

Gabion - GA



DEFINITION

Large, multi-celled, welded wire or rectangular wire mesh boxes, used as channel revetments, retaining walls, abutments, check dams, etc.

PURPOSE

Rock-filled baskets, properly wired together, to form flexible monolithic building blocks used for construction of erosion control structures and to stabilize steep slopes or highly erosive materials.

CONDITIONS

The practice is applicable wherever slope steepness or erosion potential exceeds the management capacity of less complicated applications. Gabions are typically a permanent or semi-permanent slope and/or soil stabilization application. Typical installations include:

- Retaining walls
- Bridge abutments and wing walls

- Culvert headwalls and outlet aprons
- Shore and beach protection
- Check dams

DESIGN CRITERIA

Professionals familiar with the use of gabions should prepare construction plans and drawings. Erosion and sediment control construction plans should ensure that foundations are properly prepared to receive gabions; that the gabion structure is securely “keyed” into the foundations and abutment surfaces; and that the rock used is durable and adequately sized to be retained in the baskets. See Figure 1 for a typical gabion installation.

CONSTRUCTION SPECIFICATIONS

Filling: The gabion is usually filled with 4 - 8 inch pieces of stone (clean; without fines), preferably placed by hand, but sometimes dumped mechanically, into the basket. Hand packing allows the complete filling of the basket; allowing the basket to gain strength and maintain its integrity. The filled gabion then becomes a large, flexible, and

permeable building block from which a broad range of structures may be built. This is done by setting and wiring individual, empty baskets together in courses and filling them in place. The manufacturer should provide installation details.

Geotextiles: It is recommended that geotextiles be used behind all gabion structures. If there is seepage from the excavated soil face, the appropriate geotextile should be selected to prevent the build-up of hydrostatic pressure behind the geotextile. Improper geotextile selection may result in failure of the structure or piping and erosion around the structure. Refer to specification **Geotextile – GE**.

Corrosion Resistance of Gabions: The wire mesh or welded wire used in gabions is heavily galvanized. For highly corrosive conditions, a PVC (polyvinyl chloride) coating must be used over the galvanizing. Such treatment is an economical solution to deterioration of the wire near the ocean; in some industrial areas; and/or in polluted streams. However, extra care should be taken during construction and installation because the corrosion resistance of the baskets is compromised if the PVC coating is chipped off. Baskets manufactured completely of plastic are also available.

However, estimated required wire strength should be considered in the selection of wire versus plastic.

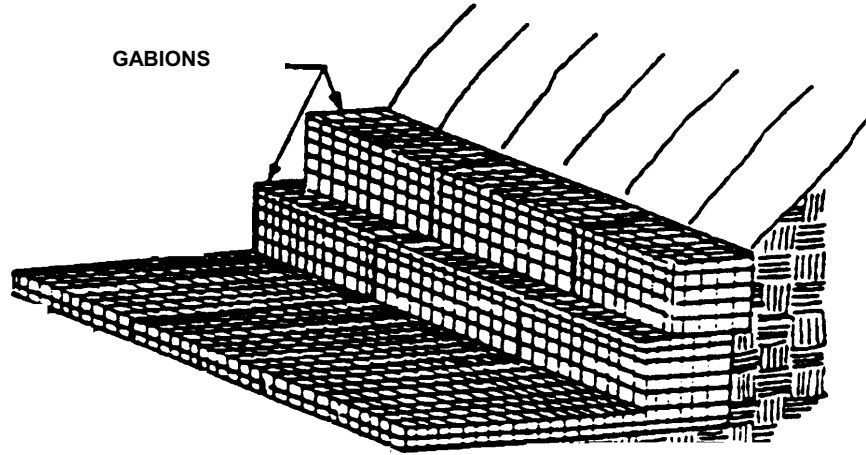
Permeability: If properly designed and constructed, hydrostatic pressure does not develop behind a gabion wall. The wall is pervious to water and stabilizes a slope by the combined action of draining and retaining. Drainage is accomplished by gravity and by evaporation as the porous structure permits active air circulation through it. Moreover, as plant growth invades the structure, transpiration further assists in removing moisture from the backfill.

INSPECTION

Inspect for signs of undercutting or excessive erosion at transition areas, and around or under the structure. Inspections should be made before anticipated storm events (or series of storm events such as intermittent showers over one or more days) and within 24 hours after the end of a storm event of 0.5 inches or greater, and at least once every fourteen calendar days. Where sites have been finally or temporarily stabilized, such inspection may be conducted only once per month.

Gabion Installation

Gabion Toe Wall



Gabion Revetment

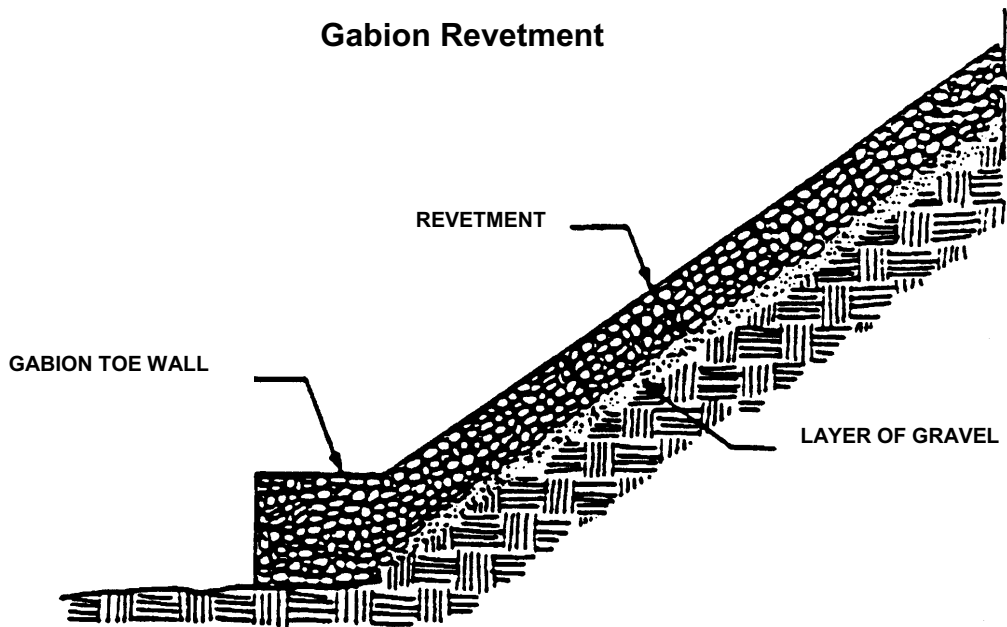


Figure 1

Source: Chattanooga Public Works Department