

## Specification of Geotextile as per Specification for Building and Roads 2023

The Geotextiles to be applied in NRDCL forest Roads should comply with the following:

1. **Type:** should be Non-Woven
2. **Size :** Width = 3m, L= as applicable
3. **GSM:** Min GSM should be **150 g/m<sup>2</sup>**

The Geotextile should conform to the following

### 3.86 Geotextile:

Geotextile shall be made of polyethylene or polypropylene or polyester or similar fibers, either woven or nonwoven in variety, through machine made process of heat bonding or needle punching or weaving techniques. These fabrics are required to pass water through but retain the particles, which require specific cross-plane permeability or permittivity and apparent opening size or equivalent opening size or 095. The above two requirements along with the requirement of strength and durability denote general characteristics of geotextiles to be used.

(a) Sustain a load of not less than 10 kN/m at break and have a minimum failure strain of 10 per cent when determined in accordance with BS:6906 (Part 1) or shall have a grab tensile strength more than 0.4kN/m and elongation corresponding to this limit in accordance with ASTM D 4632.

(b) The apparent opening size shall satisfy the following:

**TABLE 3.62 APPARENT OPENING SIZE**

Test Method	Units	Requirements per cent in-situ soil passing 0.075mm		
		<15	15 to 50	>50
ASTM D4751	mm	0.43	0.25	0.22**

These default filtration property values are based on the predominant particle size of insitu soil. In addition to the default permittivity value, the Engineer may require geotextile permeability and/or performance testing based on engineering design for drainage systems in problematic soil environments.

† Site specific geotextile design should be performed especially if one or more of the following problematic soil environments are encountered; unstable or highly erodible soils such as non-cohesive silts; gap graded soils; alternating sand/silt laminated soils; dispersive clays; and/or rock flour.

For cohesive soils with a plasticity index greater than 7, geotextile maximum average roll values for apparent opening size is 0.30mm.

(c) Allow water to flow through it at right angles to its principal plane, in either direction at a rate of not less than 10 litres/m<sup>2</sup> /sec. Under a constant head of water of

100mm, determined in accordance with BS: 6906 (Part 3) or ASTM D 4491 or as stated in the design drawing. The flow rate determined in the test shall be corrected to that applicable to a temperature of 15°C using published data on variation in viscosity of water with temperature.

(d) Have a minimum puncture resistance of 200N when determined in accordance with BS: 6906 (Part 4) or ASTM D 4833.

(e) Have a minimum tear resistance of 150N when determined in accordance with ASTM Standard D 4533.

The composite drain shall have a flow rate through each face of the drain of more than 75 per cent of the value determined by direct measurement of the composite drain using BS: 6906 (Part 3). The composite drain shall have values of long-term in-plane flow rates as stated in the design drawing.

**Testing and acceptance:** Geotextiles shall be tested in accordance with tests prescribed by BIS. In absence of IS Codes, tests prescribed either by ASTM or British Standards or International Standards Organization shall be conducted.

## Procedure to apply Geotextile

### 1. Prepare the Site:

- Clear the forest road of any debris, vegetation, or obstacles that may interfere with the installation process.
- Grade the road surface to ensure uniformity and proper drainage.
- Compact the soil to provide a stable base for the geotextile fabric.

### 2. Cut and Layout Geotextile Fabric:

- Roll out the geotextile fabric along the length of the road, starting from the lowest point and working upwards.
- Cut the fabric to size, allowing for overlapping at seams and edges. Ensure that each piece of fabric covers the entire width of the road.

### 3. Secure the Fabric:

- Anchor the geotextile fabric in place using stakes, pins, or heavy objects to prevent it from shifting during installation.
- Overlap adjacent pieces of fabric by a minimum of 12 inches and secure them with fasteners or adhesive tape to create a continuous barrier.

### 4. Cover and Protect:

- Once the geotextile fabric is installed, cover it with a layer of earth or suitable surfacing material to provide additional stability and protection.



**5. Documentation:**

- Keep detailed records of the geotextile installation process, including material specifications, installation techniques, and any modifications made during construction.
- Document maintenance activities and inspections to track the performance of the geotextile fabric over time and identify areas for improvement.

**6. Soling and Edging**

- After laying out the Geotextile, Edging and soling works to start immediately.



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Geotextile Fabric





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Natural Resources Development Corporation Limited  
ROYAL GOVERNMENT OF BHUTAN  
THIMPHU: BHUTAN



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