1. GABION STRUCTURE (revised 2-2-2022)

Description. This work consists of constructing gabion structures in accordance with the lines and grades shown on the plans, the specifications, this special provision or Manufacturer’s recommendations provided to the Project Manager. Gabions are steel wire mesh baskets, formed into square or rectangular cells with wire mesh diaphragms. The baskets are filled at the point of installation with rock fill and fastened together to form structures.

Materials.

Gabion Panels. Provide twisted wire mesh gabion panels in sizes to form the completed gabion units as shown in the plans and details and meeting the following requirements:

Individual wires must have a minimum tensile strength of 60,000 psi as determined by ASTM A370.

Meeting the requirements of the following table:

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| --- | --- | --- |
| Wire Type | Nominal Diameter | Galvanizing (ASTM A90) |
| Mesh Wire | 0.11 in | 7.20 oz/yd2 |
| Selvedge Wire | 0.13 in | 7.64 oz/yd2 |
| Connecting Wire | 0.09 in | 6.40 oz/yd2 |

Mesh openings that are uniform in size with a maximum dimension of 4.5 inches for gabion baskets, and 3.3 inches gabion mattresses.

Fabricated in a manner that produces non-raveling mesh fabric.

Conforming to ASTM A82 and ASTM A641, Class 3 Coating.

Fasteners. Use connecting wire or spiral binders for joining wire mesh panels.

An acceptable alternative to spiral binders or connection wire for joining wire mesh panels are lock wire fasteners manufactured from galvanized steel wire conforming to ASTM A764 with Type 3 coating.

Use fasteners that, when subjected to an opposed tension force along the fastener’s longest axis, resist a minimum force of 600 lbs. while remaining in a locked or closed condition. Lock wire fasteners or other alternatives to connecting wire or binders for joining wire mesh panels must be approved by the gabion manufacturer and the Project Manager.

Rock Fill for Gabions. Use sound and durable rock obtained from a source approved by the Project Manager for filling the gabion baskets.

Use well-graded angular rock with a maximum dimension of 8 inches and a minimum dimension of 4 inches, producing a minimum unit weight of 95 lbs/cubic foot.

Granular Footing Material. Provide granular footing material meeting the requirements of Section 701 for Crushed Aggregate Course.

Backfill. Provide Special Borrow for backfill material consisting of a well-graded sand and gravel, free of organic and other deleterious material, meeting the AASHTO M 145 requirements for A-1-a group classification, with 100% passing the 4 inch sieve and a maximum of 8% passing the -200 sieve.

Construction Requirements.

Perform the excavation for the gabion structure foundation in accordance with Section 209. Excavate to a width that is minimum of 6 inches greater than the horizontal dimension of the gabion structure. Where bedrock, hardpan, or other unyielding materials are encountered, remove the material below the foundation grade for a minimum depth of 12 inches.

Compact the bottom of the foundation excavation to a minimum of 95% of the maximum dry density as determined by MT-210.

Backfill the foundation excavation with granular footing material in lifts a maximum of 8 inches in thickness. Compact the footing material to a minimum of 95% of the maximum dry density as determined by MT-230.

Furnish electronic copies (PDF format preferred) of the manufacturer’s fabrication, erection, and installation instructions to the Project Manager a minimum of 5 working days before beginning gabion structure construction.

Construct gabion baskets as single units fabricated to the lengths and heights shown on the plans, or as directed by the Project Manager. Do not vary the heights, widths, and lengths of each gabion unit by more than 5% from the dimensions shown on the plans. Divide the gabion units into 3 foot long cells with diaphragms made of the same wire mesh panel style as the main basket.

Assemble the baskets by rotating the panels into position and joining the vertical edges. Each row of baskets must be reasonably straight, conforming to the lines and grades shown on the plans or as established by the Project Manager.

Fasten empty gabion baskets to the adjacent baskets along the top and vertical edges. Fasten the bottom of each stacked basket to the top of the underlying basket along the front, back, and ends.

Remove all kinks and folds in the wire mesh, and properly align all baskets. A standard fence stretcher, chain fall, or steel rod may be used to stretch the wire baskets to maintain alignment. Have the Project Manager approve the condition and alignment of the baskets prior to filling. Stagger gabions as shown on the plans to avoid vertical alignment of joints.

Carefully fill gabion cells with rock fill placed by hand and/or machine in a manner that maintains the alignment of the structure, avoids bulges, and minimizes voids. Hand-place rock fill at the gabion basket corners and face to leave all exposed rock surfaces reasonably smooth and neat in appearance. Ensure no sharp rock edges project through the wire mesh. Insert connecting wires during the filling operation in the following manner:

Fill to a depth of 1 foot and tightly tie two connecting wires in each direction to opposite faces of each gabion cell.

Fill to a depth of 2 feet and tightly tie two connecting wires in each direction to opposite faces of each gabion cell.

Fill to approximately 2 inches above the top of the basket to allow for settlement.

Loop all connecting wires around two mesh openings and twist the ends of the wires securely. Fill gabion basket cells in stages to avoid local deformations. Do not fill any cell to a depth exceeding 9 inches more than any adjacent cell. Join the lid to the sides, ends, and diaphragms in the same manner as specified for joining the vertical edges. Secure the gabion basket lid so that a maximum gap of 1 inch remains at any connection.

Place and compact backfill in accordance with Section 203. Keep all heavy compaction equipment a minimum of 3 feet away from the back of the gabion structure. Compact within 3 feet of the back of the gabion structure using hand-operated vibrating plates or rollers, or other compaction equipment as approved by the Project Manager.

Specific instructions from the gabion manufacturer which vary materially from the requirements presented here must be brought to the attention of the Project Manager for approval prior to installation.

Method of Measurement.

Gabion Structure is measured by the square yard of gabion structure face, from the top of the wall to the top of the granular footing, complete and in-place. Fasteners, Rock Fill, Excavation, Structure Excavation, Granular Footing Material, Special Borrow, and other items related to the construction of the Gabion Structures are considered incidental to the item of work and not measured for payment. Include the cost of these items in the unit price bid for Gabion Structure.

Basis of Payment.

Gabion Structure is paid at the contract unit price bid per square yard.

Payment is full compensation for all equipment, materials, and labor necessary to complete the work as specified in accordance with the Contract.