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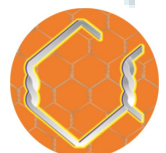
Manufacturer of
HEXAGONAL DOUBLE TWISTED GABION & ROCK FALL
MATRESSES

As per IS 16014 (2012): Mechanically woven, double -twisted, hexagonal Wire Mesh Gabions, Revet Mattresses and Rock fall Netting(Galvanized steel wire or Galvanized steel wire with PVC coating

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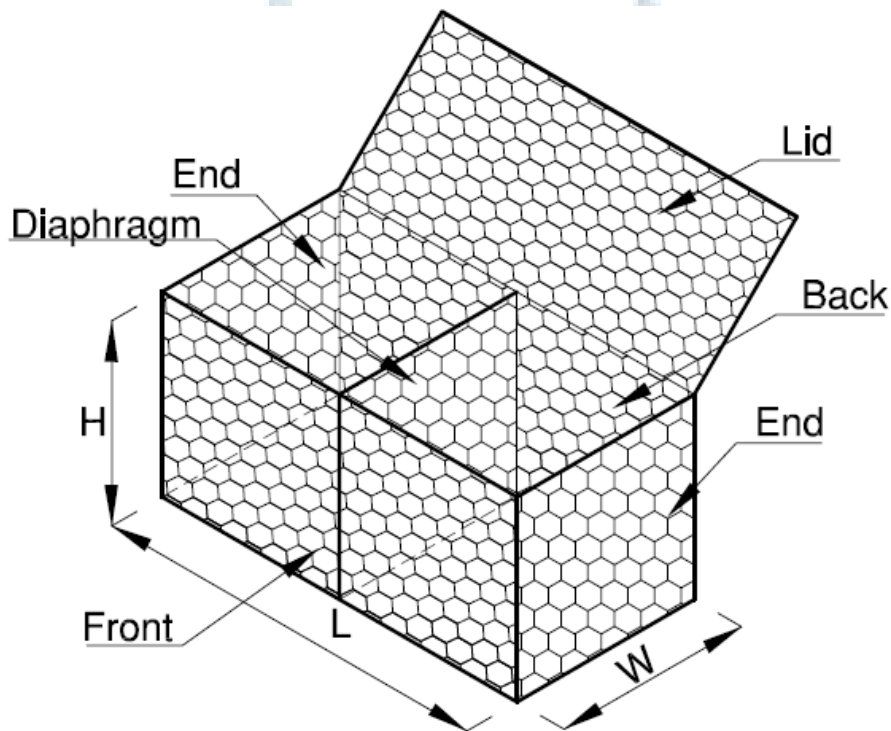
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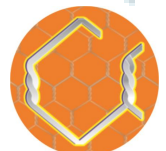
M/S GEOGAB INFRASTRUCTURE is a Gujarat based Company situated in India's fastest growing city Surat and has been providing services and cutting edge technology in the fields of earth stability for soil erosion , bank protection work, slop protection work and Ground Improvement Techniques.

Our company was formed as a partnership firm in 2001 and started manufacturing double twisted hexagonal netting Gabions having heavy Zn. Coated 2.5 , 2.7,3.7,4mm or Zn + PVC coated wire of dia 2.5/3.5 , 2.7/3.7 (1mm PVC coated) SINCE 2002 for the Indian market.



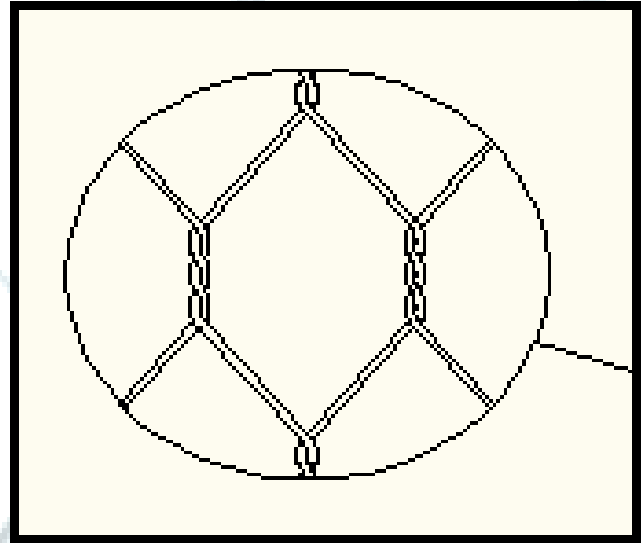
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A gabion is a structural unit consisting of a wire frame cage filled with rocks.

