TENDER SPECIFICATION

FOR SUPPLY OF RHOMBOIDAL SHAPE HIGH TENSILE STEEL WIRE MESH

(ROCKFALL PROTECTION AND GEOHAZARD MITIGATION)

1.0 GENERAL

This specification covers the use of rhomboidal shape high tensile steel wire mesh for slope stabilization including the scope of furnishing and installation as per the special provisions mentioned in the specifications, instructions from the manufacturer/supplier of the rockfall mitigation system and as directed by the Engineer-In-Charge.

2.0 MATERIALS

2.1 General Requirements

- The high tensile steel wire mesh system shall meet the minimum requirements of steel wire laid to form a panel, mainly mesh size, mesh opening type, end knotting, Zn/Al Coating as specified in this document.

- System Technology:

  The steel wire mesh system shall be made up of high tensile steel wire in a mesh / grid configuration with a single twist and the end connection shall be twisted to prevent unravelling of the mesh.

  Made in India indigenously manufactured steel wire mesh system should be preferred, considering advantages of shorter delivery periods, no inventory pile-up and rates being not affected by fluctuation of exchange rate of foreign currency.

  A plant visits by the Engineer's representative to verify the manufacturer's quality control procedures and witness testing of products is also required prior to the dispatch of material.

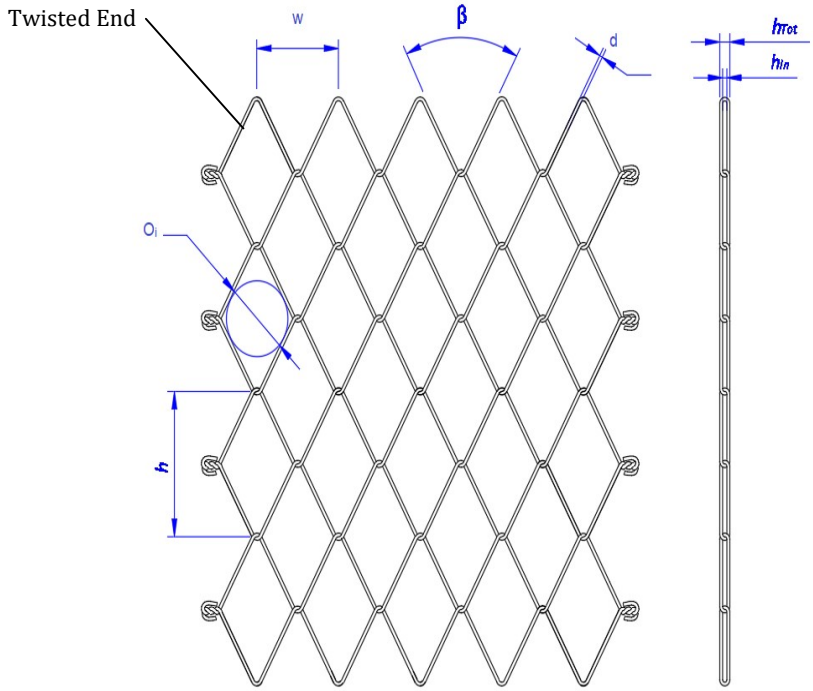

Fig 1: High Tensile Steel Wire Mesh System

2.2 Transportation, Storage and Handling

The wire mesh system shall be delivered at site in the form of rolls with edges wrapped to prevent corrosion of the twisted ends. All rolls shall have a label or tag specifying name of the product, name of the manufacturer, quantity, date of manufacture and dimension.

Material shall be protected from mud, dirt, debris, any other harmful substances or mechanical damage during transportation.

Rolls shall be stored in a secured area sufficiently elevated above the ground and adequately covered to protect them from the following: site construction damage, precipitation, prolonged exposure to chemicals that are strong acids or have strong bases, flames including welding sparks, high temperatures, and any other environmental conditions that may damage the physical property values of the wire rope net system.

Any material, which is damaged during transportation, handling or storage and do not meet the minimum requirements of the specifications is liable for rejection by the Engineer.

2.3 Quality Control & testing

The quality management system of the manufacturer shall conform to the requirements of ISO9001:2015 and in-house Testing facilities of Wire (Tensile, Zinc Mass), punch resistance, tensile strength of wire mesh.

Manufacturer shall issue a test report stating minimum average values of material properties, at the time of shipment is made.

