

WELDED GABIONS GALVANISED & PVC-GALVANISED

It is a common misconception that welded mesh gabions are quicker and simpler to install than woven mesh gabions. However, the same issues must be addressed when installing a welded gabion as with a woven gabion. Critical details remain the installation of bracing wires, the hand packing of gabion fill in order to reduce voids and the lacing of each joint. Assuming that a welded gabion, whatever the wire diameter, can be 'bulk filled' without hand-packing to reduce voids is a fundamental mistake and will cause significant settlement issues post-construction.

Material Delivery

Gabions are manufactured with all components mechanically connected at the factory. The gabions will arrive on site as a flat-packed bundle containing a number of units. The bundles are strapped together for easy shipping and handling. Lacing wire is shipped in coils. Fixing rings are shipped in boxes. Untie the bundles and remove a few units at a time.

Assembly

Unfold the units on a reasonably flat surface. Lift the front and side panels to form an open box shape. Temporarily join adjacent panels with short twists of tying wire in order to ease the overall assembly of the gabion unit.

Check that the diaphragm panel is vertical and using a suitable length of tying wire, lace up the front and rear panels using alternative single and double loops approximately every mesh as shown in Figure 3. Place the gabions in position and wire the adjacent units together using alternate single and double loops as before. The adjacent panels at the exposed corners of the structure should be laced together at this stage.

Fixing Procedure

When using tie wire, cut off a piece of wire approximately 1.5 times the length of the edge to be tied. The maximum length of the edge to be tied at one time should not exceed 1 m. Longer edges should be joined by several lengths of wire. Proceed tying with alternate double and single loops. Double loops shall be made at intervals not greater than 150 mm. The basket pieces should be pulled tightly together during the tying operation. The other end of the tie wire shall be secured by again looping and twisting the wire around itself. When using tie wire to assemble the units, pliers may be used to create tight joints. Care should be taken to avoid damaging the wire coating, if present.

When steel ring fasteners are used, the use of a pneumatic fastening tool is additionally required. Rings shall be installed at the top and the bottom connections of the end and centre diaphragms and then a maximum spacing of 150 mm along all edges shall be used.

Foundation preparation

The foundation for gabions should be level, smooth, and free of surface irregularities, loose material, and vegetation in accordance with the project specifications. Appropriate measures should be taken for filtering and drainage of the foundation, as per the project specifications (filter cloth, drain works, etc.). Geotextiles required to be installed behind or underneath gabion structures should comply with the requirements for subsurface drainage applications.

Installation and Filling

After the foundation has been prepared, the pre-assembled

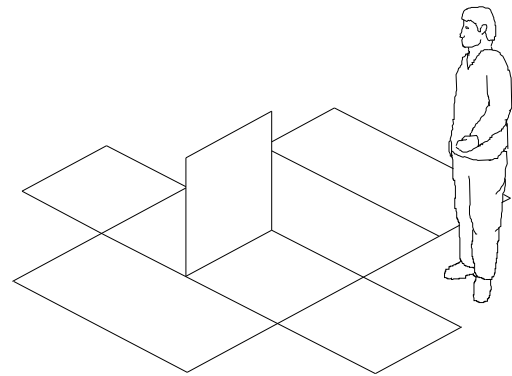


Figure 1

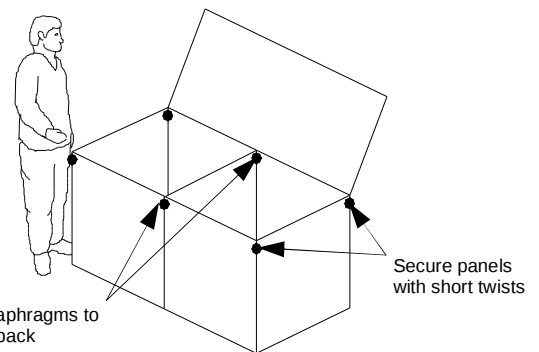


Figure 2

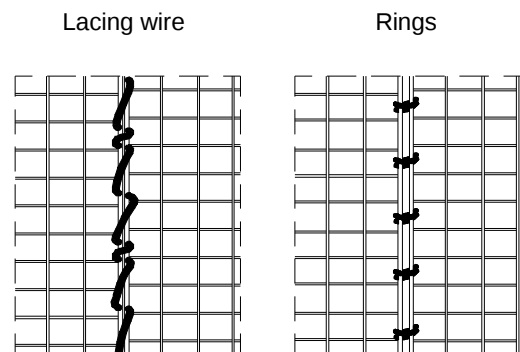


Figure 3



Typical welded gabion installation

gabions are placed in position empty, and tied or fastened to adjacent gabions along all containing edges in order to form a continuously connected, monolithic structural unit. Gabions should be placed front to front and back to back in order to expedite the stone filling and lid lacing operations.

