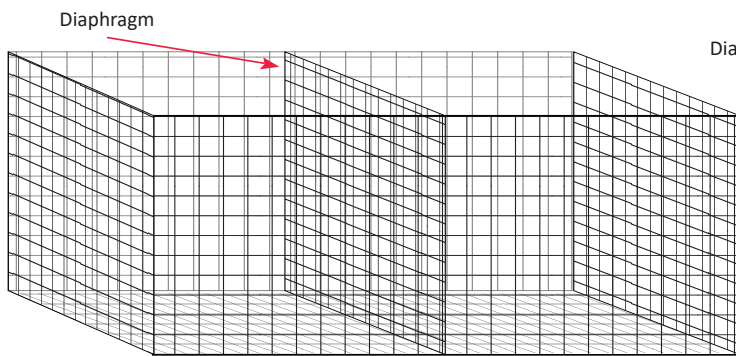
Nikolock



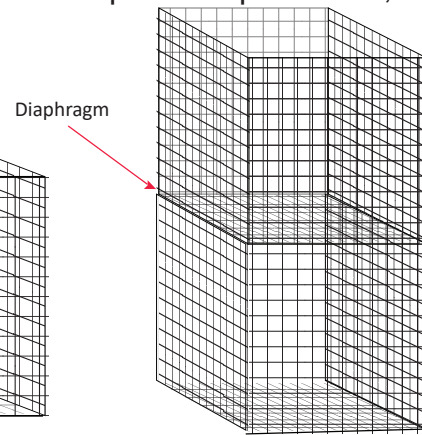
Using the spanner and allen key to tighten the nikolocks, connecting every 225mm for 75x75mm, every 200mm for 100x50mm & 50x50mm. Nikolocks are stronger than u clips and c rings, so you don't need them as frequently, sufficient nikolocks are supplied for each kit, extra are available for purchase if required.



Note: 1.2m length cages have a horizontal diaphragm, 1.5m & 2m length (or height) cages have a vertical (or horizontal) diaphragm panel at half length (or height) distance, connect the diaphragm panel to the sides and base panels same as previous procedure,

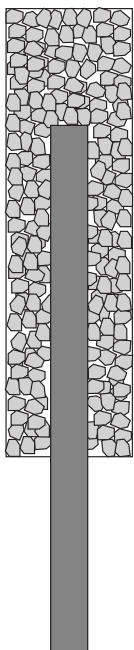


eg: 2025 L x 975 W x 525 H



eg: 300 L x 300 W x 1500 H

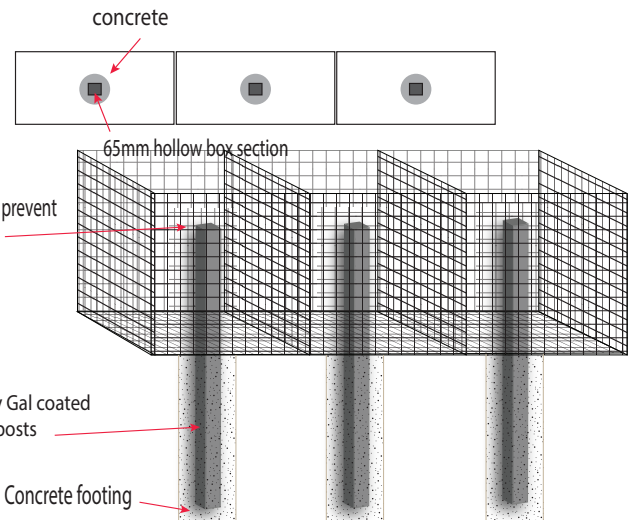
When constructing a gabion wall it is imperative to consider stability and whether the wall can be toppled over and what force is required. A free standing pillar gabion (as per example above 300x300x1500) will require internal reinforcement. As per drawing below, reinforcing is done using a capped 65mm square 4-5mm thick steel (coated internally and externally with heavy galvanising of at least 100g/m² or other approved rush protection), set into a concrete footing.



Gabion wall minimum 300mm wide

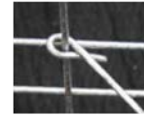
Square hollow box section, heavy gal (internal and external)
Typically 65mm x 65mm x 4 or 5mm and set into concrete or bolted to slab.
Depth of concrete determined by soil type and height of wall.
Check with your builder, concrete supplier or engineer.