(Gabions are double twisted hexagonal woven galvanized steel wire mesh compartmented baskets with a rectangular box shape) They are used to build structures such as river walling. This technique commonly uses a set of gabion



'blocks' or 'baskets' wired together. A rock 'mattress' is a relatively thin cage with comparatively large surface area, laid on the grade of the bank or bed. Gabion blocks and mattresses are often used in combination; the blocks provide the vertical gravity walling and the mattresses are placed below the blocks to provide scour protection. However, they may be installed separately, as block walls and mattress systems respectively. Gabions are also widely used in weir and storm water drainage structures.

The first industrial manufacture of gabions began in 1894. Gabion units are known under several names. The systems most widely used in India.

Gabion blocks are typically 2-4m long, 2-4m wide and 0.5-1m thick. Gabion mattresses are typically 3-6m long, 1-2m wide and from 0.15-0.5m thick.



Gabion Baskets and Rock Mattresses Used For

- Earth Retaining Structures & Retaining Wall
- River Training
- Canal Lining
- Marine Revetment
- Rock Fall Protection
- Reinforced Soils
- Coastal Protection
- Dam Overflows
- Scour Protection
- River Crossing
- Bridge Embankment
- Culverts Protection
- Roadway Protection
- RCC Road Reinforcement



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- **Earth Retaining Structures & Retaining Wall**

Gabions are used as retaining walls are functional, economical solution and a good alternative to other types of retaining structures due to their flexibility and permeability.



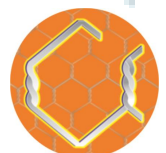
- **River Training**

Channels are protected using gabion and mattress structures against erosion which control and guide the movement of water naturally. Boundary or Security Fences: units can be used as fences which are cost effective compared to concrete fences.



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• **Bridge Embankment**

Bridge abutments and culverts are potentially at risk of scouring during heavy rains and strong flow of water. Gabion boxes and mattresses can be used as abutments and protective structure that aid the flow of water avoiding the danger of erosion due to their good permeability characteristics.

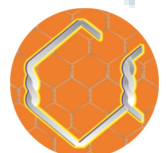


• **Canal Lining**



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• Scour Protection

Gabions and mattresses are highly resistant to corrosion and other environmental effects which are suitable for marine works, such as; retaining walls, ramps, beach protection, small jetties, groins, and piers built at great speed and minimum cost. The use of gabions and mattresses dissipate wave energy conserving beaches from being eroded



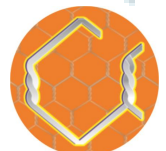
• Rock Fall Protection

Rolls of fabric with lacing, done by joining together, are provided as a blanket to cover the surface of the slopes to protect any infrastructure built on the foot of the slopes against rock fall. Gabion constructed as retaining wall is an alternative.



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. Gabions Offer

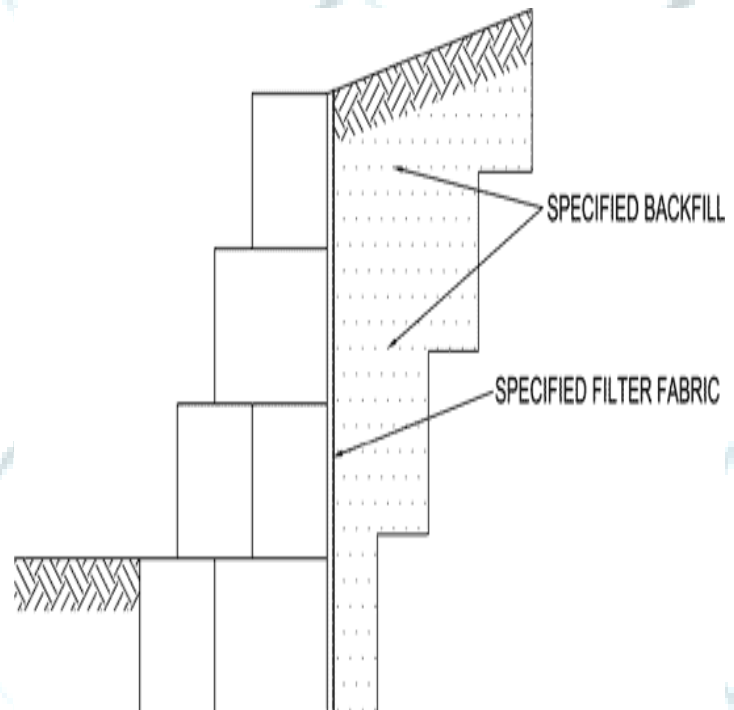
Flexibility : Gabions tolerate differential settlement without fracture. This is especially important when building on unstable ground or in marine or river applications where waves or currents are a consideration.

