

ITEM 17203.76 M - BOLTED WIRE ROPE NET

DESCRIPTION:

Under this item, the Contractor shall furnish and install wire rope net and appurtenances on rock slopes as shown on the plans or as ordered by the Engineer.

MATERIALS:

1. Furnish a net fabricated from wire rope having a minimum diameter of 8 mm, 7 by 7 construction, and a minimum tensile strength of 41 kN. The size of the openings in the net shall be approximately 300 mm by 300 mm.
2. Wire rope net braiding is to be fastened with high strength, corrosion resistant cross clips or other corrosion resistant fasteners to produce a permanent, non-movable joint. Damage to the wire rope resulting from the installation of the clips, insofar as it affects the integrity of the system, in the opinion of the Engineer, shall be cause for rejection of the net panel.
3. Where indicated, or as ordered by the Engineer, furnish chain link fencing material of at least 11 gauge, 50 mm fence fabric, conforming to AASHTO M181-98, and zinc coated in accordance with ASTM A392, Class 1.
4. Furnish galvanized net supporting wire rope, of at least 16 mm diameter, 6 by 19 construction, with a minimum breaking strength of 165 kN.
5. Furnish seam rope with a minimum diameter of 8 mm, 7 by 7 construction, and a minimum breaking strength of 41 kN.
6. All wire ropes for the wire nets, supporting ropes and for the seam ropes shall be composed of steel wires individually galvanized before being woven into the ropes.
7. All miscellaneous appurtenances such as wire rope clips, thimbles, bolts, etc., shall be hot-dipped galvanized as supplied by the manufacturer.
8. All steel bolts, U-bolts, nuts and washers shall comply with ASTM A325.
9. If used, galvanized welded forged steel rings shall have a stock diameter of 22 mm and a maximum inside diameter of 115 mm.
10. Where specified or directed by the Engineer, paint the wire rope net installation with the appropriate material and color.
11. The wire rope net panels, as obtained from the manufacturer, shall be the equivalent component as supplied in a catchment system tested to be capable of retaining a rock impact of 201 kJ of kinetic energy. Furnish the results of demonstration tests as ordered by the Engineer.

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12. Provide resin rock bolts according to Item 17203.1713 M, except that resin of only one setting time is required, no tensioning is required, a pull test of 90 kN is required, and appurtenances are as shown on the standard sheet for this specification.

CONSTRUCTION DETAILS:

1. Thoroughly scale, stabilize, and clean the rock slope of loose material to the satisfaction of the Engineer prior to installation.
2. Install untensioned, 26 mm resin rock bolts at the top of the rock slope and on the face of the rock slope. Space the bolts on a grid pattern equal to the dimensions of the wire rope net panels, not to exceed 3 meters, and along the periphery of the installation. The rock bolts shall be a minimum of 1.3 meters in length, including a 0.3 meter minimum anchor into sound rock. Install the bolts to withstand a pull test of 90 kN. Test the first bolt per resin lot number. Additional bolts may be tested as ordered by the Engineer. In areas of rock irregularities between the rope netting and the slope face, additional bolts may be required as ordered by the Engineer.
3. Attach vertical support ropes to the topmost bolts in accordance with the detail on the drawing and extend the ropes down the slope to the bottom of the area to be covered with netting.
4. Anchor horizontal support ropes to the rock bolts at each end of the corresponding horizontal run in accordance with the detail on the standard sheet for this specification. Hang the horizontal support ropes over the other bolts in the corresponding horizontal run. Maintain a minimal sag between adjacent bolts. Do not draw the horizontal support ropes taut.
5. Where specified, install chain link fence fabric to the inside of the wire rope nets in vertical strips and secure the fence fabric and net panels to each other on 0.6 meter centers, horizontally and vertically, using hog rings, tie wire or clamps approved by the Engineer. No gaps larger than the chain link openings will be permitted between fence fabric strips. Splices in support ropes shall be interlocking turnback eyes with thimbles as shown on the detail on the standard sheet for this specification. No splices will be allowed between rock bolts.
6. Place the wire rope net panels with fencing over the ends of the rock bolts and seam the panels to the support ropes and to each other with 8 mm diameter seam ropes. Fasten adjacent wire rope nets to each other, and the nets to the net support wire ropes, with a continuous weave with at least one wrap per 0.4 meter. Splicing of seam rope will be permitted with a minimum of two (2) clips installed on a minimum overlap of 150 mm.
7. Place and tighten the rock bolt cover plates with washers and nuts over the rock bolts to affix the net to the rock slope. Do not crimp any wire ropes, fencing or appurtenances.
8. After installing and tightening the nut, cut off the free end of the bolt so that no more than 100 mm extends beyond the nut.

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METHOD OF MEASUREMENT:

The quantity to be paid for will be the number of square meters of netting properly furnished and installed in accordance with this specification and the direction of the Engineer.

BASIS OF PAYMENT:

The unit price bid for this item shall include the cost of furnishing all equipment, material, tools and labor necessary to complete this work, including disposal of any material removed from the slope. Rock bolts installed for purposes other than net anchors will be paid for under the appropriate item.

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