

Gabion Cladding

Specification Gabion Cladding (based on 300mm gabion cladding to concrete wall)

This is a general guide only and shall not be used without the guidance of a professional engineer. It is based upon a cladding system built upon a compacted base of known soil conditions and is not subjected to any building or traffic loadings. The foundation shall be free of all loose material and vegetation and shall conform to specified requirements. Gabions and geotextile shall not be placed until foundation is prepared and inspected by an approved site engineer or engineer's representative. Extra care should be taken in foundation preparation to ensure a level and smooth surface with adequate drainage. Geotextile shall be installed in accordance with plans and specifications.

Materials

Permathene Gabions shall consist of square or rectangular welded mesh constructed to form containers filled with rock. The gabions supplied to site shall conform to the following standards:

The welded connections are to have a minimum average shear strength of 70% and a minimum shear strength of 60% of the ultimate tensile strength of the wire.

1. The wire is to be virgin mild steel coated in a minimum of 280gsm of Al-Ten (Aluminium 10%/ Zinc 90%) prior to forming into mesh. Gabions shall be constructed to a tolerance of +/- 5%.

2. The wire is to be stainless steel 316L. Gabions shall be constructed to a tolerance of +/- 5%.

Permathene Gabion panels shall be factory manufactured to required sizes. As follows is an example for a cladding depth of 300mm in a square mesh of 75mm x 75mm aperture, panels will be supplied as: 525mm height in lengths as determined by project, diaphragms and ends of 300mm x 525mm height.

Wire for assembly, including stiffeners, spiral binders (if specified in place of "C" rings) and "C" rings, shall be of the same material type as the gabion (AL-TEN, PVC, or Stainless Steel). When PVC coated welded mesh gabions are specified, the galvanised wire shall be coated by fusion bonded PVC material (not hot dipped).

Rock shall conform to the quality requirements. Rock shall be dense, hard and free from flaking and fissures. Rock shall be durable and shall not disintegrate during the life of the gabion structure. The material shall have unit weights of a minimum of 24 kN/m³ for any structures higher than 1000mm. The rock shall range between 80mm and 225mm. Gabion cladding walls optimum rock size should be specified as per shape of rock: 80mm to 150mm for rounded shaped rocks and 80mm to 225mm for angular shaped rocks.



Cladding Components

Eye Bolts:

Bolts shall be galvanized, Class 4.6, 6mm threaded eye bolts for mild steel mesh and stainless steel 316 for stainless steel mesh. Bolts are drilled 60mm into the concrete wall with epoxy. Eyebolts with washer and nuts to be fastened to the mesh by means of a heavy galvanised plate for mild steel mesh and stainless steel plate for stainless steel mesh. Typically the plate is wide enough to cover one full aperture vertically and 3 or more apertures horizontally. For example a 75mm x 75mm aperture cladding may be held at the back panel with a 100mm wide x 200mm length heavy gal or stainless steel. This example would use two bolts placed at points to maximise holding. The addition of washers may be required between outside of the plate and the wall due to the C rings in order to prevent bending of the panels.

Spacing of plates shall be 300mm from the ground vertically and 125mm from ends of wall and 1000mm centre to centre horizontally.

Stiffeners:

Stiffener wires (pre-formed) of required length or lacing wire shall be of the same material type as the cladding. Placement, in the case of a 300mm depth cladding) are to be 2 for every 975mm length x 525mm height section. To provide diagonal bracing two stiffeners are placed across the corners of each section, including diaphragms, midway between the base and the top, forming a "X" between each diaphragm and ends.

"C" Ring Fasteners:

1. Permathene AL-TEN coated mild steel gabion cages.

Shall be formed from Galfan wire. A minimum strength of 1700N/mm². "C" Ring fasteners must have a minimum wire diameter of 3mm.

2. Stainless Steel 316L gabion cages.

Shall be formed from stainless steel 302 wire. A minimum strength of 1600-1800N/mm². "C" Ring fasteners must have a minimum wire diameter of 3mm.

"C" ring fasteners with a maximum spacing of 150mm. Internal diaphragms must be placed every metre. Connect "C" rings in the same method.

Assembly

Based upon the example, unit sizes of 300mm depth x 525mm height (75mm x 75mm aperture mesh). 525mm x 300mm diaphragms are placed every metre. If using different aperture sizes the depth will alter accordingly.

Starting on the ground level place gabion back panels into position and connect using eyebolts and plates. Place and connect the base panels using "C" rings. Place and connect diaphragms every meter. Place and connect front panels by the same method. Complete stiffener wire connections to face panels concurrently with rock placement.

Each section of wall is based upon length of wall at 525mm heights. The base wall is complete and subsequent sections are built on top of the base. The method is modular and requires no two panels to be connected to each other unless it is for aesthetics, so the lid of the base wall becomes the base of the next level and so on. The length is built using the same method, the diaphragms divide each section, with no two panels connecting to each other. Once each 525mm height section is complete and level the next section is built on top.

Filling

Following panel assembly with all base and side connections made, ensure gabions are lined up and straight (temporary stakes may be used). Gabions shall be carefully filled with rock by either hand or machine, ensuring mesh is not damaged or bent in the process. If placement by machine rock must not be dropped from a height greater than 400mm. Align ensuring there are no bulges. Bulges, if seen, must be rectified by additional stiffeners or lacing wire. Voids should be minimised. Rocks are best hand placed with flat surfaces against the mesh to ensure a uniform appearance for all exposed faces.

Rock must be placed uniformly in every cell. This will help ensure the gabion is not distorted due to uneven stresses.

The last placement of rock for each section is levelled to the cell height to allow placement of lid with no voids. No tools may be used which may damage the gabion mesh and coating system. Lids are placed over the rock and closed using "C" rings prior to commencing the next level.