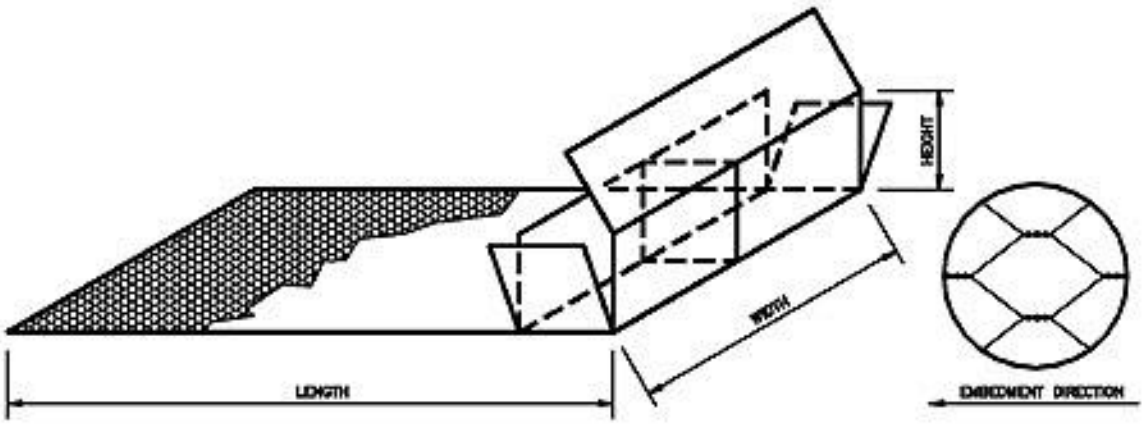
Terra Aqua
Stable Slope System



Scope: (Stable Slope System)

The Terra Aqua Stable Slope System is a mechanically soil reinforced gabion wall fabricated from a continuous double twisted PVC coated mesh that makes up the gabion box facing and the mesh reinforcement panel. The monolithic design of the Stable Slope System allows the soil reinforcement and the gabion wall to offer strength, durability, and flexibility. Each unit should be placed in direction of maximum strength, which is the direction the mesh is woven, lying parallel to the direction of soil stress.

Unit Sizes:
(Gabion Box Facing)

Length	***Width***	***Depth***
6’	3’	3’
9’	3’	3’
12’	3’	3’
6’	3’	1.5’
9’	3’	1.5’
12’	3’	1.5’
6’	3’	1’
9’	3’	1’
12’	3’	1’

(Mesh Reinforcement Panel)
The pvc coated double twisted mesh reinforcement panel width will match the length dimension of the gabion box facing, the length or embedment depth of the reinforcement panel shall be determined by application.

Terra Aqua Stable Slope Mechanically Stabilized Earth Gabion Wall

A. Units

1. A.1 Wire Mesh

a) Polyvinyl chloride coated galvanized steel wire, Class 3, Finish 5, soft, in accordance with ASTM A641.
b) Zinc coated in accordance with ASSTM A641, Class 3, soft, tested in accordance with ASTM A90.
c) Polyvinyl Chloride Coating- All wire used in the fabrication of the units and in the wiring operations during construction shall, after zinc coating, have extruded onto it a coating of polyvinyl chloride, otherwise referred to as PVC. The coating shall be gray in color unless otherwise specified. The pvc coating shall be of nominal thickness 0.0216 inches and shall nowhere be less than 0.015 inches in thickness. It shall be capable of resisting deleterious effects of salt spray, UV rays and abrasion. It shall not show any significant material difference in its initial characteristics after 3000 hours accelerated exposure according to ASTM B117, ASTM D1499 and ASTM G23 and after 200 cycles according to ASTM Method D1242, Method B.
d) Wire core for mesh diameter: 2.7 mm
Wire core plus pvc coating diameter: 3.8 mm
Wire core for selvedge- 3.4 mm
Wire core plus pvc coating for selvedge: 4.5 mm
Wire core for lacing wire diameter: 2.2 mm
Wire core plus pvc coating for lacing wire: 3.2 mm
e) Mesh opening: Nominal 8x10cm (3.25 x 4.50 inches)
f) Tensile strength of wire: 60,000 – 75,000 psi according to ASTM A641 soft
g) Tensile strength of pvc mesh: 42.3 kn/m (2900 lbs/ft) minimum pulled parallel to wire twists.

