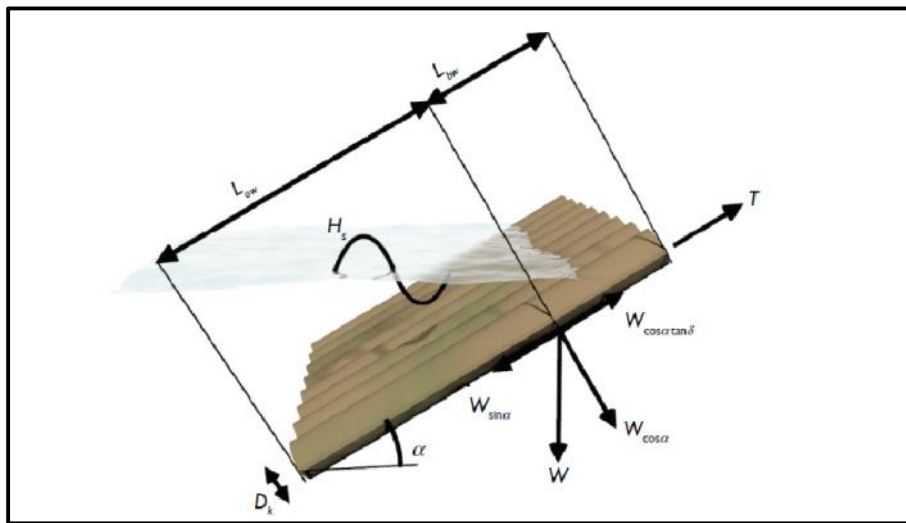


## Design Principles

Once the overall dimensions of the structure, the construction procedure and the size of the elements have been determined, the detailed design is carried out. The structure is assessed in the following stages shown:

- The Design tensile strength for the geotextile (Hoisting & Anchoring)
- Stability in waves
- Stability in longitudinal currents.
- Geotechnical Stability

If the stability requirements are not fulfilled, higher spec. TGM should be selected, having a larger volume so as to create higher counter weight and accordingly higher technical specs of geotextile. Detailing at the edges of the Tech GeoMattress is important to ensure no localised instability can occur and, in many instances, this can be the critical part of the design.



### Notes:

#### Upper Layer

1. Upper Layer fabric to specification property requirement shall be based on ASTM D 5261.
2. TGM consist of double layer fabric, Upper layer is geo-composite fabric green in color, as per ASTM D 4595 minimum tensile strength shall be 42 kN/m
3. For better efficiency in filling and permeability of fabric, In accordance of ASTM D 6767 and ASTM D 4751 minimum Apparent opening Size (AOS) of fabric shall be 350  $\mu\text{m}$ .
4. Upper layer of TGM is under lot of abrasive stresses due to flow of debris, UV exposure & other weathering effects, hence as per ASTM D 4886 minimum abrasive resistance is 80% of


tensile strength, UV stability @500 hrs (ASTM D 4355) & resistance to oxidation (ISO/TR 13438 @100°C of 28 days) with minimum value is of 80%.

### **Lower Layer**

1. Lower layer of TGM Fabric specifications requirement shall be as per ASTM D 5261.
2. Lower layer of TGM is a high strength PP woven fabric, as per ASTM D 4595 minimum tensile strength shall be 78 kN/m.
3. Lower layer of TGM is in contact with slope soil, during draw down condition in stream, lower layer fabric should be permeable enough to release the pore pressure effectively. Hence satisfy this condition, in accordance of ASTM D 6767 and ASTM D 4751 minimum Apparent opening Size (AOS) of fabric shall be 350 µm.

The sewing thread being of high tenacity polyester, continued parallel stitches positioned 350mm apart with a stitch length not exceeding 40mm (Typical value of tensile strength > 1000N, elongation at break is 20%), anchoring by cutting trench at the upper end for a depth of 1.00 m x 0.75 m placing the mat by bending it into the trench, filling the trench with earth filled, anchored, boulders or Geobags, site seaming of mattress at right angle to achieve a minimum seam strength of 25 Kn/m, the sewing yarn shall be made to tenacity polyester ( Tensile strength of 200 N and elongation at break is 20%) The important point to note : The Roll dimension of the Tubular Mattress for Type A will be 4.5 m x 33 m and Type B is of 5.1 x 33 m, after filling the mattress width has been reduced. Reduction of width depends upon the properties of fill material and other design specifications.

## Technical Specifications Tech GeoMattress

 <p><b>TECHFAB INDIA</b> At the Heart of Geosynthetic Activity</p>	<h1 style="margin: 0;">TECHFAB (INDIA) INDUSTRIES LTD</h1>			
<p>Tech Geo Mattress (TGM) is a flexible &amp; tubular shaped, erosion protection system used as a river bank revetment. Tech Mat is made up from two-layers of geotextile fabric, upper layer is composite fabric green in color, made of UV stabilized woven high strength polypropylene fabric mechanically bonded with green staple fiber needle-punched nonwovens geotextile and cut fibres on top for extra UV and abrasion protection Lower layer is made of UV stabilized high strength engineered woven fabric.</p>				
<b>Product:</b>	<b>TechGeomattress TGMT-105</b>	<b>Rev No/ Issue No:</b>	<b>00/01</b>	
<b>GEOMATTRESS SPECIFICATION</b>				
Sl. No	Construction	Parameter	Test Method	Value
<b>1</b>	Lower layer	Material of Geotextile		PP Woven Fabric
		Weight of Geotextile	ASTM D-5261	≥400 gsm
		Tensile Strength (MD/CD)	ASTM D-4595	≥78 KN/M
		AOS (Pore size)	ASTM D-6767/ ASTM D-4751	≤350 μm
		UV stability@500 hours	ASTM D-4355	≥80 %
<b>2</b>	Upper Layer	Material of Geotextile		Geocomposite Fabric (Woven pp fabric needle punched with a mixture of green fibres and cut tape yarn )
		Weight of Geotextile	ASTM D-5261	≥650 gsm
		Tensile Strength (MD/CD)	ASTM D-4595	≥42.0 / 42.0 KN/M
		AOS (Pore size)	ASTM D-6767/ ASTM D-4751	≤350 μm
		Abrasion resistance	ASTM D-4886	≥80% of Tensile Strength
		Resistance to oxidation (Strength Retained )	ISO/TR 13438@100°C of 28 days	≥80%
		UV stability@500 hours	ASTM D-4355	≥80 %
<b>3</b>	Sewing Thread of Geomattress	Tensile Strength		≥1000 N
		Tensile Elongation		≥20 %
<b>4</b>	Parallel Stitch	Stitch Position		35 cms+/-2 cms
		Stitch length (MD)		≤40 mm
<b>5</b>	Seam	Seam Tensile Strength		≥25 KN/M
<b>6</b>	Sewing thread for seam jointing	Tensile Strength		≥200 N
		Elongation at break		≥20 %
<b>7</b>	Length	Roll Length		33 mtr
<b>Note:-</b>	<p>The information given in this data sheet is based on tests conducted at our in-house laboratory and independent accredited laboratories. While the information is presented as a true and accurate representation of the attributes of the products to the best of our knowledge, no expressed or implied warranties are made and Techfab (India) Industries Ltd. assumes no responsibility or liability with regard to the use of this information. The right to make periodic revisions of the specifications without prior notice is reserved.</p>			
<p>Contact- 712 Embassy Center, Nariman Point, Mumbai -400021, INDIA Phone: +91 22 2287 6224/6225, Fax: +91 22 2287 6218 email: office@techfabindia.com / tfi@vsnl.netweb: www.techfabindia.com</p>				