Permathene gabion is built over heavy galvanised posts set into concrete
The mesh should over the post. If not cut using bolt cutters



Close stiffener ends with pliers

Step 2) Once you have connected 4 sides to the base, the next step is to place the stiffeners. Stiffeners are **IMPORTANT** for welded gabion, as they prevent bulging from the weight of rocks. Stiffeners must be placed prior to rock, and the ends of the stiffeners must be closed by pliers.

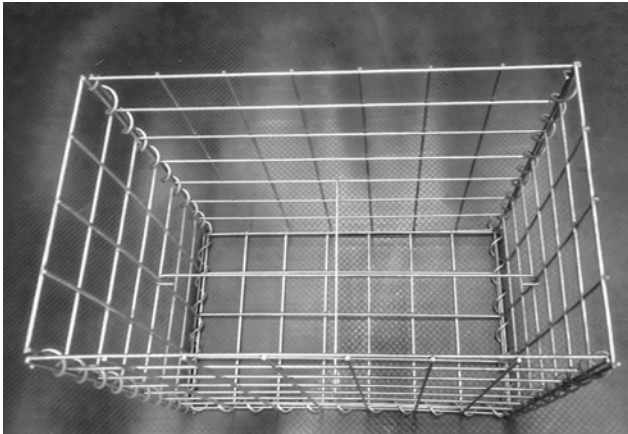


Currently Permathene offers stiffeners in three lengths to suit different-sized gabion boxes, they should be placed either front to back or diagonally in the corners. When you purchase a kitset, a set of stiffeners are included. However, you may buy extra stiffeners if required.

For example, a standard 2m L x 0.5m W x 1m H cage includes 16 x 545mm stiffeners which are generally placed diagonally at the corners, you can also use extra stiffeners by putting them front to back. Alternatively, you can use lacing wire (2.2mm) in addition to stiffeners along the length.

Type A:

2 stiffeners are placed perpendicular, one side to the other, half way down, half way across.



Stiffeners are used as follows:

75mmx75mm:

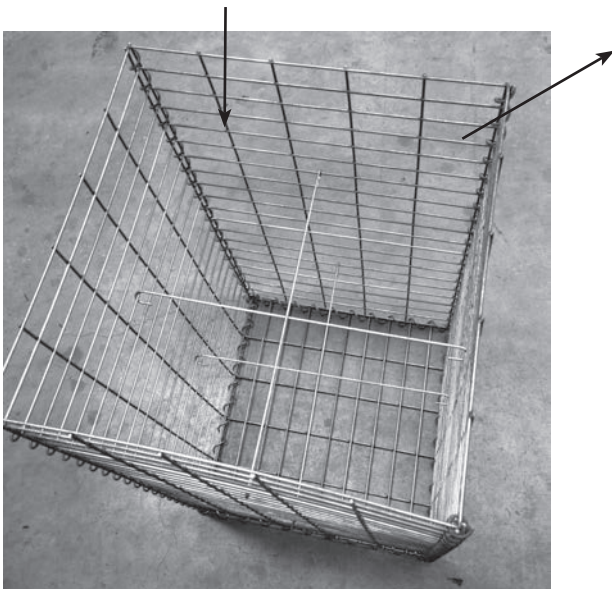
- .5 (L) x .5 (W) x .5 (H): 2 x 530mm
- .5 (L) x .5 (W) x .3 (H): 2 x 530mm
- .5 (L) x .3 (W) x .5 (H): 1 x 530mm & 1 x 310mm
- .3 (L) x .3 (W) x .5 (H): 2 x 310mm
- .3 (L) x .3 (W) x .3 (H): 2 x 310mm
- .5 (L) x .3 (W) x .3 (H): 1 x 530mm & 1 x 310mm

100mmx50mm:

- .5 (L) x .5 (W) x .5 (H): 2 x 510mm

Type B

2 stiffeners are placed perpendicular, one side to the other, approx. 300mm from top down and 300mm from base up.



Looking down into a 1m high cage, 2 stiffeners are placed 4 apertures down from top and again 2 are placed 4 apertures up from base. The stiffeners cross each other and are placed front to back.

