

greentex
INDIA

JUTE GEOTEXTILE

The Golden Fiber For A Greener Future



Jute Fiber

Jute is a very old agricultural product cultivated mostly in the Gangetic Delta. Jute is the common name given to the fiber extracted from the stems of plants belonging to the botanical genus *Cochorus*. *C. capsularis* is known as White jute and *C. olitorius* as Tossa jute. Jute plant is known to be annually agro-renewable crops mostly cultivated in the Bengal Delta since 800 BC.

In India, it is the most important commercial agro-renewable fiber crop of nature next to cotton. India, alone, accounts for about 65% of world production of jute and allied fibers. It thrives in hot and humid climate, especially in areas where rainfall is abundant. It grows up to about 3 meters in height usually and matures within four to six months. Jute fibers are extracted from the thin bark and woody core of the plant by a special manual process known as retting.



GreenTex Jute Geotextiles

Geotextiles are textiles applied in soil to enhance its engineering performance. Geotextiles may be either man-made or natural. Man-made geotextiles are made of artificial fibers like polypropylene, polyethylene and some other petrochemical derivatives. Natural geotextiles, on the other hand, are made out of natural fibers like jute, coir and sisal. **GreenTex Jute Geotextiles (JGT)** is a natural technical textile.

GreenTex Jute Geotextiles is an engineering fabric which, when placed in or on soil, helps to improve its engineering performance against extraneous loads by acting as a change agent or a catalyst. Independent researches in the laboratory and field trials have shown **GreenTex Jute Geotextiles** to be technically fit for purpose.

As geotextile acts as a change agent for a limited initial period, shorter life of **GreenTex JGT** is a technical boost. Extensive laboratory studies and field trials with **GreenTex JGT** have substantiated its efficacy in addressing a number of soil-related problems in the field of civil engineering construction.

Successive Governments ignored the jute industry but NDA is firm on reviving the industry, just like we revived the textile sector in Gujarat.



- Hon'ble PM Narendra Modi (via Twitter)



Why GreenTex JGT?

A Boon for the Farmers

The Jute industry is one of the oldest industries in India and a mainstay of the economy in the eastern region, particularly in Bihar and West Bengal. It supports the livelihood of nearly 40 lakh farm families. Using **GreenTex JGT** in construction will directly benefit these families by providing a new dimension to the ailing Jute industry.



A Boost to Employment

The jute industry is labour intensive, thus requiring a large number of people in the value chain. It provides direct employment to about 2.6 lakh industrial workers and livelihood to another 1.4 lakh persons in the tertiary sector and allied activities. Using **GreenTex JGT** will help support these people and create immense employment opportunities.



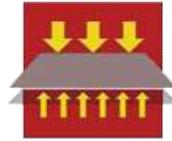
Product Benefits

- Using **GreenTex JGT** leads to atleast 30% savings on base course material costs in construction.
- **GreenTex JGT** is atleast 40% less expensive than synthetic geotextile. It is simple to lay, with minimal labour cost.
- **GreenTex JGT** has high moisture absorbing capacity. It can absorb water upto 5 times its dry weight.
- **GreenTex JGT** has excellent drapability and high tensile strength.
- Easily available, annually renewable and soil friendly.
- **GreenTex JGT** has very high thermal stability.
- **GreenTex JGT** is convenient and easy to apply.
- **GreenTex JGT** has high strength, high permittivity and transmittivity.
- **GreenTex JGT** ensures better load transfer due to its high roughness coefficient.
- Field trials have shown that **GreenTex JGT** increases the CBR by almost twice.

