

INSTALLATION GUIDELINES

LINK GABIONS AND MATTRESSES

TECHNICAL NOTE 1- GABION AND MATTRESS



FIGURE 1

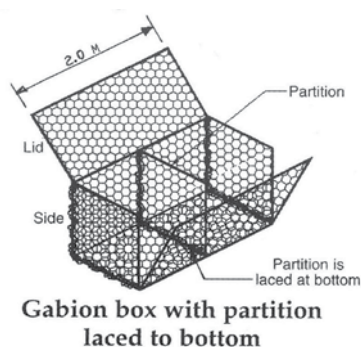


FIGURE 2

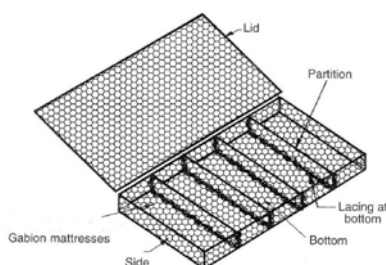


FIGURE 3

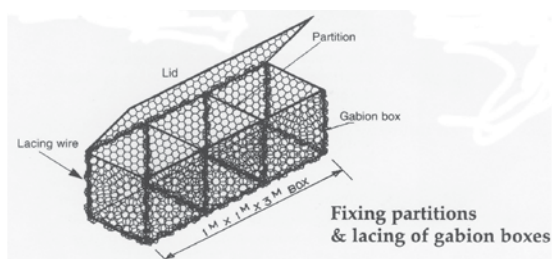


FIGURE 4

PACKING AND DELIVERY

Link gabions and mattresses are delivered to site in a flat packed form for ease of transportation.

Each bundle of units (**see Figure 1**) will contain a varying number of units but generally between 20 and 50 units and each bundle will be marked with the product size, product type and coating type for ease of identification.

Gabions baskets include an integral lid (**see Figure 2**) that is closed once filling is complete. Mattresses are delivered to site in two pieces (**see Figure 3**), a base unit and a lid unit that is wired on top of the base, once filled.

Gabions and mattresses are supplied to site with coils of tiewire/lacing wire at a nominal 5% by weight of the units. When units are to be joined using pneumatic lacing tool and "C" ring fasteners, then tiewire will only be supplied at a nominal 2% by weight of the units.

UNPACKING

The bundles shall be carefully opened to access individual units. Bundles are compressed before strapping so care must be taken to avoid injury when cutting the straps from the bundles.

PREFABRICATION

Units shall be unfolded on level ground and any unwanted creases removed. Corners shall be initially joined ensuring that the box shapes remain as square and as regular in shape as possible. Next, join all sides of the gabion/mattress unit together and each partition within the cage to the sides of the cage. The partitions or diaphragms are factory connected to the base of cage at the appropriate position not more than 1m apart (**see Figure 4**). The joining/connection shall be conducted as described following.



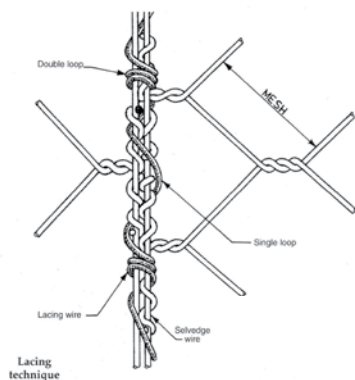


FIGURE 5

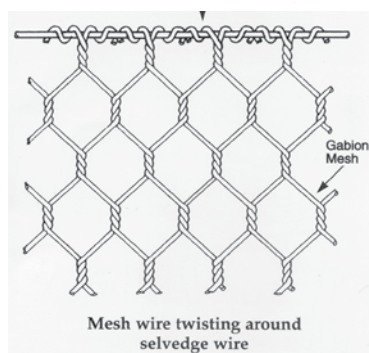


FIGURE 6



FIGURE 7

JOINING/CONNECTION TECHNIQUES

Where a connection is to be made, the traditional manner is to take a strand of tie wire and lace in and out of mesh openings no more than 150mm apart in a continuous motion (see **Figure 5**), alternating between a single loop and a double loop around the selvedge wires (see **Figure 6**). An alternative means of joining or connecting gabions or mattresses is to make a connection at no more than 150mm apart using a manufacturer approved "C" ring. The "C" ring begins as an open clip to be positioned over the gabion/mattress selvedges to be connected and is closed by the action of the pneumatic tool (see **Figure 7**) used to close the "C" rings.

Global Synthetics can assist with the appropriate selection of "C" rings. Stainless steel rings are used for connecting any PVC coated gabions or mattresses and Galfan rings are used for connecting galvanized or Galfan coated cages.