Permeability : Hydrostatic heads do not develop behind gabion structures because of their

permeable nature .They are free draining structures ideal for slope stabilization and retaining walls

Durability : The durability of gabion structures increase with age. As Consolidation takes place, silt and soil collect in the voids and vegetation becomes established

Ecology : Gabions permit the growth of vegetation and maintain the existing environment, they provide attractive and natural building blocks for decorative landscaping.



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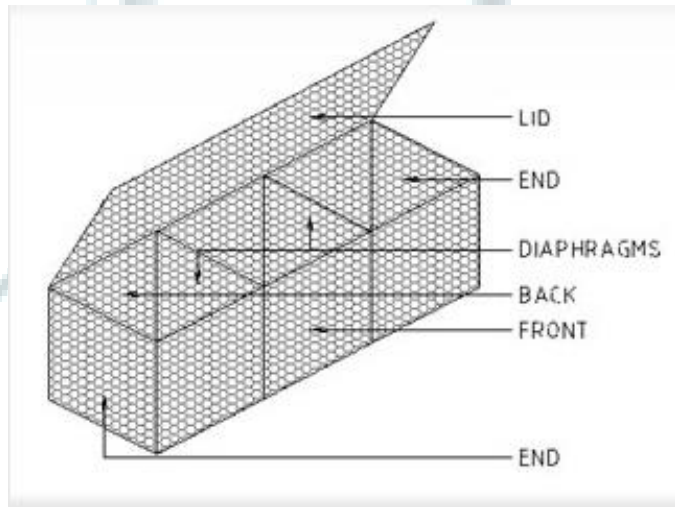
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Cost Effectiveness : Requiring unskilled labour and limited plant, a gabion structure can be built anywhere at low cost

Gabion Boxes

GEOGAB'S gabion box is a rectangular wire mesh box comprised of three one half turns (commonly called double twisted) to form hexagonal shaped mesh openings of Zinc galvanized and PVC coated steel wire. These mesh openings are then interconnected with adjacent wires to form hexagonal meshes. Selvedge / Edge wire which is a thicker and heavier wire is used to reinforce the edges and transverse diaphragm. It gives greater rigidity and shape to the gabion/mattresses/netting.

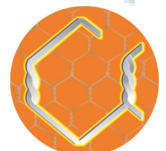


These Gabion boxes are filled with natural stones at the project site to form flexible, permeable, monolithic structures such as Retaining walls, sea walls, channel lining, revetments, and wires for erosion control projects.

The diaphragm assure minimum stone migration within the basket, thus gives strength to the container to retain its original shape and does not unravel or unzip in adverse conditions. Woven units can also be easily amended on site and shaped to suit project requirements.

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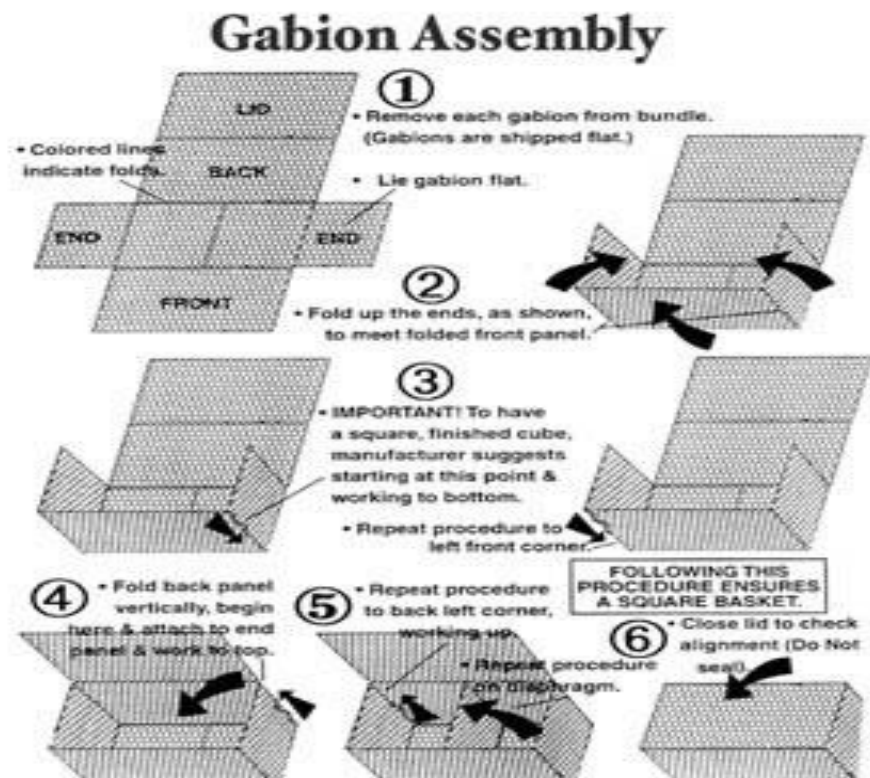