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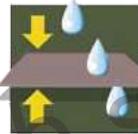
Functions

Separation



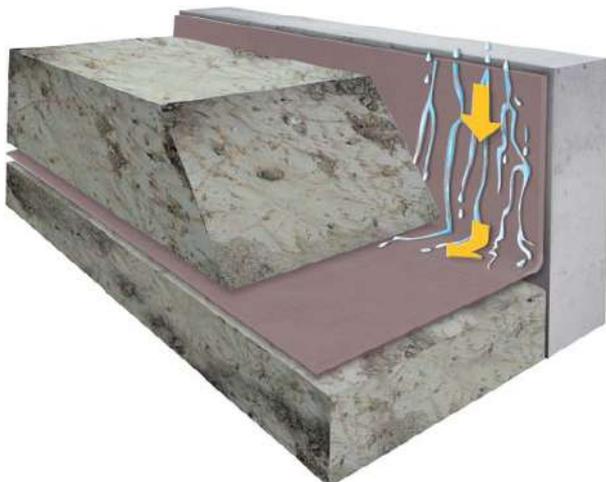
The durability and mechanical properties of **GreenTex Geotextiles** make them ideal for separating layers in construction works. A strong and flexible **GreenTex Geotextile** prevents the migration and intermingling of materials, yet allowing free movement of water. This enhances the load carrying capacity and increases the pavement life. After natural consolidation occurs, no intermingling of two layers can take place.

Filtration



The pore structure of **GreenTex JGT** is designed to retain particles while allowing free movement of water. **GreenTex JGT** creates a natural filter cake formation by retaining the coarser particles in the soil, which in turn prevents migration of even smaller grains. Migration of layers, which would reduce the load bearing capacity of the system is thereby avoided and at the same time water flow is maintained with minimum pressure loss.

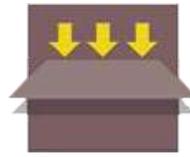
Drainage



GreenTex JGT is designed to perform drainage functions within its own thickness. It facilitates the lateral evacuation of excess water off the construction by draining the water along its plane. **GreenTex JGT** possesses a high degree of transmissivity and is capable of holding water to about 5 times its own weight. This ensures an ongoing drainage of water, thus preventing water accumulation at the sub grade level.

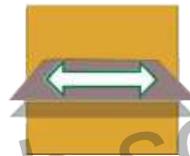
Functions

Soil Erosion Control



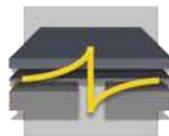
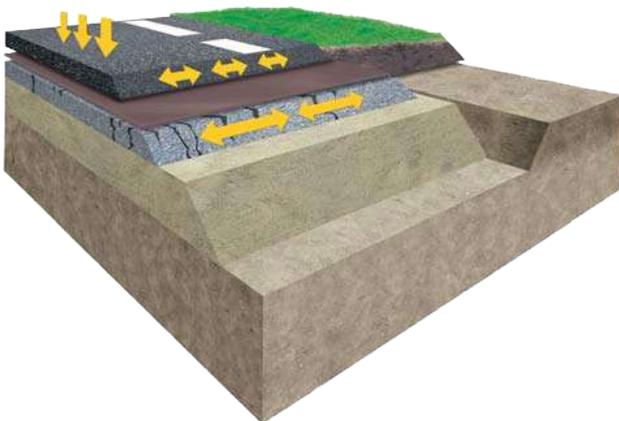
GreenTex JGT is woven from heavy and coarse jute yarn and has a wide open mesh structure, thus making it the ideal erosion control material for soil slopes under all climatic conditions. During water-flow each strand of **GreenTex JGT** forms a mini-dam that traps seeds and soil particles and reduces run-off velocity creating a microclimate conducive to germination of seeds and growth of vegetation to conserve soil.

Reinforcement



The mechanical and hydraulic properties of **GreenTex JGT** make the product ideal for reinforcing slopes and other earthworks. Any large soil body undergoes failure by vertical subsidence, lateral dispersion and rotational slides. The confining action of **GreenTex JGT** can effectively control such failures by curbing soil movement. Stability and strength of such soil-structures is thus substantially enhanced enabling faster construction.

