

## **TENDER SPECIFICATION**

### **FOR SUPPLY OF NON WOVEN NEEDLE PUNCHED, MECHANICALLY BONDED GEOTEXTILE**

#### **(SEPARATION, FILTRATION AND DRAINAGE APPLICATION)**

#### **1.0 GENERAL**

This work comprises supply of Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile conforming to the material specifications stated herein, as per the bill of quantity and schedule of supplies enclosed.

#### **2.0 MATERIALS**

##### **2.1 General Requirements**

Non-woven Needle punched mechanically bonded Polypropylene Geotextile shall be made of polypropylene staple fibers. These engineered Geotextiles shall be stabilized to resist degradation due to ultraviolet exposure and shall be resistant to commonly encountered soil chemicals, mildew and insects, and shall be non-biodegradable.

Indigenously manufactured Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile 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 visit 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.

##### **2.2 Transportation, Storage and Handling**

All rolls shall have a protective cover with a label or tag specifying name of the product, name of the manufacturer, roll number, date of manufacture and roll dimension.

Material shall be protected from sunlight, 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 ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, high temperatures, and any other environmental conditions that may damage the physical property

values of the Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile.

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 ISO 9001:2008 and In-house Laboratory should have certificate of NABL Accreditation ISO/IEC 17025:2005.

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

CE-certification (BTTG certification) should be required for supply of material.

Manufacturer shall submit the proof of supply and satisfactory performance for the quantity of 10000 Sqmt at least, for projects in India.

Contractor shall furnish proof of all above and it is mandatory.

### 2.4 Physical and Mechanical Properties

The Mechanical properties of Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile shall conform to Table-1 below:

Table-1

<i>Property</i>	<i>Test Method</i>	<i>Unit</i>	<i>Type I</i>	<i>Type II</i>	<i>Type III</i>	<i>Type IV</i>	<i>Type V</i>	<i>Type VI</i>	<i>Type VII</i>	<i>Type VIII</i>	<i>Type IX</i>	<i>Type X</i>
<b>Physical</b>												
Mass per unit area	ASTM D 5261	g/m <sup>2</sup>	150	200	230	270	300	330	350	450	500	540
Thickness	ASTM D 5199	Mm	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.7	2.9	3.2
<b>Mechanical</b>												
Grab tensile strength	ASTM D 4632	N	540	720	810	920	1010	1110	1160	1450	1570	1700
Grab elongation	ASTM D 4632	%	50	50	50	50	50	50	50	50	50	50
Puncture strength	ASTM D 4833	N	315	400	470	580	650	715	750	830	910	1010
Trapezoidal tear	ASTM D 4533	N	230	300	340	380	415	450	480	540	600	646
Mullen burst	ASTM D 3786	kPa	1655	2175	2415	2760	3185	3585	3780	4300	4700	5180
<b>Hydraulic</b>												
Apparent opening size (O <sub>95</sub> )	ASTM D4751	µm	212	212	212	180	150	150	150	150	150	150

Permittivity	ASTM D4491	s <sup>-1</sup>	1.8	1.6	1.5	1.4	1.3	1.2	1.2	0.7	0.7	0.7
Water flow rate	ASTM D 4491	l/m <sup>2</sup> /min	4800	4450	4070	3660	3455	3250	3250	2035	2035	2035
<b>Endurance</b>												
Ultraviolet resistance @ 500 hours	ASTM D 4355	%	70	70	70	70	70	70	70	70	70	70
Roll Length		M	100	100	100	100	100	100	100	100	100	100
Roll Width		M	5	5	5	5	5	5	5	5	5	5
Roll weight		Kg	75	100	115	135	150	165	175	225	250	270

### 3 INSTALLATION

#### 3.1 Site Preparation

The site shall be prepared by clearing, grubbing, and excavation or filling the area to the design grade. This includes removal of topsoil and vegetation.

#### 3.2 Laying of Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile

The Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile shall be laid smooth without wrinkles or folds on the prepared subgrade and or prepared surface if shown in the drawings with the machine direction oriented in the direction of traffic.

Adjacent rolls shall be overlapped as shown on the drawings. Unless otherwise shown on the drawings or directed by the Engineer, the minimum overlap shall be 300 to 500 mm for subgrade of CBR greater than or equal to 3 and 600 to 1000 mm for CBR between 1 and 3. All roll ends shall be overlapped by 1000 mm.

On curves, the Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile may be folded or cut to conform to the curves. The fold or overlap shall be in the direction of construction and held in place by pins.

Prior to placing subgrade or backfill material as per project requirements the installed Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile shall be inspected and approved by the Engineer. Any damages shall be repaired by covering the damaged location with a Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile patch, which extends an amount equal to the required overlap beyond the damaged area, as directed by the Engineer.

#### 3.3 Placing and Compacting Subgrade Course

The subgrade shall be placed by end dumping onto the Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile from the

edge of the Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile.

Movement of construction equipment directly over the Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile shall not be permitted.

Sudden breaking and sharp turning of construction equipment shall be avoided over the laid Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile.

Any ruts occurring during construction shall be filled with additional subgrade material, and compacted to the specified density

## **4 APPROVED MANUFACTURERS**

### **4.1 Approved Manufacturers**

- (1) Techfab (India) Industries Ltd.  
712 Embassy Centre,  
Nariman Point, Mumbai – 400021  
Phone: 022 – 2287 6224/6225  
Fax: 022 – 2287 6218

## **5 DELIVERY**

Delivery of Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile shall be done according to the delivery schedule.

## **6 PAYMENT**

### **6.1 Method of Measurement**

Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile will be measured by the Square Meter of material received at the owner's / contractor's store.

### **6.2 Basis of Payment**

Payment for the supply of Non-woven Needle Punched Mechanically Bonded Polypropylene Geotextile 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-----