The wire used to manufacture the Double twisted Hexagonal wire mesh is soft annealed, low carbon content mild steel wire as per IS 280 provided with heavy coating galvanizes as per IS 4826 to prevent corrosion. In case of use in aggressive environments, it is further extruded with 0.5mm thick PVC Coating. The PVC coating is UV stabilized as per IS 16014 : 2012.

Lacing, Assembly and Installation

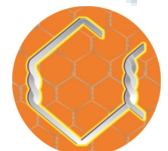
Gabion units are assembled and connected to one another using specified lacing wire can be used as internal connecting wires when a structure requires more than one layer of gabions to be stacked on top of each other. Internal connecting wires with lacing wire shall connect the exposed face of a cell to the opposite side of the cell.

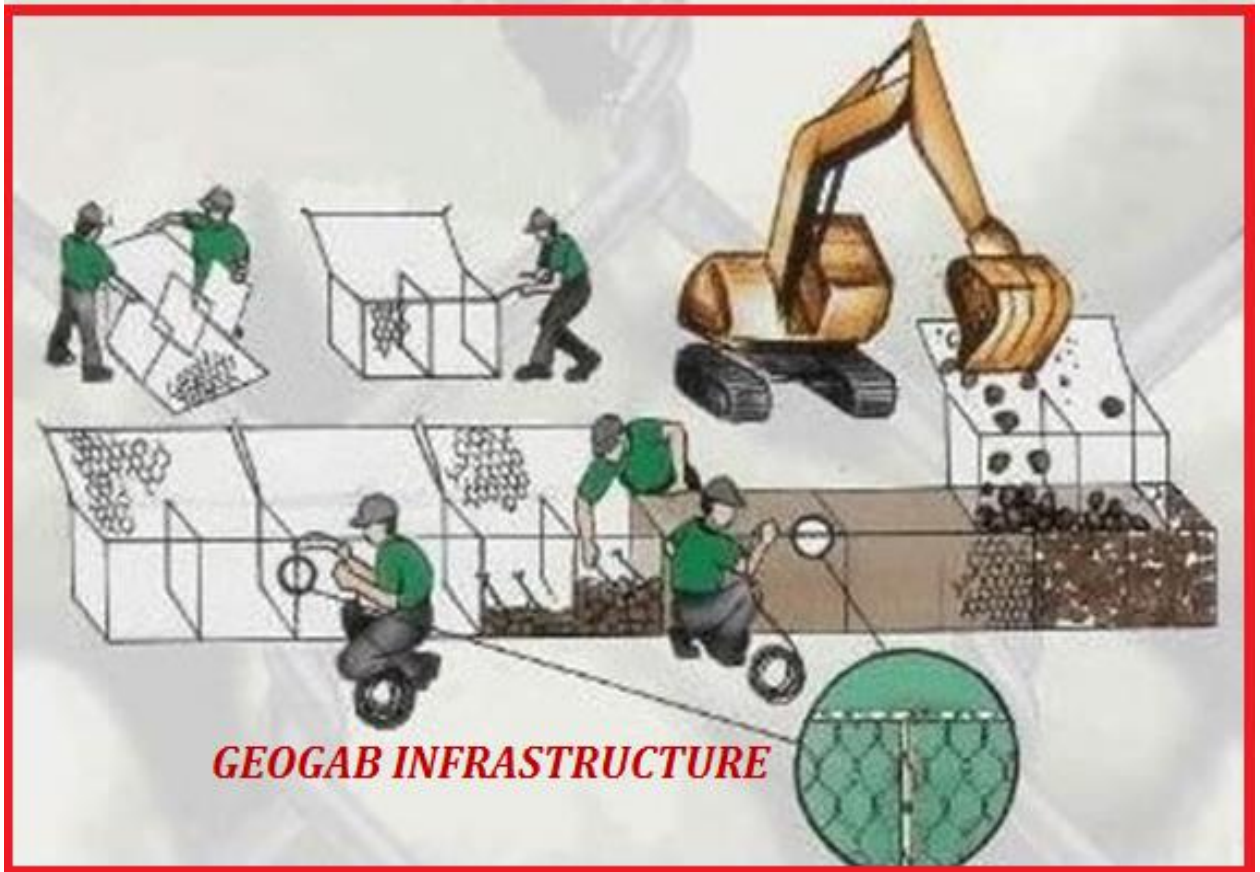
Gabion Basket Assembly



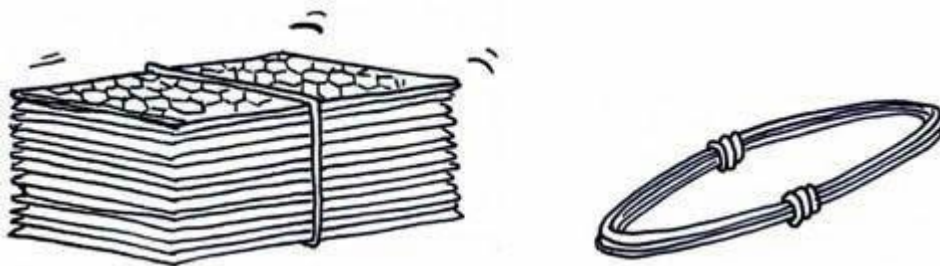
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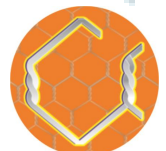
Step 1: Woven gabions have been collapsed and packaged on pallet to facilitate shipment and transport



Woven gabion basket panel in package

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Step 2: Unpack gabion basket and unfold it.



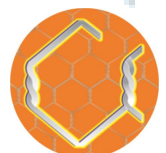
Unfolded gabion baskets panels

Step 3: Erect each side and assemble it into a cage-like container. Tie each thick edge together by binding wire.