Stiffeners are used as follows:

75mmx75mm:

- .5 (L) x .5 (W) x .75 (H): 4 x 530mm
- .5 (L) x .5 (W) x 1 (H): 4 x 530mm
- .5 (L) x .5 (W) x 1 (H): 6 x 530mm
- .5 (L) x .5 (W) x 1.5 (H): 8 x 530mm
- .5 (L) x .3 (W) x .75 (H): 2 x 530mm & 2 x 310mm
- .5 (L) x .3 (W) x 1 (H): 2 x 530mm & 2 x 310mm
- .5 (L) x .3 (W) x 1.5 (H): 4 x 530mm & 4 x 310mm
- .3 (L) x .3 (W) x .75 (H): 4 x 310mm
- .3 (L) x .3 (W) x 1 (H): 4 x 310mm
- .3 (L) x .3 (W) x 1.5 (H): 8 x 310mm
- .3 (L) x .3 (W) x 2 (H): 8 x 310mm

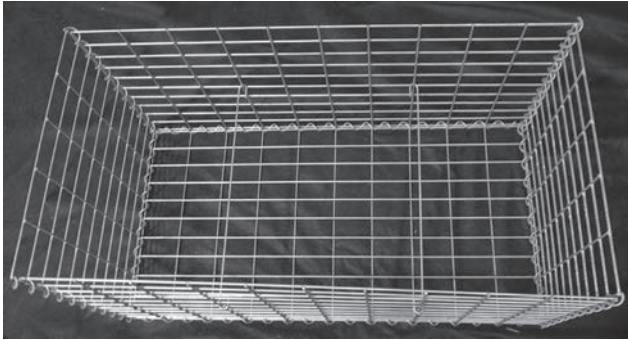
100mmx50mm:

- .5 (L) x .5 (W) x 1 (H): 4 x 510mm

Type C

2 stiffeners are placed evenly
from front to back panel,
4 apertures down and 4 across

1m length cage



Stiffeners are used as follows:

75mmx75mm:

.75 (L) x .3 (W) x .3 (H): 2 x 310mm
.75 (L) x .3 (W) x .5 (H): 2 x 310mm
.75 (L) x .5 (W) x .3 (H): 2 x 530mm
.75 (L) x .5 (W) x .5 (H): 2 x 530mm
.75 (L) x .3 (W) x .75 (H): 4 x 310mm
1 (L) x .3 (W) x .3 (H): 2 x 310mm
1 (L) x .3 (W) x .5 (H): 2 x 310mm
1 (L) x .5 (W) x .3 (H): 2 x 530mm
1 (L) x .3 (W) x .75 (H): 4 x 310mm
1 (L) x .3 (W) x 1 (H): 4 x 310mm
1 (L) x .3 (W) x 1.5 (H): 8 x 310mm
1 (L) x .5 (W) x .5 (H): 2 x 530mm
1.2 (L) x .5 (W) x .5 (H): 4 x 530mm

1.2m, 1.5m & 2m length cage:



Same as 1m cage, repeat another 2 stiffeners in the
2nd cell.

1.5 (L) x .3 (W) x .3 (H): 4 x 310mm
1.5 (L) x .3 (W) x .5 (H): 4 x 310mm
1.5 (L) x .5 (W) x .3 (H): 4 x 530mm
1.5 (L) x .5 (W) x .5 (H): 4 x 530mm
1.5 (L) x .3 (W) x 1 (H): 8 x 310mm
1.5 (L) x .3 (W) x 2 (H): 16 x 310mm
2 (L) x .5 (W) x .5 (H): 4 x 530mm
2 (L) x .5 (W) x .3 (H): 4 x 530mm
2 (L) x .3 (W) x .5 (H): 4 x 310mm
2 (L) x .3 (W) x .3 (H): 4 x 310mm
2(L) x .3 (W) x .75 (H): 8 x 310mm
2 (L) x .3 (W) x 1 (H): 8 x 310mm
2 (L) x .3 (W) x 1.5 (H): 16 x 310mm

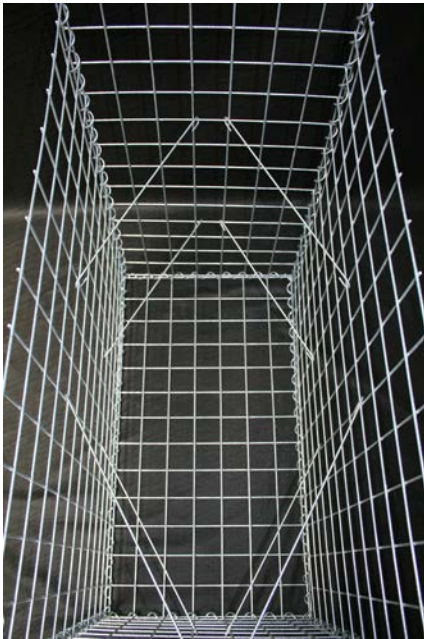
100mmx50mm:

2 (L) x .5 (W) x .5 (H): 4 x 510mm
1 (L) x .5 (W) x .5 (H): 2 x 510mm

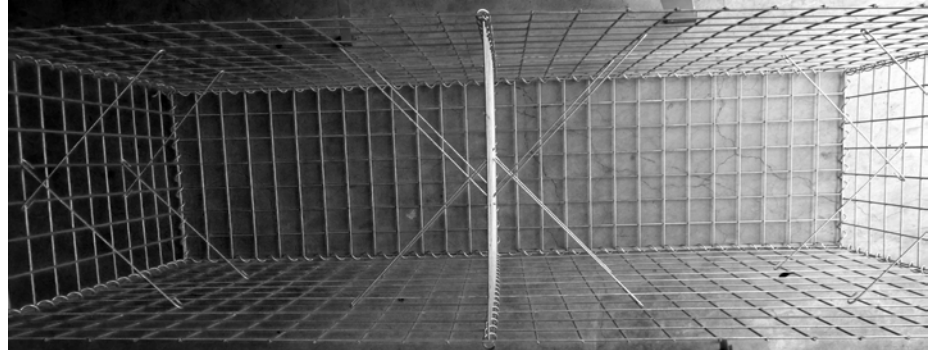
Type D

Stiffeners are placed at corners, place evenly to maximise strength. Each corner of .5m height cage must have 1 stiffener and each corner of 1m height cage must have 2 stiffeners.

Looking into the cage, stiffeners are placed at each corner including baffle panel.



1m length cage



1.2m, 1.5m & 2m length cage

Stiffeners are used as follows:

75mmx75mm:

2 (L) x 1.5 (W) x .3 (H): 8 x 545mm
 2 (L) x 1.5 (W) x .5 (H): 8 x 545mm
 2 (L) x 1.5 (W) x 1 (H): 16 x 545mm
 2 (L) x 1.2 (W) x .5 (H): 8 x 545mm
 2 (L) x 1.2 (W) x .75 (H): 16 x 545mm
 2 (L) x 1.2 (W) x 1 (H): 16 x 545mm
 2 (L) x 1 (W) x .3 (H): 8 x 545mm
 2 (L) x 1 (W) x .5 (H): 8 x 545mm
 2 (L) x 1 (W) x .75 (H): 16 x 545mm
 2 (L) x 1 (W) x 1 (H): 16 x 545mm
 2 (L) x 1 (W) x 1.2 (H): 24 x 545mm
 2 (L) x 1 (W) x 1.5 (H): 24 x 545mm
 2 (L) x .75 (W) x .3 (H): 8 x 545mm
 2 (L) x .75 (W) x .5 (H): 8 x 545mm
 2 (L) x .75 (W) x .75 (H): 16 x 545mm
 2 (L) x .75 (W) x 1 (H): 16 x 545mm
 2 (L) x .75 (W) x 1.2 (H): 24 x 545mm
 2 (L) x .5 (W) x .75 (H): 16 x 545mm
 2 (L) x .5 (W) x 1 (H): 16 x 545mm
 2 (L) x .5 (W) x 1.2 (H): 24 x 545mm
 2 (L) x .5 (W) x 1.5 (H): 24 x 545mm

 1.5 (L) x 1 (W) x .3 (H): 8 x 545mm
 1.5 (L) x 1 (W) x 1 (H): 16 x 545mm
 1.5 (L) x 1 (W) x .5 (H): 8 x 545mm
 1.5 (L) x .5 (W) x 1 (H): 16 x 545mm

1.2 (L) x .5 (W) x .75 (H): 16 x 545mm
 1.2 (L) x .5 (W) x 1 (H): 16 x 545mm
 1.2 (L) x .75 (W) x .5 (H): 8 x 545mm
 1.2 (L) x .75 (W) x .75 (H): 16 x 545mm
 1.2 (L) x .75 (W) x 1 (H): 16 x 545mm
 1.2 (L) x 1 (W) x .5 (H): 8 x 545mm
 1.2 (L) x 1 (W) x .75 (H): 16 x 545mm
 1.2 (L) x 1 (W) x 1 (H): 16 x 545mm