Protection



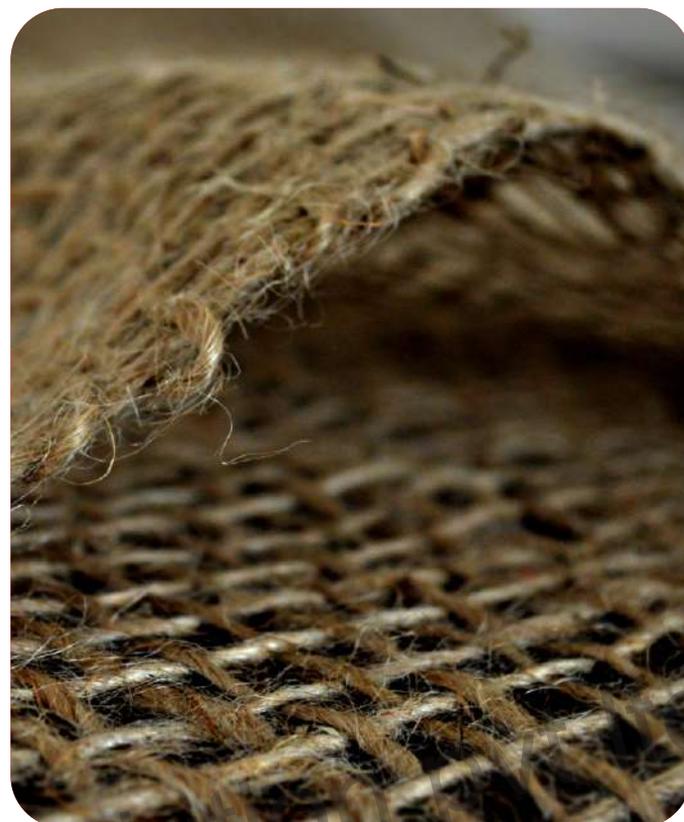
The excellent static puncture resistance of **GreenTex JGT** makes them ideal for protecting sealing materials from puncture when fill material and/or loads are applied. The fabric absorbs and distributes any pressure from the layer above, ensuring that the protected material is not stressed to failure. **GreenTex JGT** thus helps in increasing the load bearing capacity and life of the system.

Apart from the functions mentioned above, **GreenTex JGT** is also designed to provide Bio engineering support to the structure. **GreenTex JGT**, a natural product, fosters vegetation growth as it adds rich organic nutrients to the soil by decomposing. It is eco-friendly, biodegradable and free from toxins and plasticizers. It has no pollutants to run-off into ground water or to disturb the ecological system, unlike its synthetic counterparts.

An Environment-friendly Solution

- **GreenTex JGT**, being an agricultural produce, poses no adverse environmental impact. Its processing and manufacture are essentially pollution free.
- Jute plants used in the production of **GreenTex JGT** deliver about 11 metric ton of oxygen and takes away about 12 metric ton of harmful carbon dioxide over a period of 120 days in one hectare of land.
- Quantities of chemical pesticides and fertilizers that are usually necessary for jute cultivation are far less than other crops.
- Jute cultivation facilitates multiple cropping pattern, enabling farmers to increase their field outputs.
- Being biodegradable, **GreenTex JGT** coalesces with the soil on which it is laid, adding nutrients to it and retaining water for quicker growth of vegetation.

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- Water used in **GreenTex JGT** processing doesn't pollute ground water and can be used again for irrigation.
- **GreenTex JGT** is carbon neutral and doesn't draw upon valuable nitrogenous reserves of the soil.
- A comparative study between **GreenTex JGT** and Synthetic geotextile in respect of waste generation, energy consumption and CO₂ emission in their production is given below:

	GreenTex	Synthetic	Ratio (Synthetic/GreenTex)
Waste Generated (ton/ton)	0.9	5.5	6.1
Energy Used (GJ/ton)	5.4-14.35	84.3	5.9-15.6
CO ₂ Emission (ton/ton)	0-1.2	3.7-7.5	6-20

Around 6 times more waste is generated, 10 times more energy is used and 10 times more carbon dioxide is released in production of synthetic geotextile in comparison to **GreenTex JGT**.