PLACEMENT AND FILLING

Prepare the site where the gabions or mattresses are to be installed. The ground should be prepared to the correct lines and levels and be relatively smooth and flat. A geotextile should always be installed first under/behind gabions and under mattresses to prevent soil from being eroded from under/behind the structure in potential flow events. The prefabricated cages are then placed in the desired position on site. Adjacent cages shall be joined together with the connection technique described above to form one monolithic structure. It may be advisable that where additional gabion or mattress units need to adjoin a previous section of work that has been rock filled, that the last gabion or mattress compartment is left empty of rock to assist in lacing the new section to the completed section.



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FIGURE 8

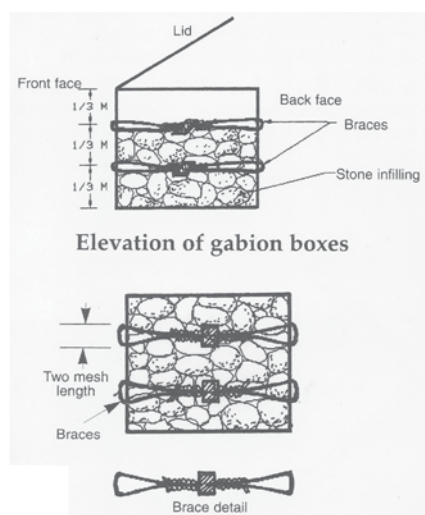


FIGURE 9

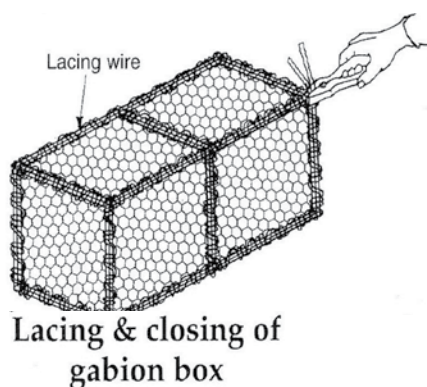


FIGURE 10

GABIONS

Gabions shall be positioned as required and adjacent units connected as described above. Once in position, gabion units shall be stretched taught to provide a neat straight alignment and where a high standard of rock facing is required to the gabions, additional formwork may be used on the face of the cage to provide an even straighter, neater finish.

The lid of the gabion that remains open during the filling process shall be folded back out of the way whilst filling. Rock shall then be machine placed into the gabion unit to about one third height of a typical 1m high cage. Labourers shall then hand position the rock against the front face of the cage to ensure a neat, tightly packed finish is achieved (**see Figure 8**). Once the rock is neatly faced, two bracing wires shall be installed from front to back of the cage to prevent bulging of the face (**see Figure 9**). The process continues with the second third of the cage height filled and faced, two additional bracing wires installed, and then the remaining one third of the cage filled. In the case of gabion units of height 0.5m, one internal set of bracing wires at the mid height is sufficient.

The gabion filling shall continue until the cages are approximately 5% over filled. Over filling allows for potential settlement of rock over time. The top of the gabion shall be relatively level and flat to ensure a sound base is available for stacking of gabions for tall structures.

Lastly, the gabion lid is pulled over into position on top of the rock and is laced closed to the perimeter of the gabion cage and to each of the vertical partitions/diaphragms within the gabion cage (**see Figure 10**). Lacing shall be as defined above in the joining/connection technique section.



MATTRESSES

When placing a mattress into position, the diaphragms/partitions shall be oriented perpendicular to the flow of water. Generally this will mean laying mattress along the base of a channel to orient the diaphragms accordingly. Conversely, when placed on steep batters, the mattress shall be oriented such that the diaphragms run across the slope. This uses the diaphragms to minimise placed rock moving within the mattress compartment.

Where mattresses are installed on steep batters, the top edge should also be secured with star pickets or similar to prevent possible sliding during rock placement. Generally a spacing distance between star pickets of approximately 1.5m along this top edge is sufficient to prevent sliding of the mattress. Rock shall then be machine placed into the mattress base unit and filling shall continue until the cages are approximately 10% over filled. During machine placement of rock, care shall be taken to ensure that the internal diaphragms are not damaged or displaced. Over filling allows for potential settlement of rock over time. Manual labour may be required to neatly pack the rock into the cage and level the top surface in preparation for the mattress lid to be placed on top.

Once full, the mattress lid is positioned on top of the rock and is laced closed to the perimeter of the mattress base and to each of the 5 partitions/diaphragms over the length of the standard 6m long mattress cage. Lacing shall be as defined above in the joining/connection technique section.

ROCK SPECIFICATION

The rock used to fill Link gabions and mattresses shall be hard durable stone. For mattresses, the nominal stone diameter should be 75mm to two thirds of the mattress depth, with no more than 10% fines. For gabions, rock shall be a nominal diameter of 100mm to 250mm with no more than 10 percent fines.

For further information, please contact your Global Synthetics representative.



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