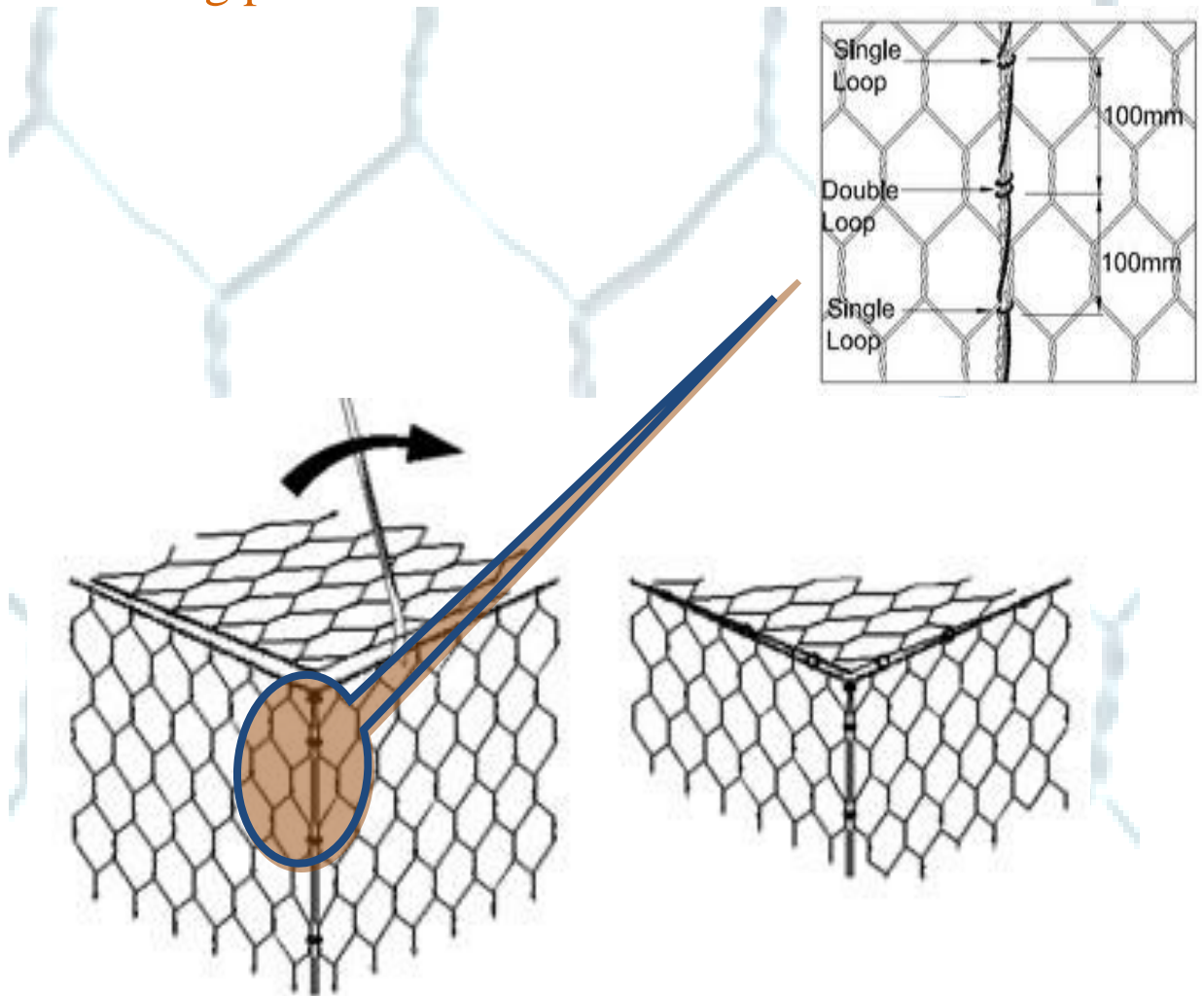


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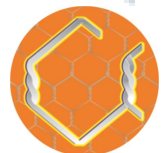
The lacing procedure is as follows:



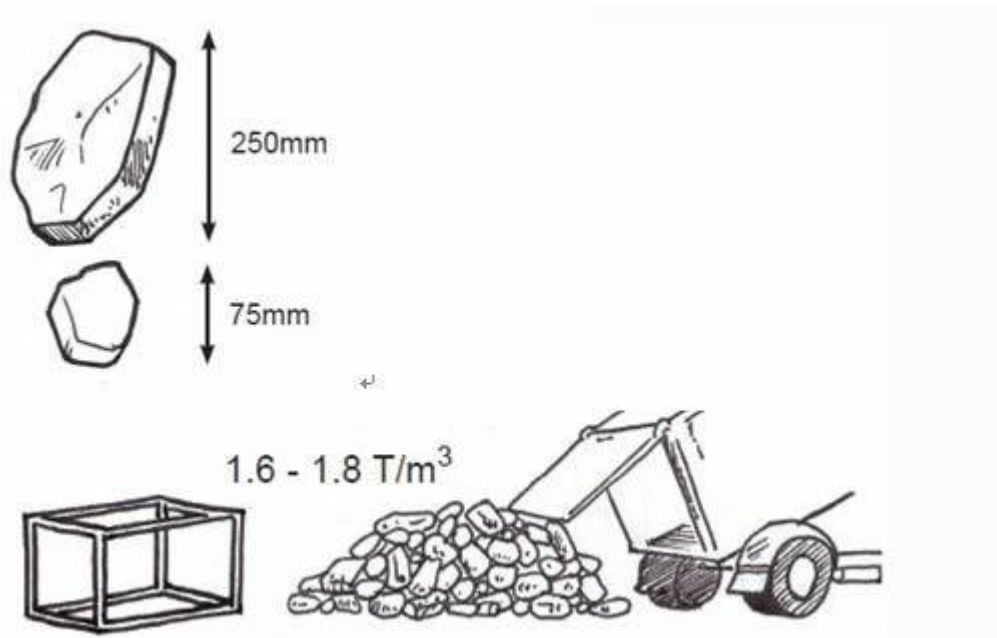
- Cut a length of lacing wire approximately 1-1/2 times the distance to be laced. This length of wire may not exceed 1.65 mt.
- Secure the wire terminal at the corner by looping and twisting
- Start lacing with single and double loops at approximately 100 mm.
- Securely fasten the other lacing wire terminal

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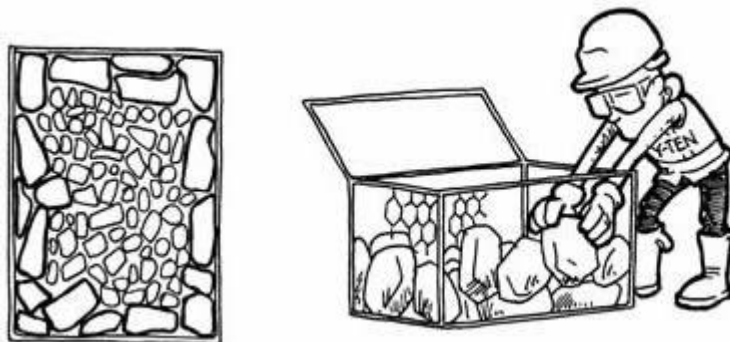
Step 4: Choose rigid and breakage-proof stones. Stones come in 75mm to 250mm.



Choose stones for filling gabion basket

Step 5: Put chosen stones into the basket.