GreenTex JGT 724

GreenTex JGT 724 is closed weave woven jute geotextile. It is manufactured by interlacement of warp and weft jute yarns set at right angle to each other through a machine called loom. The terms warp and weft are used to distinguish between the two different directions of yarns. Warp defines the longitudinal yarn, i.e. the direction in which production proceeds (also called machine direction or MD). Weft defines the transverse direction, i.e. running width-wise of the fabric (also known as cross machine direction or CD).

Application Areas

- Construction of road and railway embankments on soft soil.
- Strengthening of road pavement.



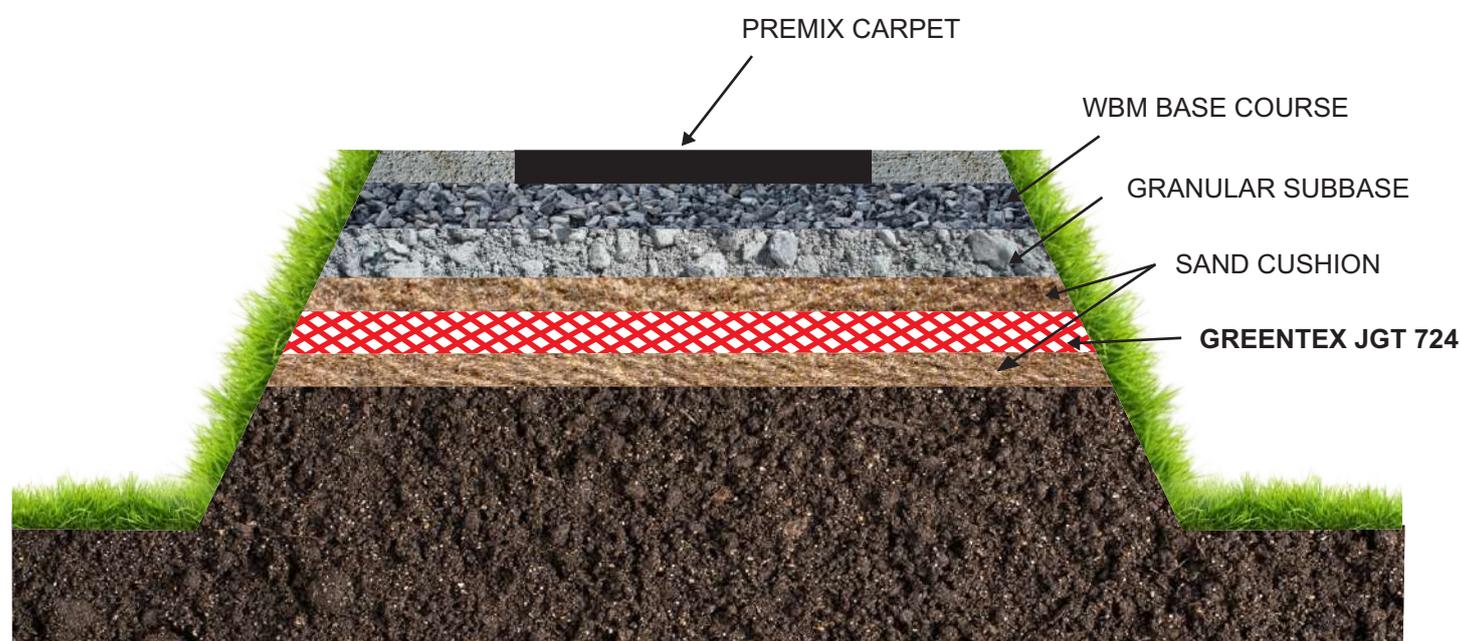
Installation Instructions

1. Excavate the sub grade to the required level, removing any foreign materials, vegetation etc.
2. Lay a cushion of sand approx. 25-30 mm thick over the subgrade to facilitate better drainage.
3. Lay **GreenTex JGT 724** by unrolling, ensuring proper drapability. Successive lapped lengths should be overlapped by 150 mm and the fabric should be stapled at 750 mm intervals using 11 gauge U shaped nails.
4. A cushion of sand approx. 25 mm thick should be spread over **GreenTex JGT 724** to prevent damage due to rolling.
5. For application in curves, **GreenTex JGT 724** should be folded or cut and overlapped in the direction of the turn.