Testing shall be done on raw material as per testing plan indicated in Table1. The material should get approved from the client before the actual start of supply. The manufacturer of the wire mesh system shall provide Manufacturers Test Certificate for the material with every lot/shipment. The Manufacturers Test Certificate shall be provided for certifying that wire rope net system for rockfall protection system conforms to all the technical and special requirements.

Table 1: Testing Plan

Sr. No	Test	Reference	Frequency of Testing	Sample size	Remarks
WIRE					
1	Tensile test on wire	IS2266/ISO2408	Once	Three	At wire mesh manufacturer lab
2	Zinc/Al mass of wire Used in rope	IS1835	Once	Three	At wire mesh Manufacturer lab
WIRE MESH					
3	Tensile strength & Elongation%	EN10223	Once	Three	At wire mesh manufacturer lab
4	Physical dimension Of Wire Mesh	TDS & Visual checking			At wire mesh manufacturer lab
Note:	Testingofwireshallbedoneonsamplesfromrawmaterial				

2.4 Physical and Mechanical Properties

- **System**: High Tensile Steel Wire Mesh system shall be made with high tensile steel wire of diameter 3mm conforming to EN 10218 with tensile strength of 1770 MPa to form a rhomboid mesh. The wire shall have a 90% Zn/10%Al coating for corrosion protection confirming to EN 10244-Class A with minimum coating thickness of 150 gms/sq.m. The intersection points shall be twisted once to

resist to an eventual static or dynamic stress that can deform the panel as shown in the figure 1. The end connection of the wires shall be twisted & closed inwards to prevent the unravelling of the mesh.

- **Lacing Rope:** The lacing rope shall be of 8mm diameter with a metal core having 6x19 + WSC configuration. It shall be used to connect the adjacent wire meshsystem.

- **Dimension & Performance of Wire Mesh System:**

Table 2 describes the dimensions & minimum performance parameters the wire mesh system shall exhibit:

Table 2: Dimension & Performance Parameters

Mesh Size (diagonal: wxh), mm	83 x 143 (+/-3%)
Mesh Opening (O_i), mm	65 (+/-3%)
Wire Diameter (d), mm	3.0
Tensile Strength of Wire (f_t), Mpa	1770
Tensile Strength of Mesh (X_t), kN/m	150
Corrosion Protection	90%Zn/10%Al
Coating Thickness, gm/m^2	150
Roll Width (W_{roll}), m	3
Roll Length (L_{roll}), m	20 - 30
End Connections	Spiral Twisting

3.0 INSTALLATIONS

The wire mesh systems are generally used in combination with rock bolting. The wire mesh panels shall be carefully draped over the slope and the rock bolts, keeping the mesh pretensioned on the slope surface. The wire mesh system shall be connected to the top anchors with help of top support rope of 12mm diameter and with anchors at base of the slope with help of bottom support rope of 12mm diameter. Lateral support ropes of 12 mm shall be placed at the end panels which shall pass through the mesh.Wire Rope Anchors of 14mm dia shall be placed at the corner of the end panels, the top support rope/ bottom support ropes along with the lateral ropes shall be connected to the wire rope anchors at the corner. Longitudinally adjacent panels shall be connected with a steel wire rope, which acts as a lacing cable. The wire mesh system may be used in combination with coir mesh for erosion protection of the slope surface.

After completion of wire mesh system installation, a heavily zinc coated/ Epoxy coated domed shaped base plate of a 200x200x10mm size shall be tightened on the rock/soil anchor, so that the wire rope net is pretensioned against the slope surface to ensure smooth load transfer from the surface to the rock/soil anchor. Manufacturer's installation guideline shall be referred for details.

4.0 APPROVED MANUFACTURERS

4.1 Approved Manufacturers

TechFab(India)IndustriesLtd.
712EmbassyCentre,
Nariman Point,
Mumbai – 400021
Phone: 022–22876224/6225
Fax:022–22876218

5.0 DELIVERIES

Delivery of the wire rope net system shall be done according to the delivery schedule.

6.0 PAYMENTS

6.1 Method of Measurement

The wire mesh system will be measured in Square Meter of material received at the owner's/contractor's store.

6.2 Basis of Payment

Payment for the wire rope net system shall be made at the contract unit price per Square Meter, which shall be full compensation for the cost of materials, transportation, duties and taxes.

----XXX-----