B. Tolerances

1. Wire- tolerances on the diameter of all wire in the above section shall be subject to a tolerance of 0.004 inches in accordance with ASTM A641 Table 3.

2. Units- tolerances shall be of plus or minus 5% on the manufacturers stated unit dimensions.

C. FABRICATION

1. Units shall be made from non-raveling, double twisted hexagonal wire mesh. The mesh will have the ability to resist pulling apart at the twists or connections forming the mesh when a single wire in a mesh section is cut.

2. Units shall be of singe piece construction. They shall be fabricated so that the lid, Front, base and reinforcement panel are continuous and made from the same

panel with no joints. The back face and end panels shall be attached to the base in the factory in such a manner that no additional tying at this juncture shall be necessary.

3. All perimeter edges of the mesh forming the units, including end panels tops and internal diaphragms, shall be terminated with a selvedge wire. For sound structural integrity the unit mesh wires shall be wrapped around the selvedge wire with a minimum of one and one half turns.

D. Wire Mesh Tests

1. Elongation- If test shall be made they shall be made on the wire before fabrication of the units on a sample 12 inches long. Elongation shall not be less than 12%.

2. Strength- The wire mesh shall not rupture when subjected to a load of 27 kn (6000 lbs) when applied as follows:

    a) Clamp a section 2 meters 6’ long, not less than 1 meter 3’ wide including selvedge bindings, for 1 meter along the width, or in the middle of widths greater than 1 meter, with the excess falling free on each side.

    b) Apply tension to elongate the section 10%.

    c) Apply the load, 27kn (6000 lbs) as stated above, to a 0.093 square meter are located approximately in the center of the sample between the clamps. The direction of the load should be perpendicular to the tension force direction an be applied with a circular ram bead with the edges beveled or rounded to prevent cutting the wires.

E. Gabion Basket Filling

1. The gabion basket facing shall be filled with hard, durable stone fill varying in dimensions from 4” – 8” in diameter. The rock shall not exceed 50% wear as determined by AASHTO Designation: T96. The rock shall not exceed 12% weighted loss after five cycles of the sodium sulfate soundness of aggregate test AASHTO Designation: T104.

F. Assembling

1. Units shall be assembled and erected according to manufacturer’s instructions and project specifications. Units are supplied folded flat and packed in bundles. Single units shall be removed from the bundle, unfolded on a hard flat surface, and have all kinks and bends worked out before assembly. The reinforcement panels may be left folded up until the baskets are placed in position. The unit shall then be assembled individually by erecting the front and back, ends and diaphragms, ensuring that all creases are in the correct position and the tops of all sides satisfactorily.

2. The four corners of the unit shall be connected first followed by the edge wires of internal diaphragms to the sides. The edge seam connection and the diaphragms to side connection should be accomplished by using lacing wire or approved interlocking fasteners.

3. Acceptable lacing wire has been described in previous Section A, paragraph A. 1.d The recommended procedure to apply lacing wire consists of cutting a sufficient length of lacing wire, approximately 1.4 – 1.5 meters (4.5" – 5") long. L Secure one end of the wire by looping and twisting, then proceed to lace with alternating single and double loops at approximately 5 inch intervals. Then securely fasten the other end of the lacing wire. This procedure shall develop a joint strength of 1200 lbs / ft for PVC and 1400 lbs / ft for galvanized gabions.