Specifications

Material	100% Natural Jute Fiber
Weight at 20% Moisture regain (g/m ²)	724
Ends × Picks / dm	≥ 94 × 39
Thickness at 2 kPa (mm)	1.85 (±10%)
Tensile Strength in MD × CD, kN/m	≥ 25 × 25
Elongation at break (%) (MD × CD)	10 × 10 (±10%)
Puncture Resistance (kN)	≥ 0.500
Burst Resistance (kPa)	≥ 3500
Permittivity at 50 mm constant head (/sec)	≥ 0.35
A.O.S., O ₉₅ (Micron)	150-400

Typical Fastening Details



GreenTex JGT 627

GreenTex JGT 627 is closed weave woven jute geotextile. Its manufacturing process is similar to **GreenTex JGT 724**.

Application Areas

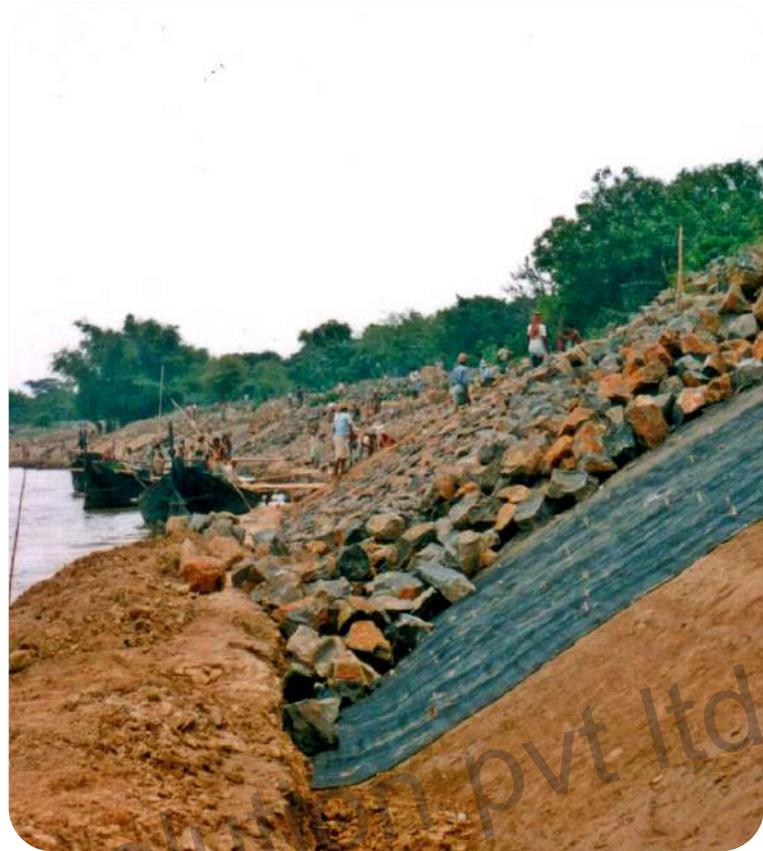
- River and canal bank protection

Installation Instructions

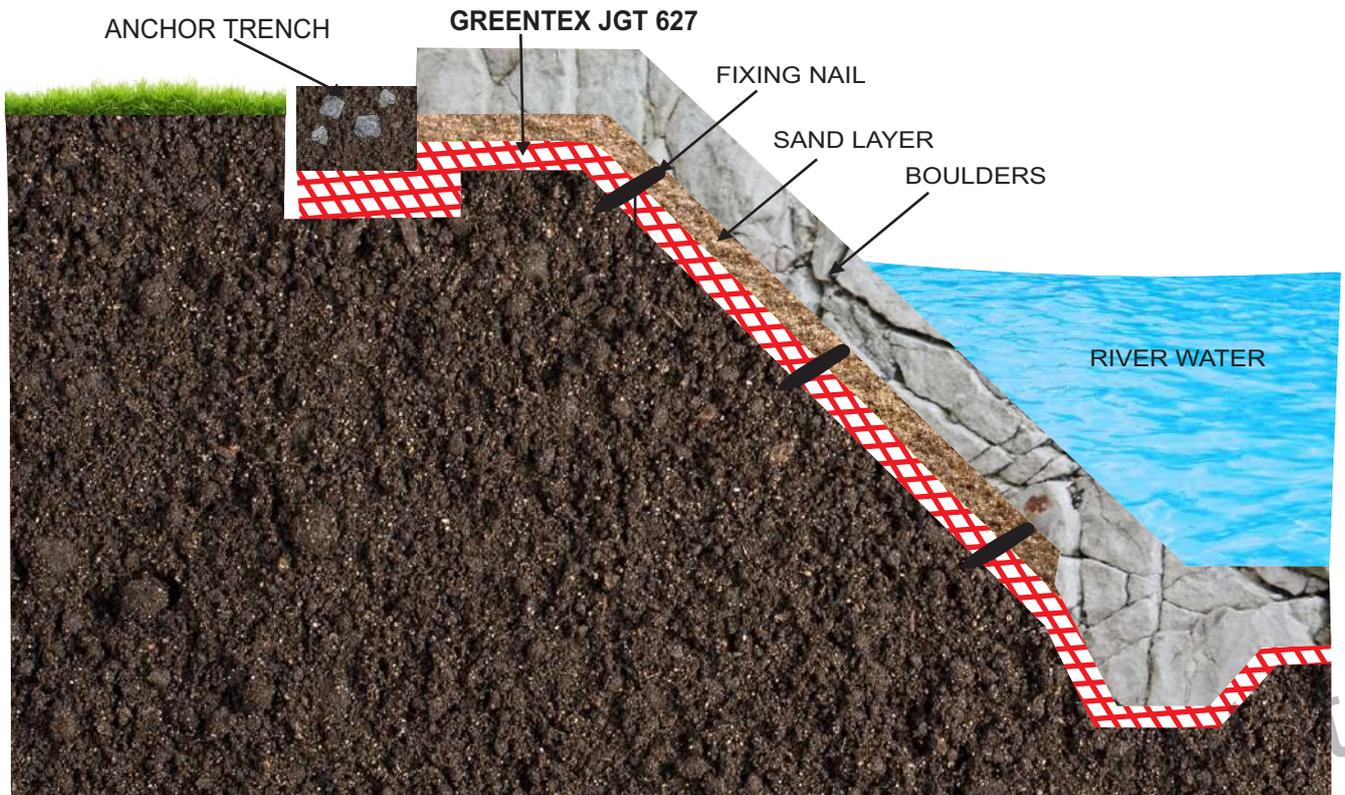
1. Cut the bank to a stable slope, removing angular projections, soil slurry, mud etc.
2. Excavate an anchoring trench at the top of the slope approx. 500 mm deep and 250 mm wide.
3. Covering the sloped area is easily achieved by unfolding the **GreenTex JGT 627** from the top of the slope. Successive lapped lengths should be overlapped by 150mm
4. Peg down **GreenTex JGT 627** at 300 mm grid intervals both down and across the slope. Steel staples of 11 gauge diameter, notched to snag the fabric are recommended.
5. **GreenTex JGT 627** should be laid with overlapping in the direction of water flow.
6. The anchoring trench should be filled with boulders for securing and protecting the **GreenTex JGT 627**.
7. An overlay of boulders should be placed on **GreenTex JGT 627**. A 25 mm layer of sand should be placed as a cushion on the JGT.