 1 (L) x 1 (W) x 1.5 (H): 16 x 545mm
 1 (L) x 1 (W) x 1.2 (H): 12 x 545mm
 1 (L) x 1 (W) x 1 (H): 8 x 545mm
 1 (L) x .5 (W) x 1.5 (H): 16 x 545mm
 1 (L) x 1.5 (W) x .5 (H): 8 x 545mm
 1 (L) x .5 (W) x 1 (H): 8 x 545mm
 1 (L) x .5 (W) x 1.2 (H): 12 x 545mm
 1 (L) x 1 (W) x .75 (H): 8 x 545mm
 1 (L) x 1 (W) x .5 (H): 4 x 545mm
 1 (L) x 1 (W) x .3 (H): 4 x 545mm
 1 (L) x .75 (W) x 2 (H): 16 x 545mm
 1 (L) x .75 (W) x 1.2 (H): 24 x 545mm
 1 (L) x .75 (W) x 1 (H): 8 x 545mm
 1 (L) x .75 (W) x .75 (H): 8 x 545mm
 1 (L) x .75 (W) x .5 (H): 4 x 545mm
 1 (L) x .75 (W) x .3 (H): 4 x 545mm
 1 (L) x .5 (W) x .75 (H): 8 x 545mm

.75 (L) x .75 (W) x 2 (H): 16 x 545mm
 .75 (L) x .75 (W) x 1.2 (H): 12 x 545mm
 .75 (L) x .75 (W) x 1 (H): 8 x 545mm
 .75 (L) x .75 (W) x .75 (H): 8 x 545mm
 .75 (L) x .75 (W) x .5 (H): 4 x 545mm
 .75 (L) x .75 (W) x .3 (H): 4 x 545mm
 .75 (L) x .5 (W) x 2 (H): 16 x 545mm
 .75 (L) x .5 (W) x 1.2 (H): 12 x 545mm
 .75 (L) x .5 (W) x 1 (H): 8 x 545mm
 .75 (L) x .5 (W) x .75 (H): 8 x 545mm

 .5 (L) x .75 (W) x 2 (H): 16 x 545mm
 .5 (L) x .75 (W) x 1 (H): 8 x 545mm
 .5 (L) x 1 (W) x 1 (H): 8 x 545mm

100mmx50mm:

2 (L) x 1 (W) x 1 (H): 16 x 510mm
 2 (L) x .5 (W) x 1 (H): 16 x 510mm
 2 (L) x 1 (W) x .5 (H): 8 x 510mm
 1 (L) x 1 (W) x .5 (H): 4 x 510mm
 1 (L) x 1 (W) x 1 (H): 8 x 510mm
 1 (L) x .5 (W) x 1 (H): 8 x 510mm
 1 (L) x 1 (W) x .5 (H): 4 x 510mm
 .5 (L) x 1 (W) x 1 (H): 8 x 510mm

Step 3) Now the cage is ready to be filled with rock.

Recommended rock size:

100x50mm: 60-200mm

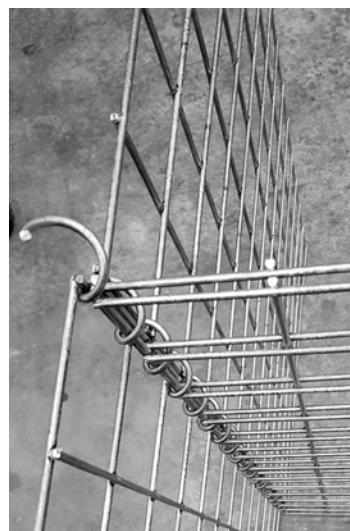
75x75mm: 80-200mm

50x50mm: 60-200mm

Recommended rock type: basalt (retaining), sand stone, blue stone, river rock, broken brick (decorative), etc

Step 4) Once filled, attach lid using remaining spirals (or u clips / nikolocks).

Step 5) If you need to join cages, you can either build separate complete cages and join them to one another, or you can build in a modular fashion. The modular method involves building a continuous wall with eliminated panels where the sections join (rather than having two panels against each other). We prefer not to eliminate any panels, as the extra ones add a great deal of strength to the wall; however, elimination is an option for those wishing to save some money. See below picture, you can join the cages using one common spiral (this spiral can go through 4 panels).



If you decide to eliminate panels, you will still need an internal diaphragm panel at least every metre. This also applies when stacking cages to make a higher wall; however, the placement of the diaphragm panels may vary depending on the height.

When building a modular gabion wall, you will need to consider access behind the wall when connecting spirals.

Note:

- 1) For 100x50mm cages, we usually suggest to have 50mm vertically and 100mm horizontally.
- 2) A nonwoven polypropylene geotextile can be placed under the gabion cages and at the back of the cages if used for retaining purposes. However, as a gabion cage is designed to be free draining, ensure that the geotextile is light enough to function as a filter fabric.



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