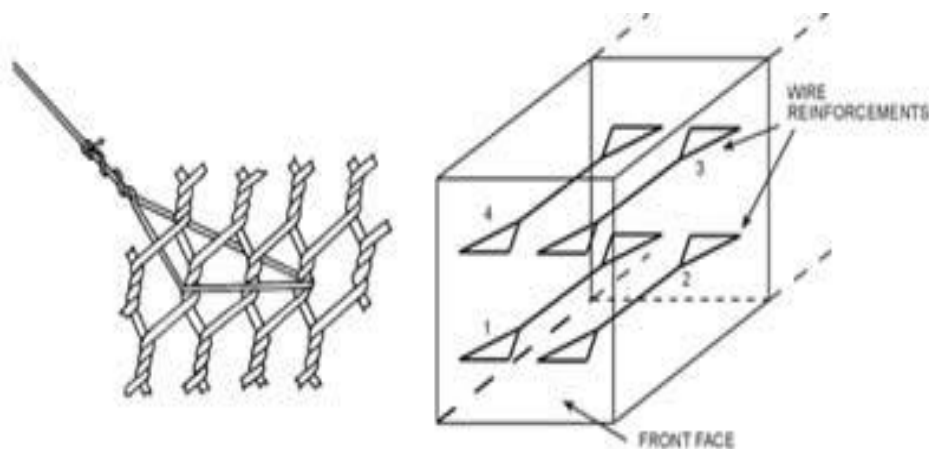
Place the big stones around the baskets and the front side where will undertake huge impacts. While small stones are placed at the bottom.



Huge stones are placed around the basket to bear impacts



Place wire reinforcements in each direction every twelve inches to retain the shape of the basket.(see the picture below)



When filling stones, double twisted binding wire is employed to connect the neighboring sides at the height of $\frac{1}{3}$ and $\frac{2}{3}$. The binding wire is designed to stabilize the structure. Generally, the stones should be 50mm higher than the basket body.

Step 6: Stretch the lid tightly and make sure its four edged wires overlap with the body's wire. Then fasten the lid with binding wire. Now, a qualified gabion basket is created.



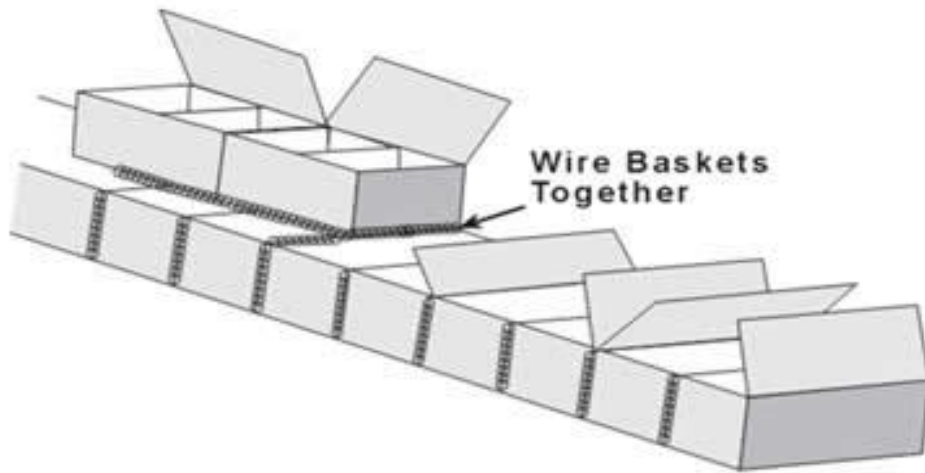
A gabion basket filled with stones is completed and can be used.