Specifications

Material	100% Natural Jute Fiber
Weight at 20% Moisture regain (g/m ²)	627
Ends × Picks / dm	≥ 85 × 32
Thickness at 2 kPa (mm)	1.70 (±10%)
Tensile Strength in MD × CD, kN/m	≥ 20 × 20
Elongation at break (%) (MD × CD)	8 × 8 (±10%)
Puncture Resistance (kN)	≥ 0.400
Burst Resistance (kPa)	≥ 3100
Permittivity at 50 mm constant head (/sec)	≥ 0.35
A.O.S., O ₉₅ (Micron)	150-400



Typical Fastening Details



GreenTex Non Woven 500, 1000

GreenTex Non-woven range is a type of non-woven jute geotextile. It is manufactured by continuous laying of fibers on a moving conveyor belt bonding them by mechanical processes such as needle punching, thermal process and chemical processes.

Application Areas

- Areas where filtration and drainage are required.
- Construction of rubber drains by the sides of roads and railways.
- Drainage for fill materials in flyovers.

Specifications

Properties	Type 1	Type 2
Material	100% Natural Jute Fiber	
Weight at 20% Moisture regain (g/m ²)	500	1000
Thickness (mm)	4 (±10%)	7 (±10%)
Width (cm)	150	150
Tensile Strength in MD × CD, kN/m	≥ 4 × 5	≥ 5 × 6
Elongation at break (%) (MD × CD)	5 × 6 (±15%)	4 × 8 (±15%)
Permittivity at 50 mm constant head (/sec)	≥ 1.94	-
Burst Strength (kPa)	≥ 1750	-
A.O.S., O ₉₅ (Micron)	265	-



GreenTex SoilSaver 730, 500, 292

GreenTex SoilSaver range is a type of open weave woven jute geotextile. It has an open structure similar to a net with a varying pore size. Its manufacturing process is similar to **GreenTex JGT 627** and **724**.

Application Areas

- Slopes of roads, railway and hill
- Bridge abutments, slope of reservoirs and embankments
- Stabilization of sand dunes on sea beaches, overburden dumps of open cast mines and flyash dumps of power plants
- Afforestation in semi-arid zones

Installation Instructions

1. Level the area, removing rocks, roots etc. to allow maximum soil contact with **GreenTex SoilSaver**.
2. Lay **GreenTex SoilSaver** loosely to closely match topsoil contours taking care not to stretch SoilSaver between anchor points.
3. Covering a sloped area is easily achieved by unfolding the **GreenTex SoilSaver** from the top of the slope. Successive lapped lengths should be overlapped by 150mm at ends and 100 mm at sides.
4. When unfolding the **GreenTex SoilSaver**, the beginning of the lapped length should be anchored in a lock trench approx. 150 mm deep and 150 mm wide.
5. Peg down **GreenTex SoilSaver** at 500 mm grid intervals both down and across the slope. Spilt bamboo pegs or steel staples of 11 gaugedia, notched to snag the fabric are recommended.
6. Avoid openings between adjacent lengths.

