

Subsection 5.07 Gabions and Gabion Mattresses

I. Scope: Furnish and install gabions and Gabion Mattresses. A gabion is a wire container, filled with stone and has a height of 1 foot or greater. A gabion mattress is a wire container, filled with stone and has a height of 6, 9, or 12 inches.

II. Materials

Furnish welded wire gabions and gabion mattresses in accordance with ASTM A974 and ASTM A975. Gabions and mattresses come in 5 styles and the style will be shown on the plans.

- A. Style 1:** Consists of welded wire fabric made from wire which is zinc coated before being welded into fabric. Spiral binders, lacing wire, and stiffeners are produced from zinc-coated wire.
- B. Style 2:** Consists of welded wire fabric which is made from uncoated wire and the fabric is subsequently zinc coated after fabrication. Spiral binders, lacing wire, and stiffeners are produced from zinc-coated wire.
- C. Style 3:** Consists of welded of wire fabric made from wire which is coated with zinc-5% aluminum-mischmetal alloy before welded into fabric. Spiral binders, lacing wire, and stiffeners are also produced from zinc-5% aluminum-mischmetal alloy.
- D. Style 4:** Consists of welded wire fabric made from wire which is aluminum coated before being welded into fabric. Spiral binders, lacing wire, and stiffeners are also produced from aluminum coated wire.
- E. Style 5:** Consists of welded wire fabric, spiral binders, lacing wire, and stiffeners as Styles 1, 2, 3, or 4 and overcoated with PVC.
- Lacing wire is used to assemble and interconnect empty gabion units. Spiral binder is an alternative to lacing wire. Stiffeners are diagonal wires running from corner to corner of gabion units.
- F. Stone:** Provide filler stone consisting of clean, hard, durable stone that does not contain shale, caliche, or other soft particles. Stone must have a 5-cycle magnesium sulfate soundness of less than 18% when tested in accordance with ASTM C 88. Stone must have a minimum specific gravity of 2.50 as determined by ASTM C 127 and C 128. Use stones that are between 4 and 8 inches in their least dimension for gabions and between 3 and 6 inches for gabion mattresses. Prevent contamination during storage and handling.
- G. Filter Fabric:** Provide Type 2 filter fabric in accordance with DMS-6200,

“Filter Fabric”, when shown on the plans.

III. Construction

During construction of the gabions and gabion mattresses, the manufacturer must have a qualified representative available for consultation as needed throughout the gabion and gabion construction.

A. Foundation Preparation: Excavate the foundation to the extent shown in the plans or as directed. Remove all loose or otherwise unsuitable materials. Carefully backfill all depressions to grade with suitable materials from adjacent required excavation, and compact the backfill to a density at least equal to the adjacent foundation. Remove all debris protruding from the foundation that will impede the proper installation and final appearance of the gabion or gabion mattress. Carefully backfill and compact voids as specified above. Inspection by the ODR or his representative is required before placement of the gabion unit.

B. Filter Placement: Store filter fabric out of direct sunlight. Spread filter material, when required, uniformly on the prepared foundation surface to the slopes, lines, and grades indicated on the plans. Repair all damage to the foundation surface that occurs during filter placement before proceeding with the work. Filter material should present a reasonably even surface without mounds or windrows. Any defects, rips, holes, flaws, or damage to the material may be cause for rejection. Torn or punctured fabric may be repaired if allowed by the ODR. Repair the tear or puncture by placing a layer of fabric over the damaged area, overlapping at least 3 foot beyond the damaged area in all directions. Place the material with the long axis parallel to the centerline of the structure. Place securing pins in the lapped longitudinal joints, spaced approximately 10 feet apart. Lap the material at least 3 foot along the longitudinal joint. If sewing joint, lap 1 foot. Lap the ends of rolls at joints by at least 3 foot. Keep fabric material from of tension, stress, folds, wrinkles, or creases. Cover filter fabric as soon as possible after placing, but within 3 days.

C. Assembly and Installation: Place PVC-coated materials, when the ambient temperature and the temperature of the coated wire are more than 15°F above the brittleness temperature of the PVC.

Assemble empty gabion or gabion mattress units individually, and place them on the approved surface to the lines and grades shown on the plans with the sides, ends, and diaphragms erected to ensure all creases are in the correct position, the tops of all sides are level, and all sides that are to remain exposed are straight and plumb. Fill the baskets units after transporting them to their final position.

Place the front row of gabion or gabion mattress unit first and successfully construct units towards the top of the slope or the back of the structure. Place the initial line of basket units on the prepared surface, and partially fill them to provide anchorage against deformation and displacement during subsequent filling operations. Stretch and hold empty basket units as necessary to remove kinks and provide a uniform

alignment. Connect all adjoin empty gabion or gabion mattress units with lacing, wire spiral binders, or approved fasteners along the perimeter of their contact surface to obtain a monolithic structure before filling. Provide continuous stitching with alternating single and double loops at intervals of no more than 5 inches if lacing wire is used. Securely fasten all lacing wire terminals.

Carefully fill the basket units with stone, using hand placement to avoid damaging wire coating, to ensure as few voids as possible between the stones and to maintain alignment. Correct excessive deformation and bulging of the mesh before filling. Fill the basket units in a row in stages consisting of maximum 12 inch courses to avoid localized deformation. Do not exceed 1 foot fill more than the adjoining cell. Do not drop stones into basket units from a height greater than 36 inches.

Place 2 uniformly spaced internal connecting wires between each stone layer in all front and side gabion units, connecting the back and the front faces of the compartments for gabion units more than 2 foot high and secure the ends to prevent loosening.

Place the outer layer of stone carefully along all exposed faces and arrange it by hand to ensure a neat and compact appearance. Overfill the last layer of stone uniformly by 1 or 2 inches for gabions and 1 inch for gabion mattresses to compensate for future settlement in rock while still allowing for the proper closing of the lid and providing an even surface with a uniform appearance. Stretch lids tight over the stone fill, using an approved lid-closing tool, until the lid meets the perimeter edges of the front and end panels. Do not use crowbars or other single-point leverage bars for lid closing. Use spiral binders or lacing wire along all edges to close lid tightly. Cut, fold and wire units together where a complete gabion or gabion mattresses units cannot be installed because of space limitations.

IV. Measurement: Gabions will be measured in place by the cubic yard of stone filled gabions. Gabion Mattresses will be measured in place by the square yard or by the cubic yard.

V. Payment: The work performed and materials furnished as prescribed by this item and measured as provided under "Measurement" shall be paid for at the unit price bid for "Gabions", which price shall be full compensation for excavation, grading, backfill, placing wire baskets, fill stone, lacing, fasteners, filter fabric, and equipment, labor, materials, tools and all incidentals necessary to complete the work.

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