



**A complete profile
of
Slope Stabilization Techniques
by
*Forest Department.***



**Jammu and Kashmir Forest Department
Government of Jammu & Kashmir**

Slope Stabilization techniques adopted by Forest Department along the National Highway

New Techniques adopted	Traditional Methods
Geo textile mating (woven & non-woven)	Plantation of slopes
Use of Coir fiber logs	SMC work (DRSM & Crates)
Vetiver Grass Technology (VGT system)	

Geo Textile Mat

Geo textile mat are blanket mats or nets made from woven or non woven jute, coir or straw materials for slope protection:

1. Woven geo textile mat: Woven geo textiles are manufactured by blending and weaving fibers together on a loom, forming one uniform length.



2. Non-Woven geo textile mat: Non-Woven geo textiles are produced by entangling fibers, long or short together either through needle punching or needle punch coir felt with double side PP netting.



These erosion control matting are designed using coir fiber materials to create strong mat for stabilization and erosion control along slopes, hillsides etc.

Benefits of Geo textile mat :

- Prevent soil erosion.
- Faster binding of soil.
- Excellent air and water permeability.
- Promotes natural vegetation.
- 100 % Biodegradable and environment friendly.

Life span : 4 to 5 year.

Geotextile mat Installation:

Step-I:

Surface dressing which includes leveling, removing of boulders and sharp objects.



Before

Step-II:

Making of anchor trench at top of bund of minimum size 1'-6" x 1'



After

Step-III:

Supply & placing of FYM/Humus.

Step-IV:

Placing of Seeds of different species.

Step-V:

Laying of Geo Textile mat such as unrolling and anchoring at top & bottom.

Step-VI:

Use of U pins for fixing of Geo Textile mat.

Step-VII:

Watering of surface giving moisture to under-soil of already placed Geo Textile mat

Coir fiber logs:

Coir fiber logs are made from coconut fiber husk densely packed inside a tubular coir twine netting. Both components are



n a t u r a l a n d biodegradable, and promote a natural solution to erosion control and slope stabilization.

Property	Type -1	Type -2	Type -3
Diameter	12 inches	16 inches	20 inches
Weight	8.2 Kg /m	14.1 Kg /m	22.3 Kg /m
Length	10 feet	10 feet	10 feet

Coir logs installation:

Installation requirements and methods may vary depending on the specifications of locations.

Step-I:

Clear the installation area of any debris, trees, rocks and obstructions. Coir logs are designed to come in contact with the soil, so any stumps or potential obstructions should be removed.

Step-II:

Dig a small trench in the location where the coir logs need to be placed (as per size of logs).

Step-III:

Place the coir logs in the trench and back fill the soil so that the coir logs are tightly packed against the slope.



Adjacent coir logs should be positioned so that the ends fit tightly against the slope. Ends should be joined/secured together with coir twine or suitable ties. Mattress coir fiber may be used to fill spacing between logs ends.

Step-IV:

Stake/anchor the coir logs into position. Coir logs should be anchored according to the torrent.

Wooden Stake Used to install coir logs:

Stake used = 2-2.5 feet for single layer coir logs.

Stake used = 3-4 feet for double layer coirlogs.



Binding wire is also used to tighten the logs where ever required.



Vetiver Grass Technology



The basic Vetiver Grass Technology (VGT) comprises a dense vetiver grass (*vetiver zizanioides*) hedge row that is planted across the slope on manually constructed contour bunds. When planted in row, vetiver plant will form thick hedges and with their stiff stems these hedges forming a living barrier which slow the velocity of runoff. The major advantages of VGT system over conventional engineering measures is its low cost. The VGT provides natural and environmental friendly method of erosion control and land stabilization.

Traditional Methods of Slope Stabilization

(I) Plantation of slopes

Planting vegetation particularly deep root system is an effective method of preventing landslide, as the roots stabilize and anchor the soil firmly.



(ii) Crate & DRSM work

Crate work : Mesh wires are filled with stones, act as barrier and maintain slope stability. DRSM used to conserve moisture.