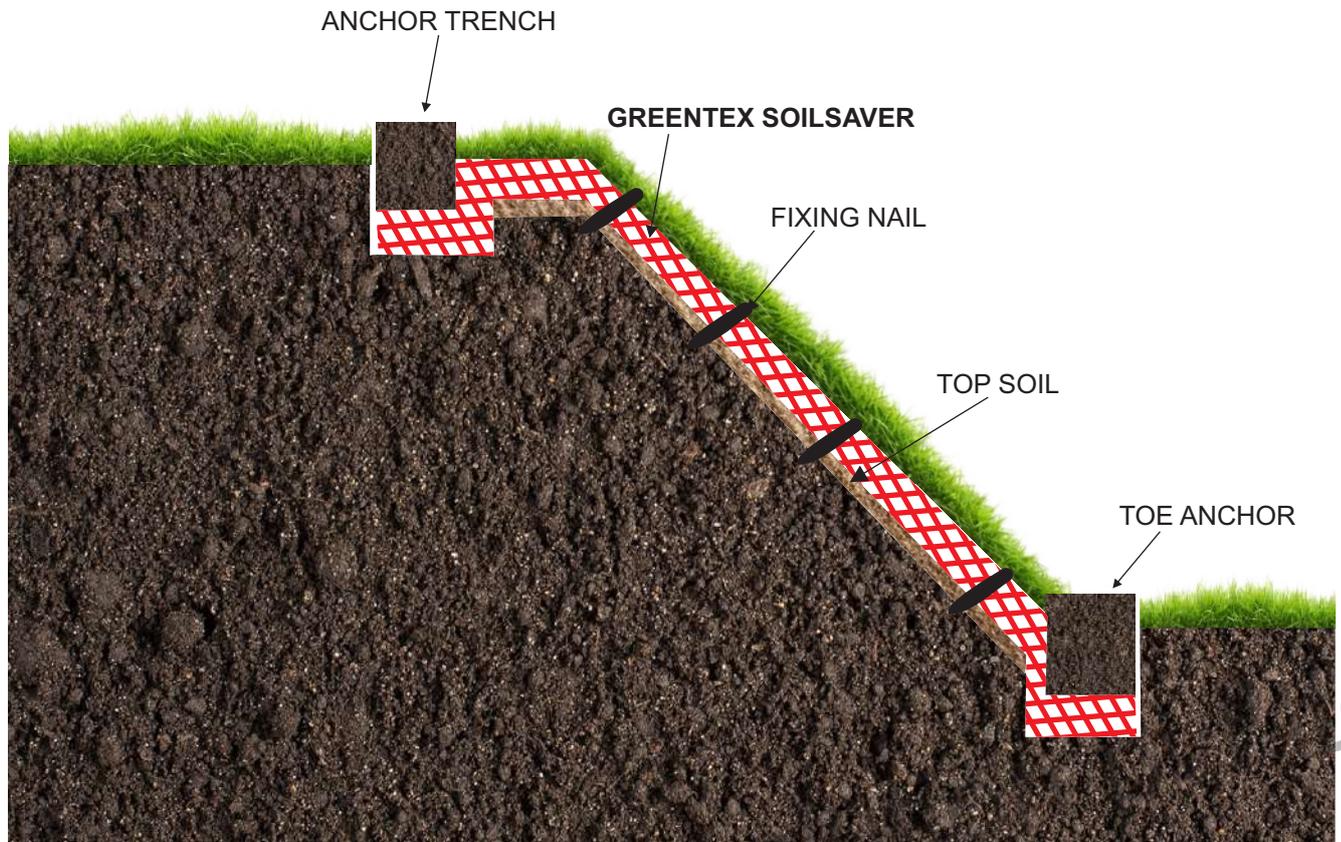


Specifications

Properties	Type 1	Type 2	Type 3
Material	100% Natural Jute Fiber		
Weight at 20% Moisture regain (g/m^2)	730	500	292
Threads/dm (MD \times CD)	7 \times 7	6.5 \times 4.5	11 \times 12
Thickness (mm)	7	5	3
Width (cm)	122	122	122
Aperture Size (mm)	12 \times 12	13 \times 20	8 \times 7
Strength (kN/m) (MD \times CD)	12 \times 12	10.4 \times 7.9	10 \times 10
Elongation at break (%) (MD \times CD)	10 \times 12	11 \times 15	12 \times 12



Typical Fastening Details



GreenTex PVJD

GreenTex Pre Fabricated Vertical Jute Drain is used for accelerated consolidation of soft soil. It is manufactured using woven jute geotextile and coir wicks. These coir wicks are inserted with jute sheaths.

Application Areas

- Airports, warehouses and car parks.
- Repairing of road and railway embankments made up of compressible fill material

Specifications

Material	100% Natural Jute Fiber and coir
Width (mm)	100
Thickness (mm)	5
Tensile Strength (kN/100 mm)	45
Pore Size O_{90} (Micron)	300
Discharge capacity at 50 kPa hydraulic gradient (ml/sec)	13





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