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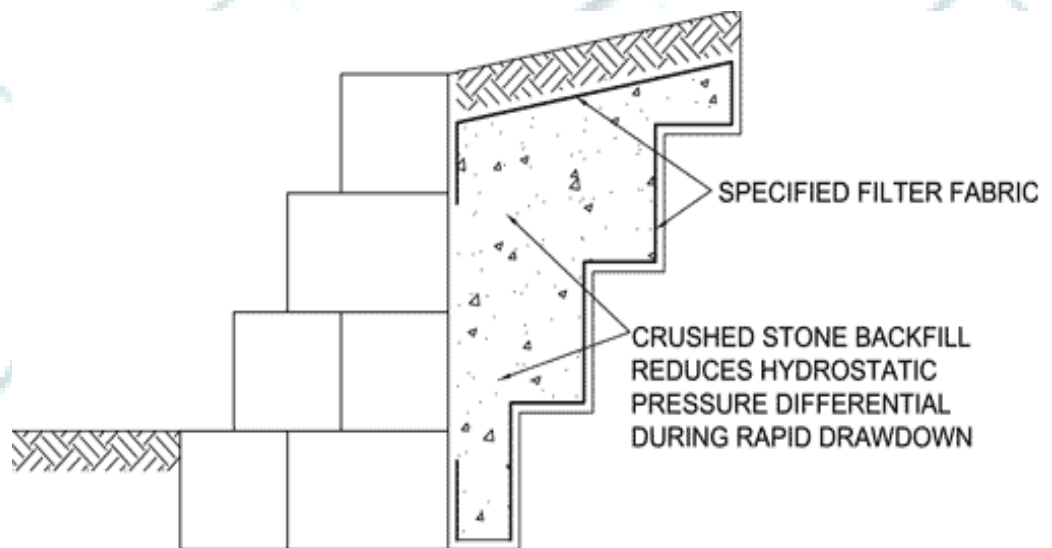
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Step 7:

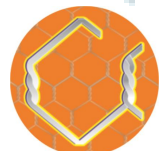


Secure the tops of the baskets with a galvanized wire and lace the baskets to each other (see the above picture). The length of wire needs to be about 1.5 times the length to be laced. Wire longer than 5 feet is difficult to handle. Secure one end at a corner, and lace the wire by alternating single and double loops at 5 inch intervals. Secure the wire again at the end. Wire the baskets shut and wire them to each other



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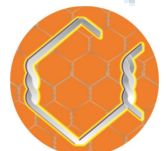
Quality Assurance & Testing Facility:

GEOGAB ensures 100% quality assured products by means of a well laid out Quality Assurance Plan meeting the quality standards as per international norms such as IS 16014: 2012, ASTM A975 and EN 10223-3. To ensure the quality, regular in house tests are conducted on the raw materials such as wire & finished products

GEOGAB is well equipped Test Lab with the necessary test equipment to carry out the tests for ensure the quality of G.I Wire (Raw Material) & Mesh Tensile (Finish Material)

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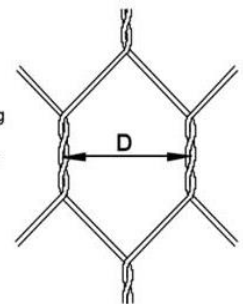
GEOGAB'S Gabion Technical Data Sheet

Gabions are baskets manufactured from 10X12 double twisted hexagonal woven steel wire mesh, as per IS 16014 (2012), ASTM A975. Gabions are filled with stones at the project site to form flexible, permeable, monolithic structures such as retaining walls, channel linings, and weirs for erosion control projects.

The steel wire used in the manufacture of the gabion is heavily zinc coated soft temper steel or PVC coated heavily zinc coated soft temper steel.

Sizes of Mesh with Their Characteristics		
Mesh types and sizes		
Double Twisted Hexagonal		
Mesh Type	'D' Nominal Size, mm	Tolerances
10 x 12	100	+16% to - 4%

The tolerance on the opening of mesh 'D' being the distance between the axis of two consecutive twists,



The gabion is divided into cells by diaphragms positioned at approximately 1M centre (Fig.). To reinforce the structure, all mesh panel edges are selvedge with a wire having a greater diameter

Gabions shall be manufactured and shipped with all components mechanically connected at the production facility.

Woven Wire Mesh Type 100 X 120 mm

The mesh and wire characteristics shall be in accordance with ASTM A975/ IS 16014 (2012).Table 1, Mesh type 10X12. The nominal mesh opening D = 100 mm .



The minimum mesh properties for strength and flexibility should be in accordance with the following:

Mesh Tensile Strength shall be 51.1 kN/m minimum when tested in accordance with ASTM A975 / IS 16014 (2012).

The tolerance on the opening of mesh 'D' being the distance between the axis of two consecutive twists, is according to ASTM A975/ IS 16014 (2012). or EN 10223-3

Wire

All tests on wire must be performed prior to manufacturing the mesh. All wire should comply with IS 280 : 2006, ASTM A975 style 1 coating. Wire used for the manufacture of Gabions and the lacing wire, shall have a maximum tensile strength as per IS 280/ ASTM A641/A641M-03, soft temper steel.

	Lacing Wire (mm)	Mesh Wire	Selvedge Wire
Mesh Diameter ϕ (mm)	2 to 2.2	2.5 to 4.0	3.5 to 4.5
Wire Tolerance (\pm) ϕ (mm)	0.10	0.10	0.10
Minimum Qty/Zinc (g/m ²)	220	260	275