4. The installation of recommended fasteners should be carried out in accordance with the contract specifications. Acceptable fasteners for joining PVC coated units shall be formed from 0.120 inch minimum diameter stainless steel wire having high tensile strength and shall conform to ASTM A313, Type 302, Class 1. Fasteners shall produce a four-wire selvedge joint of 1200 lbs / ft for PVC and 1400 lbs / ft for galvanized gabions, while remaining locked or overlapped a minimum of 1 inch.

G. Installation and Placement

1. The assembled units are carried to the job site and placed in their proper location. For structural integrity, the adjoining empty units must be securely joined together using the same connecting procedures described in Section F, paragraph 3 and 4 along with the vertical edges and the top edge of their contract surfaces in order to obtain a monolithic structure. An approved corner closure tools shall be used to adjoin adjacent gabions to insure a tight neat seam and minimize gabion wire joint deformation.

2. The reinforcement panels are then unfolded onto the compacted backfill. It is not necessary to attach the reinforcement panels to each other with lacing wire or fasteners except at one point approximately 3' behind the back panel for alignment purposes.

3. After the lower tier of units is filled, closed and the backfill compacted, the next tier of units is placed on top and shall be connected to the lower tier along the front edge of the contact surface, using the same connecting procedure described in Section F, F.3 and 4.

H. Filling

1. Units shall be filled with stone as described in Basket Fill Section E.

2. Units may be filled by almost any type of earth handling equipment. Some manual stone adjustment during the filling operation is required to minimize voids. It is also recommended that the stone against the exposed faces of the units be hand-stacked to give a neat, compact and attractive appearance. Care shall be taken when placing fill material to assure that the sheathing of the PVC

coated units will not be broken or damaged. The stone should not be dumped from a height greater than 2' – 3' above the top of the gabion units.

3. The individual cells of the units in any row shall be filled in stages so that local Deformation may be avoided. That is, at no time shall any cell be filled to a depth exceeding 1' more than an adjoining cell. It is also recommended to slightly overfill the gabion on approximately 2" – 4" above the top of the gabion unit to allow for settlement.

4. Well-packed filling of units without undue bulging, and secure lacing and/or fastening, is essential in all structures.

I. Filter Fabric Placement

1. Filter Fabric shall be placed so as to completely cover the back of the unit with 1' of excess material to be folded toward the backfill at both the top and bottom along the reinforcement panels. The fabric shall be attached to the top of the back panel with either lacing wire or approved fasteners every 18 inches. The type of fabric will be dependent upon the fill material furnished. The fabric shall be selected based upon gradation samples and approved by the Design Engineer.

K. Internal Connecting Wires

1. Internal connecting wires are used to prevent the front face of the units from bulging as additional rows or layers are placed on top of the existing layers.

2. 3' high units shall be filled in three layers 1' at a time. After the placement of each layer, two connecting wires shall be placed to connect the exposed face of a cell to the opposite side of the cell. The wire shall be looped around two mesh openings and the ends of the wires shall be securely twisted to prevent its loosening. An exposed front face is any side of a cell that will be exposed or unsupported after the structure is completed.

3. 1.5' high units shall be filled in two layers 9" at a time. After the placement of each layer two connecting wires shall be placed to connect the exposed face of a cell to the opposite side of the cell. L the wire shall e looped around two mesh openings and the ends of the wire shall be twisted to prevent its loosening.

L. Lid closing

1. The lid shall be stretched tight over the filling of the stone until the lid meets the perimeter edges of the unit. This operation shall be accomplished by using an approved lid closing tool. The lid shall then be tightly fastened along all edges, ends and tops of the diaphragms in the same manner as described in Section F, F.3 and F.4.

2. Upon completion, the structure shall be checked and all ends of wire shall be folded into the structure. Well-packed filling without undue bulging and secure lacing and/or fastening is essential in all structures.

All Terra Aqua gabion material is manufactured according to ASTM A975-97 guildelines for Double Twisted Hexagonal Mesh Gabions.

ASTM A975-75

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