Stone fill for gabions shall be produced by any suitable quarrying method and by the use of any device that yields the required sizes within the gradation limits chosen. Stone fill shall be hard, angular to round, durable and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure. Gabion stone fill shall range between 100 mm and 200 mm. The range in sizes may allow for a variation of 5% oversize and/or 5% undersize rock, provided it is not placed on the gabion exposed surface. In all cases, the oversize rock shall not be larger than 250 mm, and the undersize rock shall not be smaller than 50 mm.

The rock in exposed vertical faces may be hand placed to reduce voids and improve the aesthetic appearance to the outer face. Rock shall be placed in 300 mm lifts for 1 m high gabions, and 250 mm for 0.5 m high gabions. The fill layer shall never be more than 300 mm higher than any adjoining gabion compartment in order to avoid excessive load on the separating panel. This process is shown in Figure 6.

During filling of the gabion basket internal bracing wires need to be installed. Some Contractors may be of the opinion that welded gabions are more rigid than woven units and do not require the extra internal support provided by the ties. **This is not correct.** In fact, a 3mm diameter wire welded unit contains less steel than a 2.7mm diameter wire woven gabion and requires just as much care during installation, including bracing wires.

The bracing wires will reduce deformation in the front face of the gabion wall. Bracing wires should be installed after filling 1/3H of the basket as shown in Figure 5. Extra care should be given when installing the units that make up the end of the wall. The end units will require bracing in 2 directions (1 installed perpendicular to the other) as both faces of the gabion will be exposed. The additional bracing wires can be installed at the same height as the previous ties. For 0.50 m high baskets *when used as a revetment*, stiffeners or internal cross ties are not required.

When more than one vertical layer of gabions is installed, units should be overfilled to allow for natural settlement. The top surface shall be smoothly levelled to minimise voids. An improved finish is often achieved by using a smaller grading of stone placed between the larger gabion fill in order to reduce the voids at the top of the basket. Ensure that the diaphragm tops are accessible for fixing the lids.

Closing

After the rock has been levelled and the voids minimized, fold the lid down and pull edges of the panels together. It should require a light stretching to bring the two panels together. Take care doing this with welded gabion units as they are not as robust as woven units and can damage easily under point loads. The lid shall be tightly tied along all edges, ends and tops of the diaphragms. Adjacent lids may be tied or attached simultaneously.

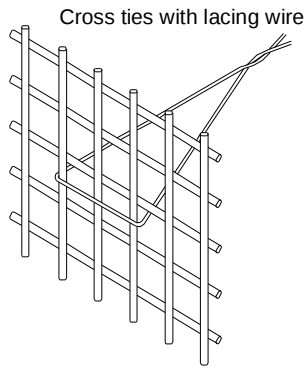


Figure 4

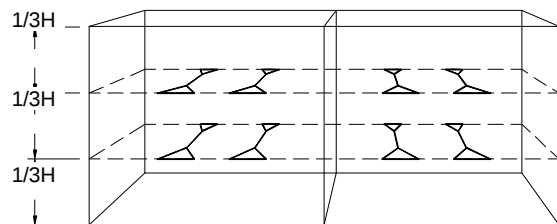
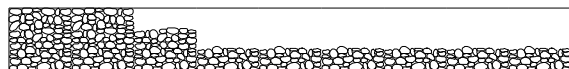


Figure 5

Phase 1



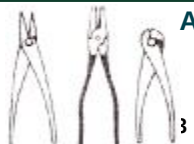
Phase 2



Phase 3



Figure 6



1. Pliers
2. Pliers with nipper
3. Nipper

Pneumatic
Spenax tool

Tools / Plant Required

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